CICS® Transaction Server for OS/390®

CICS Diagnosis Reference

Release 3

LY33-6088-02

CICS® Transaction Server for OS/390®

CICS Diagnosis Reference

Release 3

LY33-6088-02

Note!

Before using this information and the product it supports, be sure to read the general information under "Notices" on page xxi.

Third edition (March 1999)

This edition applies to Release 3 of CICS Transaction Server for OS/390, program number 5655-147, and to all subsequent versions, releases, and modifications until otherwise indicated in new editions. Make sure you are using the correct edition for the level of the product.

This edition replaces and makes obsolete the previous edition, LY33-6088-00. The technical changes for this edition are summarized under "Summary of changes" and are indicated by a vertical bar to the left of a change.

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Preface

What this book is about

When the term ”CICS” is used without any qualification in this book, it refers to the CICS element of IBM CICS Transaction Server for OS/390.

”MVS” is used for the operating system, which can be either an element of OS/390, or MVS/Enterprise System Architecture System Product (MVS/ESA SP).

This book gives a detailed description of the various components that make up a CICS system. It also provides reference tables of CICS source modules and executable modules.

This book is intended to help you in diagnosing problems with CICS.

Who this book is for

This book provides a basis for communication between the system programmer and the IBM support representative whenever a problem with CICS code is suspected.

What you need to know to use this book

You should have system programming experience and a good working knowledge of CICS and of the functions used in your system to support CICS applications.

Before using this book, you should have read the *CICS Problem Determination Guide* to learn about the general approach to CICS problem-solving and the procedures to use when diagnosing and reporting system problems. You should already be familiar with the general layout of CICS traces and dumps.

In addition, you may need to refer to the following books in the CICS library while diagnosing what appears to be a system problem:

- The *CICS Data Areas* manual for details of the layout and contents of CICS data areas
- The *CICS Messages and Codes* manual for information about the messages and abend codes that can be issued by a running CICS system

Determining if a publication is current

IBM regularly updates its publications with new and changed information. When first published, both hardcopy and BookManager softcopy versions of a publication are usually in step. However, due to the time required to print and distribute hardcopy books, the BookManager version is more likely to have had last-minute changes made to it before publication.

Subsequent updates will probably be available in softcopy before they are available in hardcopy. This means that at any time from the availability of a release, softcopy versions should be regarded as the most up-to-date.

For CICS Transaction Server books, these softcopy updates appear regularly on the *Transaction Processing and Data Collection Kit* CD-ROM, SK2T-0730-xx. Each reissue of the collection kit is indicated by an updated order number suffix (the -xx part). For example, collection kit SK2T-0730-06 is more up-to-date than SK2T-0730-05. The collection kit is also clearly dated on the cover.

Updates to the softcopy are clearly marked by revision codes (usually a "#" character) to the left of the changes.

Notes on terminology

The following abbreviations are used throughout this book:

Term	Meaning
CICS	When used without qualification in the book, refers to the CICS element of IBM CICS Transaction Server for OS/390
ESA	IBM Enterprise Systems Architecture/370 (ESA/370)
MVS	The IBM operating system, which can be either an element of OS/390, or MVS/Enterprise System Architecture System Product (MVS/ESA SP)
VTAM	IBM Advanced Communications Function/Virtual Telecommunications Access Method (ACF/VTAM)
VTAM/NCP	IBM Virtual Telecommunications Access Method/Network Control Program (VTAM/NCP)
TCAM	The DCB interface of the IBM Advanced Communications Function/Telecommunications Access Method (ACF/TCAM)
IMS	IMS/ESA
DL/I	The DL/I facilities of IMS/ESA
FEPI	Front End Programming Interface

Book structure

The structure of this book is as follows:

Part 1, "Introduction" on page 1
gives an introduction to this book and to the structure of CICS.

Part 2, "CICS components" on page 9
describes the various CICS components (domains and functions).

Part 3, "CICS modules" on page 713
lists alphabetically the contents of the CICS distribution material, gives tables showing the link-edit relationships between object modules and load modules in a CICS system, and also describes briefly many of the CICS executable modules.

CICS Transaction Server for OS/390

CICS Transaction Server for OS/390: Planning for Installation	GC33-1789
CICS Transaction Server for OS/390 Release Guide	GC34-5352
CICS Transaction Server for OS/390 Migration Guide	GC34-5353
CICS Transaction Server for OS/390 Installation Guide	GC33-1681
CICS Transaction Server for OS/390 Program Directory	GI10-2506
CICS Transaction Server for OS/390 Licensed Program Specification	GC33-1707

CICS books for CICS Transaction Server for OS/390

General	
CICS Master Index	SC33-1704
CICS User's Handbook	SX33-6104
CICS Transaction Server for OS/390 Glossary (softcopy only)	GC33-1705
Administration	
CICS System Definition Guide	SC33-1682
CICS Customization Guide	SC33-1683
CICS Resource Definition Guide	SC33-1684
CICS Operations and Utilities Guide	SC33-1685
CICS Supplied Transactions	SC33-1686
Programming	
CICS Application Programming Guide	SC33-1687
CICS Application Programming Reference	SC33-1688
CICS System Programming Reference	SC33-1689
CICS Front End Programming Interface User's Guide	SC33-1692
CICS C++ OO Class Libraries	SC34-5455
CICS Distributed Transaction Programming Guide	SC33-1691
CICS Business Transaction Services	SC34-5268
Diagnosis	
CICS Problem Determination Guide	GC33-1693
CICS Messages and Codes	GC33-1694
CICS Diagnosis Reference	LY33-6088
CICS Data Areas	LY33-6089
CICS Trace Entries	SC34-5446
CICS Supplementary Data Areas	LY33-6090
Communication	
CICS Intercommunication Guide	SC33-1695
CICS Family: Interproduct Communication	SC33-0824
CICS Family: Communicating from CICS on System/390	SC33-1697
CICS External Interfaces Guide	SC33-1944
CICS Internet Guide	SC34-5445
Special topics	
CICS Recovery and Restart Guide	SC33-1698
CICS Performance Guide	SC33-1699
CICS IMS Database Control Guide	SC33-1700
CICS RACF Security Guide	SC33-1701
CICS Shared Data Tables Guide	SC33-1702
CICS Transaction Affinities Utility Guide	SC33-1777
CICS DB2 Guide	SC33-1939

CICSPlex SM books for CICS Transaction Server for OS/390

General	
CICSPlex SM Master Index	SC33-1812
CICSPlex SM Concepts and Planning	GC33-0786
CICSPlex SM User Interface Guide	SC33-0788
CICSPlex SM View Commands Reference Summary	SX33-6099
Administration and Management	
CICSPlex SM Administration	SC34-5401
CICSPlex SM Operations Views Reference	SC33-0789
CICSPlex SM Monitor Views Reference	SC34-5402
CICSPlex SM Managing Workloads	SC33-1807
CICSPlex SM Managing Resource Usage	SC33-1808
CICSPlex SM Managing Business Applications	SC33-1809
Programming	
CICSPlex SM Application Programming Guide	SC34-5457
CICSPlex SM Application Programming Reference	SC34-5458
Diagnosis	
CICSPlex SM Resource Tables Reference	SC33-1220
CICSPlex SM Messages and Codes	GC33-0790
CICSPlex SM Problem Determination	GC33-0791

Other CICS books

CICS Application Programming Primer (VS COBOL II)	SC33-0674
CICS Application Migration Aid Guide	SC33-0768
CICS Family: API Structure	SC33-1007
CICS Family: Client/Server Programming	SC33-1435
CICS Family: General Information	GC33-0155
CICS 4.1 Sample Applications Guide	SC33-1173
CICS/ESA 3.3 XRF Guide	SC33-0661

If you have any questions about the CICS Transaction Server for OS/390 library, see *CICS Transaction Server for OS/390: Planning for Installation* which discusses both hardcopy and softcopy books and the ways that the books can be ordered.

Summary of changes

This edition of the *CICS Diagnosis Reference* is based on the CICS Transaction Server for OS/390 Release 2 edition. Changes from the CICS Transaction Server for OS/390 Release 2 edition are marked by a vertical line to the left of the change.

Changes for this CICS Transaction Server for OS/390 Release 3 edition

The main changes for this edition are as follows:

- Trace entries have been moved to the *CICS Trace Entries* by popular demand.
- New gates have been added to the following domains to support the 3270 bridge:
  - Application domain, starting on page 11.
  - Transaction Manager domain, starting on page 627.

Changes for the CICS Transaction Server for OS/390 Release 2 edition

The main changes for the previous edition are as follows:

- New chapters on the new domain components of CICS were added:
  - Log manager domain, starting on page 383.
  - VTAM generic resources, starting on page 685.
  - Recovery manager domain, starting on page 457.
- The file control chapter has been amended to show new function within file control.
- The following chapters have been deleted:
  - Asynchronous processing.
  - Dynamic backout programming.
  - Emergency restart.
  - Journaling chapters and system log/journaling utilities - this is largely replaced by the Log manager domain.
  - Local DL/I.
  - Shared databases.
  - Time of day control.
  - Volume control.

Changes for the CICS/ESA 4.1 edition

The book was enhanced to reflect the changes to the CICS product for CICS/ESA 4.1.

A new part that provides the CICS trace interpretation tables, was moved from the *CICS Trace Entries*.

New chapters on the new domain components of CICS were added:

- Directory manager domain, starting on page 153.
- Program manager domain, starting on page 437.
- Security manager domain, starting on page 497. (The security manager chapter has been removed.)
- Transaction manager domain, starting on page 627. (The transaction manager chapter has been removed.)
- User domain, starting on page 671.

The functions of the terminal allocation program (DFHALP) were replaced by calls to the TFAL gate. For information about the TFAL gate functions, see page 31.

A new chapter about the Kernel sub-component of the application domain, Chapter 5, "AP domain KC subcomponent" on page 47, was added.

The following sections from Chapter 39, "Front end programming interface (FEPI)" on page 323 were moved to the *CICS Problem Determination Guide*:

- Problem determination
- FEPI waits
- FEPI abends
- Reporting a FEPI problem to IBM

Changes for the CICS/ESA 3.3 edition

This book has been enhanced to reflect the changes to the CICS product for CICS/ESA 3.3.

There is a new section on the distributed program link component of CICS, starting on page 169.

The section on the system recovery component of CICS have been extensively rewritten while including details of the changes to this component in CICS Transaction Server for OS/390 Release 3.

Part 1. Introduction

This book describes the functional areas (or components) into which CICS is divided. To understand more about a particular functional area, use the contents list and the index to find the appropriate information.

If you are using this book to diagnose a system problem, to find out whether a function is **working as designed**, you should also consult the special topic, administration, or programming books in the CICS Transaction Server for OS/390 5.1 library listed at the front of this book.

In this and other CICS books, the word “component” is used in a general way to refer to any unit of code that performs an identifiable set of functions and manages a certain type of data.

Some CICS components are shipped as **object code only (OCO)**. If the component causing a problem is OCO, it is the responsibility of IBM to diagnose the problem further. If the component is not OCO, you can refer to the source code on microfiche, and use the detailed information in this book to identify more specifically the cause of the problem. The Chapter 104, “CICS directory” on page 715 shows which CICS object modules are regarded as OCO; no source code is available for these modules.

Chapter 1. CICS domains

At the top level, CICS is organized into **domains** as shown in Figure 1. With the exception of the application domain (more about this later), each domain is a single major component of CICS.

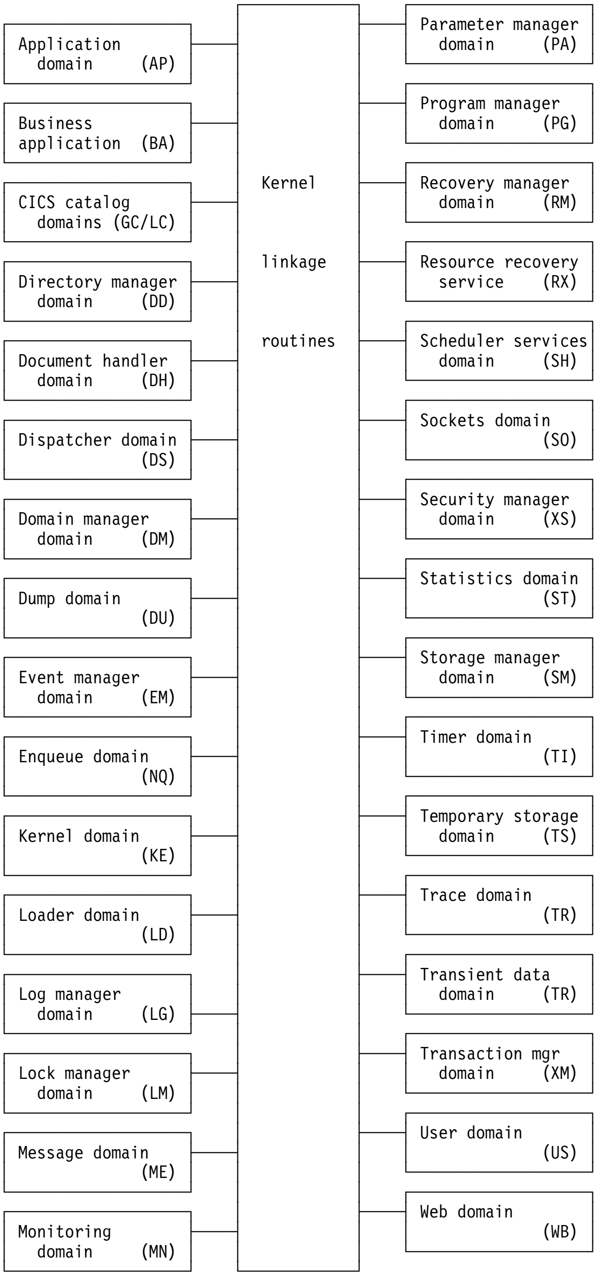

Application domain (AP)
Business application (BA)
CICS catalog domains (GC/LC)
Directory manager domain (DD)
Document handler domain (DH)
Dispatcher domain (DS)
Domain manager domain (DM)
Dump domain (DU)
Event manager domain (EM)
Enqueue domain (NQ)
Kernel domain (KE)
Loader domain (LD)
Log manager domain (LG)
Lock manager domain (LM)
Message domain (ME)
Monitoring domain (MN)
Kernel linkage routines
Parameter manager domain (PA)
Program manager domain (PG)
Recovery manager domain (RM)
Resource recovery service (RX)
Scheduler services domain (SH)
Sockets domain (SO)
Security manager domain (XS)
Statistics domain (ST)
Storage manager domain (SM)
Timer domain (TI)
Temporary storage domain (TS)
Trace domain (TR)
Transient data domain (TR)
Transaction mgr domain (XM)
User domain (US)
Web domain (WB)

Figure 1. CICS organization—domains. The domain identifiers are shown in parentheses.

Domains never communicate directly with each other. Calls between domains are routed through kernel linkage routines. Calls can be made only to official interfaces to the domains, and they must use the correct protocols.

Each domain manages its own data. No domain accesses another domain's data directly. If a domain needs data belonging to another domain, it must call that domain, and that domain then passes the data back in the caller's parameter area.

The following table lists the CICS domains alphabetically by domain identifier. For each domain, the table also shows whether or not the domain is OCO, and gives a page reference to the section describing the interfaces to the domain.

Domain ID	Domain	OCO?	See page
AP	Application	See note	11
BAM	Business Application Manager	Yes	101
DD	Directory manager	Yes	153
DH	Document handler	Yes	181
DM	Domain manager	Yes	191
DS	Dispatcher	Yes	157
DU	Dump	No	197
EM	Event mamager	Yes	233
EX	External CICS interface	Yes	253
GC	Global catalog	Yes	125
KE	Kernel	Yes	357
LC	Local catalog	Yes	125
LD	Loader	Yes	371
LG	Log manager	Yes	383
LM	Lock manager	Yes	379
ME	Message	Yes	403
MN	Monitoring	Yes	413
NQ	Enqueue	Yes	221
PA	Parameter manager	Yes	427
PG	Program manager	Yes	437
RM	Recovery manager	Yes	457
RX	Resource recovery service	Yes	481
SH	Scheduler services	Yes	491
SM	Storage manager	Yes	527
ST	Statistics	Yes	519
TD	Transient data	Yes	667
TI	Timer	Yes	605
TR	Trace	No	611
TS	Temporary storage	Yes	571
US	User	Yes	671
XM	Transaction manager	Yes	627
XS	Security manager	Yes	497

Note: The application domain is mainly non-OCO, but it contains these OCO components:

- CICS data table services
- RDO for VSAM files and LSR pools
- Some EXEC CICS system programming functions
- Autoinstall terminal model manager
- Partner resource manager
- SAA Communications and Resource Recovery
- Some of the file control functions
- Recovery manager connectors interfaces.

The offline statistics utility program (DFHSTUP) and the system dump formatting routines are also treated as OCO.

Domain gates

A **domain gate** is an entry point or interface to a domain. It can be called by any authorized caller who needs to use some function provided by the domain.

A number of domain functions are available through the exit programming interface (XPI). For details, see the CICS Customization Guide.

In practice, every domain has several gates. Each gate has a 4-character identifier; the first two characters are the identifier of the owning domain, and the second two characters differentiate between the functions of the domain’s gates. Here, for example, are two of the dispatcher (DS) domain’s gates:

DSAT
DSSR

Functions provided by gates

An individual gate can provide many functions. The required function is determined by the parameters included on the call. The DSSR gate of the DS domain, for example, provides all these functions:

- ADD_SUSPEND
- DELETE_SUSPEND
- INQUIRE_SUSPEND_TOKEN
- RESUME
- SUSPEND
- WAIT_MVS
- WAIT_OLDC
- WAIT_OLDW.

Specific gates, generic and call-back gates

It is useful to distinguish between **specific gates**, **generic gates** and **callback gates**:

- A specific gate gives access to a set of functions that are provided by that domain alone. The functions are likely to be requested by many different callers.

  DS domain, for example, has a specific gate (DSAT) that provides CHANGE_MODE and CHANGE_PRIORITY functions (among other functions). Only the DS domain provides those functions, but they can be requested by many different callers.

- A generic gate gives access to a set of functions that are provided by several domains.

  Most domains provide a QUIESCE_DOMAIN function, for example, so that they can be quiesced when CICS is shutting down normally. They each have a generic gate that provides this function. DM domain makes a **generic call** to that gate in any domain that is to be quiesced.

- A call-back gate also gives access to a set of functions that can be provided by several domains. Unlike a generic gate where the call is broadcast to all domains that have provided a gate a call-back is restricted to specific domains but uses a format owned by the calling domain.

  For example the Recovery Manager calls the domains that have registered an interest in syncpoint processing using the PERFORM_PREPARE function format that it owns.

Domain call formats

Any module calling a domain gate must use the correct **format** for the call. The format represents the parameter list structure. It describes the parameters that must be provided on the call (the **input** parameters), and the parameters that are returned to the caller when the request has been processed (the **output** parameters).

For example, Table 1 lists the input and output parameters for the ATTACH function of the DS domain’s DSAT gate.

Table 1. Domain call formats

Input parameters	Output parameters
PRIORITY	TASK_TOKEN
USER_TOKEN	RESPONSE
[TIMEOUT]	[REASON]
TYPE	
[MODE]	
[TASK_REPLY_GATE_INDEX]	
[SPECIAL_TYPE]	

Parameters not shown in brackets are mandatory, and are always interpreted in trace entries. Parameters shown in brackets are optional, and are in trace entries only if values have been set. An exception to this rule is that, regardless of whether REASON is mandatory or optional for a particular function, its value is included in a trace entry only for a non-‘OK’ response.

The domain call formats described are in the sections dealing with the domains that own them, as discussed in “Ownership of formats.”

Ownership of formats

Every format is ‘owned’ by a domain:

- The formats for specific calls are owned by the domain being called. DS domain, for example, owns the format for the CHANGE_MODE and CHANGE_PRIORITY calls. This book uses the term **specific format** to refer to such formats.
- The formats for generic calls and call-back calls are owned by the calling domain. DM domain, for example, owns the format for calls to (generic) gates providing the QUIESCE_DOMAIN function in other domains. This

book uses the term **generic format** to refer to such formats.

Tokens

Tokens are passed as parameters on many domain calls. They identify uniquely objects that are operands of domain functions.

Here are some examples:

TASK_TOKEN uniquely identifies a task to be used as the operand of a function.

DOMAIN_TOKEN uniquely identifies a domain to be used as the operand of a function.

SUSPEND_TOKEN uniquely identifies a task for the purpose of a suspend or resume dialog.

Responses

On all domain calls, one of the output parameters is the domain's response to the call. It can have any one of these values:

OK
When a domain call succeeds, a response of 'OK' is given and the REASON code is not set. The requested function has been completed successfully.

EXCEPTION
Processing of the function could not be completed for the reason specified in the REASON field. The domain state remains unchanged if such an error occurs.

DISASTER
The domain could not complete the request because of some irrecoverable system problem. If there is a major error in the domain, this is reported.

INVALID
The parameter list is not valid. If a call is used incorrectly, this is reported.

KERNERROR
The kernel was unable to call the required function gate.

PURGED
A purge has been requested for the task making the domain call.

Chapter 2. Application domain

Application programs are run in the application (AP) domain, which contains several major components, as shown in Figure 2 on page 8.

Most application domain CICS functions are either provided by modules that are part of the CICS nucleus, that is to say they are an integral part of the system and are loaded at system initialization time, or they are system application programs, which are loaded as needed in the same way as user application programs.

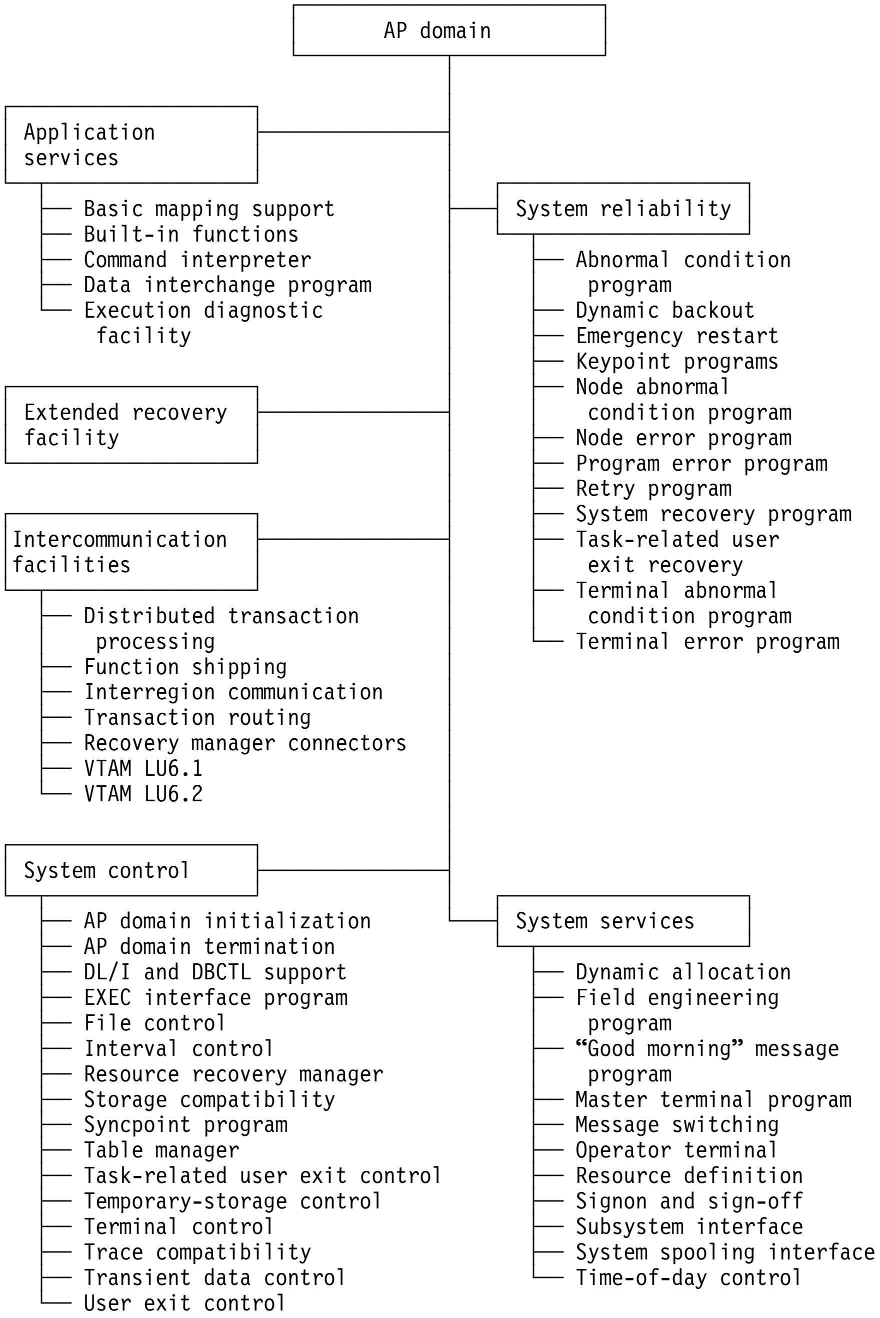


Figure 2. AP domain—major components

Part 2. CICS components

This part describes the various components of a CICS system—the domains into which CICS is organized, and the functions within these domains. Offline utilities, such as the statistics utility program, are also covered.

Apart from the application domain and the two catalog domains, each domain has one section describing it. The application domain consists of so many components that each component is described in a separate section, except for the two catalog domains that are described in the same section.

Sections are ordered alphabetically by component name for quick reference.

Chapter 3. Application domain (AP)

The principal components of the application domain are described under Chapter 2, "Application domain" on page 7.

Application domain's specific gates

Table 2 summarizes the application domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 2. Application domain's specific gates

Gate	Trace	Function	XPI
ABAB	AP 0741 AP 0742	CREATE_ABEND_RECORD UPDATE_ABEND_RECORD START_ABEND INQUIRE_ABEND_RECORD TAKE_TRANSACTION_DUMP	NO NO NO NO
APAP	AP 0910 AP 0911	TRANSFER_SIT	NO
APEX	AP 0510 AP 0515	INVOKE_USER_EXIT	NO
APIQ	AP 0920 AP 0921	INQ_APPLICATION_DATA	YES
APJC	AP F900 AP F901	WRITE_JOURNAL_DATA	YES
APLI	AP 1940 AP 1941	ESTABLISH_LANGUAGE START_PROGRAM	NO NO
APRM	AP 05A0 AP 05A1	TRANSACTION_INITIALIZATION TRANSACTION_TERMINATION INQUIRE	NO NO NO
APRT	AP 1900 AP 1901	ROUTE_TRANSACTION	NO
APTD	AP F600 AP F601	WRITE_TRANSIENT_DATA READ_TRANSIENT_DATA DELETE_TRANSIENT_DATA INITIALIZE_TRANSIENT_DATA RESET_TRIGGER_LEVEL	NO
APXM	AP 0590 AP 0591	TRANSACTION_INITIALIZATION RMI_START_OF_TASK TRANSACTION_TERMINATION	NO NO NO
BRAT	AP 2800 AP 2801	ATTACH	NO
BRFM	AP 2140 AP 2141	Subroutine for bridge facility allocation/deletion.	NO
BRIC	AP 2166 AP 2167	Subroutine interfacing interval control EXEC commands and the bridge exit.	NO
BRIQ	AP 2820	INQUIRE_CONTEXT	NO
BRMS	AP 2160 AP 2161	Subroutine interfacing BMS EXEC commands and the bridge exit.	NO
BRRM	AP 2840 AP 2841	RMRO callback for PREPARE and COMMIT	NO
BRSP	AP 216C AP 216D	Subroutine interfacing syncpoint requests and the bridge exit.	NO
BRTC	AP 2163 AP 2164	Subroutine interfacing terminal control EXEC commands and the bridge exit.	NO
BRXM	AP 2860 AP 2861	XMAC callback for INIT_XM_CLIENT and BIND_XM_CLIENT	NO
ICXM	AP 05C0 AP 05C1	BIND_FACILITY, RELEASE_FACILITY INQUIRE_FACILITY	NO NO NO
RTSU	AP 1910 AP 1911	COMMIT_SURROGATE FREE_SURROGATE GET_RECOVERY_STATUS PREPARE_SURROGATE RESET_SURROGATE	NO NO NO NO NO
TDOC	AP F640 AP F641	OPEN_TRANSIENT_DATA CLOSE_TRANSIENT_DATA CLOSE_ALL_EXTRA_TD_QUEUES	NO NO NO
TDTM	AP F680 AP F681	ADD_REPLACE_TDQDEF INQUIRE_TDQDEF START_BROWSE_TDQDEF GET_NEXT_TDQDEF END_BROWSE_TDQDEF SET_TDQDEF DISCARD_TDQDEF COMMIT_TDQDEFS	NO NO NO NO NO NO NO NO
TDXM	AP 05B0 AP 05B1	BIND_FACILITY BIND_SECONDARY_FACILITY RELEASE_FACILITY INQUIRE_FACILITY	NO NO NO NO
SAIQ	AP E120 AP E122	INQUIRE_SYSTEM SET_SYSTEM	YES YES
TFAL	AP D600 AP D601	ALLOCATE CANCEL_AID CHECK_TRANID_IN_USE CANCEL_AIDS_FOR_CONNECTION CANCEL_AIDS_FOR_TERMINAL DISCARD_AIDS FIND_TRANSACTION_OWNER GET_MESSAGE INITIALIZE_AID_POINTERS INQUIRE_ALLOCATE_AID LOCATE_AID LOCATE_REMDEL_AID LOCATE_SHIPPABLE_AID MATCH_TASK_TO_AID PURGE_ALLOCATE_AIDS RECOVER_START_DATA REMOTE_DELETE REMOVE_EXPIRED_AID REMOVE_EXPIRED_REMOTE_AID REMOVE_MESSAGE REMOVE_REMOTE_DELETES REROUTE_SHIPPABLE_AIDS RESCHEDULE_BMS RESET_AID_QUEUE RESTORE_FROM_KEYPOINT RETRIEVE_START_DATA SCHEDULE_BMS SCHEDULE_START SCHEDULE_TDP SLOWDOWN_PURGE TAKE_KEYPOINT TERM_AVAILABLE_FOR_QUEUE TERMINAL_NOW_UNAVAILABLE UNCHAIN_AID UPDATE_TRANNUM_FOR_RESTART	NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO
TFBF	AP 1730 AP 1731	BIND_FACILITY	NO
TFIQ	AP 1700 AP 1701	INQUIRE_TERMINAL_FACILITY INQUIRE_MONITOR_DATA SET_TERMINAL_FACILITY	NO NO NO
TFRF	AP 1710 AP 1711	RELEASE_FACILITY	NO
TFXM	AP 1790 AP 1791	INIT_XM_CLIENT BIND_XM_CLIENT	NO NO
MRXM	AP 17B0 AP 17B1	INIT_XM_CLIENT BIND_XM_CLIENT	NO NO
62XM	AP 17C0 AP 17C1	INIT_XM_CLIENT BIND_XM_CLIENT	NO NO

ABAB gate, CREATE_ABEND_RECORD function

The CREATE_ABEND_RECORD function of the ABAB gate is used to create an abend record (TACB).

Input parameters

[ABEND_CODE] is the four-character transaction abend code.

[FAILING_PROGRAM] is the name of the program in which the abend occurred.

[REQUEST_ID] is the request ID from the TCTTE for a terminal-oriented task.

[FAILING_RESOURCE] is the name of the system TCTTE (the connection) if the abend was raised by DFHZAND.

[REMOTE_SYSTEM] is the name of the remote system if the abend was raised in the client transaction to reflect an abend occurring in the DPL server.

[SENSE_BYTES] is the SNA sense bytes if the abend was raised by DFHZAND.

[ERROR_MESSAGE] is the error message sent from the remote system if the abend was raised by DFHZAND.

[EXECUTION_KEY] is a code indicating the execution key at the time the abend was issued, or at the time the operating system abend or program check occurred.

[STORAGE_TYPE] is a code indicating the storage hit on an OC4.

[ERROR_OFFSET] is the offset of a program check or operating system abend in the failing application program or CICS AP domain program.

[GENERAL_REGISTERS] is the contents of the general purpose registers at the time of a program check or operating system abend.

[PSW] is the contents of the PSW at the time of a program check or operating system abend.

[INTERRUPT_DATA] is the interrupt code and instruction length code etc, at the time of a program check or operating system abend.

[ALET] is the access list entry token (ALET) at the time of a program check or operating system abend.

[STOKEN] is the subspace token (STOKEN) at the time of a program check or operating system abend.

[SPACE] indicates whether the task was in SUBSPACE or BASESPACE mode at the time of a program check or operating system abend. It can have any of these values:

BASESPACE|SUBSPACE|NOSPACE

[GREG_ORDER] indicates the order of the registers passed in GENERAL_REGISTERS. DFHSRP saves the registers in the abend record in the order 0-15, and INQUIRE_ABEND_RECORD will always return them in this order. It can have either of these values:

R14TOR13|R0TOR15

[ACCESS_REGISTERS] is the contents of the access registers at the time of a program check or operating system abend.

[FLOATING_POINT_REGISTERS] is the contents of the floating point registers at the time of a program check or operating system abend.

[STATUS_FLAGS] is the status flags at the time of the abend.

Output parameters

ABEND_TOKEN is the token allocated by ABAB for this abend. The token must be passed on subsequent UPDATE_ABEND_RECORD and START_ABEND requests to ABAB. The token is no longer valid after a START_ABEND request.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND

ABAB gate, UPDATE_ABEND_RECORD function

The UPDATE_ABEND_RECORD function of the ABAB gate is used to update an abend record (TACB).

Input parameters

ABEND_TOKEN is the token allocated by ABAB for this abend (on a preceding CREATE_ABEND_RECORD request). The token must be passed on subsequent UPDATE_ABEND_RECORD and START_ABEND requests to ABAB. The token is no longer valid after a START_ABEND request.

[ABEND_CODE] is the four-character transaction abend code.

[FAILING_PROGRAM] is the name of the program in which the abend occurred.

[REQUEST_ID] is the request ID from the TCTTE for a terminal-oriented task.

[FAILING_RESOURCE] is the name of the system TCTTE (the connection) if the abend was raised by DFHZAND.

[REMOTE_SYSTEM] is the name of the remote system if the abend was raised in the client transaction to reflect an abend occurring in the DPL server.

[SENSE_BYTES] is the SNA sense bytes if the abend was raised by DFHZAND.

[ERROR_MESSAGE] is the error message sent from the remote system if the abend was raised by DFHZAND.

[EXECUTION_KEY] is a code indicating the execution key at the time the abend was issued, or at the time the operating system abend or program check occurred.

[STORAGE_TYPE] is a code indicating the storage hit on an OC4.

[ERROR_OFFSET] is the offset of a program check or operating system abend in the failing application program or CICS AP domain program.

[GENERAL_REGISTERS] is the contents of the general purpose registers at the time of a program check or operating system abend.

[PSW] is the contents of the PSW at the time of a program check or operating system abend.

[INTERRUPT_DATA] is the interrupt code and instruction length code etc, at the time of a program check or operating system abend.

[ALET] is the access list entry token (ALET) at the time of a program check or operating system abend.

[STOKEN] is the subspace token (STOKEN) at the time of a program check or operating system abend.

[SPACE] indicates whether the task was in SUBSPACE or BASESPACE mode at the time of a program check or operating system abend. It can have any of these values:

`BASESPACE|SUBSPACE|NOSPACE`

[GREG_ORDER] indicates the order of the registers passed in GENERAL_REGISTERS. DFHSRP saves the registers in the abend record in the order 0-15, and INQUIRE_ABEND_RECORD will always return them in this order. It can have either of these values:

`R14TOR13|R0TOR15`

[ACCESS_REGISTERS] is the contents of the access registers at the time of a program check or operating system abend.

[FLOATING_POINT_REGISTERS] is the contents of the floating point registers at the time of a program check or operating system abend.

[STATUS_FLAGS] is the status flags at the time of the abend.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND
EXCEPTION	INVALID_TOKEN

ABAB gate, START_ABEND function

The START_ABEND function of the ABAB gate is used to start transaction abend processing.

Input parameters

ABEND_TOKEN is the token allocated by ABAB for this abend (on a preceding CREATE_ABEND_RECORD request).

[DUMP] indicates whether a transaction dump should be produced for this abend. It can have either of these values:

`YES|NO`

[IGNORE_HANDLES] indicates whether this abend should be passed to any EXEC CICS HANDLE routines that are active. IGNORE_HANDLES(YES) results in EXEC CICS HANDLE being ignored at all levels of the program stack. It can have either of these values:

`YES|NO`

Output parameters

RETRY_ADDRESS if an XPCTA exit requests retry, control returns to the point of invocation of start_info, passing the retry address. This address includes the AMODE indicator in the first bit; it can be used as the target address in a DFHAM TYPE=BRANCH by the caller of START_ABEND GENERAL_REGISTERS is also set to point to the list of registers to be used for the retry, and SPACE to indicate the subspace.

[GENERAL_REGISTERS] is the contents of the general purpose registers at the time of a program check or operating system abend.

[SPACE] indicates whether the task was in SUBSPACE or BASESPACE mode at the time of a program check or operating system abend.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND
EXCEPTION	INVALID_TOKEN

ABAB gate, INQUIRE_ABEND_RECORD function

The INQUIRE_ABEND_RECORD function of the ABAB gate is used to inquire about an abend record (TACB).

Input parameters

[ABEND_TYPE] indicates which abend record the information is to be extracted from. It can have any of these values:

LATEST|FIRST|LASTASRA

Output parameters

[ABEND_CODE] is the four-character transaction abend code.

[DUMP] indicates whether a dump was requested for this abend. It can have either of these values:

YES|NO

[REQUEST_ID] is the request ID from the TCTTE for a terminal-oriented task.

[FAILING_RESOURCE] is the name of the system TCTTE (the connection) if the abend was raised by DFHZAND.

[FAILING_PROGRAM] is the name of the program in which the abend occurred.

[REMOTE_SYSTEM] is the name of the remote system if the abend was raised in the client transaction to reflect an abend occurring in the DPL server.

[SENSE_BYTES] is the SNA sense bytes if the abend was raised by DFHZAND.

[ERROR_MESSAGE] is the error message sent from the remote system if the abend was raised by DFHZAND.

[EXECUTION_KEY] is a code indicating the execution key at the time the abend was issued, or at the time the operating system abend or program check occurred.

[STORAGE_TYPE] is a code indicating the storage hit on an OC4.

[ERROR_OFFSET] is the offset of a program check or operating system abend in the failing application program or CICS AP domain program.

[GENERAL_REGISTERS] is the contents of the general purpose registers at the time of a program check or operating system abend.

[PSW] is the contents of the PSW at the time of a program check or operating system abend.

[INTERRUPT_DATA] is the interrupt code and instruction length code etc, at the time of a program check or operating system abend.

[ALET] is the access list entry token (ALET) at the time of a program check or operating system abend.

[STOKEN] is the subspace token (STOKEN) at the time of a program check or operating system abend.

[SPACE] indicates whether the task was in SUBSPACE or BASESPACE mode at the time of a program check or operating system abend. It can have any of these values:

BASESPACE|SUBSPACE|NOSPACE

[ACCESS_REGISTERS] is the contents of the access registers at the time of a program check or operating system abend.

[FLOATING_POINT_REGISTERS] is the contents of the floating point registers at the time of a program check or operating system abend.

[STATUS_FLAGS] is the status flags at the time of the abend.

[IGNORE_HANDLES] indicates whether this abend should be passed to any EXEC CICS HANDLE routines that are active. IGNORE_HANDLES(YES) results in EXEC CICS HANDLE being ignored at all levels of the program stack. It can have either of these values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND
EXCEPTION	NO_ABEND_RECORD

ABAB gate, TAKE_TRANSACTION_DUMP function

The TAKE_TRANSACTION_DUMP function of the ABAB gate is used to take a transaction dump.

Notes:

1. The TRANSACTION resource definition must specify dump and DUMP(YES) must be specified or defaulted on the associated START_ABEND call.
2. A transaction dump is not taken if any of the following is true:
   - The application is going to handle the abend; that is, there is an active handle at this level and IGNORE_HANDLES(NO) is specified or defaulted on the associated START_ABEND call.
   - The application is Language Environment/370 enabled, in which case the language interface deals with the abend.
   - A transaction dump is currently in progress.

Input parameters: None.

Output parameters: None.

APAP gate, TRANSFER_SIT function

The TRANSFER_SIT function of the APAP gate is used to transfer the address of DFHSIT to the AP domain after a GET_PARAMETERS call from this domain to the parameter manager domain.

Input parameters

SIT specifies the address and length of the system initialization table (DFHSIT).

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_ADDRESS, INCONSISTENT_RELEASE
INVALID	INVALID_SIT_LENGTH, INVALID_ADDRESS, INVALID_FUNCTION

APEX gate, INVOKE_USER_EXIT function

The INVOKE_USER_EXIT function of the APEX gate is used to invoke the user exit at a specified exit point.

Input parameters

EXIT_POINT is the name of the exit.

TRACE indicates whether or not user exits are to be traced. It can have either of these values:

YES|NO

[EXIT_PARAMETER_n] is the parameter (number *n*) required by the exit. The nature of the parameter varies from one exit to another.

Output parameters

EXIT_RETURN_CODE is the return code, if any, issued by the exit.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION, DISASTER, or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	EXIT_PROGRAM_FAILURE
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION, INVALID_EXIT_POINT

APIQ gate, INQ_APPLICATION_DATA function

The INQ_APPLICATION_DATA function of the APIQ gate is used to inquire about application data owned by the application domain.

Input parameters: None.

Output parameters

EIB is the address of the EXEC Interface Block.

SYSEIB is the address of the System EXEC Interface Block.

TCTUA is the address of the Task Control Table User Area.

TCTUASIZE is the length (in bytes) of the Task Control Table User Area.

TWA is the address of the Task Work Area.

TWASIZE is the length (in bytes) of the Task Work Area.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, INQ_FAILED, LOOP
EXCEPTION	DPL_PROGRAM, NO_TRANSACTION_ENVIRONMENT, TRANSACTION_DOMAIN_ERROR
INVALID	INVALID_FUNCTION

APJC gate, WRITE_JOURNAL_DATA function

The WRITE_JOURNAL_DATA function of the APJC gate is used to write a single record into a named journal.

Input parameters

JOURNALNAME is the journal identifier name.

JOURNAL_RECORD_ID is the system type record identifier.

FROM is the address of the record.

[RECORD_PREFIX] is the journal record user prefix.

WAIT specifies whether or not CICS is to wait until the record is written to auxiliary storage before returning control to the exit program. It can have either of these values:

YES|NO

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	JOURNAL_NOT_FOUND, LENGTH_ERROR, JOURNAL_NOT_OPEN, STATUS_ERROR, IO_ERROR

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

APLI gate, ESTABLISH_LANGUAGE function

The ESTABLISH_LANGUAGE function of the APLI gate is used to establish the language of a program.

Input parameters

LOAD_POINT is the load point address of the program.

ENTRY_POINT is the entry point address of the program.

[PROGRAM_LENGTH] is the length of the program.

[DEFINED_LANGUAGE] is the language defined for the program. It can have any of these values:

ASSEMBLER|C370|COBOL|LE370|PLI|NOT_DEFINED

EXECUTION_KEY is the key in which CICS gives control to the program, and determines whether the program can modify CICS-key storage. It can have either of these values:

CICS|USER

DATA_LOCATION defines whether the program can handle only 24-bit addresses (data located below the 16MB line) can handle 31-bit addresses (data located above or below the 16MB line). It can have either of these values:

ANY|BELOW

LANGUAGE_BLOCK is a token identifying the current language block for the program.

Output parameters

[NEW_BLOCK] is a new token identifying the new language block for the program.

[LANGUAGE_ESTABLISHED] is the language established for the program. It can have any of these values:

ASSEMBLER|C370|COBOL|COBOL2|LE370|PLI|
NOT_DEFINED|NOT_APPLIC

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	TRANSACTION_ABEND
INVALID	INVALID_FUNCTION

APLI gate, START_PROGRAM function

The START_PROGRAM function of the APLI gate is used to start a program.

Input parameters

PROGRAM is the eight-character name of the program.

LINK_LEVEL is the 16-bit value indicating the link-level of the program.

[CEDF_STATUS] indicates whether or not the EDF diagnostic screens are displayed when the program is running under the control of the execution diagnostic facility (EDF). It can have any of these values:

CEDF|NOCEDF

[EXECUTION_SET] indicates whether you want CICS to link to and run the program as if it were running in a remote CICS region (with or without the API restrictions of a DPL program). It can have either of these values:

FULLAPI|DPLSUBSET|NOT_APPLIC

[PARMLIST_PTR] is an optional token identifying the parameter list for the program.

COMMAREA is an optional token identifying the communications area for the program.

[ENVIRONMENT_TYPE] is the environment type of the program. It can have any of these values:

EXEC|GLUE|PLT|SYSTEM|TRUE|URM

[SYNCONRETURN] defines whether or not a syncpoint is to be taken on return from the linked program. It can have either of these values:

YES|NO

Output parameters

[NEW_BLOCK] is a new token identifying the new language block for the program.

ASSEMBLER|C370|COBOL|COBOL2|LE370|PLI|
NOT_DEFINED|NOT_APPLIC

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	TRANSACTION_ABEND
INVALID	INVALID_FUNCTION

APRM gate, TRANSACTION_INITIALIZATION function

The TRANSACTION_INITIALIZATION function of the APRM gate is called from the transaction manager domain to the AP Domain during transaction initialization. The AP domain allocates the recovery table, and initializes the RM transaction token to be the address of the recovery table.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	BAD_ENVIRONMENT
EXCEPTION	GETMAIN_FAILURE

APRM gate, TRANSACTION_TERMINATION function

The TRANSACTION_TERMINATION function of the APRM gate is called from the transaction manager domain during transaction termination. A DFHSP TYPE=KCP macro will be issued for the transaction The AP domain then releases the recovery table, and sets the RM transaction token to the address of a fetch-protected area.

Input parameters

TERMINATION_TYPE is the type of transaction termination. It can have either of these values:

NORMAL|ABNORMAL

[RESTART_REQUESTED] indicates whether or not the transaction is to be restarted on termination. It can have either of these values:

YES|NO

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	BAD_ENVIRONMENT, LINK_FAILURE
EXCEPTION	BACKOUT_FAILED, TRANSACTION_ABEND

APRM gate, INQUIRE function

The INQUIRE function of the APRM gate is used to extract the resource manager attributes of a transaction.

Input parameters

[UOW_TOKEN] is the optional extended token (ETOKEN) for the transaction.

Output parameters

[PROHIBIT_RESTART] indicates whether or not the transaction is to be prevented from restarting. It can have either of these values:

YES|NO

[SYNCPOINT_TAKEN] indicates whether or not a syncpoint is to be taken on transaction termination. It can have either of these values:

YES|NO

[CICS_UOW_ID] is the optional ETOKEN identifying the CICS unit-of-work for the transaction.

[EXTERNAL_UOW_ID] is the optional ETOKEN identifying the non-CICS unit-of-work for the transaction.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

APRT gate, ROUTE_TRANSACTION function

The ROUTE_TRANSACTION function of the APRT gate is used to dynamically route transactions (which are defined to be dynamic and not automatically initiated) based on decisions made by the dynamic transaction routing program. For transactions which are automatically initiated or are defined to be remote and not dynamic, DFHAPRT will statically route such transactions.

Input parameters

DYNAMIC indicates whether or not the transaction is defined as dynamic. It can have either of these values:

YES|NO

REMOTE indicates whether or not the transaction is defined as remote. It can have either of these values:

YES|NO

REMOTE_NAME is the four-character transaction identifier by which this transaction is to be known on the remote CICS region.

REMOTE_SYSTEM is the eight-character name of the remote CICS region to which the transaction is to be routed.

DTRTRAN indicates whether or not dynamic transaction routing is available. It can have either of these values:

YES|NO

Output parameters

RAN_LOCALLY indicates whether or not the transaction ran on the local CICS region (that is, was not routed to a remote CICS region). It can have either of these values:

YES|NO

ABEND_CODE is the four-character transaction abend code issued if the transaction terminates abnormally.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	PROGRAM_NOT_FOUND, TRANSACTION_ABEND, ISC_DISABLED, REMOTE_CONN_OOS, REMOTE_CONN_OOS_SYS_CHGD, ALL_SESSIONS_BUSY, ROUTE_FAILED, DTRTRAN_REJECTED

APTD gate, WRITE_TRANSIENT_DATA function

The WRITE_TRANSIENT_DATA function of the APTD gate is used to write a single record (or multiple records) to a named transient data queue.

Input parameters

QUEUE specifies the name of the queue to which the data is to be written

FROM_LIST is a list specifying the address and the length of each record that is to be written to the specified queue.

[RSL_CHECK] states whether resource-level checking is to be carried out. It can take the values:

```
YES|NO
```

Output parameters

[TD_RECORD] indicates the number of records that were successfully written to the transient data queue.

[TD_MIN_LENGTH] indicates the minimum allowable length of a transient data record if a RESPONSE of EXCEPTION, and a REASON of LENGTH_ERROR is returned.

[TD_MAX_LENGTH] indicates the maximum allowable length of a transient data record if a RESPONSE of EXCEPTION, and a REASON of LENGTH_ERROR is returned.

RESPONSE is Transient Data's response to the call. It can have any of the following values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION, DISASTER, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, CSM_ERROR, DCT_ERROR, DIRECTORY_MGR_ERROR, LOGIC_ERROR
EXCEPTION	QUEUE_REMOTE, QUEUE_NOT_FOUND, QUEUE_NOT_AUTH, QUEUE_DISABLED, QUEUE_NOT_OPEN, QUEUE_NOT_OUTPUT, QUEUE_FULL, NO_SPACE, IO_ERROR, LENGTH_ERROR, LOCKED, NO_RECOVERY_TABLE
INVALID	INVALID_FROM_LIST_P, INVALID_FROM_LIST_N, INVALID_FROM_P, INVALID_FROM_N, INVALID_RSL_CHECK

APTD gate, READ_TRANSIENT_DATA function

The READ_TRANSIENT_DATA function of the APTD gate is used to read a single record from a named transient data queue.

Input parameters

QUEUE specifies the name of the queue to which a record is to be read.

INTO specifies a piece of storage into which the record is placed.

SUSPEND specifies whether the caller wishes to wait if the record to be read has not been committed to the queue yet. It can take the values:

```
YES|NO
```

[RSL_CHECK] states whether resource level checking is to be carried out. It can take the values:

```
YES|NO
```

[DATA_LOC] if this is a READ TD SET rather than an INTO, DATA_LOC specifies whether Transient Data should obtain the required SET storage from above or below the 16MB line. It can take the values:

```
ANY|BELOW
```

[DATA_KEY] if this is a READ TD SET rather than an INTO, DATA_KEY specifies whether Transient Data should obtain the required SET storage from CICS key or user key storage. It can take the values:

```
CICS|USER
```

Output parameters

RESPONSE is Transient Data's response to the call. It can have any of the following values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, CSM_ERROR, DCT_ERROR, DIRECTORY_MGR_ERROR, LOGIC_ERROR

RESPONSE	Possible REASON values
EXCEPTION	QUEUE_REMOTE, QUEUE_NOT_FOUND, QUEUE_NOT_AUTH, QUEUE_DISABLED, QUEUE_NOT_OPEN, QUEUE_NOT_INPUT, QUEUE_BUSY, IO_ERROR, LENGTH_ERROR, LOCKED

APTD gate, DELETE_TRANSIENT_DATA function

The DELETE_TRANSIENT_DATA function of the APTD gate is used to delete the specified transient data queue.

Input parameters

QUEUE specifies the name of the queue to which the data is to be deleted.

[RSL_CHECK] states whether resource level checking is to be carried out. It can take the values:

YES|NO

[DISCARDING_DEFINITION] states whether this DELETEQ request is part of an attempt by Transient Data to discard a transient data queue definition. It can take the values:

YES|NO

Output parameters

RESPONSE is Transient Data’s response to the call. It can have any of the following values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, CSM_ERROR, DCT_ERROR, DIRECTORY_MGR_ERROR, LOGIC_ERROR
EXCEPTION	QUEUE_REMOTE, QUEUE_NOT_FOUND, QUEUE_NOT_AUTH, QUEUE_DISABLED, QUEUE_EXTRA, IO_ERROR, LOCKED, NO_RECOVERY_TABLE

APTD gate, RESET_TRIGGER_LEVEL function

The RESET_TRIGGER_LEVEL function of the APTD gate is used to reset a transient data queue so that another trigger transaction can be attached. Sometimes it is necessary to include the RESET_TRIGGER_LEVEL function if a trigger transaction abends.

Input parameters

QUEUE specifies the name of the queue for which the trigger transaction is to be reset.

Output parameters

RESPONSE is Transient Data’s response to the call. It can have any of the following values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are: ABEND, DCT_ERROR, CSM_ERROR, DIRECTORY_MGR_ERROR, and LOGIC_ERROR.

APTD gate, INITIALISE_TRANSIENT_DATA function

The INITIALISE_TRANSIENT_DATA function of the APTD gate is invoked as part of the initialization process for the transient data facility.

Input parameters: None.

Output parameters

RESPONSE is Transient Data’s response to the call. It can have any of the following values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, CSM_ERROR, DCT_ERROR, DIRECTORY_MGR_ERROR, LOGIC_ERROR

APXM gate, TRANSACTION_INITIALIZATION function

The TRANSACTION_INITIALIZATION function of the APXM gate is called from the transaction manager domain to the AP Domain during transaction initialization. The AP domain allocates the AP domain transaction lifetime control blocks, and anchors them in the AP domains transaction token.

Input parameters: None.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	GETMAIN_FAILURE

APXM gate, RMI_START_OF_TASK function

The RMI_START_OF_TASK function of the APXM gate is called from transaction manager domain to the AP Domain during transaction initialization. The AP domain invokes any task-related user exits enabled for start of task.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

APXM gate, TRANSACTION_TERMINATION function

The TRANSACTION_TERMINATION function of the APXM gate is called from the transaction manager domain during transaction termination, and releases AP domain transaction lifetime resources.

Input parameters

TERMINATION_TYPE is the type of transaction termination. It can have either of these values:

NORMAL|ABNORMAL

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	FREEMAIN_FAILURE

BRAT gate, ATTACH function

The ATTACH function of the BRAT gate is called to attach a transaction with a bridge primary client.

Input parameters

TRANSACTION_ID The 4 byte transaction id of the user transaction to be attached.

[BREXIT] An optional program name to be used as the bridge exit. If this is not specified, DFHBRAT will get the default value from transaction manager. If there is no default bridge exit, an error is returned.

[USERID] The USERID that should be signed-on to the terminal. This is only set when no facility token is passed.

[BRDATA] The address and length of a block of storage containing data to be passed to bridge exit. This is used as part of the primary client data.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION, DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_BREXIT, NO_STORAGE, USERID_NOT_AUTH_BREXIT, NOT_FOUND, DISABLED, NO_XM_STORAGE, NOT_ENABLED_FOR_SHUTDOWN, STATE_SYSTEM_ATTACH
DISASTER	ABEND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

BRIQ gate, INQUIRE_CONTEXT function

The INQUIRE_CONTEXT of the BRIQ gate is called to inquire on bridge state data.

Input parameters

[TRANSACTION_TOKEN] The XM transaction token for the task to be inquired upon.

Output parameters

[CALL_EXIT_FOR_SYNC] Can have either of these two values:

YES|NO

[BRIDGE_ENVIRONMENT] Can have either of these two values:

YES|NO

[CONTEXT] The transaction context. It can have either of these values:

NORMAL|BRIDGE|BREXIT

[START_CODE] The emulated startcode of the user transaction

[BRIDGE_TRANSACTION_ID] The transaction identifier of the bridge monitor (if CONTEXT is BRIDGE or BREXIT).

[BRIDGE_EXIT_PROGRAM] The name of the bridge exit program (if CONTEXT is BRIDGE or BREXIT).

[BRIDGE_FACILITY_TOKEN] A token identifying the bridge facility

[IDENTIFIER] Data created by the bridge exit for problem determination purposes.

[BRDATA] Data passed to the bridge exit during attach.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION, DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BAD_TOKEN, NO_TRANSACTION_ENVIRONMENT
DISASTER	ABEND
INVALID	INVALID_FORMAT

ICXM gate, BIND_FACILITY function

The BIND_FACILITY function of the ICXM gate is used to associate a transaction with the ICE that caused the transaction to be started.

Input parameters: None.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND

ICXM gate, RELEASE_FACILITY function

The RELEASE_FACILITY function of the ICXM gate is used to disassociate a transaction from the ICE that caused the transaction to be attached.

Input parameters

TERMINATION_TYPE is the type of termination of the transaction to ICE association. It can have either of these values:

NORMAL ABNORMAL

[RESTART_REQUESTED] indicates whether or not the transaction is to be restarted. It can have either of these values:

YES|NO

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	RESTART_FAILURE

ICXM gate, INQUIRE_FACILITY function

The INQUIRE_FACILITY function of the ICXM gate is used to inquire about the interval control facilities that support facility management calls from the transaction management domain.

Input parameters

[FACILITY_TOKEN] is the token identifying the transaction that has been trigger-level attached.

Output parameters

FACILITY_NAME is the four-character name of the transaction that has been trigger-level attached.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

TFXM gate, INIT_XM_CLIENT function

The INIT_XM_CLIENT function of the TFXM gate is the initialization phase of the transaction initialization that has been initiated from a terminal or an LU6.1 session.

Input parameters

[PRIMARY_CLIENT_BLOCK] is the address of the TCTTE and its length.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND

TFXM gate, BIND_XM_CLIENT function

The BIND_XM_CLIENT function of the TFXM gate is the bind phase of the transaction initialization that has been initiated from a terminal or an LU6.1 session.

Input parameters

[PRIMARY_CLIENT_BLOCK] is the address of the TCTTE and its length.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND

MRXM gate, INIT_XM_CLIENT function

The INIT_XM_CLIENT function of the MRXM gate is the initialization phase of the transaction initialization that has been initiated from a terminal or an MRO session.

Input parameters

[PRIMARY_CLIENT_BLOCK] is the address of the TCTTE and its length.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND

MRXM gate, BIND_XM_CLIENT function

The BIND_XM_CLIENT function of the MRXM gate is the bind phase of the transaction initialization that has been initiated from a terminal or an MRO session.

Input parameters

[PRIMARY_CLIENT_BLOCK] is the address of the TCTTE and its length.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND

62XM gate, INIT_XM_CLIENT function

The INIT_XM_CLIENT function of the 62XM gate is the initialization phase of the transaction initialization that has been initiated from a terminal or an LU6.2 or APPC session.

Input parameters

[PRIMARY_CLIENT_BLOCK] is the address of the TCTTE and its length.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND

62XM gate, BIND_XM_CLIENT function

The BIND_XM_CLIENT function of the 62XM gate is the bind phase of the transaction initialization that has been initiated from a terminal or an LU6.2 or APPC session.

Input parameters

[PRIMARY_CLIENT_BLOCK] is the address of the TCTTE and its length.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND

RTSU gate, COMMIT_SURROGATE function

The COMMIT_SURROGATE function of the RTSU gate is used to update the state of a surrogate TCTTE when a Unit of Work is committed or backed out.

Input parameters

SURROGATE The address of the surrogate TCTTE

[UOW_STATUS] Indicates if the Unit of Work is being committed or backed out. It can have either of these two values:

FORWARD|BACKWARD

Output parameters

FREE_REQUIRED Indicates if the surrogate should now be freed (because, for instance, the relay link has been freed). It can have either of these two values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND
INVALID	INVALID_FORMAT, INVALID_FUNCTION, INVALID_SURROGATE, INVALID_SAVED_STATE

RTSU gate, FREE_SURROGATE function

The FREE_SURROGATE function of the RTSU gate is used to free a surrogate TCTTE from the currently executing task.

Input parameters

SURROGATE The address of the surrogate TCTTE

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND
INVALID	INVALID_FORMAT, INVALID_FUNCTION, INVALID_SURROGATE

RTSU gate, GET_RECOVERY_STATUS function

The GET_RECOVERY_STATUS function of the RTSU gate is used to determine what actions are required of the relay link at syncpoint.

Input parameters

SURROGATE The address of the surrogate TCTTE

Output parameters

RECOVERY_STATUS Indicates the syncpoint protocols required on the relay link. It can have any of these values:

NECESSARY|UNNECESSARY|SYNC_LEVEL_1

ABORT_ALLOWED Indicates whether, during the syncpoint protocols, an ABORT FMH7 should be sent on the relay link. It can have either of these values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND
INVALID	INVALID_FORMAT, INVALID_FUNCTION, INVALID_SURROGATE

RTSU gate, PREPARE_SURROGATE function

The PREPARE_SURROGATE function of the RTSU gate is used to update the state of a surrogate TCTTE at the start of syncpoint.

Input parameters

SURROGATE The address of the surrogate TCTTE

INITIATOR Indicates if the associated relay link is the initiator of the syncpoint request. It can have either of these two values:

YES|NO

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION, DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_STATE
DISASTER	ABEND
INVALID	INVALID_FORMAT, INVALID_FUNCTION, INVALID_SURROGATE

RTSU gate, RESET_SURROGATE function

The RESET_SURROGATE function of the RTSU gate is used to restore the state of a surrogate TCTTE when ISSUE_ABEND or ISSUE_ERORR was received on the relay link in reply to an ISSUE PREPARE request.

Input parameters

SURROGATE The address of the surrogate TCTTE

REPLY_TO_PREPARE Indicates which reply was received in response to ISSUE_PREPARE. It can have either of these two values:

ISSUE_ERROR¬ISSUE_ABEND

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND
INVALID	INVALID_FORMAT, INVALID_FUNCTION, INVALID_SURROGATE

SAIQ gate, INQUIRE_SYSTEM function

The INQUIRE_SYSTEM function of the SAIQ gate is used to inquire about system data owned by the application domain.

Input parameters

[GMMTEXT] is an optional token identifying the text of the "good-morning" message.

Output parameters

[AKP] is a fullword binary field indicating the activity keypoint frequency, in the range 200 through 65 535, of the local CICS region.

[CICSREL] is a 4-character string indicating the level (version and release numbers) of CICS code present.

[CICSSTATUS] is the current status of the local CICS system. It can have any of these values:

ACTIVE|FIRSTQUIESCE|FINALQUIESCE|INITIALIZING

[CICSSYS] is the one-character identifier of the operating system for which the running CICS system has been built. A value of "X" represents MVS system with extended addressing.

[CWA] is the address of the CWA.

[CWALENGTH] is the length (in bytes) of the CWA.

[DATE] is a four-character packed-decimal value indicating the current date (00yydddc, where yy=years, ddd=days, c is the sign).

[DCE_SUFFIX] is the two-character suffix of the DCE initialization side file, as specified on the DCESUFFX system initialization parameter.

[DTRPRGRM] is the 8-character name of the program controlling the dynamic routing of transactions.

[GMMLENGTH] is a halfword binary field indicating the length of the "good-morning" message text.

[GMMTRANID] is the four-character identifier of the "good-morning" transaction.

[INITSTATUS] is the initialization status of the local CICS region. It can have any of these values:

FIRSTINIT|SECONDINIT|THIRDINIT|INITCOMPLETE

[JOBNAME] is the eight-character MVS job name for the local CICS region.

[OPREL] indicates the release number of the operating system currently running. The values is ten times the formal release number. For example, "21" represents Release 2.1.

[OPSYS] is a one-character identifier indicating the type of operating system currently running. A value of "X" represents MVS.

[PLTPI] is the two-character suffix of the program list table, which contains a list of programs to be run in the final stages of system initialization.

[SECURITYMGR] indicates whether an external security manager (such as RACF) is active in the CICS region, or whether no security is being used. It can have either of these values:

EXTSECURITY|NOSECURITY

[SHUTSTATUS] is the shutdown status of the local CICS region. It can have any of these values:

CONTROLSHUT|SHUTDOWN|CANCELLED|NOTSHUTDOWN

[STARTUP] is the type of startup used for the local CICS region. It can have any of these values:

COLDSTART|WARMSTART|EMERGENCY|LOGTERM|STANDBY|AUTOSTART

[STARTUPDATE] is a four-character packed-decimal value indicating the date on which the local CICS region was started.

[TERMURM] is the eight-character name of the terminal autoinstall program.

[TIMEOFDAY] is a four-character packed-decimal value indicating the time at which the local CICS region was started (hhmmsstc, where hh=hours, mm=minutes, ss=seconds, c is the sign).

[XRFSTATUS] indicates whether the local CICS region is a PRIMARY (active) or TAKEOVER (alternate) XRF CICS region, or has no XRF support. It can have any of these values:

PRIMARY|TAKEOVER|NOXRF

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, INQ_FAILED, LOOP
EXCEPTION	LENGTH_ERROR, UNKNOWN_DATA

SAIQ gate, SET_SYSTEM function

The SET_SYSTEM function of the SAIQ gate is used to set system data values owned by the application domain.

Input parameters

[AKP] is a fullword binary field indicating the activity keypoint frequency, in the range 200 through 65 535, of the local CICS region.

[DCE_SUFFIX] is the two-character suffix of the DCE initialization side file.

[DTRPRGRM] is the 8-character name of the program controlling the dynamic routing of transactions.

[GMMTEXT] is an optional token identifying the text of the "good-morning" message.

[GMMLENGTH] is a halfword binary field indicating the length of the "good-morning" message text.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, SET_FAILED, LOOP
EXCEPTION	AKP_SIZE_ERROR, LENGTH_ERROR, NO_KEYPOINTING

TDOC gate, OPEN_TRANSIENT_DATA function

The OPEN_TRANSIENT_DATA function of the TDOC gate is used to open an extrapartition transient data queue.

Input parameters

QUEUE specifies the name of the extrapartition transient data queue to be opened.

TD_QUEUE_TOKEN can be specified instead of QUEUE. The token uniquely identifies the extrapartition queue to be opened.

Output parameters

RESPONSE is Transient Data's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	QUEUE_INTRA, QUEUE_REMOTE, QUEUE_OPEN, QUEUE_NOT_FOUND
DISASTER	DCT_ERROR, DIRECTORY_MGR_ERROR, LOGIC_ERROR

TDOC gate, CLOSE_TRANSIENT_DATA function

The CLOSE_TRANSIENT_DATA function of the TDOC gate is used to close an extrapartition transient data queue.

Input parameters

QUEUE specifies the name of the extrapartition transient data queue to be closed.

TD_QUEUE_TOKEN can be specified instead of QUEUE. The token uniquely identifies the extrapartition queue to be closed.

Output parameters

RESPONSE is Transient Data's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, DCT_ERROR, DIRECTORY_MGR_ERROR, LOGIC_ERROR
EXCEPTION	QUEUE_INTRA, QUEUE_REMOTE, QUEUE_CLOSED, QUEUE_NOT_FOUND, QUEUE_NULL, QUEUE_NOT_CLOSED

TDOC gate, CLOSE_ALL_EXTRA_TD_QUEUES function

The CLOSE_ALL_EXTRA_TD_QUEUES function of the TDOC gate closes all extrapartition transient data queues which are currently open in the system. The CLOSE_ALL_EXTRA_TD_QUEUES function is usually invoked as part of a warm shutdown.

Input parameters: None.

Output parameters

RESPONSE is Transient Data's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER. Possible values are: ABEND, DCT_ERROR, DIRECTORY_MGR_ERROR, and LOGIC_ERROR.

TDTM gate, ADD_REPLACE_TDQUEUE function

The ADD_REPLACE_TDQUEUE function of the TDTM gate is used to install a transient data queue definition.

Input parameters

QUEUE_NAME specifies the name of the queue to be installed.

TD_QUEUE_TOKEN can be specified instead of QUEUE. The token uniquely identifies a DCT entry that has already been built, but needs to be installed.

TD_TYPE specifies the queue type. Possible values are:

`EXTRA|INTRA|INDIRECT|REMOTE`

BLOCK_LENGTH specifies the block length of an extrapartition queue.

BUFFER_NUMBER specifies the number of buffers to be associated with an extrapartition queue.

DDNAME specifies the DDNAME to be associated with an extrapartition queue.

DISPOSITION specifies the disposition of the data set to be associated with an extrapartition queue. Possible values are:

`SHR|OLD|MOD`

DSNAME specifies the DSNAME of the data set to be associated with an extrapartition queue.

ERROR_OPTION specifies the action to be taken in the event of an I/O error. This input parameter applies to extrapartition queues only. Possible values are:

`IGNORE|SKIP`

FACILITY specifies the facility associated with this intrapartition queue when a trigger transaction is attached. Possible values are:

`TERMINAL|FILE|SYSTEM`

FACILITY_ID specified together with the FACILITY option, FACILITY_ID identifies the facility that the trigger transaction should be associated with.

INDIRECT_DEST specifies the destination queue if this queue is an indirect queue.

WAIT_ACTION specifies the action to be taken if this logically recoverable intrapartition queue suffers an indoubt failure. Possible values are:

`QUEUE|REJECT`

WAIT specifies whether this logically recoverable intrapartition queue can wait for the resolution of an indoubt failure. Possible values are:

`YES|NO`

OPEN_TIME specifies whether this extrapartition queue should be opened as part of installation processing. Possible values are:

`INITIAL|DEFERRED`

RECORD_LENGTH specifies the record length of an extrapartition queue in bytes.

RECORD_FORMAT specifies the format of records held in an extrapartition queue. Possible values are:

```
FIXUNB|FIXUNBA|FIXUNBM|FIXBLK|FIXBLKA|FIXBLKM|
VARBLK|VARBLKA|VARBLKM|VARUNB|VARUNBA|
VARUNBM|UNDEFINED
```

RECOVERY specifies the recovery type of an intrapartition queue. Possible values are:

`NO|PH|LG`

REMOTE_NAME specifies the remote name of the queue if this is a remote queue definition.

REMOTE_SYSTEM specifies the remote system identifier (SYSID) if this is a remote queue definition.

REWIND specifies where the tape is positioned in relation to the end of the data set. This input parameter applies to extrapartition queues only. Possible values are:

`REREAD|LEAVE`

TRANSACTION_ID specifies the ATI transaction to be invoked when the trigger level is reached.

TRIGGER_LEVEL specifies the trigger level of the intrapartition queue.

TYPE_FILE indicates whether this queue is:

- An input queue
- An output queue
- Whether the queue is to be read backwards.

Possible values are:

`INPUT|OUTPUT|RDBACK`

USERID specifies the userid to be associated with a trigger-level attached transaction.

SYSOUTCLASS specifies the SYSOUT class to be used for the associated output extrapartition queue.

Output parameters

RESPONSE is Transient Data's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, CATALOG_WRITE_FAILED, DCT_ERROR, DIRECTORY_MGR_ERROR, LOGIC_ERROR
EXCEPTION	COLD_START_IN_PROGRESS, DDNAME_NOT_FOUND, DFHINTRA_NOT_OPENED, DISABLE_PENDING, DUPLICATE, INSUFFICIENT_STORAGE, NOT_CLOSED, NOT_DISABLED, NOT_EMPTY, NOT_SAME_TYPE, QUEUE_NOT_OPENED, SECURITY_FAILURE, USERID_NOTAUTHED

TDTM gate, INQUIRE_TDQUEUE function

The INQUIRE_TDQUEUE function of the TDTM gate is used to inquire on a specified queue.

Input parameters

QUEUE_NAME specifies the name of the queue to be inquired upon.

Output parameters

[ATI_FACILITY] specifies the facility associated with this intrapartition queue when a trigger transaction is attached. Possible values are:

TERMINAL|FILE|SYSTEM

[ATI_TERMID] specified together with the FACILITY option, FACILITY_ID identifies the facility that the trigger transaction should be associated with.

[ATI_TRANID] specifies the ATI transaction to be invoked when the trigger level is reached.

[BUFFER_NUMBER] specifies the number of buffers to be associated with an extrapartition queue.

[DDNAME] specifies the DDNAME to be associated with an extrapartition queue.

[DISPOSITION] specifies the disposition of the data set to be associated with an extrapartition queue. Possible values are:

SHR|OLD|MOD

[DSNAME] specifies the DSNAME of the data set to be associated with the extrapartition queue.

[EMPTY_STATUS] indicates whether the queue contains any records, and whether the queue is full. This option applies to extrapartition queues only. Possible values are:

FULL|EMPTY|NOTEMPTY

[ENABLE_STATUS] indicates the status of the queue. Possible values are:

ENABLED|DISABLING|DISABLED

[ERROR_OPTION] specifies what action is to be taken in the event of an I/O error. This option applies to extrapartition queues only. Possible values are:

IGNORE|SKIP

[INDIRECT_DEST] specifies the destination queue if this queue is an indirect queue.

[WAIT] specifies whether this logically recoverable intrapartition queue can wait for the resolution of an indoubt failure. Possible values are:

YES|NO

[WAIT_ACTION] specifies the action to be taken if this logically recoverable intrapartition queue suffers an indoubt failure. Possible values are:

QUEUE|REJECT

[NUM_ITEMS] states the number of committed items in the queue.

[OPEN_STATUS] indicates whether the queue is open. Possible values are:

OPEN|CLOSED

[RECORD_FORMAT] specifies the format of the records held on the extrapartition queue. Possible values are:

FIXUNB|FIXUNBA|FIXUNBM|FIXBLK|FIXBLKA|FIXBLKM|
VARBLK|VARBLKA|VARBLKM|VARUNB|VARUNBA|
VARUNBM|UNDEFINED

[RECORD_LENGTH] specifies the record length of the extrapartition queue.

[RECOVERY] specifies the recovery type of an intrapartition queue. Possible values are:

NO|PH|LG

[REMOTE_NAME] specifies the remote name of the queue if this is a remote queue definition.

[REWIND] specifies where the tape is positioned in relation to the end of the data set. This input parameter applies to extrapartition queues only. Possible values are:

REREAD|LEAVE

[TD_QUEUE_TOKEN] states which token is associated with this queue.

[TD_TYPE] specifies the queue type. Possible values are:

EXTRA|INTRA|INDIRECT|REMOTE

[TRIGGER_LEVEL] specifies the trigger level of the intrapartition queue.

[TYPE_FILE] specifies whether this queue is:

- An input queue
- An output queue
- Whether it is a queue that is to be read backwards.

Possible values are:

INPUT|OUTPUT|RDBACK

[USERID_TOKEN] indicates which token is associated with the USERID that was specified for this intrapartition queue.

[SYSOUTCLASS] specifies the SYSOUT class to be used for the associated output extrapartition queue.

[BLOCK_LENGTH] specifies the block length of an extrapartition queue.

RESPONSE is Transient Data's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

REASON is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, DCT_ERROR, DIRECTORY_MGR_ERROR, LOGIC_ERROR
EXCEPTION	QUEUE_NOT_FOUND

TDTM gate, START_BROWSE_TDQDEF function

The START_BROWSE_TDQDEF function of the TDTM gate initiates a browse from a specified queue, or from the start of the DCT.

Input parameters

START_AT specifies a queue from which the browse should start.

Output parameters

BROWSE_TOKEN is returned and uniquely identifies this browse session.

RESPONSE is Transient Data's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] returned when RESPONSE is DISASTER. Possible values are: ABEND, DCT_ERROR, DIRECTORY_MGR_ERROR, and LOGIC_ERROR

TDTM gate, GET_NEXT_TDQDEF function

The GET_NEXT_TDQDEF function of the TDTM gate returns information about a queue as part of a browse operation.

Input parameters

BROWSE_TOKEN identifies the browse session.

Output parameters

QUEUE_NAME is the name of the queue.

[ATI_FACILITY] specifies the facility associated with this intrapartition queue when a trigger transaction is attached. Possible values are:

`TERMINAL|FILE|SYSTEM`

[ATI_TERMID] specified together with the FACILITY option, FACILITY_ID identifies the facility that the trigger transaction should be associated with.

[ATI_TRANID] specifies the ATI transaction to be invoked when the trigger level is reached.

[BUFFER_NUMBER] specifies the number of buffers to be associated with an extrapartition queue.

[DDNAME] specifies the DDNAME to be associated with an extrapartition queue.

[DISPOSITION] specifies the disposition of the data set to be associated with an extrapartition queue. Possible values are:

`SHR|OLD|MOD`

[DSNAME] specifies the DSNAME of the data set to be associated with the extrapartition queue.

[EMPTY_STATUS] indicates whether the queue contains any records, and whether the queue is full. This option applies to extrapartition queues only. Possible values are:

`FULL|EMPTY|NOTEMPTY`

[ENABLE_STATUS] indicates the status of the queue. Possible values are:

`ENABLED|DISABLING|DISABLED`

[ERROR_OPTION] specifies what action is to be taken in the event of an I/O error. This option applies to extrapartition queues only. Possible values are:

`IGNORE|SKIP`

[INDIRECT_DEST] specifies the destination queue if this queue is an indirect queue.

[WAIT] specifies whether this logically recoverable intrapartition queue can wait for the resolution of an indoubt failure. Possible values are:

`YES|NO`

[WAIT_ACTION] specifies the action to be taken if this logically recoverable intrapartition queue suffers an indoubt failure. Possible values are:

`QUEUE|REJECT`

[NUM_ITEMS] states the number of committed items in the queue.

[OPEN_STATUS] indicates whether the queue is open. Possible values are:

`OPEN|CLOSED`

[RECORD_FORMAT] specifies the format of the records held on the extrapartition queue. Possible values are:

```
FIXUNB|FIXUNBA|FIXUNBM|FIXBLK|FIXBLKA|FIXBLKM|
VARBLK|VARBLKA|VARBLKM|VARUNB|VARUNBA|
VARUNBM|UNDEFINED
```

[RECORD_LENGTH] specifies the record length of the extrapartition queue.

[RECOVERY] specifies the recovery type of an intrapartition queue. Possible values are:

`NO|PH|LG`

[REMOTE_NAME] specifies the remote name of the queue if this is a remote queue definition.

[REWIND] specifies where the tape is positioned in relation to the end of the data set. This input parameter applies to extrapartition queues only. Possible values are:

`REREAD|LEAVE`

[TD_QUEUE_TOKEN] states which token is associated with this queue.

[TD_TYPE] specifies the queue type. Possible values are:

`EXTRA|INTRA|INDIRECT|REMOTE`

[TRIGGER_LEVEL] specifies the trigger level of the intrapartition queue.

[TYPE_FILE] specifies whether this queue is:

- An input queue
- An output queue
- Whether it is a queue that is to be read backwards.

Possible values are:

`INPUT|OUTPUT|RDBACK`

[USERID_TOKEN] indicates which token is associated with the USERID that was specified for this intrapartition queue.

[SYSOUTCLASS] specifies the SYSOUT class to be used for the associated output extrapartition queue.

[BLOCK_LENGTH] specifies the block length of an extrapartition queue.

RESPONSE is Transient Data's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, DCT_ERROR, DIRECTORY_MGR_ERROR, LOGIC_ERROR
EXCEPTION	NO_MORE_DATA_AVAILABLE
INVALID	INVALID_BROWSE_TOKEN

TDTM gate, END_BROWSE_TDQDEF function

The END_BROWSE_TDQDEF function of the TDTM gate terminates a browse session.

Input parameters

BROWSE_TOKEN identifies the browse session.

Output parameters

RESPONSE is Transient Data's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] returned when RESPONSE is DISASTER, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, DCT_ERROR, DIRECTORY_MGR_ERROR, LOGIC_ERROR
INVALID	INVALID_BROWSE_TOKEN

TDTM gate, SET_TDQUEUE function

The SET_TDQUEUE function of the TDTM gate updates attributes of an installed transient data queue.

Input parameters

QUEUE_NAME identifies the queue to be updated.

[ATI_FACILITY] specifies the type of facility associated with this queue. Possible values are:

`TERMINAL|FILE|SYSTEM`

[ATI_TERMID] indicates whether the ATI facility is to be updated.

[ATI_TRANID] indicates whether the ATI transaction is to be updated.

[ATI_USERID] indicates whether the USERID associated with the ATI transaction is to be updated.

[USERID_TOKEN] is the token that is supplied by the user domain when the userid is added to the system.

Output parameters

OLD_USER_TOKEN identifies the token associated with a previous USERID.

RESPONSE is Transient Data's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, DCT_ERROR, DIRECTORY_MGR_ERROR, LOGIC_ERROR, CATALOG_WRITE_ERROR ,
EXCEPTION	IS_CXRF, NOT_CLOSED, DISABLE_PENDING, NOT_DISABLED, QUEUE_IS_INDOUBT, QUEUE_NOT_FOUND

TDTM gate, DISCARD_TDQDEF function

The DISCARD_TDQDEF function of the TDTM gate deletes an installed transient data queue definition and removes it from the catalog. A DELETEQ command is issued as part of the discard process.

Input parameters

QUEUE_NAME identifies the queue to be discarded.

[TD_QUEUE_TOKEN] can be specified instead of QUEUE_NAME. TD_QUEUE_TOKEN identifies the queue to be discarded.

Output parameters

RESPONSE is Transient Data's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DCT_ERROR, DIRECTORY_MGR_ERROR, LOGIC_ERROR, CATALOG_DELETE_FAILED,
EXCEPTION	NAME_STARTS_WITH_C, NOT_CLOSED, NOT_DISABLED, DISABLE_PENDING, QUEUE_NOT_FOUND

TDTM gate, COMMIT_TDQDEFS function

The COMMIT_TDQDEFS function of the TDTM gate catalogs all installed transient data queue definitions as part of cold start processing.

Input parameters

TOKEN specifies the catalog to which the queue definitions are to be written.

Output parameters

RESPONSE is Transient Data’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] returned when RESPONSE is DISASTER. Possible values are: DIRECTORY_MGR_ERROR, CATALOG_WRITE_FAILED, and ABEND.

TDXM gate, BIND_FACILITY function

The BIND_FACILITY function of the TDXM gate is used to associate a transaction with the definition for the transient data queue that caused the transaction to be trigger-level attached, where the principal facility is the queue itself (that is there is no terminal associated with the queue).

Input parameters: None.

Output parameters

RESPONSE is Transient Data’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

REASON is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND

TDXM gate, BIND_SECONDARY_FACILITY function

The BIND_SECONDARY_FACILITY function of the TDXM gate is used to associate a transaction with the definition for a transient data queue that has caused the transaction to be trigger-level attached (where the principal facility is a terminal and the secondary facility is the transient data queue itself).

Input parameters: None.

Output parameters

FACILITY_NAME is the name of the transient data queue. The queue is the secondary facility and has been associated with this transaction.

RESPONSE is Transient Data’s response to the call. It can have any of the following values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

REASON is returned when RESPONSE is DISASTER. Possible value is ABEND.

TDXM gate, RELEASE_FACILITY function

The RELEASE_FACILITY function of the TDXM gate is used to disassociate a transaction from the TD queue. (The principal facility type is either TERMINAL or TDQUEUE.)

Input parameters

TERMINATION_TYPE is the type of transaction termination. It can have either of these values:

```
NORMAL ABNORMAL
```

[RESTART_REQUESTED] indicates whether or not the transaction is to be restarted. It can have either of these values:

```
YES|NO
```

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

REASON is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	RESTART_FAILURE

TDXM gate, INQUIRE_FACILITY function

The INQUIRE_FACILITY function of the TDXM gate is used to inquire about the transient data facilities that support facility manager calls from the transaction manager domain.

Input parameters

[FACILITY_TOKEN] is the token identifying the transaction that has been trigger-level attached.

Output parameters

FACILITY_NAME is the four-character name of the transaction that has been trigger-level attached.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

TFAL gate, ALLOCATE function

The ALLOCATE function of the TFAL gate is used to allocate a terminal for a transaction.

Input parameters

REQUEST_ID is the four-character transaction identifier initiating the attach.

[MODE_NAME] is the eight-character mode-name of the terminal to be attached.

SYSTEM_TOKEN is the token identifying the CICS region to which the terminal is to be attached.

[PRIVILEGED] indicates whether or not the terminal is to be attached as a privileged terminal. It can have either of these values:

YES|NO

[NON_PURGEABLE] indicates whether or not the terminal is to be purgeable. It can have either of these values:

YES|NO

Output parameters

TERMINAL_TOKEN is the token identifying the terminal that has been attached.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	GETMAIN_FAILED, LOGIC_ERROR
EXCEPTION	ALLOCATE_FAILURE, ALLOCATE_PURGED
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, CANCEL_AID function

The CANCEL_AID function of the TFAL gate is used to cancel a terminal-transaction AID.

Input parameters

TERMID is the four-character terminal identifier.

TRANID is the four-character transaction identifier.

TERM_OWNER_NETNAME is the APPLID of the CICS region that “owns” the terminal.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, CANCEL_AIDS_FOR_CONNECTION function

The CANCEL_AIDS_FOR_CONNECTION function of the TFAL gate is used to cancel AIDs for the given CICS region.

Input parameters

SYSTEM_TOKEN is the token identifying the CICS region.

CALLER is the method used to call this function. It can have either of these values:

BUILDER|API

FORCE indicates whether or not system AIDs are to be canceled. It can have either of these values:

YES|NO

FACILITY indicates the facility type associated with the AIDs. It can have either of these values:

CONNECTION|TERMINAL

Output parameters

[AIDS_CANCELLED] indicates whether or not AIDs were canceled as a result of this request. It can have either of these values:

YES|NO

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NULL_SYSTEM_TOKEN
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, CANCEL_AIDS_FOR_TERMINAL function

The CANCEL_AIDS_FOR_TERMINAL function of the TFAL gate is used to cancel all AIDs for the given terminal.

Input parameters

Note: Specify either TERMID or TERMINAL_TOKEN, not both.

TERMID is the four-character terminal identifier.

TERMINAL_TOKEN is the token identifying the terminal.

CALLER is the method used to call this function. It can have one of these values:

BUILDER|API|BUILDER_REMDEL

FORCE indicates whether or not system AIDs are to be canceled. It can have either of these values:

YES|NO

FACILITY indicates the facility type associated with the AIDs. It can have either of these values:

CONNECTION|TERMINAL

Output parameters

[AIDS_CANCELLED] indicates whether or not AIDs were canceled as a result of this request. It can have either of these values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NULL_TERMINAL_TOKEN,
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, CHECK_TRANID_IN_USE function

The CHECK_TRANID_IN_USE function of the TFAL gate is used to check whether any of the AID chains contain ferrences to the given TRANID

Input parameters

TRANID is the four-character transaction identifier.

Output parameters

IN_USE indicates whether or not the transaction identifier (specified by the TRANID parameter) is in use. It can have either of these values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, DISCARD_AIDS function

The DISCARD_AIDS function of the TFAL gate is used to attach a task which will release start data and free the AIDs in the chain addressed by the AID_TOKEN

Input parameters

AID_TOKEN is the token identifying the chain of AIDs.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, FIND_TRANSACTION_OWNER function

The FIND_TRANSACTION_OWNER function of the TFAL gate is used to determine the CICS region that owns the given transaction (that is, at which the transaction instance originated).

Input parameters

TERMINAL_TOKEN is the token identifying the terminal.

TRANID is the four-character transaction identifier.

Output parameters

TRAN_OWNER_SYSID is the four-character system identifier for the CICS region that owns the transaction instance.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND, TOR_LINK_NOT_ACTIVE,
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, GET_MESSAGE function

The GET_MESSAGE function of the TFAL gate is used to get a message from a terminal.

Input parameters

TERMINAL_TOKEN is the token identifying the terminal.

PREVIOUS_AID_TOKEN is the AID token identifying the previous transaction that ran at this terminal.

Output parameters

AID_TOKEN is the AID token identifying the current transaction for which the message was got.

TSQUEUE_NAME is the eight-character name of the temporary storage queue name of the message whose BMS AID was found.

BMS_TITLE_PRESENT indicates whether or not a BMS title is present on the terminal. It can have either of these values:

YES|NO

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, INITIALIZE_AID_POINTERS function

The INITIALIZE_AID_POINTERS function of the TFAL gate is used to initialize the AID pointers for the given CICS region.

Input parameters

SYSTEM_TOKEN is the token identifying the CICS region.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, INQUIRE_ALLOCATE_AID function

The INQUIRE_ALLOCATE_AID function of the TFAL gate is used to inquire about the AIDs allocated for the given CICS region.

Input parameters

SYSTEM_TOKEN is the token identifying the CICS region.

[PRIVILEGED] indicates whether or not to inquire only about privileged ISC type AIDs. It can have either of these values:

YES|NO

Output parameters

EXISTS indicates whether or not the AID exists. It can have either of these values:

YES|NO

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, LOCATE_AID

The LOCATE_AID function of the TFAL gate is used for automatic transaction initiation to determine the AID for the specified terminal, and if found, to use the transaction identifier from the AID to attach the task.

Input parameters

TERMID is the four-character terminal-identifier.

[TYPE] denotes the type of AID to be located. It can have one of these values:

BMS|PUT|INT|TDP|ISC|REMDEL

Output parameters

[TRANID] is the four-character transaction identifier associated with the specified terminal.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, LOCATE_REMDEL_AID

The LOCATE_REMDEL_AID function of the TFAL gate is used to determine the AID (for a delete remote TERMINAL definition request) for the specified system (SYSTEM_TOKEN specified) or after the given (PREVIOUS_AID_TOKEN specified).

Input parameters

SYSTEM_TOKEN is the token identifying the CICS region.

PREVIOUS_AID_TOKEN is the AID token identifying the previous transaction that ran at this terminal.

Output parameters

AID_TOKEN is the AID token identifying the transaction to be deleted.

TARGET_SYSID is the four-character system identifier for the target CICS system.

TERMID is the four-character terminal identifier from the REMDEL AID.

TERM_OWNER_NETNAME is the eight-character netname from the REMDEL AID.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, LOCATE_SHIPPABLE_AID

The LOCATE_SHIPPABLE_AID function of the TFAL gate is used to determine an AID (for a delete remote TERMINAL definition request or for a remote terminal request) to be shipped to the specified system.

Input parameters

SYSTEM_TOKEN is the token identifying the CICS region.

Output parameters

AID_TOKEN is the AID token identifying the transaction to be deleted.

LAST Indicates that either:

- there is a single qualifying AID or all qualifying AIDs have the same AIDTRMID (YES), or
- in addition to the AID returned there are other qualifying AIDs (NO)

It can have either of these values:

`YES|NO`

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, MATCH_TASK_TO_AID function

The MATCH_TASK_TO_AID function of the TFAL gate is used to inquire about AIDs for the given terminal and transaction.

Input parameters

TERMINAL_TOKEN is the token identifying the terminal.

TRANID is the four-character transaction identifier.

Output parameters

TDQUEUE_NAME is the eight-character name of the transient data queue for the AID.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND, MATCHED_TERMID_ONLY
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, PURGE_ALLOCATE_AIDS

The PURGE_ALLOCATE_AIDS function of the TFAL gate is used to delete purgeable allocate AIDs for a given connection after user exit XZIQUE in DFHZISP has issued return code 8 (delete all) or return code 12 (delete all for given modegroup).

Input parameters

SYSTEM_TOKEN is the token identifying the CICS region.

[MODE_NAME] The name of the modegroup. If this parameter is omitted, the default is all modegroups.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, RECOVER_START_DATA

The RECOVER_START_DATA function of the TFAL gate is used to retrieve a PUT-type AID stored in a DWE and rechain it onto the TCTSE in front of the first AID for the terminal.

Input parameters

AID_TOKEN is the AID token identifying the transaction to be deleted.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	NULL_SYSTEM_TOKEN, GETMAIN_FAILED
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, REMOTE_DELETE

The REMOTE_DELETE function of the TFAL gate is used to chain a REMOTE DELETE (REMDEL) AID onto the system entry of the specified target CICS region. The REMDEL AID tells the target region to delete its shipped definition of the specified terminal.

Input parameters

TARGET_SYSID is the four-character system identifier for the target CICS region.

TERMINAL_TOKEN is the token identifying the terminal.

TERMID is the four-character terminal identifier for the terminal associated with the transaction.

TERM_OWNER_NETNAME Is the VTAM APPLID of the CICS region that "owns" the terminal.

Note: The terminal identifier can either be specified as TERMID and TERM_OWNER_NETNAME (where TERMID is the name known in the terminal owning system), or it can be specified by TERMINAL_TOKEN if the TCTTE address is known.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	GETMAIN_FAILED,
EXCEPTION	TOR_LINK_NOT_ACTIVE
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, REMOVE_EXPIRED_AID

The REMOVE_EXPIRED_AID function of the TFAL gate is used to search all AID chains for a BMS AID that has yet to be initiated and which matches the eligibility parameters. Unchain the first such AID found, copy details from the AID into the caller's parameter list, and freemain the AID.

Input parameters

[NORMAL_EXPIRY_TIME] is the normal threshold time.

[ADJUSTED_EXPIRY_TIME] is the adjusted threshold time.

[MSGID] is the BMS message identifier

[LDC] is the logical device code

Note: If MSGID and LDC are specified, the expiry time is not checked.

Output parameters

TSQUEUE_NAME is the eight-character name of the temporary storage queue name of the message whose BMS AID was found.

TRANID is the four-character transaction identifier associated with the specified terminal.

TERMID is the four-character terminal identifier for the terminal associated with the transaction.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, REMOVE_EXPIRED_REMOTE_AID

The REMOVE_EXPIRED_REMOTE_AID function of the TFAL gate is used to search for an uninitiated remote AID which is older than the expiry time specified by the caller, unchain the AID, and cleanup any associated resources.

Input parameters

NORMAL_EXPIRY_TIME is the normal threshold time.

ADJUSTED_EXPIRY_TIME is the adjusted threshold time.

Output parameters

TRANID is the four-character transaction identifier associated with the specified terminal.

TERMID is the four-character terminal identifier for the terminal associated with the transaction.

TERM_OWNER_SYSID is the system identifier of the CICS region that "owns" the terminal.

SHIPPED identifies whether the AID has been shipped. It can have either of these values:

```
YES|NO
```

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, REMOVE_MESSAGE

The REMOVE_MESSAGE function of the TFAL gate is used to:

1. Find an uninitiated BMS AID for the specified terminal
2. Unchain and freemain the AID, provided that the AID security fields match those of the currently signed-on operator
3. Return the TS queue name from the AID.

Input parameters

TERMINAL_TOKEN is the token identifying the terminal.

[MSGID] is the BMS message identifier

Output parameters

TSQUEUE_NAME is the eight-character name of the temporary storage queue name for the message whose BMS AID was found.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND, SECURITY_MISMATCH
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, REMOVE_REMOTE_DELETES

The REMOVE_REMOTE_DELETES function of the TFAL gate is used to unchain and freemain all REMDEL AIDs from the AID chain of the specified system entry. Optional parameters TERMID and TERM_OWNER_NETNAME may be specified; in which case only those REMDEL AIDs which match the specified values are removed.

Input parameters

TARGET_SYSID is the four-character system identifier for the target CICS region.

SYSTEM_TOKEN is the token identifying the CICS region.

Note: Specify either the TARGET_SYSID parameter or the SYSTEM_TOKEN parameter, not both.

[TERMID] is the four-character terminal identifier for the terminal associated with the transaction.

[TERM_OWNER_NETNAME] is the netname of the region that "owns" the terminal.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, REROUTE_SHIPPABLE_AIDS

The REROUTE_SHIPPABLE_AIDS function of the TFAL gate is used to redirect AIDs for remote terminals from one remote system to another.

Input parameters

ORIGINAL_SYSTEM_TOKEN is the token identifying the remote system which was the AIDs' original target.

TARGET_SYSTEM_TOKEN is the token identifying the remote system which is the AIDs' new target.

TERMINAL_NETNAME is the eight-character NETNAME which identifies the terminal whose AIDs are to be rerouted.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, RESCHEDULE_BMS

The RESCHEDULE_BMS function of the TFAL gate is used to build a BMS AID and chain it to the front of the AID queue.

Input parameters

TERMINAL_TOKEN is the token identifying the terminal.

TRANID is the four-character transaction identifier associated with the specified terminal.

TSQUEUE_NAME is the eight-character name of the temporary storage queue name of the message whose BMS AID was found.

BMS_TIMESTAMP Timestamp for BMS AID. Used to test if AID is older than specified EXPIRY_TIME.

[OPIDENT] Identifies the operator

Note: You can specify either the OPIDENT parameter or the OPCLASS parameter, not both.

[OPCLASS] Identifies the operator class.

Note: You can specify either the OPIDENT parameter or the OPCLASS parameter, not both.

[BMS_TITLE_PRESENT] Indicates if title in message control record. You can specify either of these values:

`YES|NO`

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	GETMAIN_FAILED
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, RESET_AID_QUEUE

The RESET_AID_QUEUE function of the TFAL gate is used to:

1. Give ALP a chance to reset the AID queue when a transaction ends
2. Give ALP a chance to bid for the use of the terminal if ATI tasks are waiting.

Input parameters

TERMINAL_TOKEN is the token identifying the terminal.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, RESTORE_FROM_KEYPOINT

The RESTORE_FROM_KEYPOINT function of the TFAL gate is used to: reschedule a chain of AIDs that we restored from the catalog during CICS system initialization.

Input parameters

AID_TOKEN A token denoting the chain of AIDs which are to be rescheduled.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, RETRIEVE_START_DATA

The RETRIEVE_START_DATA function of the TFAL gate is used to return the AID address and temporary storage queue name associated with the start data for the specified transaction and terminal.

Input parameters

TERMINAL_TOKEN is the token identifying the terminal.

TRANID is the four-character transaction identifier associated with the specified terminal.

Output parameters

TSQUEUE_NAME is the eight-character name of the temporary storage queue name of the message whose BMS AID was found.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, SCHEDULE_BMS

The SCHEDULE_BMS function of the TFAL gate is used to: schedule a BMS AID.

Input parameters

TERMID is the four-character terminal identifier for the terminal associated with the transaction.

TRANID is the four-character transaction identifier associated with the specified terminal.

TSQUEUE_NAME is the eight-character name of the temporary storage queue name of the message whose BMS AID was found.

BMS_TIMESTAMP is the timestamp for the BMS AID. This is used to test if the AID is older than its EXPIRY_TIME.

[OPIDENT] Identifies the operator.

Note: You can specify either the OPIDENT parameter or the OPCLASS parameter, not both.

[OPCLASS] Identifies the operator class.

Note: You can specify either the OPIDENT parameter or the OPCLASS parameter, not both.

[BMS_TITLE_PRESENT] Indicates if the title is in the message control record. You can specify either of these values:

YES|NO

[TERMINAL_NETNAME] is the eight-character NETNAME which identifies the terminal whose AIDs are to be rerouted.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	GETMAIN_FAILED
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, SCHEDULE_START

The SCHEDULE_START function of the TFAL gate is used to schedule a PUT or INT type AID

Input parameters

TRANID is the four-character transaction identifier associated with the specified terminal.

TERMID is the four-character terminal identifier for the terminal associated with the transaction.

[TRAN_OWNER_SYSID] is the system identifier of the CICS region that "owns" the transaction.

[TERM_OWNER_SYSID] is the system identifier of the CICS region to which the request should be shipped.

Note: You can specify either the TERM_OWNER_SYSID parameter or TERM_OWNER_NETNAME parameter, not both.

[TERM_OWNER_NETNAME] is the system identifier of the CICS region to which the request should be shipped.

Note: You can specify either the TERM_OWNER_SYSID parameter or TERM_OWNER_NETNAME parameter, not both.

[ROUTED_FROM_TERMID] is the four-character terminal identifier for the terminal from which a task was transaction-routed to issue this START request.

[SHIPPED_VIA_SESSID] is the identifier of the session via which this START request was function shipped.

[MODE_NAME] is the mode name to be used

[TSQUEUE_NAME] is the name of the temporary storage queue which contains the data associated with the START request.

[FEPI] indicates that this is a FEPI START request. It can have either of these values:

YES|NO

[RECOVERABLE_DATA] indicates that the request is associated with recoverable data It can have either of these values:

YES|NO

[IN_DOUBT] indicates that the Unit of Work making the request is in doubt, and the request should not be scheduled until the Unit of Work is committed. It can have either of these values:

YES|NO

[TERMINAL_NETNAME] is the eight-character NETNAME of the terminal associated with the transaction.

[SHIPPED_VIA_SYSID] identifies the connection via which this request was function shipped or transaction routed.

[TOR_NETNAME] is the netname of the CICS region that owns the terminal.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	GETMAIN_FAILED
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, SCHEDULE_TDP

The SCHEDULE_TDP function of the TFAL gate is used to schedule a TDP type AID.

Input parameters

TRANID is the four-character transaction identifier associated with the specified terminal.

TERMID is the four-character terminal identifier for the terminal associated with the transaction.

TDQUEUE_NAME is the destination identifier for the TD queue.

[TERMINAL_NETNAME] is the eight-character NETNAME of the terminal associated with the transaction.

Output parameters

AID_TOKEN is the AID token identifying the transaction to be deleted.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	GETMAIN_FAILED
EXCEPTION	UNKNOWN_TRANID
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, SLOWDOWN_PURGE

The SLOWDOWN_PURGE function of the TFAL gate is used to:

1. Search the specified system entry's AID chain for the first allocate-type AID associated with a stall-purgeable task
2. Cancel the identified transaction.

Input parameters

SYSTEM_TOKEN is the four-character terminal identifier for the terminal associated with the transaction.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, TAKE_KEYPOINT

The TAKE_KEYPOINT function of the TFAL gate is used to return a chain of AIDs which are to be written to the global catalog.

Input parameters: None.

Output parameters

AID_TOKEN is the token identifying the chain of AIDs.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, TERM_AVAILABLE_FOR_QUEUE

The TERM_AVAILABLE_FOR_QUEUE function of the TFAL gate is used, when a terminal becomes available for allocation, to give DFHALP the chance to attach or resume a task which requires this terminal.

Input parameters

TERMINAL_TOKEN is the token identifying the terminal.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	GETMAIN_FAILED ATTACH_ERROR
EXCEPTION	NOT_FOUND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, TERMINAL_NOW_UNAVAILABLE

The TERMINAL_NOW_UNAVAILABLE function of the TFAL gate is used to perform required actions when a terminal or connection becomes unavailable.

Input parameters

TERMINAL_TOKEN is the token identifying the terminal.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, UNCHAIN_AID

The UNCHAIN_AID function of the TFAL gate is used to unchain and optionally freemain the specified AID.

Input parameters

AID_TOKEN is the AID token identifying the transaction to be deleted.

FREEMAIN indicates whether freemain is wanted. It can have either of these values:

YES|NO

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFAL gate, UPDATE_TRANNUM_FOR_RESTART

The UPDATE_TRANNUM_FOR_RESTART function of the TFAL gate is used to update the AID's TRANNUM to that of the restarted task.

Input parameters

TERMINAL_TOKEN is the token identifying the terminal.

ORIGINAL_TRANNUM is the TRANNUM set in the AID when original task was attached.

NEW_TRANNUM is the new TRANNUM to be set in the AID.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NULL_TERMINAL_TOKEN
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFBF gate, BIND_FACILITY function

The BIND_FACILITY function of the TFBF gate is used to associate a transaction with the terminal.

Input parameters

[PROFILE] is the eight-character name of the profile to be used to associate the transaction and terminal.

[PARTITIONSET_NAME] is the eight-character name of a partition set. This parameter is used only of the value of PARTITIONSET is NAME.

[PARTITIONSET] indicates if a partition set is to be used for the terminal facility. It can have any of these values:

NONE|NAME|OWN|KEEP

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, REMOTE_SCHEDULE_FAILURE, SECURITY_FAILURE, TABLE_MANAGER_FAILURE
EXCEPTION	NO_TERMINAL, TRANSACTION_ABEND
INVALID	INVALID_FORMAT, INVALID_FUNCTION

TFIQ gate, INQUIRE_TERMINAL_FACILITY function

The INQUIRE_TERMINAL_FACILITY function of the TFIQ gate is used to inquire about attributes of a named terminal facility.

Input parameters

Note: Specify a value for either the TRANSACTION_TOKEN or TERMINAL_TOKEN parameter, not both.

[TRANSACTION_TOKEN] is a token identifying a transaction for which you want to inquire about the associated terminal.

[TERMINAL_TOKEN] is a token identifying a terminal.

Output parameters

[FACILITY_NAME] is the four-character name of the terminal facility.

[NETNAME] is the eight-character netname of the terminal facility.

[PSEUDO_CONV_COMMAREA] is a block into which the communications area for a pseudo-conversational transaction is copied.

[TERMINAL_TRAFFIC_READ] indicates whether or not reading is supported. It can have either of these values:

`YES|NO`

[TERMINAL_TRAFFIC_WRITE] indicates whether or not writing is supported. It can have either of these values:

`YES|NO`

[TERMINAL_USER_AREA] is a block into which the terminal user area is copied.

[NATIONAL_LANGUAGE_IN_USE] is the three-character code indicating the national language in use for the terminal facility. (See Table 83 on page 500.)

[INSPECT_DATA] is a token indicating the LE/370 runtime options for the terminal facility.

[STORAGE_FREEZE] indicates whether or not storage normally freed during the processing of a transaction for the terminal facility is to be frozen. (The frozen storage is not freed until the end of the transaction.) It can have either of these values:

`YES|NO`

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_TERMINAL
INVALID	INVALID_TERMINAL_TYPE

TFIQ gate, SET_TERMINAL_FACILITY function

The SET_TERMINAL_FACILITY function of the TFIQ gate is used to set attributes of a named terminal facility.

Input parameters

Note: Specify a value for either the TRANSACTION_TOKEN or TERMINAL_TOKEN parameter, not both.

[TRANSACTION_TOKEN] is a token identifying a transaction for which you want to inquire about the associated terminal.

[TERMINAL_TOKEN] is a token identifying a terminal.

[COUNT_STORAGE_VIOLATION] indicates whether or not storage violations are to be counted for this terminal facility. It can have either of these values:

`YES|NO`

[INPUTMSG] is a block into which the input message for a pseudo-conversational transaction is copied.

[PSEUDO_CONV_NEXT_TRANSID] is the four-character identifier of the transaction to which control is passed on a normal return from a pseudo-conversational transaction (to which the pseudo_conversational data is passed).

[PSEUDO_CONV_COMMAREA] is a block into which the communications area for a pseudo-conversational transaction is copied.

[PSEUDO_CONV_IMMEDIATE] is the four-character identifier of the transaction to which control is passed on an immediate return from a pseudo-conversational transaction (to which the pseudo_conversational data is passed).

[NATIONAL_LANGUAGE_IN_USE] is the three-character code indicating the national language in use for the terminal facility. (See Table 83 on page 500.)

[INSPECT_DATA] is a token indicating the LE/370 runtime options for the terminal facility.

[STORAGE_FREEZE] indicates whether or not storage normally freed during the processing of a transaction for the terminal facility is to be frozen. (The frozen storage is not freed until the end of the transaction.) It can have either of these values:

`YES|NO`

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_TERMINAL, PERMANENT_TRANSID
INVALID	INVALID_TERMINAL_TYPE

TFIQ gate, INQUIRE_MONITOR_DATA function

The INQUIRE_MONITOR_DATA function of the TFIQ gate is used to inquire about monitoring data of the terminal facility.

Input parameters: None.

Output parameters

[FACILITY_TYPE] indicates the type of terminal facility. It can have any of these values:

LU61|LU62|IRC|IRC_XCF|OTHER

[FACILITY_NAME] is the four-character name of the terminal facility.

[NETNAME] is the eight-character netname of the terminal facility.

[INPUT_MSG_LENGTH] is the length (in bytes) of the input message for the terminal facility.

[SERVICE_REPORTING_CLASS] is a token indicating the service reporting class for the terminal facility (for MVS workload manager purposes).

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_TERMINAL

Application domain’s generic gates

Table 3 summarizes the application domain’s generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 3. Application domain’s generic gates

Gate	Trace	Function	Format
APDM	AP 0900 AP 0901	INITIALISE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
APDS	AP 0500 AP 0501	TASK_REPLY PURGE_INHIBIT_QUERY	DSAT
APST	AP D400 AP D401	COLLECT_STATISTICS COLLECT_RESOURCE_STATS	STST
APSM	AP F110 AP F111	STORAGE_NOTIFY	SMNT
APTI	AP F300 AP F301	NOTIFY	TISR

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats, as follows:

Functions and parameters

Format DMDM—“Domain manager domain’s generic formats” on page 195

Format DSAT—“Dispatcher domain’s generic formats” on page 167

Format STST—“Statistics domain’s generic format” on page 521

Format SMNT—“Storage manager domain’s generic format” on page 536

Format TISR—“Timer domain’s generic format” on page 606

Application domain’s generic formats

Table 4 describes the generic formats owned by the application domain and shows the functions performed on the calls.

Table 4. Generic formats owned by application domain

Format	Calling module	Function
APUE	DFHUEM	SET_EXIT_STATUS

In the descriptions of the formats that follow, the “input” parameters are input not to the application domain, but to the domain being called by the application domain. Similarly, the “output” parameters are output by the domain that was called by the application domain, in response to the call.

APUE format, SET_EXIT_STATUS function

The SET_EXIT_STATUS function of the APUE format is used to set the exit status at a specified exit point.

Input parameters

EXIT_POINT is the name of the exit to be enabled or disabled.

EXIT_STATUS (ACTIVE|INACTIVE indicates whether the exit is to be made active or inactive.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

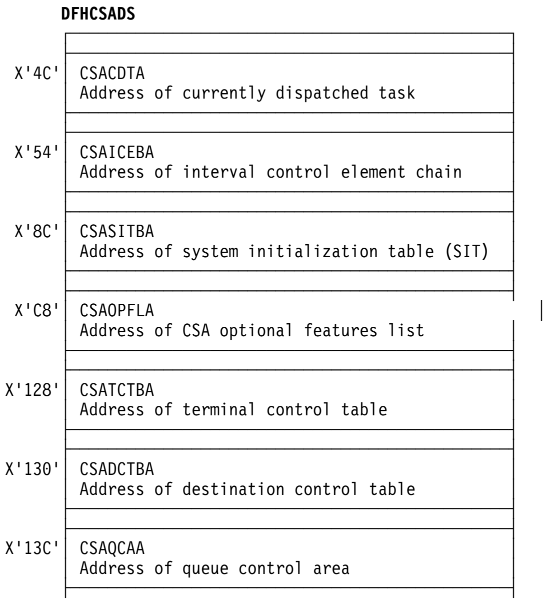
RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION, INVALID_EXIT_POINT

Control blocks

The main CICS control block in the AP domain is the common system area (CSA), which exists from CICS system initialization time until CICS is closed down. The CSA contains:

- Register save area
- Pointers to the CICS control modules
- Control information
- System constants
- Time-control storage
- Work area for statistics
- Task abnormal termination interface
- Pointers to CICS system tables.

Figure 3 shows the main fields in the CSA.



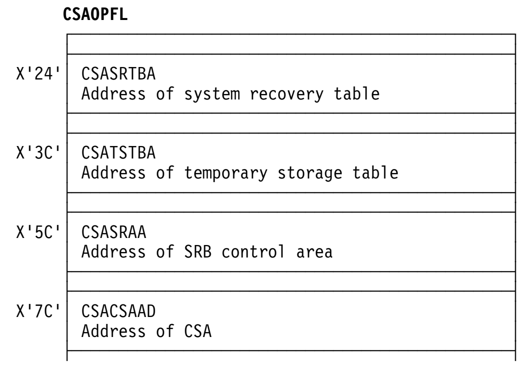
DFHCSADS

X'4C'	CSACDTA Address of currently dispatched task
X'54'	CSAICEBA Address of interval control element chain
X'8C'	CSASITBA Address of system initialization table (SIT)
X'C8'	CSAOPFLA Address of CSA optional features list
X'128'	CSATCTBA Address of terminal control table
X'130'	CSADCTBA Address of destination control table
X'13C'	CSAQCAA Address of queue control area

Figure 3. Main fields of the Common system area (CSA

The CSA has an extension area known as the CSA optional features list. The address of the optional features list is held in CSAOPFLA in the CSA, and also in TCACSOAD in the TCA.

Figure 4 shows the main fields in the optional features list.



CSAOPFL

X'24'	CSASRTBA Address of system recovery table
X'3C'	CSATSTBA Address of temporary storage table
X'5C'	CSASRAA Address of SRB control area
X'7C'	CSACSAAD Address of CSA

Figure 4. Main fields of the CSA optional features list (CSAOPFL

See the *CICS Data Areas* manual for a detailed description of these control blocks.

There is also a user-defined work area, called the common work area (CWA). The user can govern the length and storage key of the CWA by using the WRKAREA and CWAKEY system initialization parameters.

The CWA is available to any task while it has control of the system (that is, for operations performed between requests to CICS).

Modules

Module	Function
DFHAPDM	AP domain/domain manager gate service module. Handles the following calls made by the domain manager to the AP domain: INITIALISE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHAPEX	AP domain user exit service module. This module handles INVOKE_USER_EXIT made by several domains to the AP domain.
DFHAPIQ	AP domain task data inquire and set gate service module. Handles the following call to the AP domain: INQ_APPLICATION_DATA
DFHAPJC	AP domain/journal gate service module. This module handles WRITE_JOURNAL_DATA calls made by the user exits' XPI.
DFHAPSM	AP domain storage notify gate service module.
DFHAPST	AP domain functional gate for statistics. This module accepts a request for and then supervises the copying and resetting of statistics counters in the AP domain by calling the appropriate DFHSTxx modules to access the counters.
DFHAPTI	AP domain timer domain gate service module. This module handles NOTIFY calls made by the timer domain to the AP domain.
DFHAPTIM	CICS interval control midnight task. This module deals with NOTIFY requests from the timer domain.
DFHAPTIX	CICS expiry analysis task. This module deals with NOTIFY requests from the timer domain.
DFHAPXM	AP domain/transaction manager gate service module. Handles the following calls made by the transaction manager to the AP domain: TRANSACTION_INITIALIZATION RMI_START_OF_TASK TRANSACTION_TERMINATION
DFHICXM	AP domain/interval control principal facility management gate service module. Handles the following calls made by the transaction manager to the AP domain: BIND_FACILITY, RELEASE_FACILITY INQUIRE_FACILITY
DFHSAIQ	AP domain system data inquire and set gate service module. Handles the following calls to the AP domain: INQUIRE_SYSTEM SET_SYSTEM
DFHSRP	Default system recovery program for the AP domain. It includes the ABAB functions. For more information about DFHSRP, see Chapter 79, "System recovery program" on page 551.
DFHTDXM	AP domain/transient data principal facility management gate service module. Handles the following calls made by the transaction manager to the AP domain: BIND_FACILITY, BIND_SECONDARY_FACILITY, RELEASE_FACILITY INQUIRE_FACILITY
DFHTFBF	AP domain/terminal facility manager bind facility gate service module. Handles the following call made by the terminal facility manager to the AP domain: BIND_FACILITY
DFHTFIQ	AP domain/terminal facility manager inquire and set gate service module. Handles the following calls made by the terminal facility manager to the AP domain: INQUIRE_TERMINAL_FACILITY INQUIRE_MONITOR_DATA SET_TERMINAL_FACILITY
DFHTFRF	AP domain/terminal facility manager release facility gate service module. Handles the following calls made by the terminal facility manager to the AP domain: RELEASE_FACILITY

Exits

Various global user exit points are provided for this domain, and these are described under the appropriate functions in the rest of this book.

Trace

Various trace point IDs are provided for this domain, and these are described under the appropriate functions in the rest of this book.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 4. AP domain initialization program

The AP domain initialization program is resident only long enough to start up the AP domain.

Modules

The main initialization program is DFHAPSIP. DFHAPSIP calls a series of modules DFHSIA1, DFHSIB1, ..., DFHSIJ1, which complete initialization. DFHAPSIP receives control from DFHAPDM. For further information about DFHAPDM, see page “Modules” on page 44.

Exits

No global user exit points are provided for this function.

Trace

The following point ID is provided for this function:

- AP 0700 (DFHSII1 add gate), for which the trace level is Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 5. AP domain KC subcomponent

The AP domain KC subcomponent does the following:

- Provides an enqueue facility
- Manages profile definitions (making use of table manager program (see "The FEPI Resource Manager work queues" on page 324)).
- Converts some DFHKC macro calls into dispatcher domain calls and transaction manager domain calls.

Design overview

This section describes the macro calls supported by the AP domain KC subcomponent.

DFHKC macro calls

ATTACH. This call is converted into a transaction manager domain XMAT ATTACH call to create an instance of the requested transaction. This request is only used to create CICS system transactions and may not be used to attach a user transaction.

DEQ. DEQ is used to reduce the use count of a resource previously enqueued on by this transaction. If the use count reaches zero, the resource is freed for use by another transaction. The NQED DEQUEUE service of the NQ domain is used for this function.

ENQ. The caller passes a resource name or address. The AP domain KC subcomponent issues an NQED ENQUEUE request to the NQ domain.

INITIALIZE. INITIALIZE is used during CICS initialization to tell the AP domain KC subcomponent to build profile table entries in storage.

PROFBROWSE. This is used to browse profile table (PFT) entries.

PROFLOC. This finds the profile table (PFT) entry for the profile ID passed.

REPLACE. This replaces an existing profile table entry by a new version.

RESUME. This call is converted into a dispatcher domain DSSR RESUME call to resume the suspended task.

WAIT. Wait calls are converted into the appropriate dispatcher domain call.

WAITINIT. This is used once during initialization to wait for the completion of an earlier INITIALIZE call.

Control blocks

Static storage area (SSA). The AP domain KC subcomponent uses an SSA as a permanent work area. Field SSAKCP in the static storage area address list (as defined by the DSECT DFHSSADS) points to the AP domain KC subcomponents static storage area. The address of the static storage area address list is held in field CSASSA in the CSA optional features list.

See the *CICS Data Areas* manual for a detailed description of these control blocks.

Modules

The following are link-edited together to form the DFHKCP module:

Module	Function
DFHKCP	This is a startup routine that passes control to either DFHXCP or DFHXCPC.
DFHXCP	Processes DFHKC ATTACH, RESUME, and WAIT macro calls to the transaction manager and dispatcher and handles the DFHKC PROFLOC AND PROFBROWSE (profile locate and profile browse) services.
DFHXCPC	Processes DFHKC DEQ and ENQ macro calls to the AP domain KC subcomponent Receives DFHKC INITIALIZE, REPLACE, WAITINIT, and DISCARD macro calls to the transaction manager and passes them on to DFHKCQ.
DFHKCQ	Processes DFHKC INITIALIZE, REPLACE, WAITINIT, and DISCARD macro calls to the AP domain KC subcomponent.
DFHKCSC	Provides chain scanning facilities for the DISCARD TRANSACTION command.

Exits

There are two globasl user exit points in DFHEKC: XNQEREQ and XNQEREQC. See the *CICS Customization Guide* for further information.

Trace

The following point ID is provided for the AP domain KC subcomponent

- AP F0xx, for which the trace levels are AP 1, AP 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Dumps

F007 DFHXCP was called to process a AP domain KC subcomponent request but did not recognize the function code in the TCA.

External interfaces

The AP domain KC subcomponent calls the following domains: DS, GC, KE, ME, MN, NQ, SM, TR and XM.

The AP domain KC subcomponent calls the following CICS AP domain function:

- Table manager

Statistics

No statistics are created by the AP domain KC subcomponent

Chapter 6. AP domain termination program

The AP domain (system) termination program (DFHSTP) provides for an orderly shutdown of CICS. When an PERFORM SHUTDOWN or PERFORM TAKEOVER command is used, either on the CEMT transaction or by an EXEC CICS command, the DFHEIPSH program invokes DFHSTP to handle it.

Design overview

Figure 5 shows the relationships between the components of AP domain termination.

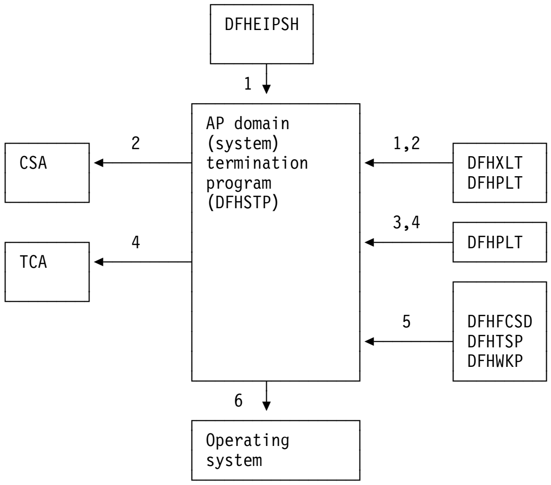


Figure 5. AP domain termination program interfaces

Notes:

1. When a PERFORM SHUTDOWN or PERFORM TAKEOVER command is used, either on the CEMT transaction or by an EXEC CICS command, the DFHEIPSH program:

   - Loads the transaction list table (XLT) and program list table (PLT) from the DFHRPL DD concatenation
   - Transfers control to DFHSTP by means of a DFHPGXE PREPARE_XCTL_EXEC domain call.

For an immediate shutdown, statistics are collected at the step described by 1. Following this, the resource managers and the subsystem interface are terminated; no load of tables, terminal quiescing, or execution of programs specified in the PLT occurs, that is to say the steps described in notes 1, 2, 3, and 4 are not performed on an immediate shutdown. Also, CICS files are not closed during step 5 on an immediate shutdown.

2. Terminal activity is quiesced via an indicator in the CSA. This tells terminal control not to attach any transactions other than those specified in the XLT and those specifying SHUTDOWN(ENABLED) in their associated TRANSACTION resource definitions. The termination task logically disconnects itself from the physical terminal to allow other activity on that terminal.
3. The termination task allows all other tasks (except any journal tasks) to complete before linking to the first program specified in the first portion of the PLT.
4. When all programs in the first portion of the PLT have executed, terminal activity is quiesced completely, using bit CSATQIM in CSASSI2 in the CSA. If monitoring is running, it is stopped. The ICE and AID chains are broken (addresses saved in the TWA), the IRC session is quiesced, and the programs specified in the second portion of the PLT are executed.
5. All open files managed by CICS file control are closed by the file control shutdown program, DFHFCSD; temporary-storage control, DFHTSP is requested to output its buffer; and a keypoint is taken by the warm keypoint program, DFHWKP.
6. Control is returned to the operating system, with or without a dump (depending upon the parameters specified in the shutdown request causing termination).

   For the high-performance option (HPO), the service request block (SRB) in the system queue area (SQA) is freed by using a CICS SVC (DFHCSVC).

Modules

DFHSTP

Exits

There is one global user exit point in DFHSTP: XSTERM. See the *CICS Customization Guide* for further information.

Trace

No trace points are provided for this function.

Chapter 7. Autoinstall for terminals, consoles and APPC connections

Autoinstall for terminals provides the ability to log on to CICS from a logical unit (LU), known to VTAM but not previously defined to CICS, and to make a connection to a running CICS system.

A new connection is created and installed automatically if autoinstall for connections is enabled, and either of the following occurs:

- An APPC BIND request or CINIT request is received for an APPC service manager (SNASVCMG) session that does not have a matching CICS CONNECTION definition
- A BIND is received for a single session that does not have a matching CICS CONNECTION definition.

A new console is created and installed automatically if autoinstall for consoles is enabled and a CIB (Command Input Buffer sent from MVS) is received by CICS (DFHZCNA) and the console TCTTE does not already exist.

For an introduction to autoinstall, and information about how to implement it, see the *CICS Resource Definition Guide*.

The *CICS Customization Guide* gives information about implementing the autoinstall user program. The CICS-supplied programs are:

- DFHZATDX, which provides autoinstall for terminals only
- DFHZATDY, which provides autoinstall for terminals and APPC connections.

These programs are user-replaceable, because you may need to tailor the basic function to suit your CICS environment.

Design overview

Before a VTAM device can communicate with CICS, a VTAM session must be established between the device and CICS. The sequence of operations is LOGON, Open Destination (OPNDST), and Start Data Traffic (SDT). CICS can also initiate the LOGON by using a SIMLOGON.

The session can be requested by:

- Specifying AUTOCONNECT when the terminal is defined to CICS
- A VTAM master terminal command requesting a LOGON to CICS for a given terminal; for example, V NET,LOGON=CICSA,ID=L3277C1
- An individual terminal operator issuing a LOGON request (LOGON APPLID(CICSA))
- A CICS master terminal command requesting LOGON for a given terminal (CEMT SET TERMINAL(xxxx) INSERVICE ACQUIRED)
- CICS internally requesting a LOGON; for example, to process an ATI request
- LOGAPPL=CICS in the LU statement.

Consoles are not VTAM resource but they usse a similar mechanism to autoinstall the TCTTE.

Autoinstall of a terminal logon flow

This section describes the flow of control for a terminal that is to be logged on by autoinstall.

1. When a terminal or single session APPC device attempts to log on, VTAM drives the **logon exit**. The CICS logon exit is DFHZLGX (load module DFHZCY).

   In the following circumstances, an LU is a candidate for autoinstall:

   - If it is not already defined to CICS (using RDO)
   - If neither CICS nor VTAM is quiescing
   - If the autoinstall user program (specified by the AIEXIT system initialization parameter) exists
   - If the VTAM RPL is present
   - If it is not an LU6.1 session or an LU6.2 parallel session
   - If it is an LU6.2 single session terminal and the ISC=YES system initialization parameter is specified
   - If the maximum number of concurrent logon requests (specified by the AIQMAX system initialization parameter) has not been exceeded.

   DFHZLGX searches for the terminal in the terminal control table (TCT) by comparing the NETNAME passed by VTAM with the NETNAME found in the NIB descriptor for each installed terminal.

   If a match is not found and AUTOINSTALL is enabled (TCTVADEN is set), CICS verifies that the terminal is eligible for autoinstall. Processing then consists of:

   - Building an autoinstall work element (AWE) by issuing an MVS GETMAIN for subpool 1
   - Copying the CINIT RU into the AWE
   - Adding the AWE to the end of the AWE chain, which is chained from the TCT prefix.

   If a match is found showing that this autoinstall terminal already exists, a postponed work element (PWE) is created and the terminal is reinstalled after deletion of the TCTTE (TCTEDZIP is ON) or if AILDELAY=0. If, however, AILDELAY¬=0 but TCTEDZIP is not ON (that is, the TCTTE deletion is pending), the TCTTE is reused after cleanup.

2. Later, the work element (AWE) is actioned by DFHZACT attaching transaction CATA. For every AWE on the AWE chain, the DFHZATA autoinstall program is dispatched, passing to DFHZATA the AWE’s address.
3. The DFHZATA program:
   a. Validates the BIND image in the CINIT RU. If the image is not valid, issue message DFHZC6901.
   b. If VTAM Model Terminal Support (MTS) is being used (ACF/VTAM 3.3 or later), and the name of a CICS model has been supplied in a X'2F' MTS control vector, DFHZATA checks that the model exists by using the AIIQ subroutine interface of the AITM manager (see Chapter 8, “Autoinstall terminal model manager” on page 59). If the model does not exist, issue message DFHZC6936.

      DFHZATA compares the BIND image contained in the MTS model with the BIND image passed in the CINIT RU. If there is a mismatch, issue message DFHZC6937.

      This validated MTS model is the only model passed to the autoinstall control program.
   c. In the absence of an MTS model name, DFHZATA browses the autoinstall terminal model (AITM) table using the AIIQ subroutine interface of the AITM manager. These models must have been installed, with appropriate TYPETERM definitions, either at system initialization or by a CEDA INSTALL command.

      Compare the BIND image contained in each model with the BIND image passed in the CINIT RU, and build a list of suitable models to be passed to the autoinstall control program.

      For autoinstall of an LU to be successful, the following ***must match***:

      - CINIT BIND image, taken from the VTAM LOGMODE entry specified for the LU in the VTAMLST
      - Autoinstall terminal model BIND image, built according to the specifications in the TYPETERM and TERMINAL definitions.

      (Both versions of the BIND image should accurately define the characteristics of the device.) If the model BIND matches the CINIT BIND, the model is added to the list of candidate entries.

      If the list is empty (no matching models are found), the request is rejected and message DFHZC6987 is written to the CADL log.
   d. On completion of the model search, if any, DFHZATA links to the autoinstall control program (the CICS-supplied default is DFHZATDX).
   e. Issue DFHZCP_INSTALL to create the TCTTE. DFHZATA uses information from the model selected by the exit program and the associated TYPETERM entry to build the TCTTE.
   f. If the install was successful, commit the TCTTE and queue it for LOGON processing. The new TCTTE is queued for OPNDST processing, then later the “good morning” message is written.
   g. Free the AWE.

Autoinstall of APPC device logon flow

This section describes the flow of control for an APPC parallel session device (or single session via a BIND) that is to be logged on by autoinstall.

1. When an APPC device attempts to logon, VTAM drives the logon exit DFHZLGX if a CINIT is received, or the SCIP exit DFHZBLX if a BIND is received.

   Note that DFHZBLX is a new VTAM exit module that is called by DFHZSCX if an LU62 BIND has been received.

   In the following circumstances, an APPC LU is a candidate for autoinstall.

   - If the connection is not already defined to CICS.
   - If the connection is not already installed.
   - If the autoinstall user program (specified by the AIEXIT system initialization parameter) exists and caters for functions 2-4 as well as functions 0-1.
   - If the VTAM ACB is open.
   - If it is an APPC parallel session connection.
   - If it is an APPC single session connection with an incoming BIND (as opposed to CINIT - which uses terminal autoinstall).
   - If ISC=YES is specified in the SIT.
   - If the maximum number of concurrent logon requests (specified by AIQMAX) has not been exceeded.
   - If the customer has installed the correct 'template' connection that is to be 'cloned' (or copied) to create the new connection.

   DFHZLGX or DFHZBLX searches for the connection in the terminal control table (TCT) by comparing the NETNAME passed by VTAM with the NETNAME found in the NIB descriptor for each installed session.

   If a match is found and AUTOINSTALL is enabled (TCTVADEN is set), CICS verifies that the terminal is eligible for autoinstall. Processing then consists of:

   - Building an autoinstall work element (AWE) by issuing an MVS GETMAIN for subpool 1.
   - Copying the CINIT RU (DFHZLGX) or BIND (DFHZBLX) into the AWE.
   - Adding the AWE to the end of the AWE chain, which is chained from the TCT prefix.

If a match is found showing that this connection already exists then the logon proceeds as for a defined connection.

2. Later, the AWE is actioned by DFHZACT attaching transaction CATA. For every AWE on the AWE chain, the DFHZATA autoinstall program is dispatched, passing to DFHZATA the AWE's address.
3. The DFHZATA program:
   a. Validates the BIND image passed in the AWE. If the image is not valid, issue message DFHZC6901.
   b. Calls DFHZGAI Function(CREATE_CLONE_BPS) to create a Builder Parameter Set from which to create the new connection ('clone'). This is done by calling the customer supplied autoinstall user exit program (which can be based on DFHZATDY) in which the customer chooses which 'template' connection the new connection should be copied from.

      If at any point DFHZGAI finds a problem it issues message DFHZC6920 or DFHZC6921 or DFHZC6922 with an exception trace entry which will explain the reason for failure.
   c. Issue DFHZCP function(INSTALL) to create the CONNECTION, MODEGROUP and SESSIONs, based on the attributes of the template connection.
   d. For parallel sessions with an incoming BIND, chose the SNASVCMG secondary session and call DFHZGAI (SET_TCTTE_FOR_OPNDST). This mimics code in DFHZBLX to check the session against the incoming BIND.

      If at any point DFHZGAI finds a problem it issues message DFHZC6923 with an exception trace entry which explains the reason for failure.
   e. For parallel session with an incoming CINIT, chose the SNASVCMG primary session.
   f. If the install was successful, commit the CONNECTION and queue it for logon processing. The new CONNECTION is queued for OPNDST processing.
   g. Free the AWE.

Autoinstall of an APPC Generic Resource connection: If this system is registered as a generic resource and a bind is received from another generic resource then VTAM exit DFHZBLX will initiate an autoinstall if there is no generic or member name connection available for use.

An AWE is created with extra parameters such as the generic resource name and member name of the partner and possibly a suggested template.

Autoinstall then continues as for normal APPC and the extra parameters are reflected into the TCSE and TCTTE via the BPS.

Autoinstall of consoles install flow

1. The modify command comes into DFHZCNA via a CIB (Command Input Buffer) from MVS when a user types a console command for CICS.
2. DFHZCNA scans the Console Control Elements for a matching console name. If no CCE is found and autoinstall for consoles is enabled then an Autoinstall Work Element is created and added to the AWE queue.
3. DFHZACT scans the AWE queue and attached the CATA transaction.
4. The CATA transaction calls DFHZATA which sees the AWE is fir a console (sometimes called a Console Work Element) and calls DFHZATA2.
5. DFHZATA2 does the following:
   a. Finds the console models (AICONS is supplied in group DFHTERMC).
   b. If SIT AICONS(YES) is specified the models are passed to the autoinstall URM which returns the termid. The default AI URM returns the last 4-characters of the consolename.
   c. If SIT AICONS(AUTO) is specified DFHZGBM is called to get a name in the console bitmap in the form AAA. The AI URM is not called.
   d. Calls DFHZCP FUNCTION(INSTALL).
   e. Issues EXEC CICS SYNCPOINT.
   f. Signs on if using preset security of USERID=*EVERY|*FIRST specified in the AI model TYPETERM.
   g. Geta a TIOA to hold the data specified in the command, e.g. if /f jobname,CEMT I TE was typed at the console then CEMT I TE is put into the TIOA.
   h. Call DFHZATT to attach the transaction specified in the MODIFY command (e.g. CEMT).

Sign-on to consoles flow

If a CIB is received with the same console name but with a different USERID then the autoinstall program DFHZATA2 is called to sign off the original USERID and sign on to the new USERID as follows:

1. DFHZCNA receives the modify and
   a. Finds the CCE
   b. Finds that the USERID is different and is already signed on
   c. Creates an AWE for signoff/on
   d. Chains the AWE for DFHZACT.
2. DFHZACT attaches CATA

3. CATA calls DFHZATA which calls DFHZATA2 for signoff/on
4. DFHZATA2 issues preset security sign off for the original USERID followed by sign on for the new USERID
5. DFHZATA2 then gets a TIOA for the modify command data and calls DFHZATT to attach the transaction as for normal autoinstall for consoles.

Disconnection flow for terminals (LU-initiated)

This section describes the flow of control when a request is made to disconnect an autoinstalled terminal (for example, by entering a CESF LOGOFF command), ultimately causing an EXEC CICS ISSUE LOGOFF command to be issued.

1. First the following functions are performed:
   - Set on the CLSDST flag in the TCTTE.
   - Put the TCTTE on the **activate chain** for DFHZACT to dispatch.
2. Control is then passed to the **Close destination program**, DFHZCLS, which performs the following functions:
   - Set on the SHUTDOWN_IN_PROGRESS flag in the TCTTE.
   - Set on the REQUEST_SHUTDOWN flag in the TCTTE.
3. The **Send asynchronous commands program**, DFHZDSA is then called to send a VTAM SHUTD command to the LU (autoinstalled terminal) to be disconnected. The DFHZDSA program removes the TCTTE from the activate chain, pending completion of the SHUTD command.
4. When the VTAM SHUTD command has completed, VTAM calls the **asynchronous send exit**, DFHZSAX, which performs the following functions:
   - Set off the REQUEST_SHUTDOWN flag in the TCTTE.
   - Set on the SHUTDOWN_SEND flag in the TCTTE.
   - Put the TCTTE back on the activate chain for DFHZACT to dispatch.
5. VTAM then drives the **asynchronous receive exit**, DFHZASX, with the SHUTC ("shutdown complete") command sent by the LU to be disconnected. DFHZASX performs the following functions:
   - Ensures that the NODE_QUIESCED_BY_CICS, SHUTDOWN_IN_PROGRESS, and CLSDST flags are still on.
   - Puts the TCTTE back on the activate chain for DFHZACT to dispatch.
6. Control is then passed to the **Close_Destination program**, DFHZCLS. The DFHZCLS program performs the following functions:
   - Set on the PENDING_DELETE flag in the TCTTE to prevent VTAM exits scheduling requests for the device.
   - Issue UNBIND (CLSDST POST=RESP) for the device.
7. The **Close destination exit**, DFHZCLX, is driven. If the CLSDST request is successful (that is, there is a positive response from UNBIND), the following functions are performed:
   - Set on the SESSION_CLOSED flag in the TCTTE.
   - Flag the TCTTE for deletion.
   - Enqueue the TCTTE to DFHZNAC.
8. Control is passed to the DFHZNAC program, which performs the following functions:
   - Set on the DELETE_REQUIRED flag in the TCTTE.
   - Put the TCTTE on the activate chain for DFHZACT to dispatch.
   - Issue message DFHZC3462 (session terminated).
9. On the delete request, the DFHZNCA copybook of DFHZNAC checks the value of the system initialization parameter AILDELAY.
   - If AILDELAY is zero, the TCTTE is queued via DFHZACT with the address of the TCTTE as input. Its function is to perform cleanup operations, the principal operation being to ask DFHZCQ to delete the TCTTE.
   - If AILDELAY is not zero, DFHZNCA initiates CATD using the delay specified and passes the address of the TCTTE.

   Up to three attempts are made to delete the TCTTE. This is because the reason for the failure may be the existence of a transient condition, such as the TCTTE being on the DFHZNAC queue to output a message to CSMT. If the initial delete attempt fails, it is attempted again after one second; if this fails, another attempt is made after a further 5 seconds. If the third attempt fails, it is assumed that the failure is a hard failure, which will not disappear until the device is reconnected; in this case, message DFHZC6943 is issued, a syncpoint is taken, and the TCTTE delete status is reset to make the TCTTE reusable.

   If the deletion is successful, the delete is committed, the autoinstall control program is invoked to permit any specific cleanup operations to take place, and message DFHZC6966 is issued.

   If a PWE exists for this TCTTE, the PWE is requeued onto the AWE chain.

Disconnection of an autoinstalled terminal can also be requested by CICS shutdown, terminal time-out, and terminal errors. In these cases the flow is slightly different.

Deletion of autoinstalled APPC devices.

This section describes the flow of control when an APPC sync level 1 device has its last session released. This can occur as a result of unbind flows from the partner or a RELEASE command being issued against the connection in this system.

Only synclevel 1 autoinstalled connections are deleted in this way. They will have had TCSE_IMPLICIT_DELETE set by the builders from zx_delete_x in the BPS (set by DFHZGAI).

TCSE_CATLG_NO indicates that the connection is not to be written to the catalogue (SIT Parameter AIRDELAY=0).

1. After DFHZCLS, the CLSDST program, issues DFHTCPLR TIDYUP TCSEDDP and TCSE_DELETE_SCHEDULE are set and CATD is initiated with a delay of AILDELAY.
2. CATD runs DFHZATD which sets TCSE_DELETE_STARTED and calls DFHZCP FUNCTION=DELETE to delete the sessions, modegroup and connection.

If a SIMLOGON or BIND occur before the delete actually starts (TCSE_DELETE_SCHEDULED) then the connection delete is aborted and the connection reused.

If a SIMLOGON occurs during the actual delete (TCSE_DELETE_STARTED) then the delete is vetoed and the connection is reacquired.

If a BIND occurs during the actual delete (TCSE_DELETE_STARTED) then the delete goes ahead and the PWE that was created is turned into an AWE and the logon will create a new connection.

If TCSE_DELETE_AT_RESTART is set then DFHZATR will delete the connection if it has not been used after restart with a delay specified in the SIT AIRDELAY parameter.

Disconnection flow (APPC devices): These connections are not deleted at LOGOFF time, so the disconnection flow is the same as for a defined connection.

Deletion of autoinstalled consoles

Consoles are deleted after a certain period of inactivity. The default is 60 minutes but this can be overridden in the autoinstall URM.

1. The delete time is saved in the CCE during install in TCTCE_TIMEOUT_TIME.
2. DFHCESC runs at certain intervals
3. DFHCESC checks the CCEs for any console whose delete time has expired
4. For each expired CCE DFHCESC does the following
   a. Attaches CATD to do the delete
   b. CATD calls DFHZATD as for a terminal

Shipping a TCTTE for transaction routing

For transaction routing, a terminal can be defined by an entry in the terminal-owning region (TOR) with the SHIPPABLE=YES attribute. In this case, the terminal definition is shipped to any application-owning region (AOR) when the terminal user invokes a transaction owned by (and defined to) that region. Definitions for advanced program-to-program communication (APPC) devices always have the SHIPPABLE=YES attribute set.

(The entry in the TOR could have been installed using CEDA INSTALL, the GRPLIST at system initialization, or autoinstall.)

The first time a transaction is invoked: For non-APPC devices (see Figure 6 on page 56), the following processing is performed:

- In the AOR, look for an existing skeleton TCTTE (TCTSK) whose REMOTENAME is the same as the local name in the TOR. If found, skip the following steps; otherwise:
- Issue ZC_INQUIRE to the TOR.
- In the TOR:
  - Send a builder parameter set (BPS) representing the TCTTE to the AOR.
  - Set on the SHIPPED flag (TCTEMROP) in the TCTTE.
  - Set on the SHIPPED flag (TCSEMROP) in the TCTSE for the AOR system.
  - Rewrite each entry to the catalog.
- In the AOR:
  - Use the existing name from the TOR.
  - INSTALL the terminal (DFHZATS does the remote install).
  - Set on the SHIPPED flag (TCTSKSHI) in the TCTSK.
  - Set on the SHIPPED flag (TCSEMROG) in the TCTSE for the TOR system.
  - Rewrite each entry to the catalog.

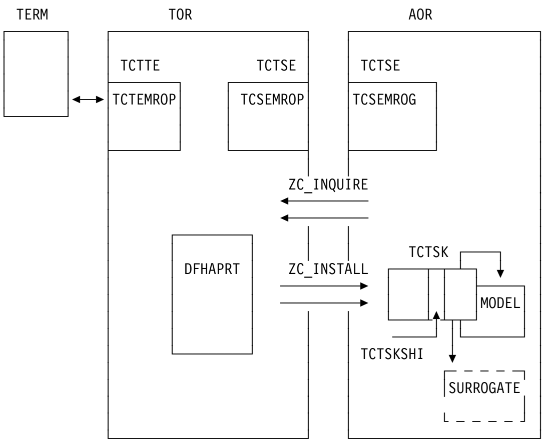


Figure 6. Transaction-routing flow for non-APPC devices

For APPC devices:

- In the AOR, look for an existing skeleton TCTTE (TCTSK) whose REMOTENAME is the same as the local name in the TOR. If found, skip the following steps; otherwise:
- INSTALL the terminal (DFHZATS does the remote install).
- Set on the SHIPPED flag (TCTSKSHI) in the TCTSK.
- Set on the SHIPPED flag (TCSEMROG) in the TCTSE for the TOR system.
- Rewrite each entry to the catalog.

When an autoinstalled TCTTE in a TOR is deleted: If this CICS is linked to a Pre CICS/ESA 4.1 system then the following occurs.

- If the deleted entry is flagged (TCTEMROP or TCSERDLR for APPC devices) as having been shipped, notify all remote systems that have received shipped definitions (TCSEMROP) that this terminal is being deleted.
- Determine from the TCTSK in the AOR whether a definition for this terminal has been shipped (TCTSKSHI). If so, call ZC_DELETE in the AOR.

If this CICS is linked to CICS/ESA 4.1 or above then relevant shipped terminals are deleted using a separate timing mechanism.

Modules

ZC (terminal control) together with the following:

Module	Function
DFHZATA	Autoinstall program
DFHZATA2	Console autoinstall program linkedits with DFHZATA
DFHZATD	Autoinstall delete program
DFHZATDX	Autoinstall control program
DFHZATDY	Sample autoinstall user exit
DFHZATR	Autoinstall restart program
DFHZATS	Remote autoinstall|delete program
DFHZCTRI	Trace interpretation for DFHZGAI
DFHZGAI	APPC-specific autoinstall functions

DFHZATDX

The DFHZATDX module provides user input to autoinstall processing. This module is a component of ZCP, and is the default autoinstall user program (that is, it is used if you choose not to provide your own). For further information about the DFHZATDX sample program, see the *CICS Customization Guide*.

DFHZATDX is also called when creating and deleting shipped terminals (skeletons).

DFHZATDY

DFHZATDY is a sample autoinstall user-replaceable module, which you must modify before you can use it. Its main function is to choose a template connection which is to be used in creating the new autoinstall connection clone. It also has to chose a name for the new connection. For further information about the DFHZATDY sample program see the *CICS Customization Guide*.

DFHZATDY is also called when creating and deleting shipped terminals (skeletons).

Diagnosing autoinstall problems

When diagnosing problems with autoinstall, consult the following list. If you have a problem with autoinstall of APPC devices, and the following list does not resolve the problem, see “Diagnosing APPC autoinstall problems” on page 57.

- The autoinstall model table (AMT) in an SDUMP
- CEMT INQUIRE AUTINSTMODEL—showing which models are installed
- TC level-1 trace, point ID AP FC8A—showing the CINIT RU contained in the AWE on entry to DFHZATA
- CADL, CSMT, and CSNE logs:
  - Autoinstall messages (DFHZC69xx)
  - Builder messages (DFHZC59xx, DFHZC62xx, and DFHZC63xx)
  - Terminal error messages
  - Information produced by DFHZNAC
- Dump taken in the user install program (the CICS-supplied default is DFHZATDX).

Most autoinstall problems can be grouped into three categories:

1. CICS rejects the LOGON request (message DFHZC2411 on the CSNE log).

2. The device rejects the actual BIND parameters (message DFHZC2403 on the CSNE log).
3. DFHZATA diagnoses a problem (message DFHZC69xx on the CADL log).

The first category of problem is caused by CICS being in the wrong state to accept an autoinstall, for example, CICS is shutting down or AUTOINSTALL is disabled (message DFHZC2433).

The second category of problem arises when the two BIND images match, but the BIND is rejected by the actual device (message DFHZC2403). For information about valid BIND parameters, consult the *3274 Control Unit Description and Programmer's Guide*, GA23-0061.

The BIND image is contained in the CINIT RU passed to the LOGON exit. This is shown in trace point ID AP FC8A.

The reason for the third category of problem should be shown in the contents of the associated DFHZC69xx message on the CADL log. For example, message DFHZC6987 shows a BIND image mismatch between the incoming CINIT and the best available model (unlikely).

The length of each BIND image is found in the halfword preceding the image. A comparison is made for the ***smaller*** of the two length values, but not exceeding X'19' (decimal 25) bytes. The comparison is accomplished by an XC (exclusive OR) of the two BIND images into a work area. The result is ANDed with a mask that defines the required settings.

Additional bits are reset if the LU type, found in byte 14 of the BIND image, is 1, 2, 3, or 4. The final result in the work area must be 256 bytes of X'00'; any other value causes DFHZATA to reject the LOGON and write message DFHZC6987 to the CADL log.

For autoinstall to function correctly, three items must match:

1. The CINIT BIND image taken from the LOGMODE entry specified for the LU in the VTAMLST
2. The CICS MODEL BIND image built according to the specifications in the TYPETERM and TERMINAL entries
3. Device characteristics.

Diagnosing APPC autoinstall problems

When diagnosing APPC autoinstall problems, first refer to "Diagnosing autoinstall problems" on page 56. Most of points in that section apply to APPC autoinstall problems except for points that refer to autoinstall models.

Any APPC autoinstall problem should be accompanied by message DFHZC6920 to 23. These messages each have exception trace entries which should trace enough information to allow you to diagnose the problem.

There are three autoinstall instances of DFHZC2411:

- 4 System termination - CSASTIM tested.
- 5 VTAM termination - TCTVVTQS tested.
- 6 ISC=NO specified in the SIT.

There are two additional instances of DFHZC2433:

- 3 Autoinstall disabled - TCTVADEN tested in DFHZBLX.
- 4 Autoinstall temporarily disabled - TCTVADIN tested in DFHZBLX.

There are two additional instances of DFHZC3482:

- 3 No MVS storage for DFHZBLX to obtain MVS AWE storage.
- 4 No MVS storage for reporting a failure in a dummy work element.

Diagnosing console autoinstall problems

Much of the autoinstall for terminal advice is relevant. However, the following points should also be helpful.

1. Information about autoinstalled consoles is contained in:
   - The AWE (CWE)
   - The TCT prefix in the console BITMAP
   - The CCE
   - The SNEX
   - The AI URM interface
2. When DFHZCNA is called with a modify command trace point AP FCF0 is issued and traces the CIB and CIB extension.
3. Trace point AP FCA7 shows the AWE/CWE created by DFHZCNA and passed to DFHZATA2.
4. DISCARD (used via CEMT or EXEC CICS) is useful whilst testing autoinstall for consoles.
5. CEMT INQUIRE TERMINAL is useful for seeing what consoles are installed and what their console names are.
6. The console names can vary depending on how the modify command was issued:
   - /f jobname,CEMT I TE from a TSO SDSF panel gives a console name of the USERID or the console name if changed using option 8 of SDSF.
   - f jobname,CEMT I TE from a TSO console gives a console name of the TSO USERID.
   - M/F jobname, CEMT I TE from the TSO SDSF panel gives a console name of MASTnn where nn is the names of the system. If SEC=YES is specified in the SIT then the user must first sign on with m/f jobname,CESN.
   - // MODIFY jobname,CEMT I TE freom a jobstream gives a console names of INTERNAL. If SEC=YES

is specified in the SIT then the user must first sign on with m/f jobname,CESN.

7. The console name BITMAP is dumped in the TCP section of system dumps.
8. The extended control blocks are dumped if present when a system dump is taken.

VTAM exits

A VTAM exit is a special-purpose user-written routine that is scheduled by VTAM when the requested operation is complete. VTAM creates a trace record when the exit is given control.

RE entries represent RPL exits except SEND, RECEIVE, OPNDST, and CLSDST. UE entries represent non-RPL and asynchronous exits SCIP, LOGON, and LOSTERM.

See the *OS/390 eNetwork Communications Server: SNA Programming* manual, SC31-8573, for general VTAM exit information.

Trace

The following point IDs are provided for the autoinstall programs (DFHZATA, DFHZATD, DFHZATR, and DFHZATS), as part of terminal control:

- AP FC80 through AP FC8C, for which the trace levels are TC 1 and TC 2.

The following point IDs are provided for APPC autoinstall:

- AP FA00 to FA21, for which the trace levels are TC1 and TC2.

The following point IDs are provided for console autoinstall:

- AP FCF0
- AP FCA3 to FCA7

RE and UE trace points are recorded when the VTAM trace API option is requested by:

```
F NET,TRACE,TYPE=VTAM,OPTION=API,MODE=EXT
```

GTF must have been started with the USR option.

Each VTAM exit routine in CICS sets an ID byte in the TCTTE exit trace field (TCTEEIDA).

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 8. Autoinstall terminal model manager

The autoinstall terminal model manager (an OCO component of the AP domain) is responsible for managing all operations involving the autoinstall terminal model table. Autoinstall terminal models are used during the autoinstall logon process (see step 3 on page 52). They are installed either at system initialization or using CEDA INSTALL (see Chapter 66, "Resource definition online (RDO)" on page 485), and can be discarded using either the CEMT transaction or EXEC CICS commands.

The acronym AITM is often used for "autoinstall terminal model" in the contexts of both the manager and the associated table; it is also the name of one of the subroutine call formats.

The AITM manager is implemented as a set of subroutine interfaces.

Functions provided by the autoinstall terminal model manager

Table 5 summarizes the external subroutine interfaces provided by the autoinstall terminal model manager. It shows the subroutine call formats, the level-1 trace point IDs of the modules providing the functions for these formats, and the functions provided.

Table 5. Autoinstall terminal model manager's subroutine interfaces

Format	Trace	Function
AIIN	AP 0F10 AP 0F11	START_INIT COMPLETE_INIT
AIIQ	AP 0F18 AP 0F19	LOCATE_TERM_MODEL UNLOCK_TERM_MODEL INQUIRE_TERM_MODEL START_BROWSE GET_NEXT END_BROWSE
AITM	AP 0F08 AP 0F09	ADD_REPL_TERM_MODEL DELETE_TERM_MODEL

AIIN format, START_INIT function

The START_INIT function of the AIIN format is used to attach a CICS task to perform initialization of the AITM manager.

Input parameters: None.

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

OK|DISASTER|KERNERROR

AIIN format, COMPLETE_INIT function

The COMPLETE_INIT function of the AIIN format is used to wait for the initialization task attached by the START_INIT function to complete processing.

Input parameters: None.

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

OK|DISASTER|KERNERROR

AIIQ format, LOCATE_TERM_MODEL function

The LOCATE_TERM_MODEL function of the AIIQ format is used to obtain the attributes of a named autoinstall terminal model, and obtain a read lock on that entry in the AITM table in virtual storage.

Input parameters

TERM_MODEL_NAME specifies the name of the autoinstall terminal model to be located.

BPS identifies a buffer into which the attributes of the autoinstall terminal model are to be placed.

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	TM_LOCATE_FAILED
EXCEPTION	TERM_MODEL_NOT_FOUND

AIIQ format, UNLOCK_TERM_MODEL function

The UNLOCK_TERM_MODEL function of the AIIQ format is used to release a read lock on a previously located entry from the AITM table in virtual storage.

Input parameters

TERM_MODEL_NAME specifies the name of the autoinstall terminal model to be unlocked.

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|KERNERROR
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	TM_UNLOCK_FAILED
EXCEPTION	TERM_MODEL_NOT_FOUND

AIIQ format, INQUIRE_TERM_MODEL function

The INQUIRE_TERM_MODEL function of the AIIQ format is used to obtain the attributes of a named autoinstall terminal model. (No read lock is retained.)

Input parameters

TERM_MODEL_NAME specifies the name of the autoinstall terminal model to be located.

BPS identifies a buffer into which the attributes of the autoinstall terminal model are to be placed.

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|KERNERROR
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	TM_LOCATE_FAILED|TM_UNLOCK_FAILED
EXCEPTION	TERM_MODEL_NOT_FOUND

AIIQ format, START_BROWSE function

The START_BROWSE function of the AIIQ format is used to initiate a browse of the AITM table. The browse starts at the beginning of the table.

Input parameters: None.

Output parameters

BROWSE_TOKEN is a token used to refer to this browse session on subsequent browse requests.

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER. It has this value:

```
START_BROWSE_FAILED
```

AIIQ format, GET_NEXT function

The GET_NEXT function of the AIIQ format is used to obtain the name and attributes of the next autoinstall terminal model in the AITM table for the specified browse session.

Input parameters

BROWSE_TOKEN is the token identifying this browse session.

BPS identifies a buffer to receive the attributes of the next entry in the AITM table.

Output parameters

TERM_MODEL_NAME is the name of the next entry in the AITM table.

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|KERNERROR
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	TM_GET_NEXT_FAILED, TM_UNLOCK_FAILED
EXCEPTION	END_OF_MODELS

AIIQ format, END_BROWSE function

The END_BROWSE function of the AIIQ format is used to terminate a browse of the AITM table.

Input parameters

BROWSE_TOKEN is the token identifying this browse session.

Output parameters

RESPONSE is the subroutine's response to the call. It can have either of these values:

```
OK|KERNERROR
```

AITM format, ADD_REPL_TERM_MODEL function

The ADD_REPL_TERM_MODEL function of the AITM format is used to add or update an entry in the AITM table in virtual storage, and record the entry on the CICS catalog.

Input parameters

TERM_MODEL_NAME specifies the name of the autoinstall terminal model to be added or updated.

BPS specifies the attributes of the named autoinstall terminal model.

SYSTEM_STATUS specifies the status of the CICS system at the time of the call. It can have any one of these values:

```
COLD_START|WARM_START|ONLINE
```

where ONLINE means during execution.

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|KERNERROR
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	NOT_INITIALISED, ADD_REPL_FAILED
EXCEPTION	TERM_MODEL_IN_USE

AITM format, DELETE_TERM_MODEL function

The DELETE_TERM_MODEL function of the AITM format is used to remove an entry from the AITM table in virtual storage and the CICS catalog.

Input parameters

TERM_MODEL_NAME specifies the name of the autoinstall terminal model to be added or updated.

SYSTEM_STATUS specifies the status of the CICS system at the time of the call. It can have any one of these values:

```
COLD_START|WARM_START|ONLINE
```

where ONLINE means during execution.

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|KERNERROR
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	NOT_INITIALISED, DELETE_FAILED
EXCEPTION	TERM_MODEL_IN_USE, TERM_MODEL_NOT_FOUND

Modules

Module	Function
DFHAIDUF	Formats the AITM manager control blocks in a CICS system dump
DFHAIIN1	Handles the following requests: START_INIT COMPLETE_INIT
DFHAIIN2	Runs as a CICS task to perform initialization of the AITM manager
DFHAIIQ	Handles the following requests: LOCATE_TERM_MODEL UNLOCK_TERM_MODEL INQUIRE_TERM_MODEL START_BROWSE GET_NEXT END_BROWSE
DFHAIRP	Initializes the AITM table at CICS startup
DFHAITM	Handles the following requests: ADD_REPL_TERM_MODEL DELETE_TERM_MODEL
DFHAPTRN	Interprets AITM manager trace entries

Exits

No global user exit points are provided for this component.

Trace

The following point IDs are provided for the AITM manager:

- AP 0F00 through AP 0F1F, for which the trace levels are AP 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 9. Basic mapping support

Basic mapping support (BMS) allows the CICS application programmer to have access to input and output data streams without including device-dependent code in the CICS application program.

BMS provides the following services:

Message routing
This allows application programs to send output messages to one or more terminals not in direct control of the transaction.

Terminal paging
This allows the user to prepare a multipage output message without regard to the physical size of the output terminal; the output can then be retrieved by page number in any order.

Device independence
This allows the user to prepare output without regard to the control characters required for a terminal; CICS automatically inserts the control characters and eliminates trailing blanks from each line.

Most of the BMS programs are resident in the CICS nucleus.

Design overview

BMS is an interface between CICS and its application programs. BMS formats input and output display data in response to BMS commands in programs. To do this, it uses device information from CICS system tables, and formatting information from **maps** that you have prepared for the program.

BMS enables an application program to read in device-dependent data and convert it to a device-independent standard form, or to generate device-dependent output data from this device-independent standard form. In both cases, the structure of the device-independent standard form, and the layout of the data on the display terminal, are determined by a user-defined map. Related maps—for example, maps used in the same application program—are grouped together into a **map set**. See the *CICS Application Programming Guide* for further information about the definition and use of maps and map sets.

On some terminals (such as the IBM 8775 display terminal and the IBM 3290 information panel), the available display area may be divided into a set of related "logical" screens called **partitions**. The layout and properties of the set of partitions that can be simultaneously displayed on a terminal are defined by the BMS user in a **partition set**. See the *CICS Application Programming Guide* for further details about the definition and use of partition sets.

Maps, map sets, and partition sets are assembled offline using CICS macros. The user defines and names fields and groups of fields that can be written to and read from the devices supported by BMS. The assembled maps contain all the device-dependent control characters necessary for the proper manipulation of the data stream.

Associated with each map is a table of field names which is copied into each application program that uses the map. Data is passed to and from the application program under these field names. The application program is written to manipulate the data under the various field names so that alteration of a map format does not necessarily lead to changes in program logic. New fields can be added to a map format without making it necessary to reprogram existing applications.

Output data can be supplied from the application program by placing the data in the table under the appropriate field name. As an alternative, output maps can contain field default data that is sent when data is not supplied by an application program. This facility permits the specification of titles, headers, and so on, for output maps.

Optionally, the display of all the default data can be suppressed by the application program for any output map. Each time a map is used, the application program can temporarily modify the attributes of any named field in the output map. The extended attributes can also be modified if maps are defined with the DSATTS operand.

Output map fields with no field names can contain default data, but the application program cannot replace the default data or modify the attributes of unnamed fields.

For input, the user assembles a map defining the fields that can be written to and received from a particular device. Any data received for a particular field is moved across using the field name in the symbolic storage definition for the map. Light-pen-detectable fields defined in an input map are flagged as detected if present in an IBM 3270 Information Display System input stream. An input map for a particular case can specify a subset of the fields potentially receivable; any fields received and not represented in that map are discarded. This permits the number of fields from a map that can be typed or selected to be changed, without making it necessary to reprogram applications that currently receive data from the map.

Maps are stored in the CICS program load library. When a map is required by BMS, a copy is automatically retrieved by CICS from the program load library without application program action. Multiple users of a map contained in the program load library share a single copy in main storage.

BMS permits any valid combination of field attributes to be specified by the user when generating maps. Inclusion of BMS in CICS is a system generation option and does not prevent the application program from accessing a particular device in native mode (without using BMS). Intermixing BMS and native mode support for a terminal from the same application program may yield unpredictable results. When using mixed mode support, it is the user's responsibility to ensure the correct construction and interpretation of native mode data streams.

BMS permits the application program to pass a native mode data stream that has already been read in, and (if, for a terminal of the IBM 3270 Information Display System, the screen has been formatted) to interpret this data stream according to a given input map. This facility allows data entered with the initial reading of a transaction to be successfully mapped using BMS.

BMS provides the following services:

- Message routing
- Terminal paging
- Device independence.

Message routing

Message routing permits the application program to send an output message to one or more terminals not in direct control of the transaction. The message is automatically sent to a terminal if the terminal status allows reception of the message. If a terminal is not immediately eligible to receive the message, the message is preserved for that terminal until a change in terminal status allows it to be sent. The message routing function is used by the CICS message-switching transaction.

A BMS map that specifies extended attributes can be used for terminals that do not support extended attributes. When sending data to a variety of terminals, some of the terminals may support extended attributes and others may not. When a BMS ROUTE request is processed, BMS looks at the TCTTEs for all specified terminals and constructs a set of all the supported attributes.

A data stream is produced by BMS using this set of attributes, and the data stream and set of attributes for each page are written to a temporary-storage record. When the page is later read from temporary storage, the data stream for each terminal is modified, if necessary, to delete attributes not supported by that terminal.

Terminal paging

Terminal paging allows the user to prepare more output than can be conveniently or physically displayed at the receiving terminal. The output can then be retrieved by pages in any order; that is, in the order in which they were prepared or by skipping forward or backward in the output pages.

Terminal paging also provides the ability to combine several small areas into one area, which is then sent to the terminal. This enables the user to prepare output without regard for the record size imposed by the output terminal.

CICS provides the terminal operator with a generalized page retrieval facility that can be used to retrieve and dispose of pages.

Device independence

Device independence allows the user to prepare output without regard for the control characters required for message heading, line separation, and so on. Input to device independence consists of a data string with optional new-line characters.

Device independence divides the data string into lines no longer than those defined for the particular terminal. If new-line characters appear occasionally in the data string to further define line lengths, they are not ignored. CICS inserts the appropriate leading characters, carriage returns, and idle characters, and eliminates trailing blanks from each line. If the device does not support extended attributes, the extended attributes are ignored.

CICS allows the user to set horizontal and vertical tabs on those devices that support the facility (for example, the IBM 3767 Communication Terminal, and the IBM 3770 Data Communication System). For such devices, CICS supports data compression inbound and data compression outbound, based on the tab characteristics in the data stream under the control of the appropriate maps.

Control blocks

BMS makes use of the following control blocks (see Figure 7 on page 65):

DSECT	Function
DFHMAPDS	Defines a physical map. It contains overlays for map set data, map data, and field data. The physical map set is stored in the CICS program library and requires a resource definition when loaded into main storage by BMS.
DFHMCAD	Defines a mapping control area (MCA). MCAs are used in DFHM32 and DFHML1 to merge (both) and sort (DFHML1 only) fields in different maps in the chain of map copies. The MCA contains field position, flags, and pointers to map and application data structure relating to this field.
DFHMCBDS	Defines the message control block (MCB). MCBs are built and referenced by DFHTPR. There is one MCB per level of page chaining. The MCBs are chained together, with the head of the chain anchored off the TCTTE BMS extension. The MCB contains a copy of the MCR, with additional working data.

DSECT	Function
DFHMCRDS	Defines the message control record (MCR). MCRs are held in CICS temporary storage. There is one MCR per BMS message in temporary storage. The MCR contains data such as the number of pages in this message, the list of target terminals for this message, data on which pages are for which LDCs or partitions, and so on. The MCR is written to temporary storage by DFHMCP. It is read and purged by DFHTPR, DFHTPS, and DFHTPQ.
DFHOSPWA	Defines the output services processor work area (OSPWA). This is the main BMS control block. For standard and full-function BMS, there is an OSPWA that is chained off the TCA and is built by DFHMCP on the first BMS command in a transaction. It contains a copy of the BMS TCA request bytes, together with the BMS status and working area. DFHTPR has its own private OSPWA. This overlays the TWA for DFHTPR unless SEND PAGE RETAIN is used. If SEND PAGE RETAIN is used, DFHTPR obtains an additional OSPWA, and chains the base OSPWA off the new OSPWA. This avoids DFHTPR damaging the base OSPWA. The OSPWA is deleted during task termination. A shorter version of the OSPWA is used by DFHMCPE (part of both the minimum-function BMS mapping control program DFHMCPE$ and also the BMS fast-path module DFHMCX). It is built in DFHMCPE's LIFO storage, and includes space for the request information from the TCA. The DFHMCPE OSPWA is defined within DFHMCPE.
DFHPGADS	Defines a page control area (PGA). DFHTPP builds a PGA at the end of the device data stream in the terminal input/output area (TIOA) (addressed as ADDR(TIOADBA) + TIOATDL) for the SET and PAGING disposition. The PGA contains the 3270 write control character (WCC), flags about the type of TC write required, and the extended features used in this page of data stream.
DFHPSDDS	Defines a physical partition set. The partition set is stored in the CICS program library and requires a resource definition when loaded into main storage by BMS.
DFHTTPDS	Defines the terminal type parameter (TTP). This contains information for a terminal type. Note that BMS builds pages on a TTP basis. For standard and full-function BMS, DFHRLR builds TTPs as follows: 1. A "direct TTP" is built for the transaction terminal. If this supports partitions or LDCs, a further direct TTP is built for each referenced LDC or partition. This contains data for that LDC or partition. These direct TTPs are chained together, and the head of the chain is contained in the OSPWA. Direct TTPs are deleted by DFHMCP on a SEND PAGE, PURGE MESSAGE, or SEND PARTNSET command. 2. If routing is in effect, there is a chain of routed TTPs, with one TTP per terminal type in the route list. Routed TTPs are deleted by DFHMCP on a SEND PAGE or PURGE MESSAGE command. Most of BMS uses the TTP rather than the TCTTE to determine terminal-related information.
TCTTETTE	The TCTTETTE DSECT in the DFHTCTZE macro defines the TCTTE BMS extension. It is chained off the TCTTE (TCTTETEA field).
DFHTPE	Defines the BMS partition extension. This is chained off the TCTTE BMS extension if the terminal supports partitions.

See the *CICS Data Areas* manual for a detailed description of these control blocks.

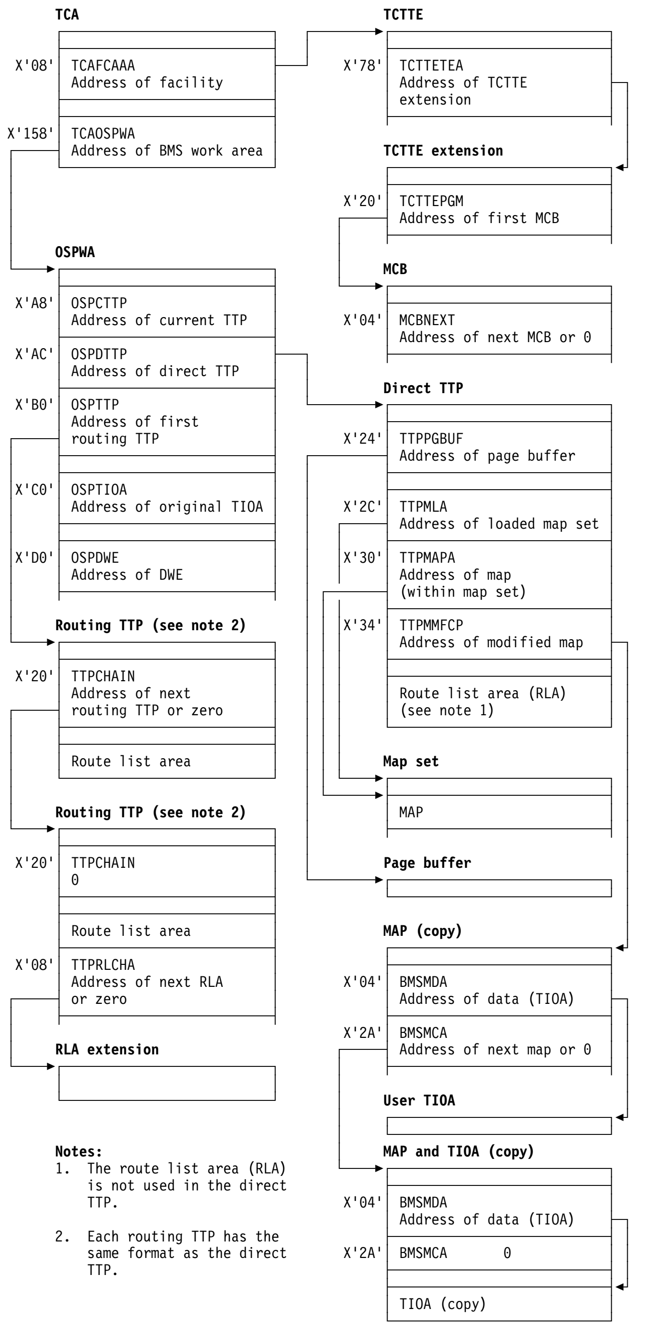

TCA
X'08' TCAFCAAA Address of facility
X'158' TCAOSPWA Address of BMS work area
TCTTE
X'78' TCTTETEA Address of TCTTE extension
TCTTE extension
X'20' TCTTEPGM Address of first MCB
MCB
X'04' MCBNEXT Address of next MCB or 0
OSPWA
X'A8' OSPCTTP Address of current TTP
X'AC' OSPDTTP Address of direct TTP
X'B0' OSPTTP Address of first routing TTP
X'C0' OSPTIOA Address of original TIOA
X'D0' OSPDWE Address of DWE
Direct TTP
X'24' TTPPGBUF Address of page buffer
X'2C' TTPMLA Address of loaded map set
X'30' TTPMAPA Address of map (within map set)
X'34' TTPMMFCP Address of modified map
Route list area (RLA) (see note 1)
Routing TTP (see note 2)
X'20' TTPCHAIN Address of next routing TTP or zero
Route list area
Routing TTP (see note 2)
X'20' TTPCHAIN 0
Route list area
X'08' TTPRLCHA Address of next RLA or zero
RLA extension
Map set
MAP
Page buffer
MAP (copy)
X'04' BMSMDA Address of data (TIOA)
X'2A' BMSMCA Address of next map or 0
User TIOA
MAP and TIOA (copy)
X'04' BMSMDA Address of data (TIOA)
X'2A' BMSMCA 0
TIOA (copy)
Notes:
1. The route list area (RLA) is not used in the direct TTP.
2. Each routing TTP has the same format as the direct TTP.

Figure 7. Control blocks associated with basic mapping support (BMS)

Modules

BMS makes use of the following modules (see Figure 8 on page 67):

Module	Function
DFHDSB	Addresses the page buffer, which was composed by the page and text build program (DFHPBP).
DFHEMS	The EXEC interface processor for BMS commands.

Module	Function
DFHIIP	Called in response to requests for BMS services involving terminals other than IBM 3270 Information Display Systems.
DFHMCP	The interface between application programs and the modules that perform mapping, message switching, page and text building, device-dependent output preparation, and message disposition to terminals, temporary-storage areas, or the application program.
DFHMCX	The BMS fast path module for standard and full-function BMS, and the program for minimum BMS support. It is called by DFHMCP if the request satisfies one of the following conditions: • It is a non-cumulative direct terminal send map or receive map issued by a command-level program. • It is for a 3270 display or an LU3 printer which does not support outboard formatting. If the terminal supports partitions, it is in the base state. • The CSPQ transaction has been started. • The message disposition has not changed.
DFHM32	Called in response to requests for BMS services involving terminals of the 3270 Information Display System.
DFHPBP	Processes all BMS output requests (SEND MAP, SEND PAGE, and SEND TEXT). It performs the following functions: • Positions the data in the page, either by actually placing it in a buffer, or by copying it and adjusting the map for an IBM 3270 Information Display System (SEND MAP ACCUM) • Places the data into the page buffer (SEND TEXT ACCUM) • Inserts device-dependent control characters for other than 3270 Information Display System devices, removing extended attributes.
DFHPHP	Processes terminal operations that involve partitions.
DFHRLR	Builds terminal type parameters (TTPs), which are the main blocks for building and writing out data in BMS.
DFHTPP	Directs completed pages to a destination specified in the BMS output request: SEND TEXT sends to the originating terminal; SEND MAP PAGING or SEND TEXT PAGING directs to temporary storage; and SEND MAP SET or SEND TEXT SET directs to a list of completed pages that are returned to the application program).
DFHTPQ	Checks the chain of automatic initiate descriptors (AIDs) to detect and delete AIDs that have been on the chain for an interval exceeding the purge delay time interval specified by the PRGDLAY system initialization parameter, if this has a nonzero value.
DFHTPR	Processes messages built by BMS and placed in temporary storage.
DFHTPS	Invoked for each terminal type to which a BMS logical message built with SEND MAP PAGING or SEND TEXT PAGING is to be sent. For each terminal designated by the originating application program, DFHTPR is scheduled to display the first page of the logical message if the terminal is in paging status, or the complete message if it is in autopage status.

Basic mapping support (BMS) is provided by means of a number of modules, each of which interfaces with other BMS modules, CICS control components, and application programs. The maps that are handled by BMS may be new maps, created to utilize BMS mapping capabilities. The interrelationships of CICS programs requesting mapping services are summarized in Figure 8 on page 67. Further details for specific programs within BMS are given on pages that follow.

One of three versions (MINIMUM, STANDARD, or FULL) of basic mapping support can be selected by the system initialization parameter BMS (see the *CICS System Definition Guide*). Where the generated versions of a BMS module differ according to the level of function provided, a suffix identifies the version as follows:

- E$ for minimum function
- A$ for standard function
- 1$ for full function.

In the module lists that follow, an asterisk (*) after a module name shows that the module is suffixed in this way. Elsewhere in this book, however, the BMS modules are usually referenced by their unsuffixed names with no distinction made between the minimum, standard, and full-function versions.

The module used by all three versions of BMS (minimum, standard, and full-function) is:

- DFHMCP* (mapping control program).

Additional modules used by both standard and full-function versions of BMS are:

- DFHDSB* (data stream build)
- DFHIIP* (non-3270 input mapping)
- DFHMCX (fast path module)
- DFHML1 (LU1 printer mapping)
- DFHM32* (3270 mapping)
- DFHPBP* (page build program)
- DFHPHP (partition handling program)
- DFHRLR* (route list resolution)
- DFHTPP* (terminal page processor).

Additional modules used only by full-function BMS are:

- DFHTPQ (terminal page cleanup)
- DFHTPR (terminal page retrieval)
- DFHTPS (terminal page scheduling).

A detailed description of each of these modules follows in alphabetic order of module name.

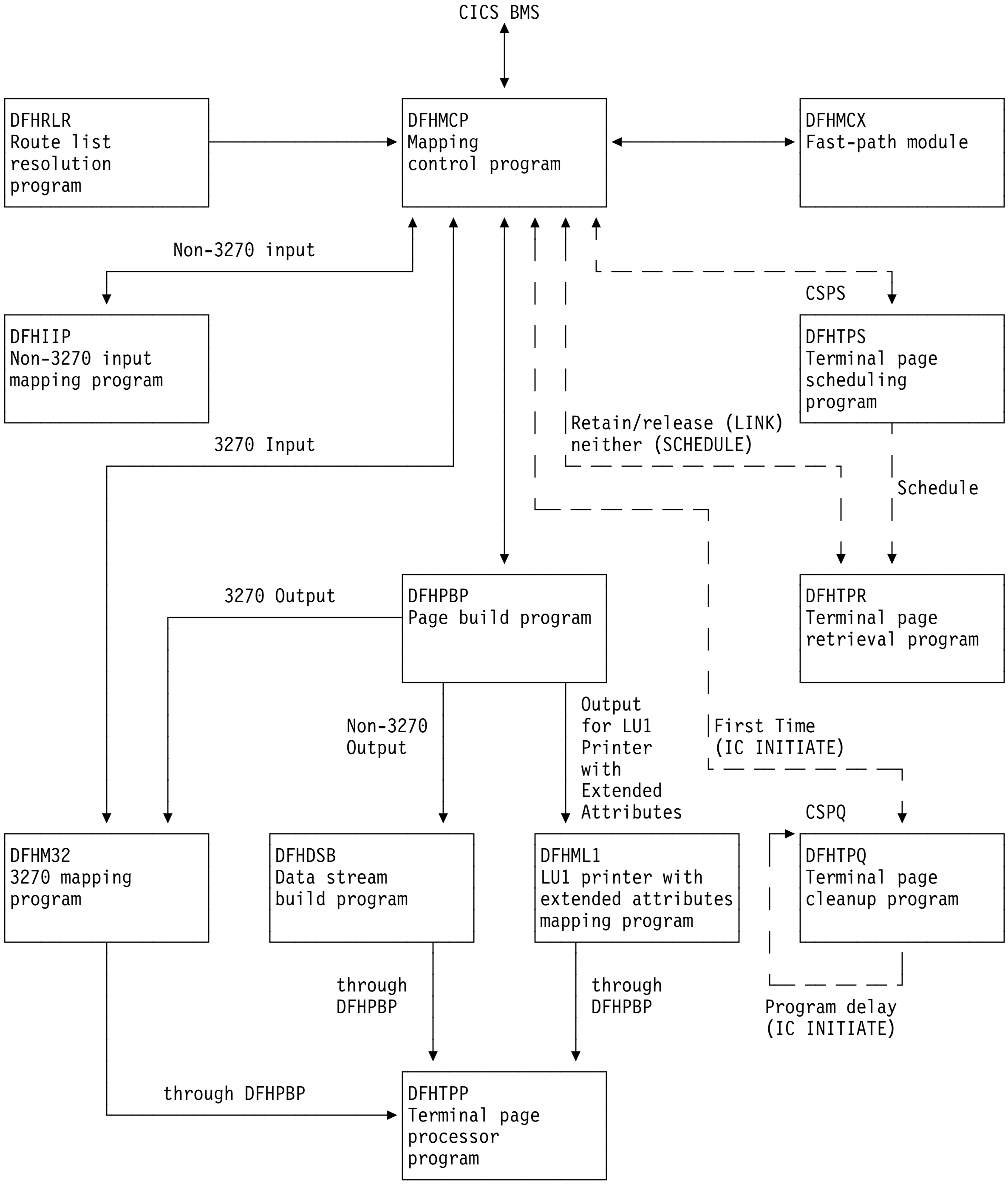


Figure 8. Modules associated with basic mapping support (BMS)

DFHDSB (data stream build)

The data stream build program addresses the page buffer, composed by the page and text build program (DFHPBP). The page buffer contains lines of output data that are to be written to a terminal other than an IBM 3270 Information Display System. The number of lines is contained in the TTPLINES field. The data stream build program performs the following functions on the data in the page buffer:

- Truncates trailing blanks within data lines
- Substitutes strings of physical device control characters for logical new-line characters that terminate each line of data
- Provides a format management header (FMH) for some VTAM-supported devices
- Allows horizontal and vertical tab processing.

Figure 9 shows the relationships between the components of data stream build.

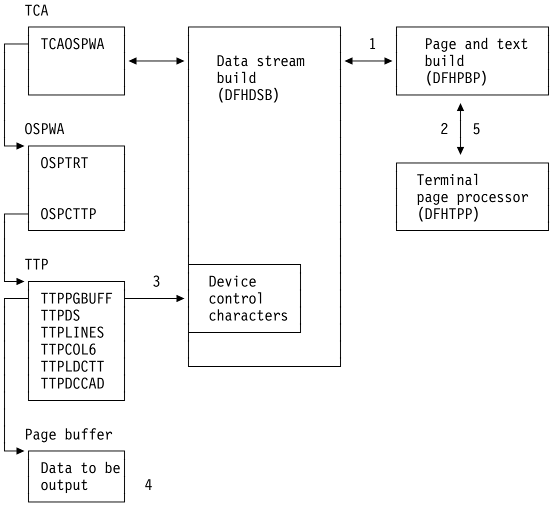

TCA
TCAOSPWA
Data stream build (DFHDSB)
1
Page and text build (DFHPBP)
2
5
OSPWA
OSPTRT
OSPCTTP
Terminal page processor (DFHTPP)
TTP
3
Device control characters
TTPPGBUFF
TTPDS
TTPLINES
TTPCOL6
TTPLDCTT
TTPDCCAD
Page buffer
Data to be output
4

Figure 9. Data stream build interfaces

Notes:

1. DFHDSB is entered from the page build program to process the page buffer.
2. For SEND TEXT commands with the NOEDIT option specified, page buffer compression is skipped and control returns to DFHPBP, which calls the terminal page processor (DFHTPP).
3. For SEND TEXT commands without the NOEDIT option, the appropriate device control characters for the target device are selected for substitution.
4. The page buffer containing the data to be compressed is located through the address stored at TTPPGBUF.
5. After compression of the page buffer data, control returns to DFHPBP, which calls DFHTPP to provide disposition of the page.

DFHIIP (non-3270 input mapping)

The non-3270 input mapping program (DFHIIP) is called in response to requests for BMS services involving terminals other than IBM 3270 Information Display Systems.

Figure 10 shows the relationships between the components of non-3270 input mapping.

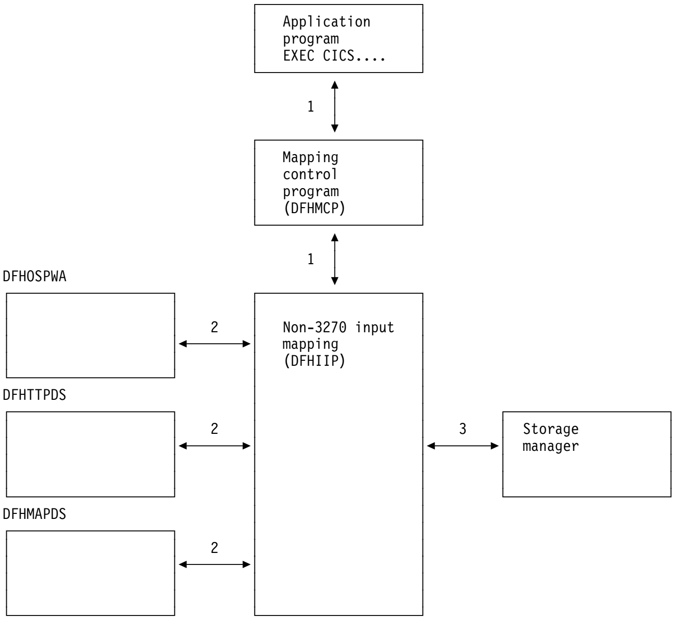

Application program EXEC CICS....
1
Mapping control program (DFHMCP)
1
DFHOSPWA
2
Non-3270 input mapping (DFHIIP)
DFHTTPDS
2
3
Storage manager
DFHMAPDS
2

Figure 10. Non-3270 input mapping interfaces

Notes:

1. A RECEIVE MAP request by an application program, communicating with other than an IBM 3270 Information Display System, passes information through the TCA through the mapping control program (DFHMCP) to DFHIIP.
2. The map required for an operation is either passed by the application program or loaded by DFHMCP.
3. DFHIIP communicates with storage control to obtain and release buffers for mapping operations.

DFHMCP (mapping control program)

The mapping control program (DFHMCP) is the interface between application programs and the modules that perform mapping, message switching, page and text building, device-dependent output preparation, and message disposition to terminals, temporary-storage areas, or the application program.

Figure 11 on page 69 shows the relationships between the components of mapping control.

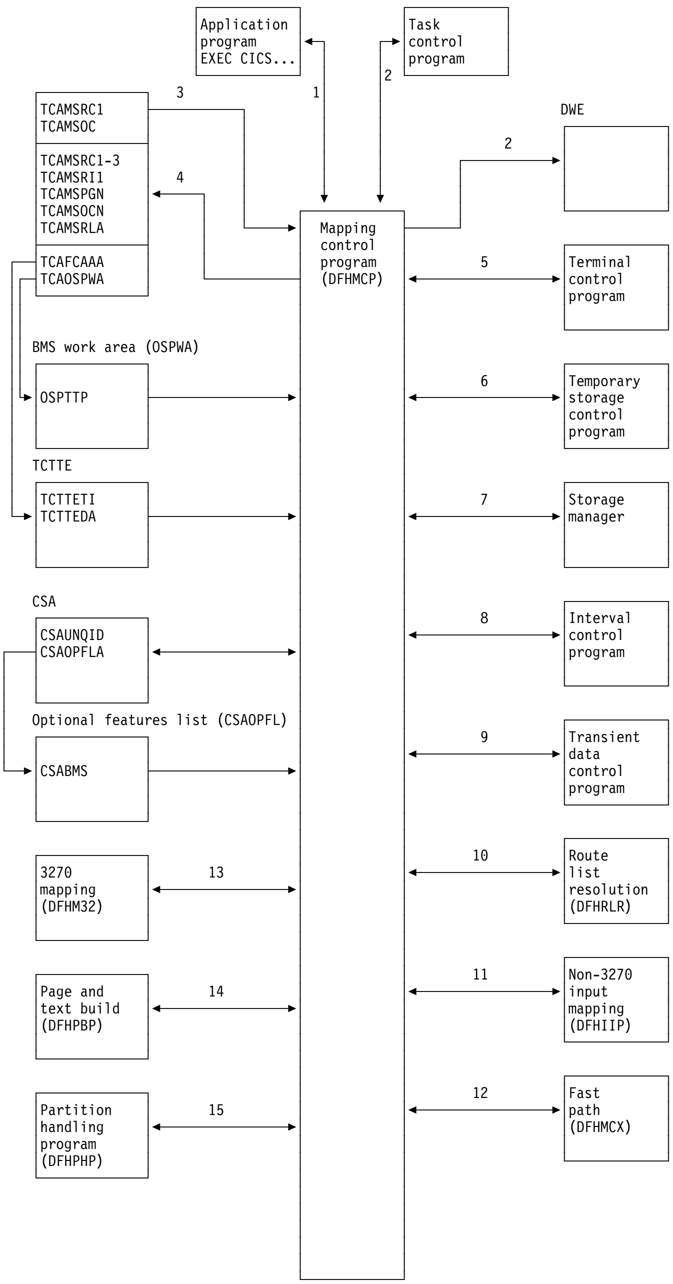


Figure 11. Mapping control program interfaces

Notes:

1. This program is entered when an application program issues a request for basic mapping support services.
2. It may also be called by task control to process a deferred work element (DWE) if an application program terminates and there are partial pages in storage, or the message control record (MCR) created during execution of the task has not been placed in temporary storage.
3. The following information is returned to the requester: error codes, page overflow information, and (for a SEND MAP SET or SEND TEXT SET command) a list of completed pages.
4. DFHMCP communicates with temporary storage control to put the MCR for routed or stored messages, if a ROUTE command, or SEND MAP PAGING or SEND TEXT PAGING command is issued. A DELETEQ TS command is issued to request that a message be purged from temporary storage if a PURGE MESSAGE command is issued.
5. DFHMCP communicates with storage control to:
   - Acquire and free storage in which the MCR is built (a SEND MAP command after a SEND MAP PAGING, SEND TEXT PAGING, or ROUTE command)
   - Acquire and free storage in which to copy the message title (a ROUTE command with the TITLE option specified)
   - Acquire storage to build automatic initiate descriptors (AIDs) for non-routed messages, or routed messages to be delivered immediately (a SEND PAGE command)
   - Acquire a BMS work area (OSPWA) at the time of the initial BMS request
   - Acquire and free an area used for user request data if a SEND PAGE command must be simulated before processing the user's request
   - Free the returned page list (a DELETEQ TS command)
   - Free map copies if SEND PAGE command was issued and pages were being built in response to SEND PAGE commands
   - Free terminal type parameters (TTPs) (SEND PAGE command).
6. DFHMCP communicates with program manager to:
   - Load and delete map sets
   - Link to the terminal page retrieval program (DFHTPR) to process one or more pages of a message if a SEND PAGE command is issued with the RETAIN or RELEASE option specified
   - Abnormally terminate tasks that incur errors that cannot be corrected.
7. DFHMCP communicates with interval control to:
   - Initiate transaction CSPQ
   - Obtain the current time of day, which is then used to time stamp AIDs for routed messages
   - Initiate transaction CSPS for messages to be delivered later.
8. DFHMCP communicates with task control to schedule transaction CSPQ for every terminal that is to receive a routed message to be delivered immediately.
9. Transient data control is used to send error and information messages to the master terminal.

10. Route list resolution (DFHRLR) is used to collect terminals from a user-supplied route list or from the entire TCT by terminal type, and build a terminal type parameter (TTP), which controls message building, for each terminal type. It is also used to build a single-element TTP for the originating terminal.
11. Non-3270 input mapping (DFHIIP) is used to process RECEIVE MAP requests for a terminal other than an IBM 3270 Information Display System.
12. The mapping control program calls DFHMCX if the request is eligible for the BMS fast-path module.
13. 3270 mapping (DFHM32) is used to process RECEIVE MAP requests for an IBM 3270 Information Display System.
14. Page and text build (DFHPBP) processes the following output requests:
15. Page and text build program (DFHPBP) processes all BMS output requests

    SEND MAP
    SEND MAP PAGING
    SEND MAP SET
    SEND PAGE
    SEND TEXT
    SEND TEXT PAGING
    SEND TEXT SET.

    For 3270 output, DFHM32 is called; for other output, DFHML1 is called.
16. The partition handling program (DFHPHP) is called when the data is in an inbound structured field. DFHPHP extracts the partition ID, device AID, and cursor address.

DFHML1 (LU1 printer with extended attributes mapping)

The LU1 printer with extended attributes mapping program, DFHML1, is called in response to requests for BMS services involving terminals of the 3270 Information Display System. Figure 12 shows how the DFHML1 program responds to these requests.

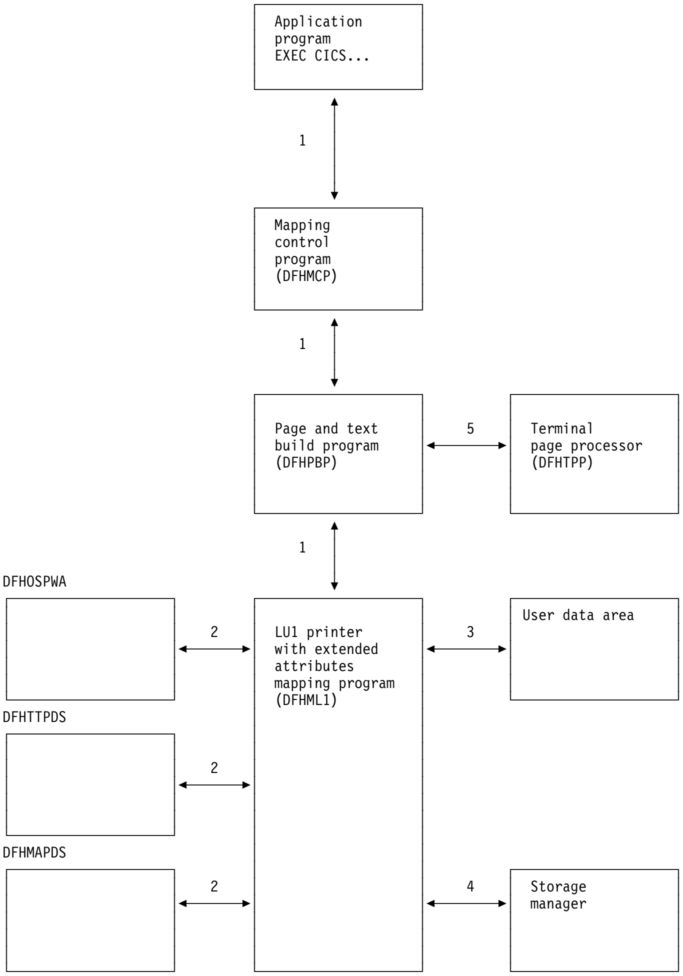

Application program EXEC CICS...
1
Mapping control program (DFHMCP)
1
Page and text build program (DFHPBP)
5
Terminal page processor (DFHTPP)
1
DFHOSPWA
2
LU1 printer with extended attributes mapping program (DFHML1)
3
User data area
DFHTTPDS
2
DFHMAPDS
2
4
Storage manager

Figure 12. LU1 printer with extended attributes mapping program interfaces

Notes:

1. The following types of requests, by application programs communicating with LU1 printer mapping, pass information through the mapping control program (DFHMCP), and the page and text build program (DFHPBP), to DFHML1:

    SEND MAP ACCUM
    SEND MAP SET
    SEND TEXT
    SEND TEXT ACCUM
    SEND TEXT SET

    For one page of output, DFHML1 acquires an area and formats it into a chain of control blocks known as map control areas (MCAs). Each MCA corresponds to one map on the page and contains information about chaining down the maps and processing the fields in each map. DFHML1 then builds the data stream directly from the maps and the TIOAs.
2. Maps are either passed by the application program or loaded by DFHMCP.

3. The address of a terminal input/output area (TIOA) is supplied by the application program for all requests.
4. DFHML1 communicates with storage control to obtain and release storage for MCAs and for the mapped data.
5. All requests (see note 1 on page 70) are sent to a designated destination by the terminal page processor (DFHTPP), after the return of control to DFHPBP.

DFHM32 (3270 mapping)

The 3270 mapping program (DFHM32) is called in response to requests for BMS services involving terminals of the 3270 Information Display System. Figure 13 shows how the 3270 mapping program responds to these requests.

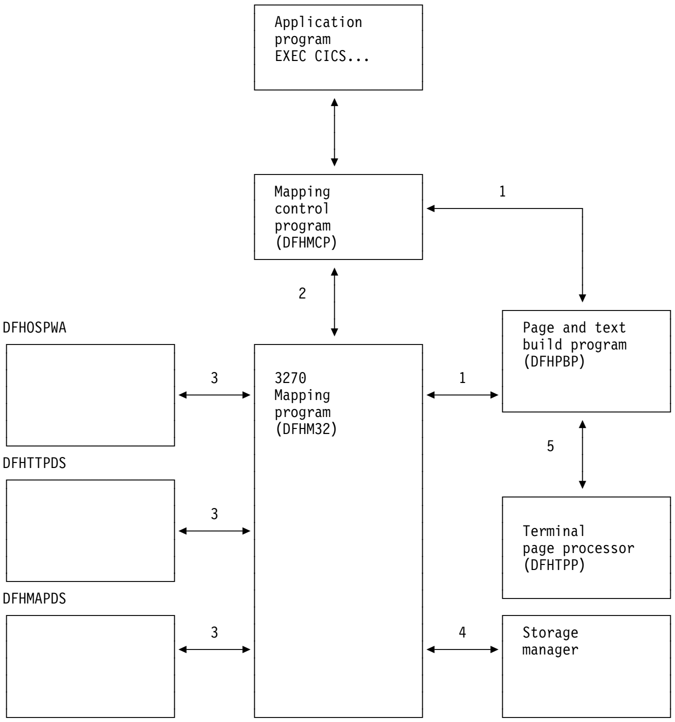

Application program EXEC CICS...
Mapping control program (DFHMCP)
1
2
DFHOSPWA
Page and text build program (DFHPBP)
3
3270 Mapping program (DFHM32)
1
5
DFHTTPDS
3
Terminal page processor (DFHTPP)
DFHMAPDS
3
4
Storage manager

Figure 13. 3270 mapping program interfaces

Notes:

1. The following types of requests by an application program communicating with an IBM 3270 Information Display System passes information through the TCA by way of the mapping control program (DFHMCP) and the page and text build program (DFHPBP) to DFHM32:

   SEND MAP ACCUM
   SEND MAP PAGING
   SEND MAP SET
   SEND TEXT
   SEND TEXT ACCUM
   SEND TEXT PAGING
   SEND TEXT SET

   For one page of output, DFHM32 acquires an area and formats it into a chain of control blocks known as map control areas (MCAs). Each MCA corresponds to one map on the page and contains information for chaining down the maps and processing the fields in each map. DFHM32 then builds the data stream directly from the maps and the TIOAs.
2. A RECEIVE MAP or RECEIVE MAP FROM request by an application program communicating with an IBM 3270 Information Display System passes information through the TCA through the message control program (DFHMCP) to DFHM32.
3. Maps are either passed by the application program or loaded by DFHMCP.
4. DFHM32 communicates with storage control to obtain and release storage for MCAs and for the mapped data.
5. All output requests (see note 1) are sent to a designated destination by the terminal page processor (DFHTPP) after control is returned to DFHPBP.

DFHPBP (page and text build)

The page and text build program (DFHPBP) processes all BMS output requests

SEND MAP
SEND MAP PAGING
SEND MAP SET
SEND PAGE
SEND TEXT
SEND TEXT PAGING
SEND TEXT SET.

It performs the following functions:

- Positions the data in the page, either by actually placing it in a buffer, or by copying it and adjusting the map for an IBM 3270 Information Display System (SEND MAP ACCUM)
- Places the data into the page buffer (SEND TEXT ACCUM)
- Inserts device-dependent control characters for other than 3270 Information Display System devices, removing extended attributes.

Figure 14 on page 72 shows the relationships between the components of page and text build.

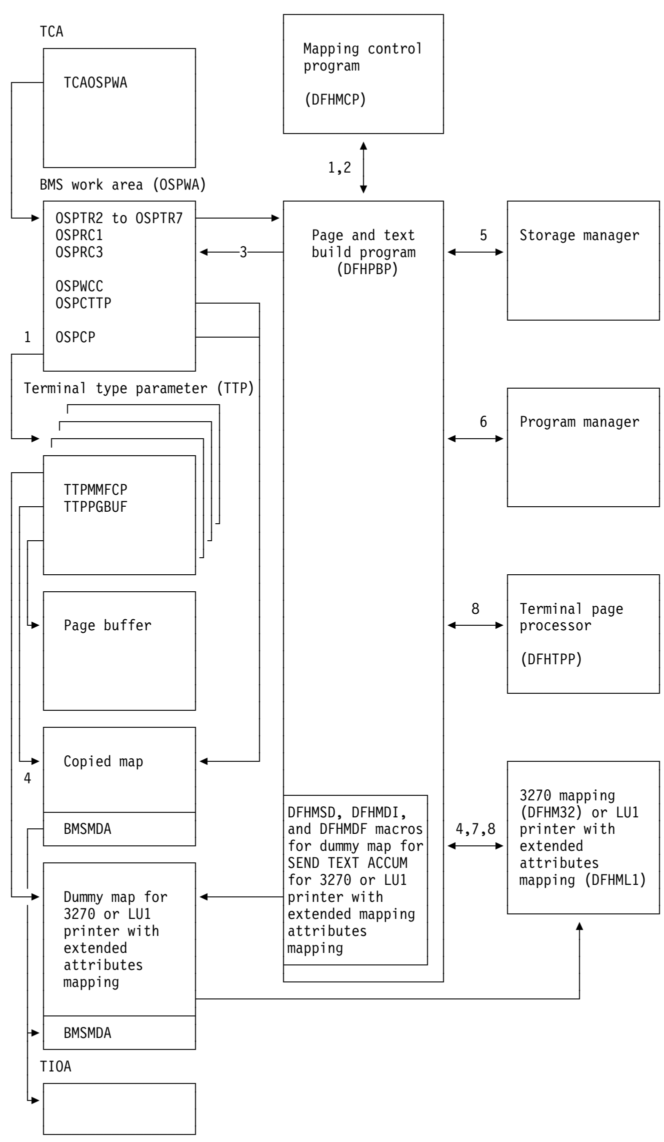

TCA
TCAOSPWA
Mapping control program
(DFHMCP)
1,2
BMS work area (OSPWA)
OSPTR2 to OSPTR7
OSPRC1
OSPRC3
OSPWCC
OSPCTTP
1
OSPCP
3
Page and text build program (DFHPBP)
5
Storage manager
Terminal type parameter (TTP)
6
Program manager
TTPMMFCP
TTPPGBUF
Page buffer
8
Terminal page processor
(DFHTPP)
Copied map
4
BMSMDA
DFHMSD, DFHMDI, and DFHMDF macros for dummy map for SEND TEXT ACCUM for 3270 or LU1 printer with extended mapping attributes mapping
4,7,8
3270 mapping (DFHM32) or LU1 printer with extended attributes mapping (DFHML1)
Dummy map for 3270 or LU1 printer with extended attributes mapping
BMSMDA
TIOA

Figure 14. Page and text build program interfaces

Notes:

1. DFHPBP is entered from the mapping control program, DFHMCP, to process all BMS output requests. It is called once for each terminal type parameter (TTP) on the TTP chain pointed to by OSPTTP. The current TTP in the chain is pointed to by OSPCTTP.
2. DFHPBP returns control to DFHMCP when request processing is complete, or when the page must be written out before a SEND MAP ACCUM request can be processed and an OFLOW=symbolic address operand was specified.
3. OSPTR2, OSPTR3, ..., OSPTR7 contain request data from the DFHBMS macro expansion. OSPRC1 and OSPRC3 contain return codes to be examined by DFHMCP.
4. For a SEND MAP ACCUM request for an IBM 3270 Information Display System, the map is copied and chained to the TTP. For a SEND TEXT ACCUM request for an IBM 3270 Information Display System, a dummy map is created and chained to the TTP. When a page is complete, control is given to 3270 mapping (DFHM32), which combines the map copies chained to the TTP and maps the data.

   For a SEND MAP ACCUM request for an LU1 printer with extended attributes, the map is copied and chained to the TTP. For a SEND TEXT ACCUM request, a dummy map is created and chained to the TTP. When a page is complete, control is given to the LU1 printer mapping program (DFHML1), which combines the map copies chained to the TTP and maps the data.
5. DFHPBP communicates with storage control to:
   - Acquire and free buffers in which pages are built
   - Acquire storage for copies of maps for SEND MAP ACCUM or SEND TEXT ACCUM
   - Acquire storage for a copy of the user's data for SEND MAP ACCUM or SEND TEXT ACCUM.
6. DFHPBP requests program manager to terminate a transaction abnormally (ABEND) if certain errors occur that cannot be corrected.
7. A SEND TEXT ACCUM request for an IBM 3270 Information Display System causes a map set consisting of one dummy map to be passed to 3270 mapping (DFHM32). The map has one field with attributes FREEKB and FRSET.

   SEND TEXT ACCUM requests for an LU1 printer cause a map set consisting of one dummy map to be passed to the LU1 printer mapping program (DFHML1). The map has one field with attributes FREEKB and FRSET.
8. If the page is being constructed for an IBM 3270 Information Display System, control is given to DFHM32 to map the data and then to DFHTPP to output the page.

   If the page is being constructed for an LU1 printer, control is given to DFHML1 to map the data, and then to DFHTPP to output the page. Otherwise, control is given to DFHDSB to add device dependencies to the page, and then to the terminal page processor (DFHTPP) to output the page.

DFHPHP (partition handling program)

The partition handling program (DFHPHP) processes terminal operations that involve partitions. DFHPHP has one entry point, and starts with a branch table that passes control to the required routine according to the request. It consists of routines that perform the following functions:

- PHPPSI tests whether there is a partition set in storage. If there is and it is not the required partition set, that partition set is deleted. When no partition set is in storage, an attempt is made to load the appropriate partition set.
- PHPPSC builds a data stream to destroy any partitions that may already be loaded on the terminal, creates the partition set designated by the application partition set, and sets the name of the partition set in the TCTTE to be the name of the application partition set.
- PHPPIN extracts the AID, cursor address, and partition ID. The AID and cursor address are put in the TCTTE, and the partition ID is converted to a partition name and returned to the caller. A check is made that the partition ID is a member of the application partition set.
- PHPPXE sends a data stream to a terminal to activate the appropriate partition and sends an error message to any error message partition if input arrived from an unexpected partition.

Figure 15 shows the relationships between the components of partition handling.

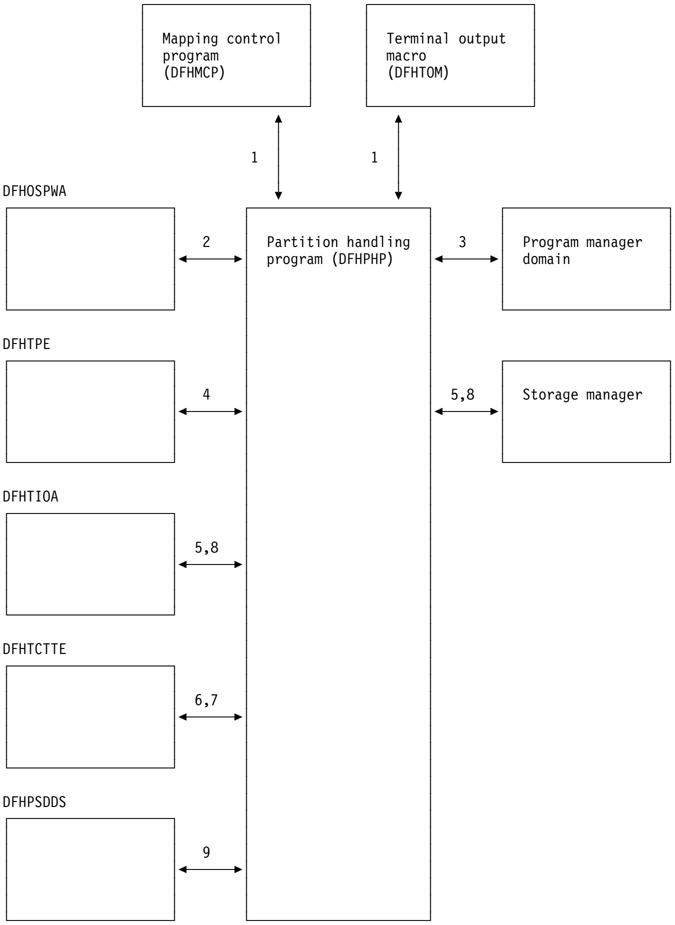

Mapping control program (DFHMCP)
Terminal output macro (DFHTOM)
1
1
DFHOSPWA
2
Partition handling program (DFHPHP)
3
Program manager domain
DFHTPE
4
5,8
Storage manager
DFHTIOA
5,8
DFHTCTTE
6,7
DFHPSDDS
9

Figure 15. Partition handling program interfaces

Notes:

1. DFHPHP is called by the mapping control program (DFHMCP) and by the terminal output macro (DFHTOM).
2. PHPPSI refers to OSPWA to check whether a partition set is loaded.
3. PHPPSI communicates with program manager to load the partition set.
4. PHPPSI puts the name of the partition set in TPE (terminal partition extension) as the application partition set.
5. PHPPSC calls storage control to acquire a TIOA in which to build and free the original TIOA.
6. PHPPSC sets a slot in the TCTTE to be the partition set data stream concatenated with the terminal partition set name if the terminal is not in the base state.
7. PHPPIN places the AID and the cursor address in the TCTTE.
8. PHPPXE calls storage control to get a TIOA, retrieves the error message text by calling the message domain, fills the TIOA with data, transmits the data, and frees the TIOA.

9. PHPPSC references the partition set object to build the partition creation data stream.

DFHRLR (route list resolution program)

The route list resolution program (DFHRLR) builds terminal type parameters (TTPs), which are the main blocks for building and writing out data in BMS.

Figure 16 shows the route list resolution program interfaces.

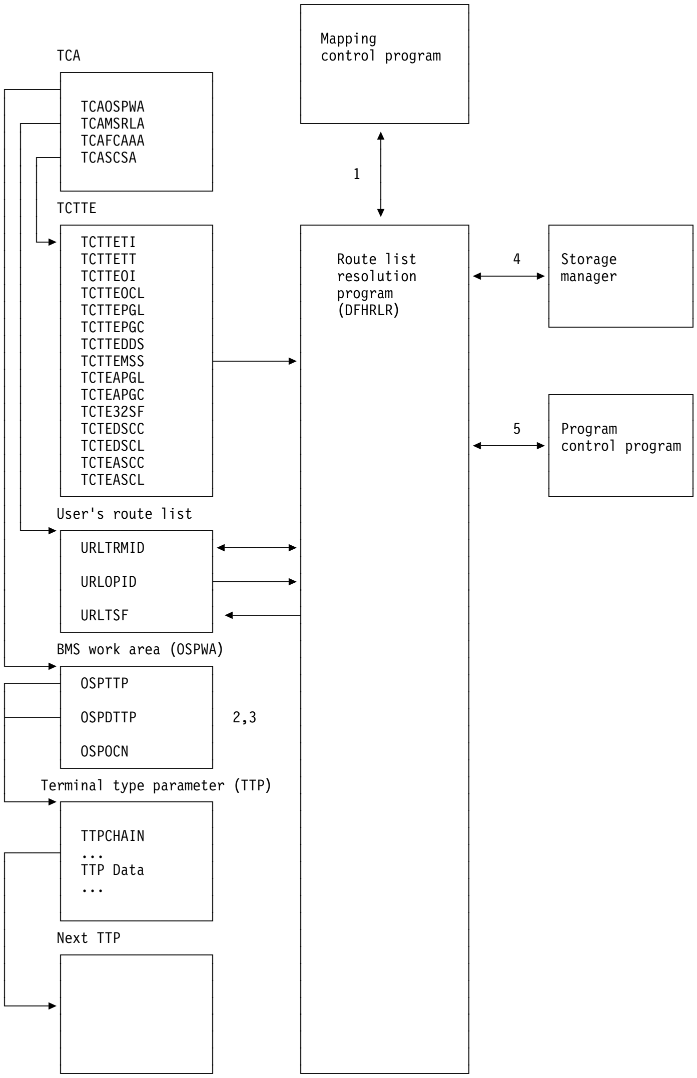


Figure 16. Route list resolution program interfaces

Notes:

1. DFHRLR is called by the mapping control program (DFHMCP) to determine the grouping of terminal destinations.
2. If data is to be routed, DFHRLR groups the terminals in the user’s route list by terminal type and builds a routing TTP for each type. For each TTP, the supported attributes of the corresponding terminals are accumulated. The address of the first routing TTP in the chain of TTPs is placed in OSPTTP.
3. If data is not to be routed, a direct TTP is built for the originating terminal and its address is placed in OSPDTTP.
4. DFHRLR communicates with storage control to acquire storage for the TTP.
5. Program manager services are requested by means of an ABEND command if errors occur that cannot be corrected.

DFHTPP (terminal page processor)

The terminal page processor (DFHTPP) directs completed pages to a destination specified in the BMS output request:

- SEND MAP or SEND TEXT sends to the originating terminal
- SEND MAP PAGING or SEND TEXT PAGING directs to temporary storage
- SEND MAP SET or SEND TEXT SET directs to a list of completed pages that are returned to the application program.

Figure 17 on page 75 shows the relationships between the terminal page processor and other components in response to BMS output requests.

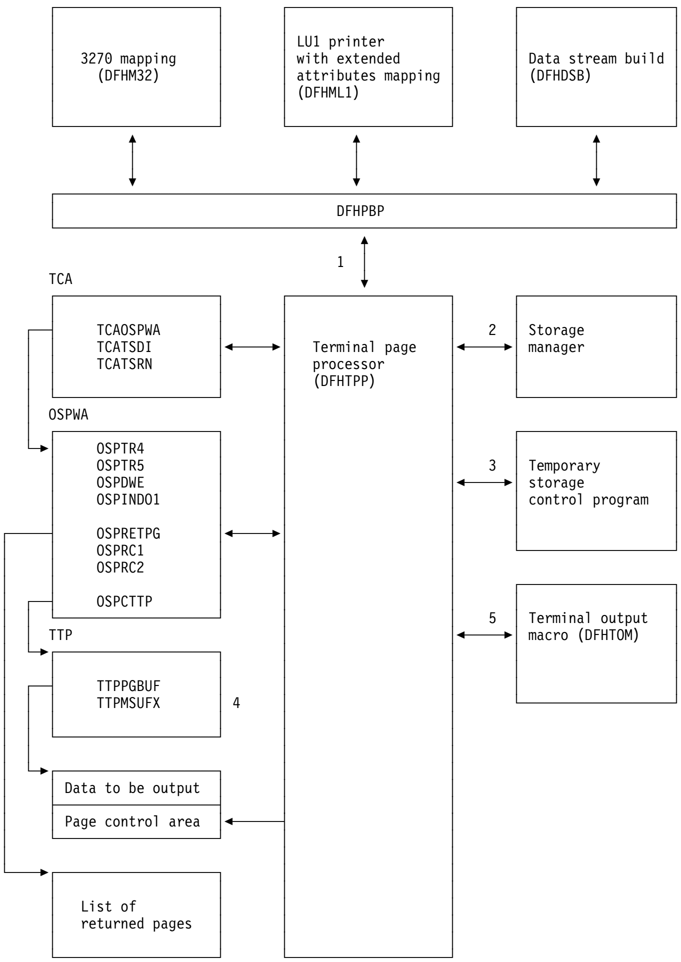


Figure 17. Terminal page processor interfaces

Notes:

1. DFHTPP is entered from DFHPBP after processing by 3270 mapping (DFHM32) for 3270s, by LU1 printer with extended attributes mapping (DFHML1) for those LU1 printers, and by data stream build (DFHDSB) for other devices.
2. DFHTPP communicates with storage control to obtain:
   - The return list (to store the address of completed pages to be returned to the program)
   - Deferred work elements (DWEs), which ensure that message control information is written to disk, even if the program neglects to issue a SEND PAGE request
   - Storage for a list that correlates pages on temporary storage with the logical device codes for which they are destined.
3. Temporary-storage control is used to store pages and the message control record (MCR) for messages stored on temporary storage.
4. The terminal type parameter (TTP) controls the formatting of a message for a particular terminal type (for example, an IBM 2741 Communication Terminal). TTPPGBUF contains the address of a completed page.
5. The terminal output macro (DFHTOM) is issued to provide an open subroutine assembled within DFHTPP that puts a completed page out to the terminal. If the data stream contains extended attributes, and the terminal does not support extended attributes, the extended attributes are deleted.

DFHTPQ (undelivered messages cleanup program)

The undelivered messages cleanup program (DFHTPQ) checks the chain of automatic initiate descriptors (AIDs) to detect and delete AIDs that have been on the chain for an interval exceeding the purge delay time interval specified by the PRGDLAY system initialization parameter, if this has a nonzero value.

Figure 18 shows the undelivered messages cleanup program interfaces.

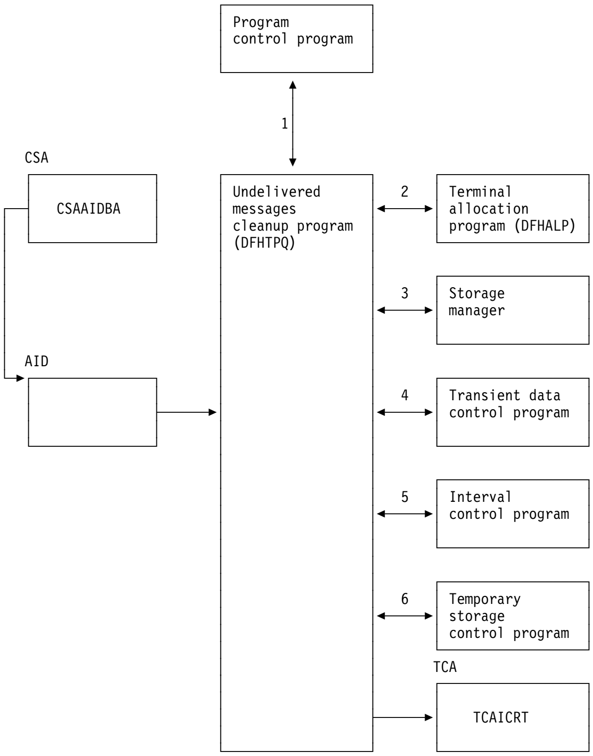

Program control program
1
CSA
CSAAIDBA
Undelivered messages cleanup program (DFHTPQ)
2
Terminal allocation program (DFHALP)
3
Storage manager
AID
4
Transient data control program
5
Interval control program
6
Temporary storage control program
TCA
TCAICRT

Figure 18. Undelivered messages cleanup program interfaces

Notes:

1. DFHTPQ is initiated the first time by the mapping control program (DFHMCP), by interval control, or by the transaction CSPQ. Thereafter, it reinitiates itself (see note 5).
2. DFHTPQ communicates with the allocation program (DFHALP) to locate and unchain AIDs.

3. DFHTPQ communicates with storage control to free AIDs that have been purged and to acquire storage for notification messages.
4. Transient data control is used to send notification messages.
5. Interval control is used to obtain the current time and to reinitiate this task (DFHTPQ).
6. DFHTPQ communicates with temporary-storage control to retrieve and replace message control records (MCRs) and to purge messages.

DFHTPR (terminal page retrieval program)

The terminal page retrieval program (DFHTPR) processes messages built by BMS and placed in temporary storage.

Figure 19 shows the relationships between the components of page retrieval.

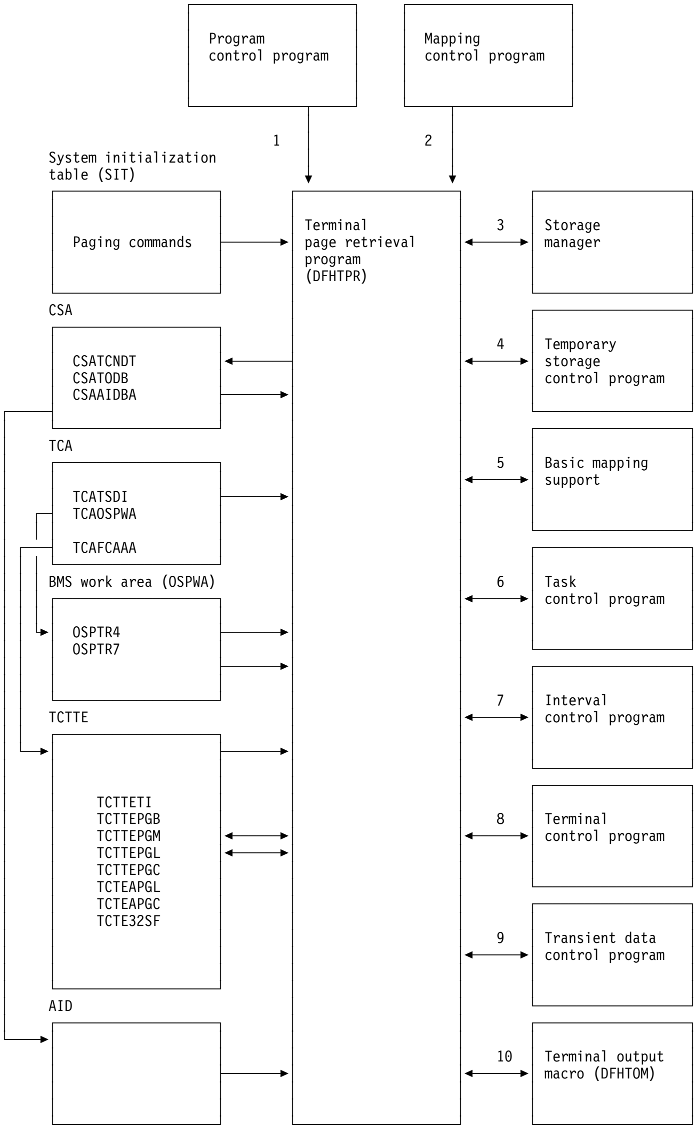


Figure 19. Page retrieval program interfaces

Notes:

1. DFHTPR can be initiated as a stand-alone transaction (CSPG), or by a user-defined paging command (for example, P/, or 3270 PA/PF keys), or linked to from a BMS conversational operation (SEND PAGE request with CTRL=RETAIN or RELEASE).

   DFHTPR performs the following functions:

   - Displays the first page of a routed message
   - Displays subsequent pages of a message at a terminal for which a SEND PAGE request with CTRL=AUTOPAGE was specified
   - Processes paging commands from a terminal
   - Processes the CSPG transaction when it is entered at the terminal

- Purges a message displayed at the terminal if the terminal is in display status and other than a paging command is entered at the terminal.

2. DFHTPR is entered from the BMS mapping control program (DFHMCP) to display the first page of a message originated at the terminal if CTRL=RETAIN was specified in the BMS request. DFHTPR reads from the terminal and processes paging commands until other than a paging command is entered.
3. DFHTPR uses storage control to:
   - Acquire and free message control blocks (MCBs)
   - Free message control record (MCR) storage
   - Acquire storage for information and error messages to be sent to the destination terminal and the master terminal
   - Free an automatic initiate descriptor (AID) taken off the AID chain
   - Acquire and free storage for a route list constructed in response to a COPY command entered at a terminal
   - Acquire a TIOA into which to place a device-independent page when performing the COPY function.
4. Temporary-storage control is used to retrieve and replace MCRs and to retrieve and purge pages.
5. Basic mapping support is used to display error and information messages at a requesting terminal, and to send a page to the destination terminal in the COPY function.
6. Task control is used to retain exclusive control of an MCR while it is being updated.
7. DFHTPR communicates with interval control during error processing when a temporary-storage identification error is returned while attempting to retrieve an MCR. Up to four retries (each consisting of a one-second wait followed by another attempt to read the MCR) are performed. (The error may be due to the fact that an MCR has been temporarily released because another task is updating it. If so, the situation may correct itself, and a retry is successful.)
8. Terminal control is used to read in the next portion of terminal input after a page or information message is sent to the terminal when a SEND PAGE request with CTRL=RETAIN was specified.
9. Transient data control is used to send error or information messages to the master terminal.
10. The terminal output macro (DFHTOM) is issued to provide an open subroutine that puts a completed page out to the terminal.

DFHTPS (terminal page scheduling program)

The terminal page scheduling program (DFHTPS) is invoked for each terminal type to which a BMS logical message built with SEND MAP PAGING or SEND TEXT PAGING is to be sent. For each terminal designated by the originating application program, DFHTPR is scheduled to display the first page of the logical message if the terminal is in paging status, or the complete message if it is in autopage status.

Copy books

Copy book	Function
DFHBMSCA	Defines constants for field attribute values, flags returned by BMS, and character attribute types and values for SEND TEXT. It is usually copied into BMS application programs.
DFHMCPE	Included in the minimum-function BMS mapping control program DFHMCPE$, and also forms the BMS fast-path module DFHMCX used by both standard and full-function BMS. It is a small, fast, self-contained, limited-function BMS for 3270 displays and printers.
DFHMCPIN	Included in the standard and full-function versions of the BMS mapping control program, DFHMCPA$ and DFHMCP1$ respectively. It contains the code for input mapping.
DFHMIN	Included in the DFHM32 and DFHMCPE programs. It contains input mapping code for 3270 terminals.
DFHMSRCA	Defines constants for MSR control. This is usually copied into BMS application programs.

Exits

No global user exit points are provided for this function.

Trace

The following point IDs are provided for basic mapping support, all with a trace level of BM 1:

- AP 00CD, for temporary-storage errors
- AP 00CF, for exit trace
- AP 00FA, for entry trace.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 10. Builders

The builder modules:

- Make the autoinstall process possible (that is, build a terminal control table terminal entry (TCTTE) dynamically).
- Allows new TCT entries to be added on a running CICS system.
- Allow the TCT to be dynamically updated on a running CICS system.
- Allow TCT entries to be deleted on a running CICS system.
- Reduce emergency restart times for those systems that use the autoinstall function. These systems have to take the time to restore and recover only those terminals that were autoinstalled at the time of termination.
- Reduce warm start times for those systems that use auto-install. No auto-installed terminals (except LU6.2 parallel systems are recovered at warm start).
- Reduce shutdown times for those systems using auto-install. Auto-install catalog entries are deleted but the entry in storage is not destroyed during shutdown.

In this section, the term TCTTE is used in a general way to refer to the terminal control table entries for connections (TCT system entries, TCTSEs), mode groups (TCT modegroup entries, TCTMEs), sessions (session TCT terminal entries, TCTTEs), skeletons (TCTSKs), and models.

To build or delete a control block for a particular device, a set of builders is called. The set of builders is specified by a tree structure of patterns, each pattern specifying one builder.

The builder modules (DFHBS*) are link-edited together into the DFHZCQ load module.

On microfiche, the individual DFHBS* modules are listed separately.

Design overview

What is a builder (DFHBS*)?

A builder is responsible for all the actions that can occur on a particular subcomponent of the TCTTE. The term subcomponent means a separately obtained area of storage which is referenced from the TCTTE or a collection of fields in the TCTTE that are logically associated with one another. General terms sometimes used instead of subcomponent are **object** or **node**. For example, the NIB descriptor, LUC extension, and BMS extension are all considered to be subcomponents.

Builder parameter set (BPS)

Each time a calling module invokes DFHZCQ for INSTALL, it supplies a builder parameter set (BPS). The BPS describes the device to be defined. The device-type is determined by matching attributes in the BPS with a table of definitions, DFHTRZYT, in module DFHTRZYP.

A BPS consists of a fixed-length prefix, a bit map preceded by its own length, an area for fixed-length parameters preceded by its own length, and three variable-length parameters, BIND, USERID, and PASSWORD. Each variable-length parameter has a 1-byte length field.

TCTTE creation and deletion

This section starts by describing the structure of the main components involved in the process of creating and deleting TCTTEs. Figure 20 on page 80 is in two halves: the top half shows those components that can initiate the process of collecting all the necessary data or parameters that go toward fully defining a TCTTE, and the bottom half is concerned with how to go about creating the TCTTE after it has the full set of parameters. Thus, all the processes are aiming for the same common interface. This section deals first with the top-level processes that are activated to create or delete TCTTEs; for the time being, assume that after returning from the DFHZCQ interface a TCTTE has been created. (For a more detailed description, see “DFHZCQ and TCTTE generation” on page 80.)

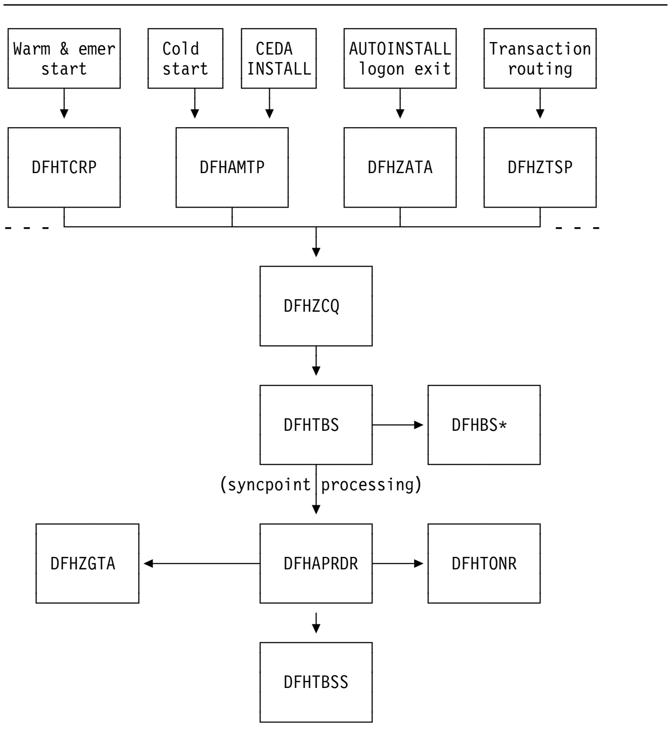


Figure 20. Top-level view of the components participating in TCTTE creation

Component overview

DFHTCRP: The DFHTCRP program is responsible for reestablishing the TCTTEs that were in existence in the previous run. There are conceptually three stages of processing in this module:

1. Initialize DFHZCQ. Initialize DFHAPRD. If START=COLD, terminate.
2. Reestablish TCTTEs that were saved on the CICS catalog. If START=WARM, terminate.
3. Call DFHAPRDR to forward-recover in-flight TCTTEs from the system log, if an emergency restart is being performed.

DFHAMTP: The DFHAMTP program is used as part of INSTALL processing. It calls DFHTOR, then DFHZCQ.

DFHZATA and the CATA transaction: CATA is a transaction that is initiated by the logon exit and causes DFHZATA to run. It is passed the CINIT which is used to deduce the parameters which must be passed to DFHZCQ in order to create a TCTTE.

DFHZTSP: The terminal sharing program, DFHZTSP, is used by transaction routing for devices of all types, exclusively so for non-APPC devices.

DFHZCQ: The DFHZCQ program supports the INSTALL and DELETE interface that results in the TCTTE being created or deleted. It relies on its callers to supply the complete set of parameters that are to be used to create the TCTTE; that is, it is not responsible for determining parameters for the TCTTE.

DFHBS* builder programs: The builders are responsible for creating the TCTTE. The parameters given to DFHZCQ are passed on to the builders. They extract the parameters and set the relevant fields in the TCTTE.

DFHTBS: The DFHTBS program is an interpreter that uses a pattern given to it by DFHZCQ to drive the whole TCTTE creation or deletion process according to certain rules.

DFHAPRDR: The DFHAPRDR program is the orchestrator of the commitment of TCTTE creation or deletion. It is responsible for driving DFHTBSS and DFHTONR for syncpoints, during cold start and also for recovering in-flight creates or deletes from the system log during emergency restart. It is called by the Recovery Manager, DFHTCRP and DFHAMTP during start-up and directly from DFHTBS (to roll-back an atom).

DFHTBSS: The DFHTBSS program is responsible for logging forward recovery records and for updating the catalog as a result of the request initiated by DFHZCQ and actioned by DFHTBS. It is driven by DFHAPRDR.

DFHTONR: The DFHTONR program is responsible for logging forward recovery records and for updating the catalog for install or delete requests for TYPETERMS. It is driven by DFHAPRDR.

DFHZGTA: DFHZGTA is the module called by DFHBS* and DFHZTSP (for remote system entry sessions) to add or delete index entries for TCTTE entries. It maintains locks on terminal namespaces, and handles calls to TMP to add, quiesce, delete, unlock and unquiesce entries. It is driven at syncpoint or rollback for an atom by DFHAPRDR.

DFHZCQ and TCTTE generation

This section describes how a TCTTE gets built and deleted. You need to understand at least one method by which a builder parameter set (BPS) is created; for example, CEDA INSTALL or AUTOINSTALL. A BPS contains all the values necessary for the creation of a TCTTE.

Figure 21 on page 81 gives a more detailed view of the main components involved in the INSTALL process.

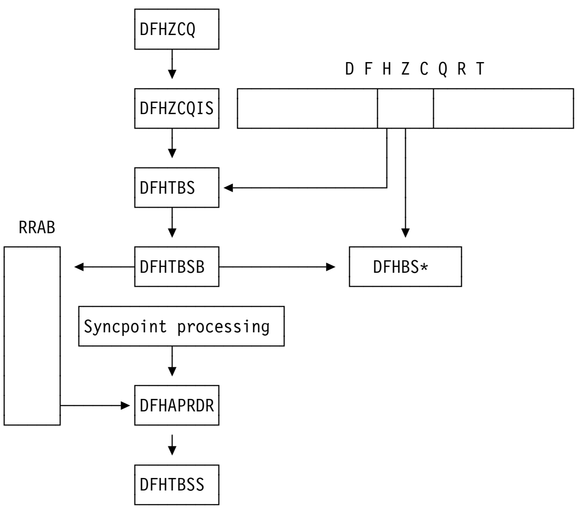


Figure 21. Major active components in the INSTALL process

The four-stage process

In summary, the process consists of four stages:

1. **Collecting the parameters** together.
2. **Creating the storage** for the TCTTE and copying the parameters. Note however, that at the end of this stage, a TCTTE has effectively been built. It is still unknown to the rest of the CICS system, that is, the TCTTE name has not been exposed. The modules involved here are DFHTBSB and DFHBS*.
3. **Producing a recovery record**. This is done at syncpoint processing time in the DFHTBSS module. This stage is usually called Phase 1 syncpoint.
4. **Writing or updating the catalog**. Again, this is done in DFHTBSS and is called Phase 2 syncpoint. It is at about this stage that the TCTTE name becomes exposed and known to the rest of CICS.

What is DFHZCQRT?: DFHZCQRT is an array of "patterns" where each pattern defines a list of builders that need to be called in order to create this particular type of TCTTE, that is, a pattern is equivalent to a type of terminal. The array entry consists of two parts: information that is private to DFHZCQ, and the pattern that is interpreted by DFHTBS.

What does DFHTBSBP do?: The pattern entry is passed to DFHTBSBP (via DFHTBSB) after it has been found by DFHZCQIS. DFHTBSBP calls each builder identified by the pattern in sequence to create the object for which the builder is responsible. Note that DFHTBSBP knows nothing about the TCTTE; DFHTBSBP merely follows a set of simple rules. It keeps an audit trail of each builder that is called.

What is the RRAB used for?: The audit trail kept by DFHTBSBP is implemented by obtaining a Resource definition Recovery Anchor Block (RRAB) that has some user storage attached to it. As DFHTBSBP calls each builder to perform an action, it adds an "action element" to the RRAB. (See "What is syncpointing?" on page 82) The address of the RRAB for a UOW is held in the 'APRD' recovery manager slot, which ensures that DFHAPRDR will be called at syncpoint. The RRAB stores the action blocks in two types of chains, one for actions that are not part of a named resource definition 'atom' and one for actions that are part of a named atom. This later type are chained off a Resource definition Action Name block (RABN). Also held in the RRAB is an indicator set by DFHTOR if DFHTONR should be called at syncpoint (if a typeterm has been installed), and a chain of Resource Definition Update Blocks (RDUB).

What is a resource definition 'atom'?: Certain resource definitions must be installed or deleted as a single set. These definitions are called a resource definition 'atom'. CICS installs the members of a RDO group as individual resource definitions, which can fail without causing the other resources to fail except for these atoms, which bear the name of the logical set of definitions. For example:

A connection and its associated sessions is named for the connection

A pool of terminals is named for the pool of terminals

What is a Resource definition Atom Name block (RABN)?: The RABN is only created for those atoms of resource recovery that are named. It holds the name of the atom, a chain of action elements for the atom, and the recovery outcome of the atom (whether it failed and was backed out, or succeeded and should be committed). DFHTBSB uses the RABN to decide if a session definition should not be installed because the install of the parent connection has already failed, for example. In our auto-install example, if the definition being installed is a parallel connection, there will be a RABN for it from which the action elements are chained.

What is a Resource Definition Update Block (RDUB)?: The RDUB is a record of locks held by a UOW against names in three namespaces:

1. Termids and Sysids
2. Netnames
3. Unique ids (Composed of the Netname of a Terminal Owning Region followed by a period '.' followed by the Termid or Sysid in that TOR)

During the installation, deletion, or replacement of a TCTTE definition the builders DFHBS* obtain locks by calling DFHZGTA. These locks guarantee exclusive or shared access to names in these namespaces. Exclusive access is used to prevent another task from installing another definition with the same name, netname or unique-id while this UOW is trying to install or delete (an action which may have to be reversed). Shared access is used to block another task from deleting an entry that a definition that this task is updating (for example, a system definition name may be locked by a remote terminal definition that refers to it).

RDUBs also exist on a global chain so that other UOWs can easily find out if a particular lock is held.

What is syncpointing?: When DFHTBSBP has exhausted the list of builders, it returns to its caller. Similarly, DFHZCQIS returns to its caller, which could have been autoinstall. However, there is still an audit trail that is attached to the RRAB. It is only when the calling task terminates or issues DFHSP USER or EXEC CICS SYNCPOINT that the next two stages occur.

Syncpoint processing consists of two phases. The first phase (prepare phase) requires the resource manager to write a forward-recovery record to the log. Thus, if the second phase (commit phase) fails to write to the catalog, this recovery record can be used to forward-recover the action on an emergency restart.

DFHTBS: The DFHTBS program is an interpreter that uses a pattern given to it by DFHZCQ to drive the whole TCTTE installation or deletion process according to certain rules.

DFHAPRDR: DFHAPRDR is invoked by recovery manager if the 'APRD' RM slot is non-zero. This slot contains the address of the RRAB for this UOW if any resource definition has taken place. It is also called by DFHTBS directly if an atom needs to be rolled-back or to commit an atom during Cold Start. DFHAPRDR examines the RRAB and chooses whether to call DFHTBSS, DFHTONR and DFHZGTA for each phase of syncpoint or individual atom commitment.

If either DFHTBSS or DFHTONR have records to log/catalog, DFHAPRDR calls the recovery manager to request that a record is written to the catalog noting that a forget record will be written once syncpoint completes. The purpose of this call is that if CICS should fail between the start of syncpoint phase 2 and the end, on an emergency restart recovery manager will call DFHAPRDR with the log records for this UOW so that they can be re-applied to the catalog, and the TCTTE entry or entries can be re-built.

DFHTBSS: The DFHTBSS program is responsible for performing the correct recovery actions for each atom and UOW at syncpoint (or during the rollback of an individual atom). It writes forward recovery records to the system log and updates the catalog during phase 1 and phase 2 of syncpoint respectively. It is directly driven by DFHAPRDR.

The purpose of the builder (DFHBS*) modules is to build a TCTTE, TCTSE, and TCTME and its associated control blocks. A TCTTE is built for terminals only; a TCTSE and TCTME are built for both LU6.1 with MRO and LU6.2 single sessions; all three are built for LU6.2 parallel sessions. DFHTBSS is invoked by DFHAPRDR with a parameter list that indicates whether this call is for an individual atom or for syncpoint and which phase is in force. For phase 1, it uses the action blocks audit-trail to recall each builder. It asks each builder to supply the address and length of the subcomponent so that it can create a single record containing a copy of each component as a list; that is, the first part of the record contains a copy of the object created by the first builder in the sequence, the second part contains a copy of the object created by the second builder, and so on until the audit trail list is finished. This record is then written to the system log as a forward recovery record.

When DFHTBSS is reentered for the second phase (again a parameter on the call by DFHAPRDR), it uses the record created in the first phase as the record that is written to the catalog. During this stage, each builder is called to tidy up after the object for which it is responsible; for example, for the TCTTE itself, it puts the TCTTE in service.

Again note, DFHTBSS only implements a set of rules.

DFHTONR: DFHTONR is responsible for writing catalog records for TYPETERMs. It is called by DFHAPRDR.

DFHZGTA: DFHZGTA is the module that is called by DFHBS* modules to add index entries for TCTTE entries so that they can be located quickly either by DFHZLOC, DFHZGTI or in VTAM exit code. It calls DFHTMP services. It obtains and releases locks using the RDUB blocks, and at syncpoint is responsible for releasing all TMP locks and unquiescing any TMP entries that were quiesced by DFHBS* modules.

Summary

- In overview, the process consists of four stages: parameter collection, obtaining and initializing, phase 1 recovery record and logging, and phase 2 catalog record.
- A builder contains TCTTE specific code.
- DFHTBS* modules implement the abstract rules for creating generic "objects".
- DFHZCQRT contains patterns that define what builders are to be used to build the TCTTE.
- Syncpoint processing consists of two stages (prepare and commit).
- DFHAPRDR is responsible for orchestrating the syncpoint process for all of resource definition recovery.
- DFHTBSS is driven by DFHAPRDR using the audit trail produced by DFHTBSB.
- DFHTONR is driven by DFHAPRDR if any TYPETERMs were installed.
- DFHZGTA is driven by DFHAPRDR if any locks need to be released.

Example of an autoinstall: Consider the following: a terminal operator has logged on to the system and is being autoinstalled. The CATA transaction is responsible for collecting together the parameters required for the DFHZCQ INSTALL.

The process continues from the point where the DFHZCQ INSTALL is issued from CATA.

Step	DFHZCQ	DFHZCQIS	DFHTBS	DFHTBSB	DFHBS*	DFHTBSS
1.	A call has been made to cause an install to occur. DFHZCQ ensures that other related modules are already loaded.					
2.	Calls the install-specific module (given in the parameter block passed to DFHZCQ).					
3.		Performs various checks on the parameters passed by the caller of DFHZCQ.				
4.		Finds a pattern in DFHZCQRT that matches with information given in the parameters.				
5.		Calls DFHTBS with the pattern and parameters.				
6.			DFHTBS only routes the request to DFHTBSB, so is omitted from further discussions.			
7.				Checks that a valid pattern has been passed.		
8.				Creates the RRAB which gets attached to the 'APRD' Recovery Manager slot.		
9.				Calls the next builder as defined by the pattern.		
10.					Each builder creates its section of the TCTTE.	
11.				Adds an action element to the RRAB giving information about this particular builder.		
12.				Repeats steps 9, 10, and 11 until the pattern is finished.		
13.				Tidies up the RRAB and returns.		
14.			Returns.			
15.		If the return code was ‘OK’, returns the address of the hidden TCTTE.				
16.	Returns.					

Figure 22 (Part 1 of 2). Flow of control for a build

Step	DFHZCQ	DFHZCQIS	DFHTBS	DFHTBSB	DFHBS*	DFHTBSS
17.	(Caller continues until DFHSP USER is issued or task terminates.)					
18.	(DFHAPRDR invokes DFHTBSS with the RRAB indicating phase 1.)					
19.						Examines the RRAB to determine phase.
20.						Using the action elements created in step 11, recalls each builder asking for information to be saved on the recovery log.
21.					Returns the address of the object built in step 10.	
22.						Using these addresses, builds the recovery record.
23.						Writes this out to the system log.
24.						Saves stored version for the next phase.
25.						Returns.
26.	(Recovery Manager calls all other resource managers who have a part to play in the process; it knows this because there are addresses in the RM slots for this UOW).					
27.						Discovers that this is phase 2, and reuses the in-storage version of the recovery record to write to the catalog.
28.						Returns.

Figure 22 (Part 2 of 2). Flow of control for a build

Patterns, hierarchies, nodes, and builders

Patterns were introduced in the previous section. This section examines in detail what they look like. To achieve this, several terms have to be explained.

What is a hierarchy?: In this context, "hierarchy" is another word for tree. The structure of the TCTTE can be thought of as a tree: at the top **node** is the TCTTE itself, containing pointers to lower-level **nodes**.

Figure 23 shows the **master node** as the TCTTE, with **subnodes** connected to it (BMS extension, special features extension, and so on).

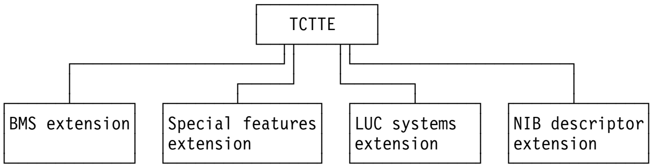


Figure 23. TCTTE structure

As a result of this structure, it can be seen that the creation process must follow several rules. For example, the storage for the **master node** has to be obtained before pointers to **subnodes** are saved in it.

What is a pattern?: The objective of a pattern is to reflect or represent the hierarchy as described above. Figure 24 outlines the shape of a pattern. For each of the nodes in Figure 23, there is a pattern. Starting with the TCTTE (**the master node**), there is a **master pattern**. B1offset references the **subpattern** for the BIND image node; B2offset references the subpattern for the BMS extension node; B3offset and B4offset reference the subpatterns for user area and SNTTE **subnodes** respectively. In total, there are five patterns: the master pattern and four subpatterns—so what is meant by **pattern** above was really a collection of patterns.

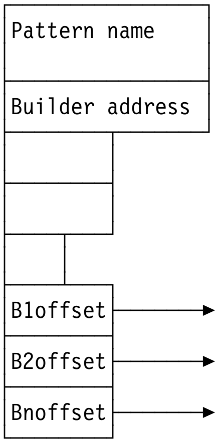


Figure 24. Pattern structure

Note that each pattern contains the address of a builder, so we could represent the TCTTE structure as:

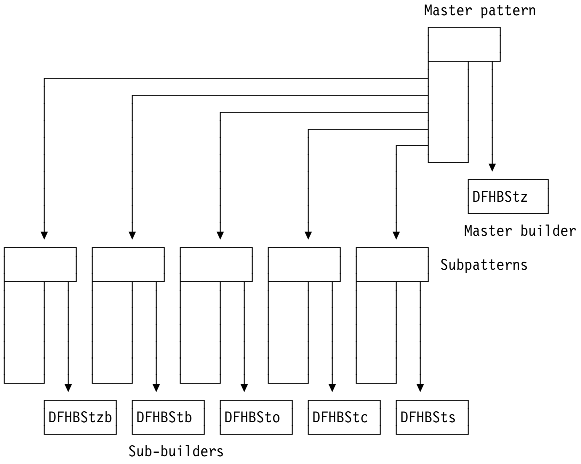


Figure 25. Patterns and subpatterns

The purpose of the builders: The purpose of the builders is to centralize the major functional code for creation and deletion of the **nodes** associated with the TCTTE. Figure 24 and Figure 25 show how the **patterns** refer to the builders; the pattern is exploited by the DFHTBS* code to activate the relevant builder function. For example, DFHTBSBP, when given a pattern, extracts the address of the builder and invokes the BUILD function belonging to the builder.

How does DFHTBSBP do its work?: First, you must examine more closely the structure of a builder in Figure 26.

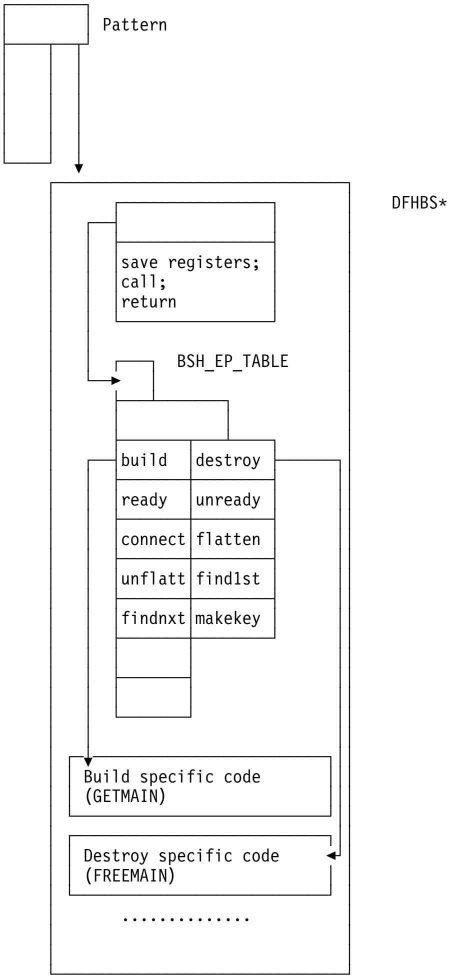


Figure 26. The builder stub

Remember that the pattern references a builder. In fact, it references a stub, the first word of which points to a table (BSH_EP_TABLE), and is followed by code that is responsible for enacting the entry as required by the caller. For example, if the caller wanted to call BUILD, a call would be made to the stub with value 1. The stub would extract the offset to the build code from the BSH_EP_TABLE, and perform the call.

Thus, making a call from DFHTBS* to DFHBS* is relatively simple: all that is needed is the function number (1 for BUILD, 2 for DESTROY, ...), a call to the stub, and the pattern.

Summary

- The TCTTE is structured as a **hierarchy** with a **master node** (the TCTTE itself) and **subnodes** (BIND image, BMS extension, and so on).
- **Patterns** mimic this hierarchy and consist of a **master pattern** which refers to **subpatterns**.
- In turn, each pattern points to a builder: the master pattern refers to the **master builder** and the subpatterns refer to the **sub-builders**.
- Builders centralize the major creation and deletion functions associated with the node for which they are responsible.
- The invocation (or activation) of the builder functions is performed under the strict control of the DFHTBS* modules.
- The **order of invocation** is totally determined by the structuring of the patterns.

The DELETE process

By examining the hierarchy (see Figure 23 on page 84), you can see that there are certain rules that have to be established. Firstly, you should check that the TCTTE and its subcomponents are quiesced, that is, there is no activity in progress. And secondly, and perhaps more obviously, the top node must not be the first object to be freed. From this, you can derive two basic rules, or "functions", that must be supplied by any DFHBS*:

UNREADY For all nodes associated with the master node. Ensures that no activity is occurring; for example, that a CLSDST is not in progress. It must also achieve exclusive ownership of the object; for example, ZGTA QUIESCE ensures no locates on the given TCTTE succeed and that no other UOWs can install another similarly named object until syncpoint. Further, it **initiates** the ZGTA DELETE which does a TMP DELETE to remove the entry.

DESTROY ***Lower*** objects first. (See "What about the "lower objects first" rule?":) Frees the storage belonging to the node.

What about the "lower objects first" rule?:

Figure 27 tries to add meaning to the descriptions of the UNREADY and DESTROY functions. As each builder is called (as determined by the master pattern), DFHTBSD records an audit trail of called builders. However, the audit trail is managed slightly differently for the delete process, to guarantee order of processing by DFHTBSS at phase 2 time. For further information, see "Completing the process description" on page 88.

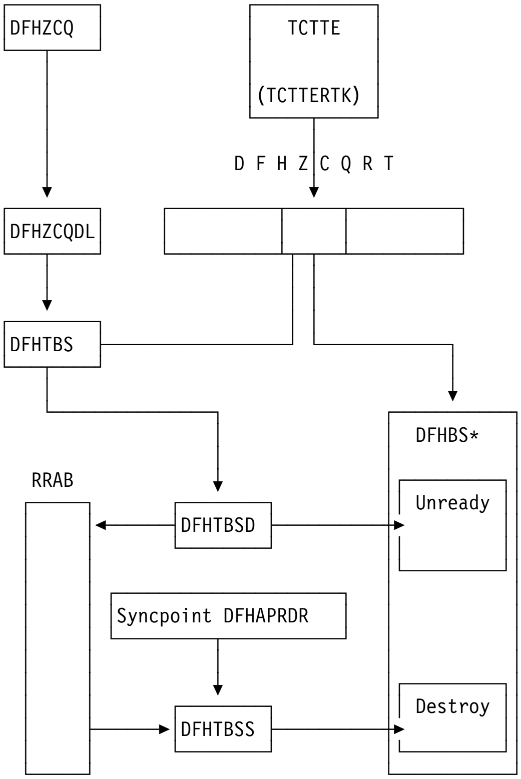


Figure 27. Major active components in the DELETE process

Example of a reinstall

Step	CEDA	ZCQIS	TBSB	BS*	ZCQDL	TBSD	BS*
1.	Reads the CSD and converts the definition into a builder parameter set (BPS).						
2.	Issues a DFHZCP INSTALL passing the BPS.						
3.		Using the resource type code in the BPS, searches the DFHZCQRT table for the associated pattern.					
4.		Calls DFHTBSB passing the BPS and the pattern.					
5.			Checks the pattern and creates a resource definition. recovery action block (RRAB) for the audit trail.				
6.			Using the pattern, calls the CHECKSET entry point of the associated builder.				
7.				The master builder does a ZGTI LOCATE to check whether the TCTTE already exists.			
8.				A TCTTE is found to exist, so the builder issues DFHZCP DELETE passing the address of the old TCTTE.			
9.					When a TCTTE is created, its position within the DFHZCQRT table is saved in the TCTTE. This value is now used to find the pattern associated with this TCTTE.		
10.					Calls DFHTBSD passing the object to be deleted and the pattern.		
11.						Extends the audit trail so that information about this delete can be recorded.	
12.						Calls the UNREADY entry of each builder.	
13.							Each builder checks whether its part of the TCTTE is being used. (A builder vetoes if it is.) Calls ZGTA QUIESCE and ZGTA DELETE to lock and remove the index entries.
14.						Updates the audit trail for each called builder.	
15.						Returns.	
16.					Returns.		
17.				Checks return code (that is, no builder vetoed the UNREADY).			

Figure 28 (Part 1 of 2). Flow of control for a reinstall

Step	CEDA	ZCQIS	TBSB	BS*	ZCQDL	TBSD	BS*
18.				Returns.			
19.			Checks return code and recalls the builder at the BUILD entry point passing the BPS.				
20.				Obtains some storage and copies the parameters from the BPS. Uses ZGTA ADD calls to lock and add index entries			
21.			Repeats for each builder in the set of patterns.				
22.			Tidies up the RRAB and returns.				
23.		Records the position within DFHZCQRT that enabled you to get the pattern.					
24.		Returns.					
25.	Checks the return code and issues DFHSP USER.						
	Note: At this stage there are two TCTTEs: the old one that was UNREADY and the new one.						
26.	DFHTBSS is entered for the first time (phase 1). The audit trail consists of two parts (A and B). Part A contains the list of builders involved with the UNREADY; part B contains the list of builders that created the new TCTTE.						
27.	Writes a recovery record for Part A indicating that a delete is about to take place in phase 2 to the system log.						
	Creates a recovery record from Part B which represents the new TCTTE to be built.						
29.	Calls each builder asking for its subcomponent (FLATTEN).						
30.		Returns an address and length.					
31.	Concatenates each subcomponent into the recovery record.						
32.	Writes the recovery record to the system log.						
33.	Returns (end of phase 1).						
34.	**Reenter for phase-2 processing.**						
35.	Processes Part A, calling the DESTROY entry for each builder.						
36.		Each builder frees its part of the old TCTTE.					
37.	Processes Part B of the audit trail.						
38.	Writes the recovery record to the catalog.						
39.	Calls the READY entry point for each builder on the audit trail.						
40.		Each builder does any tidying up that needs to be done.					
41.	Returns.						

Figure 28 (Part 2 of 2). Flow of control for a reinstall

Completing the process description

To complete the description of the creation and deletion process, two further functions must be described: CONNECT and READY.

CONNECT: Figure 23 on page 84 shows the TCTTE hierarchy. All that has happened at build time is that the separate parts of the TCTTE have been obtained. Access to these subcomponents is achieved by referencing pointers that are held in the TCTTE. So the CONNECT builder entry point is used to join the subcomponent to the TCTTE.

READY: The READY builder entry point is provided to enable any final tidying up that may be required at the end of the build process. For example, if the TCTTE has the AUTOCONNECT option, a SIMLOGON is initiated from this entry point. In general, this entry point is rarely used.

The creation/deletion state machine: Figure 29 shows the symmetry between the various builder functions.

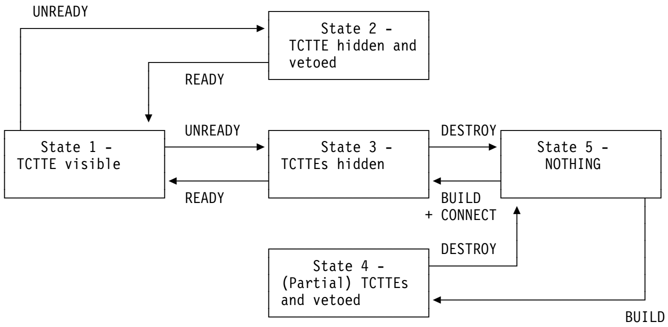


Figure 29. Create/delete state diagram

The starting point can be either state 5 (installing a TCTTE) or state 1 (deleting a TCTTE). Thus, if several TCTTEs had been successfully built, but the last one resulted in an error, we would end up in state 4. If it were not for the last one, we would have ended up in state 3. So the caller is returned an error response, and issues a DFHSP ROLLBACK. This causes DFHTBSS to call the DESTROY function of the builders for all elements on the audit trail—even for those that were "successfully" built in this atom, or UOW. Thus, an install of a atom can be perceived as one complete unit. During the DESTROY process, if the atom is being rolled-back, the builders call ZGTA QUIESCE and ZGTA DELETE to remove index entries for the new TCTTE. Likewise during the READY process, if a delete is being rolled back, the builders call ZGTA ADD to re-instate index entries for the TCTTE.

The hierarchy and its effect upon the creation process

Summary so far

- Object creation is a four-stage process.
- It is controlled by a pattern.
- Each pattern refers to a builder.
- Each builder is responsible for a subcomponent of the TCTTE.
- Builders have a number of procedural entry points:
  - BUILD
  - CONNECT
  - DESTROY
  - READY
  - UNREADY.
- These entry points are called under the control of the DFHTBS components.

This section now looks in greater detail at how the control of the builder calling process is implemented. To do that, you need to understand in greater detail the structure of the hierarchy, and the way the DFHTBS components interpret that structure.

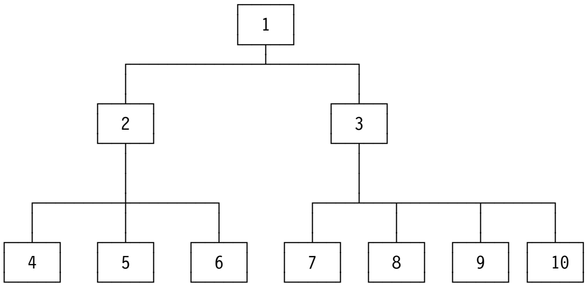


Figure 30. A general hierarchy

Figure 30 shows a more general hierarchy. Node 1 can be considered as a master node: it is at the top of the tree and has two subnodes (2 and 3). However, you could say that node 2 and its subnodes are also a tree: node 2 is the master node, and nodes 4, 5, and 6 are the subnodes. Similarly, with node 3: it has subnodes 7, 8, 9, and 10.

The DFHTBS components exploit the idea that a tree consists of a node with trees below it. In fact, DFHTBSBP uses **recursion** to access the tree of patterns.

Recursion: This section demonstrates how recursion is used to process a much simpler structure than that given in Figure 30. The example shown in Figure 31 on page 90 is for the DFHTBSP program, which has the following parameters:

Input:	PATTERN, HIGHERNODE, and BUILDER
Inout:	AUDITTRAIL

Output: NODE and RESPONSE.

The following list outlines the flow in DFHTBSBP. The step references refer to steps in this list.

1. Add and initialize an action to the AUDITTRAIL (this is used later in steps 5 and 11).
2. Using parameter PATTERN, find the address of the associated builder.
3. Call the builder stub with function number 1 (for BUILD) with the following parameters:

   Input: HIGHERNODE and BUILDER
   Output: NODE.

The builder uses the BUILDER parameters to create its specific object. Storage is obtained and the parameters are copied into it.

4. Check that the response from the build is ‘OK’.
5. Copy the address of the output parameter NODE into the AUDITTRAIL action.
6. Process all the subpatterns that may be attached to your pattern
7. Get the next subpattern Pn.
8. Call DFHTBSBP with the following parameters:

   Input: Pn, NODE, and BUILDER
   Inout: AUDITTRAIL
   Output: SUBNODE and SUBRESPONSE

   Note: In this step, you call yourself again, passing NODE. At the next level of recursion, this appears as HIGHERNODE.
9. Stop when the last pattern is processed.
10. Call the builder stub with function number 5 (for CONNECT) with the following parameters:

    Input parameters: NODE
    Inout parameters: HIGHERNODE

The builder’s CONNECT entry point now places the address as given by NODE into an offset of HIGHERNODE.

11. Finally, place the address of the pattern into the AUDITTRAIL action.

Simple recursion example

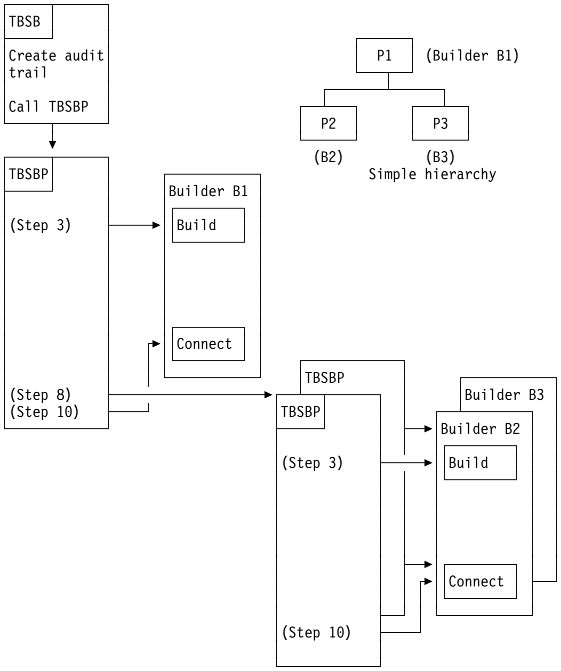


Figure 31. Simple example showing recursion

Consider the following simplified version of the hierarchy as given in Figure 31. The step references refer to steps in the list in the section “Recursion” on page 89.

1. Start with pattern P1. Call its associated builder (step 3). This creates node N1.
2. All the patterns below P1 are processed, the first of which is P2.
3. Call DFHTBSBP passing P2, N1, BUILDER parameters, and others:
   a. Using the passed pattern (now P2), call the builder. This creates node N2.
   b. Process all patterns below P2; there are no subpatterns, so steps 6 through 9 on page 90 are not performed.
   c. Call the CONNECT entry of the builder, passing higher node N1 and the node just created, N2. This makes N1 point to N2.
   d. Return to caller.
4. Get the next pattern, P3.
5. Call DFHTBSBP passing P3, N1, BUILDER parameters, and others:
   a. Using the passed pattern (now P3), call the builder. This creates node N3.
   b. Process all patterns below P3; there are no subpatterns, so steps 6 through 9 on page 90 are not performed.

   c. Call the CONNECT entry of the builder passing in higher node N1 and the node just created N3. This makes N1 point to N3.
   d. Return to caller.
6. Last pattern processed (step 10 on page 90).
7. Call the builder associated with P1 to connect node N1 to HIGHERNODE. (This is zero because there is no higher node. Usually, a master builder's CONNECT function either does nothing or adds the TCTTE name and address into the table management tables.)

ROLLBACK

What happens when an error occurs during the install process? An example of this would be when one TCTTE within a group is still in service when a CEDA COPY command is being processed for the group with the REPLACE option specified. "Example of a reinstall" on page 87 shows such a replace operation. The builders for the existing TCTTE are called (UNREADY) in order to check that the DELETE (FREEMAIN) can proceed. Thus, the audit trail refers to all called builders.

If the "total vote" from all the UNREADY builder calls indicates OK, the build proceeds for the new TCTTE that is to replace the existing one. Thus, at the end of the process, the audit trail consists of a list of references to builders associated with the old TCTTE, and a list of references to builders for the new TCTTE (lists A and B).

Consider the case when the group contains definitions for three TCTTEs, and a VETO occurs for the last one. This means that there is an audit trail for A1, B1, A2, B2 for which there was success, and list A3 for the unsuccessful UNREADY for the third TCTTE.

The failure condition is returned to the caller (CEDA), which then issues a DFHSP ROLLBACK.

Recovery Manager invokes DFHAPRDR which in turn invokes the DFHTBSS module, with a parameter that indicates a rollback is required. Thus, the "A" lists are processed, and all the READY entry points of the builders are called. Then the "B" lists are processed, and the DESTROY builder entry is called to free the storage obtained for the supposedly new TCTTEs.

To summarize, the rollback operation for UNREADY is READY, and the one for BUILD is DESTROY.

Catalog records and the CICS global catalog data set

Overview: The fourth stage of the process is to produce a catalog record that is written to the CICS global catalog data set. This record is used on a subsequent restart to recreate the TCTTE, but in a different way from the "Build" process described above. A CEDA INSTALL means that the TCTTE lives across CICS restarts, avoiding the necessity of rerunning the install.

A RESTORE from the CICS catalog is a faster operation than a CEDA INSTALL because there is no conversion of the CSD definition to a builder parameter set, and less I/O involved.

In summary, a catalog record is produced by recalling each of the builders asking for the address of the data that they want to be recorded on the catalog. Each subcomponent of the TCTTE is then copied and concatenated into one record, which is then written to the catalog. This process is known as FLATTEN.

A CATALOG call is made when significant events change the state of a TCT entry which would be needed on a subsequent emergency restart. An example is the recording of the membername of a generic VTAM resource connection when a bind has occurred for the first time.

On the restart, the record is read from the catalog, and presented back to each of the original builders. Each builder performs a GETMAIN, and copies its section of the recovery record into the acquired storage. This process is known as UNFLATTEN.

At shutdown, auto-installed entries are removed from the catalog with an UNCATALOG call (if they were cataloged because AIRDELAY¬=0). This drives DFHTBS and the builders to produce similar records to those for a DELETE call, but only to take action to delete the catalog record. This is significantly more efficient than calling the builders to DELETE each entry, as the copy in storage is left untouched.

The key and the recovery record: When the build process in DFHTBSBP has finally finished, this module makes a call to the master builder at the MAKEKEY entry point. The builder produces a key that is used to index the associated recovery record. (See Figure 32 on page 92.)

This information is placed on the audit trail so that it can be picked up by DFHTBSS. It consists of two parts:

1. Information that allows access to the catalog
2. The recovery record header.

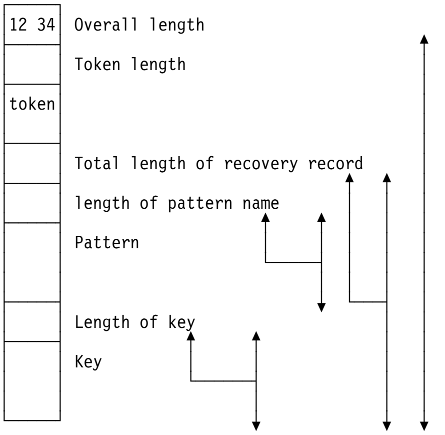


Figure 32. The recovery record

More about the audit trail: Figure 33 shows the layout of an audit trail. Internally it is known as an **action block**, which consists of **action elements**. As each builder is invoked by DFHTBSBP or DFHTBSDP, an action element is appended to the action block. Each element has a reference to a pattern (PATT). This is to allow DFHTBSS to enter the associated builder at the READY or DESTROY entry points.

CCRECP contains the address of the recovery record header. Only one of these is produced as a direct result of the MAKEKEY call to the **master builder**. All other action elements have their CCRECP set to zero.

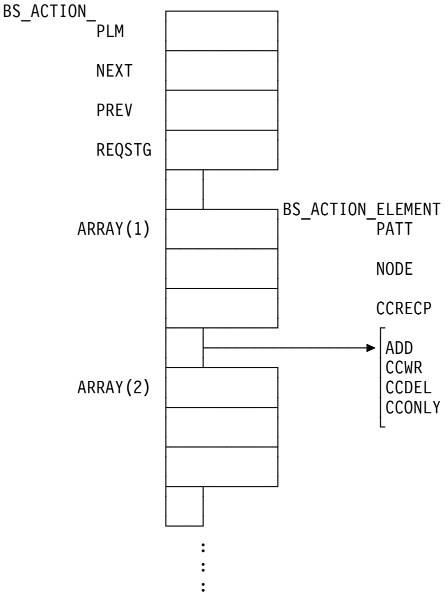


Figure 33. Action block and action elements (audit trail)

DFHTBSS and the FLATTEN process: During phase-1 syncpoint processing, DFHTBSS searches the action elements for a nonzero CCRECP. On detection, it calls DFHTBSLP, passing the reference to the pattern as given in the action element.

The storage "segments" are returned to DFHTBSSP which extracts the address and length from each segment and copies them into the recovery record.

The RESTORE process: The recovery record header contains the pattern name which is used to find the master pattern in DFHZCQRT. This is then passed to DFHTBSR to drive the recovery process by calling each builder's UNFLATTEN entry.

Each segment is extracted from the recovery record and is passed to the associated builder's UNFLATTEN entry point. These routines usually obtain some storage and copy the segment into it.

Control blocks

Builder modules all use both LIFO and a builder parameter set (BPS), which are passed between the CSECTs (DFHBS* modules). See "Builder parameter set (BPS)" on page 79 for further information about the BPS.

Terminal storage acquired by the builders

The following terminal storage is acquired by the builders:

Control block field	Description	Storage manager subpool
TCTSE	Terminal control table system entry	ZCTCSE
TCTME	Terminal control table mode entry	ZCTCME
TCTTE	Terminal control table terminal entry	ZCTCTTEL (large TCTTEs) ZCTCTTEM (medium TCTTEs) ZCTCTTES (small TCTTEs)
TCTENIBA	NIB descriptor	ZCNIBD
TCTEBIMG	BIND image	ZCBIMG
TCTTECIA	User area	ZCTCTUA
TCTTESNT	Signon extension	ZCSNEX
TCTELUCX	LUC extension	ZCLUCEXT
TCTTETEA	BMS extension	ZCBMSEXT
TCTTETPA	Partition extension	ZCTPEXT
TCTTECCE	Console control element	ZCCCE

TCTTE layout

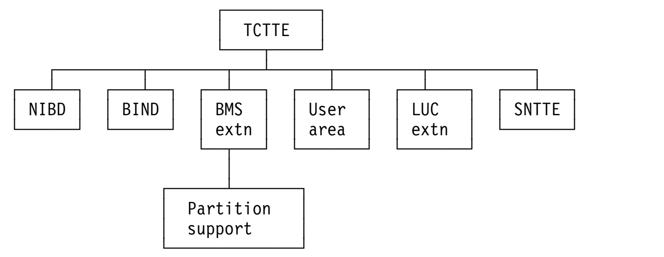


Figure 34. TCTTE layout

Formatted dumps give the TCTTE first, followed by its supporting control blocks.

Terminal definition

CEDA DEFINE puts a definition on the CSD. The definition is in the form of a CEDA command.

CEDA INSTALL reads the definition from the CSD, calls the builders and builds the definition in CICS DSA, and updates the CICS global catalog data set for future recovery.

EXEC CICS CREATE builds the same record that would be obtained from the CSD and then calls the builders just like CEDA INSTALL.

EXEC CICS DISCARD calls the builders with a pointer to the TCTTE entry that is to be deleted. The builders then freemain the TCTTE, remove index entries and the catalog record.

Modules

DFHZCQ handles all requests for the dynamic add and delete of terminal control resources. It contains the following CSECTs:

DFHBSIB3
DFHBSIZ1
DFHBSIZ3
DFHBSMIR
DFHBSMPP
DFHBSM61
DFHBSM62
DFHBSS
DFHBSSA
DFHBSSF
DFHBSSS
DFHBSSZ
DFHBSSZB
DFHBSSZG
DFHBSSZI
DFHBSSZL
DFHBSSZM
DFHBSSZP
DFHBSSZR
DFHBSSZS
DFHBSSZ6
DFHBST
DFHBSTB
DFHBSTBL
DFHBSTB3
DFHBSTC
DFHBSTD
DFHBSTE
DFHBSTH
DFHBSTI
DFHBSTM
DFHBSTO
DFHBSTP3
DFHBSTS
DFHBSTT
DFHBSTZ
DFHBSTZA
DFHBSTZB
DFHBSTZC
DFHBSTZE
DFHBSTZH
DFHBSTZL
DFHBSTZO
DFHBSTZP
DFHBSTZR
DFHBSTZS
DFHBSTZV
DFHBSTZZ
DFHBSTZ1
DFHBSTZ2
DFHBSTZ3
DFHBSXGS
DFHBSZZ
DFHBSZZS
DFHBSZZV
DFHZCQCH
DFHZCQDL
DFHZCQIN
DFHZCQIQ
DFHZCQIS
DFHZCQIT
DFHZCQRS
DFHZCQRT
DFHZCQ00

Note: The term "node" refers either to a TCTTE or to one of its subsidiary parts, such as the NIB descriptor.

Subroutines that are found in the builders:

BSEBUILD
BUILD: Create the node. For example, obtain the shared storage for the node.

BSECON
CONNECT: Connect the higher node to the lower. For example, make the TCTTE point to the NIB descriptor.

BSEDESTR
DESTROY: Abolish a deleted node. For example, free the storage removed from TMP's chains.

BSEFINDF
FINDFIRST: Find the first subsidiary node of a higher node. For example, BSFINDF(TCTTE) returns the NIBD being built.

BSEFINDN
FINDNEXT: Find the next subsidiary node of the one just found. For example, return the address of the next model TCTTE.

BSEFLAT
FLATTEN: Build the catalog or log record segment for each part of the TCTTE. This is passed back to the caller to create a complete "flattened" TCTTE.

BSEMAKEY
MAKEKEY: Create a key that is used to write out the new node to the global catalog.

BSENQIRE
ENQUIRE: The converse of BUILD, it creates a BPS from a TCTTE. The BPS can then be shipped to another system.

BSEREADY
READY: Make a node ready to use. For example, add to TMP's chains.

BSERESET
RESET: Build the TCTTE from the CICS global catalog. (RESET is a cut-down version of UNFLATTEN.)

BSEUNFLA
UNFLATTEN: Build the TCTTE from the CICS global catalog.

BSEUNRDY
UNREADY: Check that a node can be deleted. For example, ensure that no AIDs are queued on a TCTTE before deleting.

Not all subroutines are found in all builders. Certain subroutines are required, but do nothing other than return to the caller. The subroutine names are the same in each builder.

Module entry

Consider a module entry to be a router that does some housekeeping and then branches to the appropriate subroutine:

- Enter the builder at offset X'18'.
- The first X'17' bytes are taken up by the standard DFHVM macro expansion.
- Save DFHTBS’s registers (DFHTBS calls each builder).
- Save the first two entries in the parameter list:
  1. The address of LIFO storage
  2. The index number of the subroutine to call.
- Increase the value of register 1 by 8 to get past the first two entries.
- Branch to the appropriate subroutine of the builder using the index number passed.
- Return from the builder subroutine.
- Restore registers.
- Return to DFHTBS.

Subroutine entry

- Register 1 points to the parameter list.
- Store Register 14 (return address) at Register 2 + X'nn' (varies by entry point).
- Store the parameter list into Register 2 + X'nn' (varies by entry point).
- The length of the parameter list varies.

Subroutine exit (return to module entry)

- Exit from the subroutine only through an “official” exit point.
- The exit point is usually the end of the subroutine.
- The end of the subroutine is indicated with “*end; /*BUILD */”.
- In some cases, the end of the subroutine branches back to the exit point somewhere within the subroutine.
- Return (BR R14) from within the subroutine.
- Reload Register 14 from Register 2 + X'nn' and return to caller.

Patterns

In DFHZCQRT, a series of patterns define the flow through the builder modules. (See Figure 35.) For each kind of terminal, there is a different pattern.

If installing, DFHZCQIS selects the pattern and calls DFHTBS (table builder service). If deleting, DFHZCQDL does the selection.

DFHTBS interprets the pattern and calls each builder that the pattern calls out. DFHTBS knows nothing about the terminal or whether you are installing or deleting. It simply does what the pattern tells it to do.

DFHTBS passes a BPS as it calls each builder. The BPS allows one builder to be used for many different kinds of terminals. For example, DFHBSTC obtains the user area for all terminal types. The BPS contains the length to be obtained.

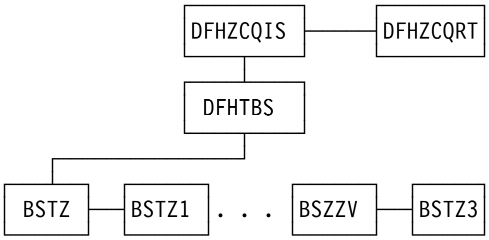


Figure 35. Calling sequence of builders (determined by patterns)

Calling sequence of builders for a 3277 remote terminal

1. DFHZCQRT contains a series of comments followed by the patterns. The comment appears as:

   ```
   /* * * * * * * * * * * * */
   /*      3277 REMOTE      */
   /* * * * * * * * * * * * */
   ```

2. Shortly afterwards is a Declare (DCL) followed by a level-1 name:

   ```
   DCL  1 P145002  STATIC
   ```

   This is the name of the pattern that drives the build process for a 3277 remote terminal.

   - DFHBSTZ is indicated to be the first builder called.
   - One pattern is used to drive the building process.
   - 18 subpatterns are to be used.
   - Three of these 18 subpatterns each call one additional pattern.
   - The terms “pattern” and “builder” mean the same thing. Therefore:

     ```
     DFHBSTZ  +  DFHBSxx  +  DFHBSxx  =  22
       (1)    +    (18)   +    (3)    =  22
      pattern +    sub-   +  sub-sub- =  22
                 patterns    patterns
     ```

     Thus we have to go through 22 builder modules to build a 3277 remote terminal.

3. Go to the cross-reference at the back of the dump and find where P145002 is defined in assembler language. Go to that address.
4. This states that the first builder to be called is DFHBSTZ. This is the main one.

5. Drop down to the 2-byte fields that follow: these state the names of the builders that are to be called, in sequence (18 should be listed).
6. The first one is IAATZ1 which does not sound familiar:
   - Go to the cross-reference at the back of the dump, look up IAATZ1, and go to where it is defined.
   - You see that this is DFHBSTZ1.
   - You can also see a close resemblance between IAATZ1 and DFHBSTZ1, but do not count on this to be always true.
7. Now you know that the second builder to be called is DFHBSTZ1.
8. The next two builders to be called are IAATCV (DFHBSTV) and IAATCB (DFHBSTB).
9. The fifth builder to be called according to the pattern needs to be looked at:
   - The pattern says that IACTZ3 should be called.
   - When you go to where IACTZ3 is defined, you find that this is DFHBSIZ3.
   - You also see that DFHBSIZ3 calls IAATM.
   - Look up IAATM and you see that it is DFHBSTM.
   - This is a sub to a subpattern, and this is how nesting of builder calls occurs.
   - Thus, DFHBSIZ3 calls DFHBSTM when building a local 3277.
   - DFHBSTM accounts for one of the "other" three mentioned in step 2.
10. If you continue through this pattern, you can identify the names of the 22 builders that would be called to build a 3270 local TCTTE.

    Here is the complete list, in order, of the builders that are called:

    ```
    1  DFHBSTZ
    2  DFHBSTZ1
    3  DFHBSTZV
    4  DFHBSTZB
    5  DFHBSIZ3
    6  DFHBSTM
    7  DFHBSTB
    8  DFHBSIB3
    9  DFHBSTO
    10 DFHBSTC
    11 DFHBSTE
    12 DFHBSTH
    13 DFHBSTI
    14 DFHBSTS
    15 DFHBSTT
    16 DFHBSTZA
    17 DFHBSTP3
    18 DFHBSZZ
    19 DFHBSTB3
    20 DFHBSTZE
    21 DFHBSZZV
    22 DFHBSTZ3
    ```

    A look at "Pattern Trace" supports this flow. Note that the first ZCP TBSB(P) BUILD and its matching return (the return has no builder suffix) should be ignored.

Builder parameter list

As each builder is called by DFHTBS, a parameter list is passed. Unique data is passed to enable one builder module to be called for a variety of terminal types. The length of the builder parameter list is fixed for each kind of subroutine; for example, the parameter list passed to BSEBUILD is always X'23' bytes long, regardless of the builder involved.

Subroutine	Length of parameter list (hexadecimal)
BSEBUILD	23
BSECON	13
BSEDESTR	7
BSEMAKEY	B
BSEREADY	3
BSEUNRDY	17
BSEFINDF	F
BSEFINDN	B
BSEFLAT	B
BSEUNFLA	27
BSENQIRE	7

When the builders are called

Builders are called during:

- Cold start
- Warm start
- Emergency restart
- After emergency restart
- Autoinstall logon and logoff
- APPC autoinstall
- CEDA INSTALL
- EXEC CICS CREATE
- EXEC CICS DISCARD
- Transaction routing
- Non-immediate shutdown.

Cold start

- Read information from the CSD and call builders to build RDO-defined terminals.
- Load in DFHTCT for non-VTAM terminals. Builders are not called.

Warm start

Note: A warm start is identical to an emergency restart from the builders perspective. The only difference is that Recovery Manager has no forward-recovery records to pass to DFHAPRDR.

- Read information from the global catalog and call builders to restore RDO-defined terminals.
- Load in DFHTCT for non-VTAM terminals. Builders are not called.

Emergency restart

- Read information from the global catalog and call builders to restore RDO-defined terminals.

  Note: Auto-installed terminals will not have a catalog entry if AIRDELAY=0
- Recovery Manager calls DFHAPRDR which calls the builders to restore in-flight terminals installs from the system log.
- Load in DFHTCT for non-VTAM resources. Builders are not called.

After emergency restart: Delete autoinstalled terminals after the time period has expired as specified in the AIRDELAY parameter (if the user has not logged back on before then).

APPC autoinstall

- Inquire on the model supplied by the autoinstall user program
- Install an APPC connection created from the above inquire.

Autoinstall logon and logoff

- Logon: Install terminal entry using model entry in the AMT.
- Logoff: Delete terminal entry.

CEDA INSTALL: Install VTAM terminal resources. (There is no builder process for CEDA DEFINE or ALTER.)

EXEC CICS CREATE: Install VTAM terminal resources.

EXEC CICS DISCARD: Delete VTAM terminal resources.

Transaction routing: If a TCTTE is defined as shippable, its definition is shipped to the remote system and installed there. The definition is obtained by an INQUIRE call to the builders in the Terminal Owning Region and built with an INSTALL call in the Application Owning Region.

Shutdown: Delete autoinstalled terminals from the catalog (if they had entries, and are not LU6.2 parallel connections). On a warm start, therefore, autoinstalled terminals are not recovered.

Diagnosing problems with the builders

When working on a problem associated with a builder (for example, abend or loop), it may be helpful to ask yourself the following questions:

- Why am I in a DFHBS* module? Am I doing CEDA GRPLIST install, CEDA GROUP install, autoinstall, logon, logoff, catalog, uncatalog, create or discard?
- What is the termid/sysid of the terminal I am working with (the one I am installing, deleting, cataloging or uncataloging)?
- Is this resource part of an resource definition atom?
- How is this terminal defined?
- Are there any messages associated with this terminal?

Exits

No global user exit points are provided for this function.

Trace

The following point IDs are provided for the DFHZCQxx modules:

- AP FCB0 - FCBF, for which the trace level is 1.

The following point IDs are provided for the DFHTBSx modules:

- AP FCC0 - FCC9, for which the trace level is 1.

The following point IDs are provided for the DFHTBSxP modules:

- AP 0630 - 0644, exception trace.
- AP FCD0 - FCD9, for which the trace level is 1.
- AP FCDA - FCDB, for which the trace level is 2.

The following point IDs are provided for the DFHTBSS module:

- AP 0620 - 0621, for which the trace level is 1.
- AP 0622 - 062E, and 0645 exception trace.

The following point IDs are provided for the DFHTONR module:

- AP 0648 - 0649, for which the trace level is 1.
- AP 064A - 064C, exception trace.

The following point IDs are provided for the DFHAPRDR module:

- AP 0601 - 0602, for which the trace level is 1.
- AP 0603 - 061E, exception trace.

The following point IDs are provided for the DFHZGTA module:

- AP FA80 - FA81, for which the trace level is 1.
- AP FA82 - FA9A, exception trace.

The following point ID is provided for message set production:

- AP FCDD, exception trace.

The following point ID is provided for DFHBSTZA:

- AP FCDE, exception trace.

See the *CICS Trace Entries* for further information.

Messages

Builder modules issue messages in the DFHZC59xx, DFHZC62xx, and DFHZC63xx series.

Message sets

If a builder finds an error, it adds a message to a message set. This set is then printed by the caller; for example:

```
DFHTCRP   Cold start (local system entry
                      and error console only)
DFHAMTP   CEDA, EXEC CICS CREATE
DFHEIQSC  EXEC CICS DISCARD CONNECTION
DFHEIQST  EXEC CICS DISCARD TERMINAL
DFHZATA   Autoinstall
DFHZATD   Autoinstall delete
DFHZATS   Install and delete transaction routed terminals
```

How messages show up in a trace

If a message is issued from a builder module (that is, those with a prefix of DFHZC59xx, DFHZC62xx, or DFHZC63xx), it appears in the trace as a TBSM trace entry with the following point ID:

- AP FCDD, exception trace.

This trace entry is produced when a message is added to the message set and indicates there was a problem in building or deleting a terminal or connection.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 11. Built-in functions

CICS provides the application programmer with two commonly used functions: field edit and phonetic conversion.

These are functions that generally used to be coded as separate subroutines by the programmer. They are referred to as built-in functions.

The field edit function is provided by the BIF DEEDIT command of the CICS application programming interface.

The phonetic conversion function is provided as a subroutine that can be called by CICS application programs, and also by any offline programs.

Design overview

The built-in functions component includes field edit and phonetic conversion, both of which are available to a CICS application program. Also, the phonetic conversion subroutine can be used offline.

Field edit (DEEDIT)

The field edit function allows the application program to pass a field containing EBCDIC digits (0 through 9) intermixed with other values, and receive a result with all non-numeric characters removed.

For further details of this function, see the *CICS Application Programming Reference*.

Phonetic conversion

This facility allows the user to organize a file according to name (or similar alphabetic key), and access the file using search arguments that may be misspelled.

The phonetic conversion subroutine (DFHPHN) converts a name into a partial key, which can then be used to access a database file. The generated key is based upon the sound of the name. This means that names sounding similar, but spelled differently, generally produce identical keys. For example, the names SMITH, SMYTH, and SMYTHE all produce a phonetic key of S530. Likewise, the names ANDERSON, ANDRESEN, and ANDRESENN produce a phonetic key of A536. The encoding routine ignores embedded blanks in a name, so you can write names prefixed by 'Mc' with or without a blank between the prefix and the rest of the name, for example, 'McEWEN' or 'Mc EWEN'.

For details of how to code a CALL statement for the DFHPHN subroutine according to the language of the application program, see the *CICS Application Programming Guide*.

Modules

Module	Description
DFHEBF	EXEC interface processor for BIF DEEDIT command
DFHPHN	Phonetic conversion subroutine

Exits

No global user exit points are provided for these functions.

Trace

No tracing is performed for the phonetic conversion subroutine.

The following point ID is provided for DFHEBF:

- AP 00FB, for which the trace level is BF 1.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 12. Business Application Manager domain (BAM)

The business application manager domain (also sometimes known simply as “buisness application manager”) is responsible for managing CICS business transaction services' (BTS) processes, process types and activities. It deals with the hardening of the associated data to BTS repository files. Along with scheduler services domain and event manager domain it forms the CICS BTS function.

Business application manager domain’s specific gate

Table 6 summarizes the business application manager domain’s specific gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and whether or not the functions are available through the exit programming interface (XPI).

Table 6. Business application manager domain’s specific gate

Gate	Trace	Function	XPI
BATT	BA 0160	ADD_REPLACE_PROCSSTYPE	NO
	BA 0161	INQUIRE_PROCESSTYPE	NO
		START_BROWSE_PROCESSTYPE	NO
		GET_NEXT_PROCESSTYPE	NO
		END_BROWSE_PROCESSTYPE	NO
		SET_PROCESSTYPE	NO
		DISCARD_PROCESSTYPE	NO
		COMMIT_PROCESSTYPE_TABLE	NO
BAXM	BA 0170	INIT_ACTIVITY_REQUEST	NO
	BA 0171	BIND_ACTIVITY_REQUEST	NO
BAPR	BA 0110	ADD_PROCESS	NO
	BA 0111	RUN_PROCESS	NO
		LINK_PROCESS	NO
		ACQUIRE_PROCESS	NO
		CANCEL_PROCESS	NO
		SUSPEND_PROCESS	NO
		RESUME_PROCESS	NO
		CHECK_PROCESS	NO
		RESET_PROCESS	NO
BAAC	BA 0120	ADD_ACTIVITY	NO
	BA 0121	RUN_ACTIVITY	NO
		CHECK_ACTIVITY	NO
		RETURN_END_ACTIVITY	NO
		DELETE_ACTIVITY	NO
		SUSPEND_ACTIVITY	NO
		RESUME_ACTIVITY	NO
		CANCEL_ACTIVITY	NO
		LINK_ACTIVITY	NO
		ACQUIRE_ACTIVITY	NO
		RESET_ACTIVITY	NO
		ADD_TIMER_REQUEST	NO
		ADD_REATTACH_ACQUIRED	NO
BABR	BA 0150	STARTBR_ACTIVITY	NO
	BA 0151	GETNEXT_ACTIVITY	NO
		ENDBR_ACTIVITY	NO
		INQUIRE_ACTIVITY	NO
		STARTBR_CONTAINER	NO
		GETNEXT_CONTAINER	NO
		ENDBR_CONTAINER	NO
		INQUIRE_CONTAINER	NO
		STARTBR_PROCESS	NO
		GETNEXT_PROCESS	NO
		ENDBR_PROCESS	NO
		INQUIRE_PROCESS	NO
		INQUIRE_ACTIVATION	NO
		COMMIT_BROWSE	NO
BACR	BA 0130	DELETE_CONTAINER	NO
	BA 0131	GET_CONTAINER_INTO	NO
		GET_CONTAINER_SET	NO
		PUT_CONTAINER	NO
BAGD	BA 0401	INQUIRE_DATA_LENGTH	NO
	BA 0402	GET_DATA	NO
		DESTROY_TOKEN	NO
		ADDRESS_DATA	NO
		RELEASE_DATA	

BATT gate, ADD_REPLACE_PROCESSTYPE function

The ADD_REPLACE_PROCESSTYPE function of the BATT gate is used to add a new process type definition or replace an existing process type definition. Process types are defined using RDO.

Input parameters

PROCESSTYPE_NAME is an 8-character name.

FILE_NAME is an 8-character name of the repository file to be associated with this process type. The file is defined using RDO.

AUDITLOG_NAME is an 8-character name of the audit log to be associated with this process type. The log is defined using RDO.

AUDITLEVEL determines the level of auditing to be undertaken for this process type. It can take the values:

OFF|PROCESS|ACTIVITY|FULL

USERRECORDS indicates whether user audit records are to be written to the log. It can take the values:

YES|NO

CATALOG_PTDEF indicates whether the definition should be written to the global catalog. It can take the values:

YES|NO

STATUS indicates whether the process type definition should be installed in a disabled or enabled state. It can take the values:

DISABLED|ENABLED

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_DISABLED, INSUFFICIENT_STORAGE

BATT gate, INQUIRE_PROCESSTYPE function

The INQUIRE_PROCESSTYPE function of the BATT gate is used to return information on the named process type.

Input parameters

PROCESSTYPE_NAME is the 8-character name of the process type to be inquired upon.

Output parameters

FILE_NAME is the 8-character name of the repository file associated with this process type.

AUDITLOG_NAME is an 8-character name of the audit log associated with this process type.

AUDITLEVEL identifies the level of auditing for this process type. It can take the values:

`OFF|PROCESS|ACTIVITY|FULL`

USERRECORDS indicates whether user audit records are to being written to the log. It can take the values:

`YES|NO`

STATUS indicates the status of the process type. It can take the values:

`DISABLED|ENABLED`

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|PURGED|INVALID|DISASTER|KERNERROR`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ENTRY_NOT_FOUND

BATT gate, START_BROWSE_PROCESSTYPE function

The START_BROWSE_PROCESSTYPE function of the BATT gate is used to initiate a browse of the process types known to this region.

Input parameters: None

Output parameters

BROWSE_TOKEN is the token used to identify this browse.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

BATT gate, GET_NEXT_PROCESSTYPE function

The GET_NEXT_PROCESSTYPE function of the BATT gate is used to return the name of the next process type in the browse, identified by the browse token.

Input parameters

BROWSE_TOKEN is the token returned to the caller on the START_BROWSE_PROCESSTYPE call.

Output parameters

PROCESSTYPE_NAME the 8-character process type name.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_MORE_DATA_AVAILABLE

BATT gate, END_BROWSE_PROCESSTYPE function

The END_BROWSE_PROCESSTYPE function of the BATT gate is used to end the browse identified by the browse token.

Input parameters

BROWSE_TOKEN is the token returned to the caller on the START_BROWSE_PROCESSTYPE call.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

BATT gate, SET_PROCESSTYPE function

The SET_PROCESSTYPE function of the BATT gate is used to alter the named processtype definition.

Input parameters

PROCESSTYPE_NAME is the 8-character process type name.

FILE_NAME is an 8-character name of the repository file to be associated with this process type.

AUDITLEVEL determines the level of auditing to be undertaken for this process type. It can take the values:

`OFF|PROCESS|ACTIVITY|FULL`

USERRECORDS indicates whether user audit records are to be written to the log. It can take the values:

YES|NO

STATUS indicates whether the status of the process type. It can take the values:

DISABLED|ENABLED

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ENTRY_NOT_FOUND, NOT_DISABLED

BATT gate, DISCARD_PROCESSTYPE function

The DISCARD_PROCESSTYPE function of the BATT gate is used to discard the named processtype definition.

Input parameters

PROCESSTYPE_NAME is the 8-character process type name.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ENTRY_NOT_FOUND, NOT_DISABLED

BATT gate, COMMIT_PROCESSTYPE_TABLE function

The COMMIT_PROCESSTYPE_TABLE function of the BATT gate is used to commit the process type definitions to the global catalog.

Input parameters

TOKEN is the token identifying the table of process type definitions.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

BAXM gate, INIT_ACTIVITY_REQUEST function

The INIT_ACTIVITY_REQUEST function of the BAXM gate is used when the transaction requires a 3270 bridge facility, in which case the named bridge exit program is invoked.

Input parameters

REQUEST_BLOCK a block used to hold the request data.

BRIDGE_EXIT the 8-character name of the bridge exit program.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

BAXM gate, BIND_ACTIVITY_REQUEST function

The BIND_ACTIVITY_REQUEST function of the BAXM gate is used to make the current UOW an activation of the activity specified in the activity request. This activation could be used to mark the activity complete abended because the previous activation failed, hence the abend information.

Input parameters

ABEND_CODE the 4-character abend code.

ABEND_PROG the 8-character abend program name.

ABEND_MSG the 6-character abend message number.

REQUEST_BLOCK a block used to hold the activity request data.

Output parameters

PROGRAM is the 8-character program name.

RUN_PROGRAM is used to indicate if a program is to be invoked on the program manager INITIAL_LINK. It can take the values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, TIMEOUT, READ_FAILURE

BAPR gate, ADD_PROCESS function

The ADD_PROCESS function of the BAPR gate is used to define a new process in reponse to an EXEC CICS DEFINE PROCESS call.

Input parameters

PROCESS_NAME the 36-character process name.

PROCESSTYPE the 8-character process type.

TRANID the 4-character transaction id.

PROGRAM the 8-character program name associated with the root activity.

USERID the 8-character userid.

Output parameters

PROCESS_TOKEN a token representing this process internally.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUPLICATE_PROCESS_NAME, FILE_NOT_AUTH, PROCESS_ALREADY_ACQUIRED, PROCESSTYPE_NOT_ENABLED, PROCESSTYPE_NOT_FOUND, WRITE_FAILED

BAPR gate, RUN_PROCESS function

The RUN_PROCESS function of the BAPR gate is used to execute the acquired process (invoke the root activity), either asynchronously or synchronously i.e. with a context switch.

Input parameters

MODE can take the values:

SYNC|ASYNC

INPUT_EVENT the 16-character name of the input event.

FACILITY_TOKEN the 8-character facility token.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROCESS_NOT_FOUND, PROCESSTYPE_NOT_FOUND, PROCESS_SUSPENDED, OTHER_PROCESS_CURRENT, INVALID_EVENT, INVALID_MODE, AUTOINSTALL_FAILED, AUTOINSTALL_INVALID_DATA, AUTOINSTALL_MODEL_NOT_DEF, AUTOINSTALL_URM_FAILED, PROGRAM_NOT_AUTHORISED, PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE, REMOTE_PROGRAM, SECOND_JVM_PROGRAM, RUN_SYNC_ABENDED, RECORD_BUSY, REMOTE_TRAN, TRAN_NOT_AUTH

BAPR gate, LINK_PROCESS function

The LINK_PROCESS function of the BAPR gate is used to invoke the acquired process synchronously, without a context switch.

Input parameters

INPUT_EVENT the 16-character name of the input event.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROCESS_NOT_FOUND, PROCESSTYPE_NOT_FOUND, PROCESS_SUSPENDED, OTHER_PROCESS_CURRENT, INVALID_EVENT, INVALID_MODE, AUTOINSTALL_FAILED, AUTOINSTALL_INVALID_DATA, AUTOINSTALL_MODEL_NOT_DEF, AUTOINSTALL_URM_FAILED, PROGRAM_NOT_AUTHORISED, PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE, REMOTE_PROGRAM, SECOND_JVM_PROGRAM, NO_EVENTS_PROCESSED, PENDING_ACTIVITY_EVENTS

BAPR gate, ACQUIRE_PROCESS function

The ACQUIRE_PROCESS function of the BAPR gate is used to acquire the named process.

Input parameters

PROCESS_NAME the 36-character process name.

PROCESSTYPE the 8-character process type.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROCESS_NOT_FOUND, PROCESSTYPE_NOT_FOUND, FILE_NOT_AUTH, OTHER_PROCESS_CURRENT, RECORD_BUSY

BAPR gate, CANCEL_PROCESS function

The CANCEL_PROCESS function of the BAPR gate is used to synchronously cancel the acquired process.

Input parameters: None

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROCESS_NOT_FOUND, PROCESSTYPE_NOT_FOUND, FILE_NOT_AUTH, RECORD_BUSY

BAPR gate, SUSPEND_PROCESS function

The SUSPEND_PROCESS function of the BAPR gate is used to suspend the acquired process.

Input parameters: None

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROCESS_NOT_FOUND, RECORD_BUSY

BAPR gate, RESUME_PROCESS function

The RESUME_PROCESS function of the BAPR gate is used to resume a previously suspended process.

Input parameters: None

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROCESS_NOT_FOUND, RECORD_BUSY

BAPR gate, CHECK_PROCESS function

The CHECK_PROCESS function of the BAPR gate is used to establish how the acquired process completed.

Input parameters: None

Output parameters

COMPLETION_STATUS is the completion status of the process. It can have any of these values:

`NORMAL|ABENDED|FORCEDCOMPLETE|INCOMPLETE`

ABEND_CODE the 4-character abend code.

ABEND_PROGRAM the 8-character name of the program which abended.

SUSPENDED indicates whether the process is suspended. It can take the value:

`YES|NO`

ACTMODE the active mode of the process. It can take the value:

`INITIAL|ACTIVE|DORMANT|CANCELLING|COMPLETE`

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROCESS_NOT_FOUND, RECORD_BUSY

BAPR gate, REST_PROCESS function

The RESET_PROCESS function of the BAPR gate is used to reset the state of the acquired root activity to initial, so it may be run again.

Input parameters: None

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROCESS_NOT_FOUND, FILE_NOT_AUTH, PROCESSTYPE_NOT_FOUND, INVALID_MODE, RECORD_BUSY

BAAC gate, ADD_ACTIVITY function

The ADD_ACTIVITY function of the BAAC gate is used to define a new activity in response to an EXEC CICS DEFINE ACTIVITY call.

Input parameters

ACTIVITY_NAME the 16-character activity name.

COMPLETION_EVENT the 16-character completion event.

TRANID the 4-character transaction id.

PROGRAM the 8-character program name associated with the root activity.

USERID the 8-character userid.

ACTIVITYID the buffer containing the activity identifier.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUPLICATE_ACTIVITY_NAME, NO_CURRENT_ACTIVITY, UNKNOWN_TRANSACTION_ID, INVALID_NAME

BAAC gate, RUN_ACTIVITY function

The RUN_ACTIVITY function of the BAAC gate is used to execute the named child activity or the acquired activity either asynchronously or synchronously i.e. with a context switch.

Input parameters

ACTIVITY_NAME the 16-character activity name.

MODE can take the values:

SYNC|ASYNC

INPUT_EVENT the 16-character name of the input event.

FACILITY_TOKEN the 8-character facility token.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, INVALID_EVENT, INVALID_MODE, NO_CURRENT_ACTIVITY, NO_COMPLETION_EVENT, REMOTE_PROGRAM, ACTIVITY_SUSPENDED, RUN_SYNC_ABENDED, READ_FAILURE, RECORD_BUSY, REMOTE_TRAN, TRAN_NOT_AUTH

BAAC gate, LINK_ACTIVITY function

The LINK_PROCESS function of the BAAC gate is used to invoke the named child activity or acquired activity synchronously, without a context switch.

Input parameters

ACTIVITY_NAME the 16-character name of the activity.

INPUT_EVENT the 16-character name of the input event.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, NO_CURRENT_ACTIVITY, NO_COMPLETION_EVENT, INVALID_EVENT, INVALID_MODE, AUTOINSTALL_FAILED, AUTOINSTALL_INVALID_DATA, AUTOINSTALL_MODEL_NOT_DEF, AUTOINSTALL_URM_FAILED, PROGRAM_NOT_AUTHORISED, PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE, REMOTE_PROGRAM, SECOND_JVM_PROGRAM, NO_EVENTS_PROCESSED, PENDING_ACTIVITY_EVENTS

BAAC gate, CANCEL_ACTIVITY function

The CANCEL_ACTIVITY function of the BAAC gate is used to synchronously cancel the named child activity or the acquired activity.

Input parameters

ACTIVITY_NAME the 16-character activity name.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, NO_CURRENT_ACTIVITY, INVALID_MODE, INVALID_ACTIVITYID, FILE_NOT_AUTH, RECORD_BUSY

BAAC gate, SUSPEND_ACTIVITY function

The SUSPEND_ACTIVITY function of the BAAC gate is used to suspend the named child activity or the acquired activity.

Input parameters

ACTIVITY_NAME the 16-character activity name.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, NO_ACQUIRED_ACTIVITY, INVALID_MODE, READ_FAILURE, RECORD_BUSY

BAAC gate, RESUME_ACTIVITY function

The RESUME_ACTIVITY function of the BAAC gate is used to resume a previously suspended activity.

Input parameters

ACTIVITY_NAME the 16-character activity name.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, NO_ACQUIRED_ACTIVITY, INVALID_MODE, READ_FAILURE, RECORD_BUSY

BAAC gate, CHECK_ACTIVITY function

The CHECK_ACTIVITY function of the BAAC gate is used to establish how the named child activity or acquired activity completed.

Input parameters

ACTIVITY_NAME the 16-character activity name.

Output parameters

COMPLETION_STATUS is the completion status of the activity. It can have any of these values:

```
NORMAL|ABENDED|FORCEDCOMPLETE|INCOMPLETE
```

ABEND_CODE the 4-character abend code.

ABEND_PROGRAM the 8-character name of the program which abended.

SUSPENDED indicates whether the process is suspended. It can take the value:

```
YES|NO
```

ACTMODE the active mode of the process. It can take the value:

```
INITIAL|ACTIVE|DORMANT|CANCELLING|COMPLETE
```

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, NO_CURRENT_ACTIVITY, READ_FAILURE, RECORD_BUSY

BAAC gate, RESET_ACTIVITY function

The RESET_ACTIVITY function of the BAAC gate is used to reset the state of the named child activity to initial, so it may be run again.

Input parameters

ACTIVITY_NAME the 16-character activity name.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, NO_CURRENT_ACTIVITY, FILE_NOT_AUTH, INVALID_MODE, READ_FAILURE, RECORD_BUSY

BAAC gate, RETURN_END_ACTIVITY function

The RETURN_END_ACTIVITY function of the BAAC gate is used to indicate the completion of the current activity and so raise the completion event.

Input parameters: None

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY

BAAC gate, DELETE_ACTIVITY function

The DELETE_ACTIVITY function of the BAAC gate is used to delete the named child activity from the repository.

Input parameters

ACTIVITY_NAME the 16-character activity name.

Output parameters

ACTMODE the active mode of the process. It can take the value:

```
INITIAL|ACTIVE|DORMANT|CANCELLING|COMPLETE
```

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, NO_CURRENT_ACTIVITY, INVALID_MODE, READ_FAILURE, RECORD_BUSY

BAAC gate, ACQUIRE_ACTIVITY function

The ACQUIRE_ACTIVITY function of the BAAC gate is used to acquire the specified activity.

Input parameters

ACTIVITYID the buffer for the activity identifier.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, ACTIVITY_ALREADY_ACQUIRED, READ_FAILURE, RECORD_BUSY

BAAC gate, ADD_TIMER_REQUEST function

The ADD_TIMER_REQUEST function of the BAAC gate is used to add a delayed request to BAM domain in response to an EXEC CICS DEfINE TIMER call.

Input parameters

REQUEST_TOKEN the token representing the request.

TIMER_EVENT the timer event name.

EVENT_VERSION the version of the event.

DATETIME the time at which the timer expires.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY

BAAC gate, ADD_REATTACH_ACQUIRED function

The ADD_REATTACH_ACQUIRED function of the BAAC gate is used to reattach an activity.

Input parameters: None

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_ACQUIRED_ACTIVITY

BABR gate, STARTBR_ACTIVITY function

The STARTBR_ACTIVITY function of the BABR gate is used to initiate a browse of activities from the specified activity identifier or from the root activity of the specified process.

Input parameters

ACTIVITYID is a buffer containing the activity identifier.

PROCESS_NAME is a buffer containing the process name.

PROCESS_TYPE is the 8-character process type.

Output parameters

BROWSE_TOKEN is the token identifying the browse.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, FILE_NOT_AUTH, NO_CURRENT_ACTIVITY, PROCESS_NOT_FOUND, PROCESSTYPE_NOT_FOUND, RECORD_BUSY
INVALID	INVALID_ACTIVITYID_LEN, INVALID_PROCESSNAME_LEN

BABR gate, GETNEXT_ACTIVITY function

The GETNEXT_ACTIVITY function of the BABR gate is used to return the next activity in the specified browse.

Input parameters

RETURNED_ACTIVITYID is a buffer containing the activity identifier.

BROWSE_TOKEN is the browse token.

Output parameters

ACTIVITY_NAME is the 16-character activity name.

LEVEL is the level into the activity tree.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BROWSE_END, INVALID_BROWSE_TOKEN, INVALID_BROWSE_TYPE, RECORD_BUSY
INVALID	INVALID_BUFFER_LENGTH

BABR gate, ENDBR_ACTIVITY function

The ENDBR_ACTIVITY function of the BABR gate is used to end the specified activity browse.

Input parameters

BROWSE_TOKEN is the browse token.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_BROWSE_TOKEN, INVALID_BROWSE_TYPE

BABR gate, INQUIRE_ACTIVITY function

The INQUIRE_ACTIVITY function of the BABR gate is used to obtain information about the specified activity.

Input parameters

ACTIVITYID is a buffer containing the identifier of the activity which is to be inquired upon.

RETURNED_ACTIVITYID is a buffer containing the returned activity identifier.

RETURNED_PROCESS_NAME is a buffer containing the returned process name.

Output parameters

ABEND_CODE is the 4-character abend code.

ABEND_PROGRAM is the 8-character name of the program which abended.

ACTIVITY_NAME is the 16-character activity name.

COMPLETION_STATUS is the completion status. It can take the values:

```
ABENDED|FORCED|INCOMPLETE|NORMAL
```

EVENT_NAME is the 16-character event name.

MODE is the mode of the activity. It can take the values:

```
INITIAL|ACTIVE|DORMANT|CANCELLING|COMPLETE
```

PROCESS_TYPE is the 8-character process type.

PROGRAM is the 8-character name of the activity program.

TRANSID is the 4-character transaction identifier.

INIT_TRANSID is the 4-character transaction identifier of the transaction under which the activity was initiated.

USERID is the 8-character userid.

SUSPENDED indicates whether the activity is currently suspended. It can take the values:

```
YES|NO
```

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, FILE_NOT_AUTH, NO_CURRENT_ACTIVITY, RECORD_BUSY
INVALID	INVALID_ACTIVITYID_LEN, INVALID_BUFFER_LEN

BABR gate, STARTBR_CONTAINER function

The STARTBR_CONTAINER function of the BABR gate is used to initiate a browse of containers associated with a specified activity or process.

Input parameters

ACTIVITYID is a buffer containing the activity identifier.

PROCESS_NAME is a buffer containing the process name.

PROCESS_TYPE is the 8-character process type.

Output parameters

BROWSE_TOKEN is the token identifying the browse.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, FILE_NOT_AUTH, NO_CURRENT_ACTIVITY, PROCESS_NOT_FOUND, PROCESSTYPE_NOT_FOUND, RECORD_BUSY
INVALID	INVALID_ACTIVITYID_LEN, INVALID_PROCESSNAME_LEN

BABR gate, GETNEXT_CONTAINER function

The GETNEXT_CONTAINER function of the BABR gate is used to return the next container in the specified browse.

Input parameters

BROWSE_TOKEN is the browse token.

Output parameters

CONTAINER_NAME is the 16-character container name.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BROWSE_END, INVALID_BROWSE_TOKEN, INVALID_BROWSE_TYPE, RECORD_BUSY

BABR gate, ENDBR_CONTAINER function

The ENDBR_CONTAINER function of the BABR gate is used to end the specified container browse.

Input parameters

BROWSE_TOKEN is the browse token.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_BROWSE_TOKEN, INVALID_BROWSE_TYPE

BABR gate, INQUIRE_CONTAINER function

The INQUIRE_CONTAINER function of the BABR gate is used to obtain information about the specified container.

Input parameters

CONTAINER_NAME the 16-character container name.

ACTIVITYID is a buffer containing the activity identifier.

PROCESS_NAME is a buffer containing the process name.

PROCESS_TYPE is the 8-character process type.

Output parameters

DATA_LENGTH is the length of the container data.

DATA_ADDRESS is the address of the container data.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, CONTAINER_NOT_FOUND, PROCESS_NOT_FOUND, PROCESSTYPE_NOT_FOUND, FILE_NOT_AUTH, NO_CURRENT_ACTIVITY, RECORD_BUSY
INVALID	INVALID_ACTIVITYID_LEN, INVALID_PROCESSNAME_LEN

BABR gate, STARTBR_PROCESS function

The STARTBR_PROCESS function of the BABR gate is used to initiate a browse of the processes of a certain type.

Input parameters

PROCESS_TYPE is the 8-character process type.

Output parameters

BROWSE_TOKEN is the token identifying the browse.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	FILE_NOT_AUTH, FILE_UNAVAILABLE, NO_CURRENT_ACTIVITY, PROCESSTYPE_NOT_FOUND, RECORD_BUSY

BABR gate, GETNEXT_PROCESS function

The GETNEXT_PROCESS function of the BABR gate is used to return the next process in the specified browse.

Input parameters

BROWSE_TOKEN is the browse token.

RETURNED_ACTIVITYID is a buffer containing the activity identifier.

RETURNED_PROCESS_NAME is a buffer containing the process name.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BROWSE_END, INVALID_BROWSE_TOKEN, INVALID_BROWSE_TYPE, RECORD_BUSY
INVALID	INVALID_BUFFER_LENGTH

BABR gate, ENDBR_PROCESS function

The ENDBR_PROCESS function of the BABR gate is used to end the specified process browse.

Input parameters

BROWSE_TOKEN is the browse token.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_BROWSE_TOKEN, INVALID_BROWSE_TYPE

BABR gate, INQUIRE_PROCESS function

The INQUIRE_PROCESS function of the BABR gate is used to obtain information about the specified process.

Input parameters

RETURNED_ACTIVITYID is a buffer containing the activity identifier.

PROCESS_NAME is a buffer containing the process name.

PROCESS_TYPE is the 8-character process type.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROCESS_NOT_FOUND, PROCESSTYPE_NOT_FOUND, FILE_NOT_AUTH, RECORD_BUSY
INVALID	INVALID_BUFFER_LENGTH

BABR gate, INQUIRE_ACTIVATION function

The INQUIRE_ACTIVATION function of the BABR gate is used to obtain information about the activation associated with a running transaction, if there is one.

Input parameters

TRANSACTION_TOKEN is a token representing an instance of a transaction.

RETURNED_ACTIVITYID is a buffer containing the activity identifier.

RETURNED_PROCESS_NAME is a buffer containing the process name.

Output parameters

ACTIVITY_NAME is the 16-character activity name.

PROCESS_TYPE is the 8-character process type.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND,
INVALID	INVALID_BUFFER_LENGTH

BABR gate, COMMIT_BROWSE function

The COMMIT_BROWSE function of the BABR gate is used to release any CICS BTS browses associated with this UOW.

Input parameters

CHAIN_HEAD pointer to the head of the browse chain.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

BACR gate, DELETE_CONTAINER function

The DELETE_CONTAINER function of the BACR gate is used to delete a named container and its associated data.

Input parameters

CONTAINER_NAME is the 16-character container name.

ACTIVITY_NAME is the 16-character activity name.

CONTAINER_SCOPE identifies the scope of this container. It can the values:

`CHILD_ACTIVITY|ACTIVITY|PROCESS|`
`ACQUIRED_ACTIVITY|ACQUIRED_PROCESS`

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, CONTAINER_NOT_FOUND, NO_ACQUIRED_PROCESS, NO_ACQUIRED_ACTIVITY, NO_CURRENT_PROCESS, NO_CURRENT_ACTIVITY, RECORD_BUSY, CONTAINER_READONLY

BACR gate, GET_CONTAINER_INTO function

The GET_CONTAINER_INTO function of the BACR gate is used to place the data in a named container into an area provided by the caller.

Input parameters

CONTAINER_NAME is the 16-character container name.

ACTIVITY_NAME is the 16-character activity name.

CONTAINER_SCOPE identifies the scope of this container. It can the values:

`CHILD_ACTIVITY|ACTIVITY|PROCESS|`
`ACQUIRED_ACTIVITY|ACQUIRED_PROCESS`

ITEM_BUFFER is the buffer into which the container data is placed.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, CONTAINER_NOT_FOUND, LENGTH_ERROR, NO_ACQUIRED_PROCESS, NO_ACQUIRED_ACTIVITY, NO_CURRENT_ACTIVITY, NO_CURRENT_PROCESS, RECORD_BUSY

BACR gate, GET_CONTAINER_SET function

The GET_CONTAINER_SET function of the BACR gate is used to place the data in a named container into an area provided by BAM domain and return this area to the caller.

Input parameters

CONTAINER_NAME is the 16-character container name.

ACTIVITY_NAME is the 16-character activity name.

CONTAINER_SCOPE identifies the scope of this container. It can the values:

`CHILD_ACTIVITY|ACTIVITY|PROCESS|`
`ACQUIRED_ACTIVITY|ACQUIRED_PROCESS`

Output parameters

ITEM_DATA a block holding the named container's data.

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, CONTAINER_NOT_FOUND, NO_ACQUIRED_PROCESS, NO_ACQUIRED_ACTIVITY, NO_CURRENT_ACTIVITY, NO_CURRENT_PROCESS, RECORD_BUSY

BACR gate, PUT_CONTAINER function

The PUT_CONTAINER function of the BACR gate is used to place data into a named container.

Input parameters

CONTAINER_NAME is the 16-character container name.

ACTIVITY_NAME is the 16-character activity name.

CONTAINER_SCOPE identifies the scope of this container. It can the values:

```
CHILD_ACTIVITY|ACTIVITY|PROCESS|
ACQUIRED_ACTIVITY|ACQUIRED_PROCESS
```

ITEM_DATA a block holding the data to be placed in the named container.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, CONTAINER_NOT_FOUND, LENGTH_ERROR, NO_ACQUIRED_PROCESS, NO_ACQUIRED_ACTIVITY, NO_CURRENT_ACTIVITY, NO_CURRENT_PROCESS, INVALID_CONTAINER_NAME, CONTAINER_READONLY, RECORD_BUSY

BAGD format, INQUIRE_DATA_LENGTH function

The INQUIRE_DATA_LENGTH function of the BAGD format is used by BAM domain to query the called domain as to the size of the flattened data which is to be included in the activity record.

Input parameters

DATA_TOKEN a token representing the data.

Output parameters

DATA_LENGTH the length of the flattened data.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|PURGED|KERNERROR|DISASTER
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_TOKEN

BAGD format, DESTROY_TOKEN function

The DESTROY_TOKEN function of the BAGD format is used by BAM domain to tell interested parties (EM domain) to destroy their data token.

Input parameters

DATA_TOKEN a token representing the data.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|PURGED|KERNERROR|DISASTER
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_TOKEN

BAGD format, ADDRESS_DATA function

The ADDRESS_DATA function of the BAGD format is a call made to BAM domain which returns the length of the calling domain's data in the activity record.

Input parameters

ACTIVITYID a block to hold the activity identifier.

ACQUIRED_ACTIVITY indicates if this is an acquired activity. It can take the values:

```
YES|NO
```

Output parameters

DATA_BLOCK a block containing the flattened data.

ACTIVITY_TOKEN a token representing the activity.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|PURGED|KERNERROR|DISASTER
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ACTIVITY_NOT_FOUND, NO_CURRENT_ACTIVITY, FILE_NOT_AUTH

BAGD format, RELEASE_DATA function

The RELEASE_DATA function of the BAGD format is a call made to BAM domain which releases the calling domain's storage associated with the identified activity.

Input parameters

ACTIVITY_TOKEN a token representing the activity.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|PURGED|KERNERROR|DISASTER`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_TOKEN

Business application manager domain’s generic gates

Table 7 summarizes the business application manager domain’s generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 7. Business application manager domain’s generic gates

Gate	Trace	Function	Format
DMDM	BA 0101 BA 0102	PRE_INITIALISE INITIALISE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
RMRO	BA 0140 BA 0141	PERFORM_PREPARE PERFORM_COMMIT START_BACKOUT DELIVER_BACKOUT_DATA END_BACKOUT PERFORM_SHUNT PERFRM_UNSHUNT	RMRO
RMKP	BA 0140 BA 0141	TAKE_KEYPOINT	RMKP
RMDE	BA 0140 BA 0141	START_DELIVERY DELIVER_RECOVERY END_DELIVERY	RMDE
APUE	BA 0180 BA 0181	SET_EXIT_STATUS	APUE

For descriptions of these functions and their input and output parameters, refer to the §s dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—“Domain manager domain’s generic formats” on page 195

Format RMRO—“Recovery Manager domain’s call back formats” on page 474

Format RMKP—“Recovery Manager domain’s call back formats” on page 474

Format RMDE—“Recovery Manager domain’s call back formats” on page 474

Format APUE—“Application domain’s generic formats” on page 42

Modules

Module	Function
DFHBADM	DFHBADM is the gate module for the following requests: PRE_INITIALISE INITIALISE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHBATT	DFHBATT is the gate module for the following requests: ADD_REPLACE_PROCESSTYPE INQUIRE_PROCESSTYPE START_BROWSE_PROCESSTYPE GET_NEXT_PROCESSTYPE END_BROWSE_PROCESSTYPE DISCARD_PROCESSTYPE COMMIT_PROCESSTYPE_TABLE
DFHBAAC	DFHBAAC is the gate module for the following requests: ADD_ACTIVITY RUN_ACTIVITY CHECK_ACTIVITY RETURN_END_ACTIVITY DELETE_ACTIVITY SUSPEND_ACTIVITY RESUME_ACTIVITY CANCEL_ACTIVITY LINK_ACTIVITY ACQUIRE_ACTIVITY RESET_ACTIVITY ADD_TIMER_REQUEST ADD_REATTACH_ACQUIRED
DFHBAPR	DFHBAPR is the gate module for the following requests: ADD_PROCESS RUN_PROCESS CHECK_PROCESS SUSPEND_PROCESS RESUME_PROCESS CANCEL_PROCESS LINK_PROCESS ACQUIRE_PROCESS RESET_PROCESS
DFHBACR	DFHBACR is the gate module for the following requests: DELETE_CONTAINER GET_CONTAINER_INTO GET_CONTAINER_SET PUT_CONTAINER
DFHBAXM	DFHBAXM is the gate module for the following requests: INIT_ACTIVITY_REQUEST BIND_ACTIVITY_REQUEST
DFHBAGD	DFHBAGD is the gate module for the following requests: INQUIRE_DATA_LENGTH GET_DATA DESTROY_TOKEN ADDRESS_DATA RELEASE_DATA

Module	Function
DFHBABR	DFHBABR is the gate module for the following requests: STARTBR_ACTIVITY GETNEXT_ACTIVITY ENDBR_ACTIVITY INQUIRE_ACTIVITY STARTBR_CONTAINER GETNEXT_CONTAINER ENDBR_CONTAINER INQUIRE_CONTAINER STARTBR_PROCESS GETNEXT_PROCESS ENDBR_PROCESS INQUIRE_PROCESS INQUIRE_ACTIVATION COMMIT_BROWSE
DFHBASP	DFHBASP is the gate module for the following requests: PERFORM_PREPARE PERFORM_COMMIT PERFORM_SHUNT PERFORM_UNSHUNT START_BACKOUT DELIVER_BACKOUT_DATA END_BACKOUT START_RECOVERY DELIVER_RECOVERY END_RECOVERY TAKE_KEYPOINT
DFHBAUE	DFHBAUE is the gate module for the following requests: SET_EXIT_STATUS
DFHBAAC0	Implements general activity class methods.
DFHBAAC1	Initialises the activity class.
DFHBAAC2	Implements the prepare method of the activity class.
DFHBAAC3	Implements the commit method of the activity class.
DFHBAAC4	Implements the delete method of the activity class.
DFHBAAC5	Implements the set_complete method of the activity class.
DFHBAAC6	Implements the invoke_exit method of the activity class.
DFHBAA10	Implements the read_activity method of the activity class.
DFHBAA11	Implements the get_activity_instance method of the activity class.
DFHBAA12	Implements the run_sync method of the activity class.
DFHBAAR1	Intialises the audit class.
DFHBAAR2	Implements the write method of the audit class.
DFHBAPR0	Implements general process class methods.
DFHBAVP1	Initialises the variable length subpool class.
DFHBAOFI	Initialises the object factory class.
DFHBABU1	Initialises the buffer class.
DFHBAPT1	Initialises the processtype class.
DFHBAPT2	Implements the rebuild_table method of the processtype class.
DFHBAPT3	Implements the purge_catalog method of the processtype class.
DFHBALR2	Implements the create_key method of the logical record class.
DFHBALR3	Implements the write_buffer method of the logical record class.
DFHBALR4	Implements the read_key method of the logical record class.
DFHBALR5	Implements the read_record method of the logical record class.
DFHBALR6	Implements the delete_record method of the logical record class.
DFHBALR7	Implements the get_browse_token method of the logical record class.
DFHBALR8	Implements the read_next_record method of the logical record class.
DFHBALR9	Implements the release_browse_token method of the logical record class.
DFHBARUP	The BTS repository utility program.
DFHBARUC	The BTS repository utility program.
DFHBARUD	The BTS repository utility program.
DFHBADUF	Formats the BAM domain control blocks
DFHBADU1	Formats the BAM domain control blocks
DFHBATRI	Interprets BAM domain trace entries

Exits

There are two user exit points in BAM domain, XRSINDI and XBADEACT. See the CICS Customization Guide for further details.

Trace

The point IDs for the business application manager domain are of the form BA xxxx; the corresponding trace levels are BA 1, BA 2, and Exc.

For more information about the trace points, see the *CICS User's Handbook*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 13. CICS-AD/Cycle Language Environment/370 interface

This section describes the run-time interface between CICS and IBM Systems Application Architecture (SAA) AD/Cycle Language Environment/370 that supports the execution of CICS application programs written to use AD/Cycle Language Environment/370, hereafter usually abbreviated to "Language Environment/370".

Design overview

Communication between CICS and Language Environment/370 is made by calling a special Language Environment/370 interface module (CEECCICS) and passing to it a parameter list (addressed by register 1), which consists of an indication of the function to be performed and a set of address pointers to data values or areas.

Module CEECCICS is distributed in the Language Environment/370 library, but must be copied to an authorized library defined in the STEPLIB concatenation of the CICS startup job stream (see the *CICS System Definition Guide*).

All calls to Language Environment/370 are made directly from the CICS language interface module DFHAPLI. This module is called by several components of CICS to perform specific functions. Table 8 lists those functions, and shows the name of the CICS module initiating each function call and the Language Environment/370 call made by DFHAPLI to support the function. The format of each call parameter list is given in "External interfaces" on page 119.

Table 8. CICS-AD/Cycle Language Environment/370 interface calls

Function	Module	LE/370 call
Terminate Languages	DFHSTP	Partition Termination
Establish Language	DFHPGLK, DFHPGLU, DFHPGPG	Establish Ownership Type
Start Program	DFHPGLK, DFHPGLU	Thread Initialization Run Unit Initialization Run Unit Begin Invocation Run Unit End Invocation Run Unit Termination Thread Termination
Goto	DFHEIP	Perform Goto
Find Program Attributes	DFHEDFX	Determine Working Storage
Initialize Languages	DFHSIJ1	Partition Initialization

The logical relationship between the different calls is shown in Figure 36.

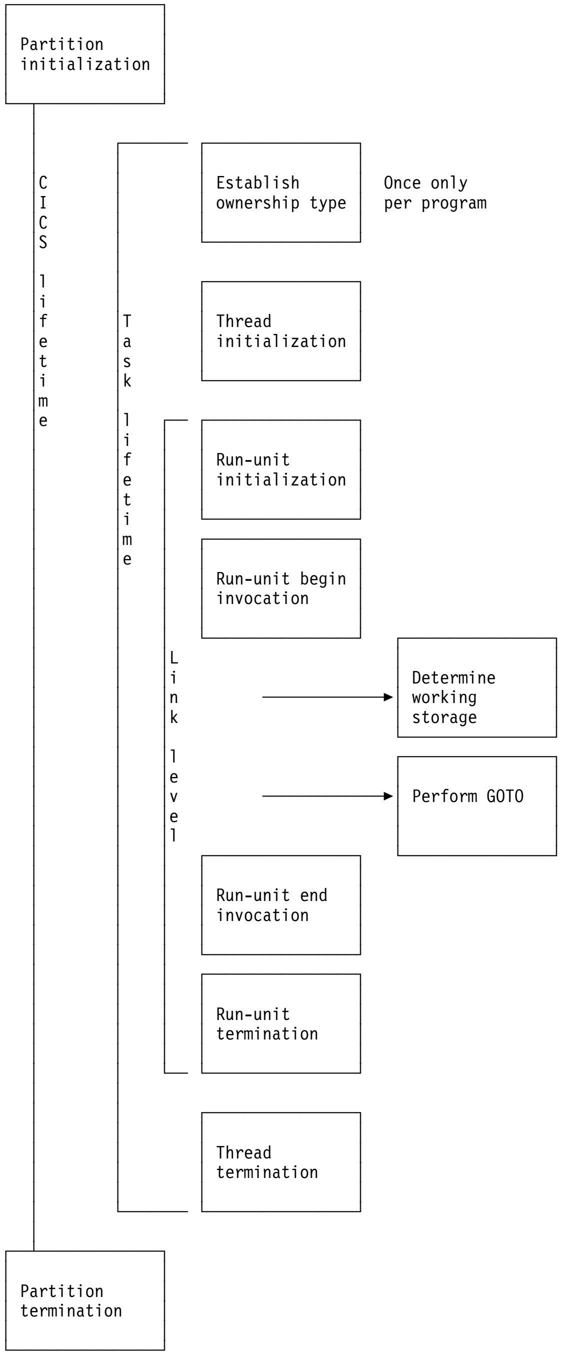


Figure 36. CICS-AD/Cycle Language Environment/370 interface components

Note: The actual passing of control to CEECCICS is made from the CICS language interface program (DFHAPLI), which provides a single point of contact between CICS and Language Environment/370. Other modules call DFHAPLI to initiate the desired function.

All calls to DFHAPLI use either the DFHAPLIM macro (for calls from outside the CICS application domain), or the DFHLILIM macro (for calls made from within the application domain).

Establishing the connection

The procedure for establishing the initial connection with Language Environment/370 is as follows:

1. **Load CEECCICS.** At CICS startup, DFHSIJ1 invokes DFHAPLI to "initialize languages". DFHAPLI issues a BLDL for CEECCICS, followed by an MVS LOAD macro.
2. **Initialize contact with Language Environment/370.** Contact is first made with Language Environment/370 by having CICS drive the partition initialization function. DFHAPLI attempts partition initialization only if the earlier load of CEECCICS was successful; otherwise, the logic is bypassed.

   If the Language Environment/370 partition initialization is successful, and Language Environment/370 indicates that it can support the running of programs in languages supported by CICS, a flag is set and no further processing takes place.

   If the partition initialization function fails, CICS issues error message DFHAP1200. CICS then attempts initialization of the VS COBOL II and C/370 environments separately.

Application program contact with Language Environment/370. Whenever a program written in a supported language is run, the application's attempt to make contact with Language Environment/370 fails if the "Language Environment/370 initialization bits" flag is not set. CICS then tries to run the program itself using the basic support for the language. If this fails, CICS then abends the transaction and sets the associated installed resource definition as disabled.

The following sections describe application programs that can use the Language Environment/370 support as being "Language Environment/370 enabled". This term means that the program has been defined in the CSD as LANGUAGE(LE370) or the program has been compiled by a Language Environment/370-enabled compiler. For further information about enabling application programs to use Language Environment/370 support, see the *CICS System Definition Guide*.

Storage for the transaction

A set of work areas is required during the lifetime of any task that includes one or more programs supported by Language Environment/370. This set is known as the "language interface work area". It is shared by any additional VS COBOL II or C/370 programs that form part of the task.

The language interface work area contains storage for the following:

- The largest possible CICS-Language Environment/370 interface parameter list (currently 15 parameter elements, but with space allowed for a further three elements)
- A general-purpose register save area for use by DFHAPLI
- A general-purpose register save area for use by Language Environment/370
- A 240-byte special work area for use by Language Environment/370 as the equivalent of DFHEISTG for CICS
- A 4-byte Language Environment/370 reason code field
- The IOINFO area (see page 122)
- The PGMINFO1 area (see page 122)
- The program termination block (see page 123).

Also, a thread work area is required if Language Environment/370 is involved in the running of the task. The length of a thread work area is a constant value that is notified to CICS by Language Environment/370 during the partition initialization processing. This additional work area is built contiguous with the language interface work area if the transaction is known to contain one or more programs that are Language Environment/370 enabled. When such a program is first encountered, DFHAPLI:

1. Gets from the transaction manager the address of the transaction-related instance data.
2. Flags the data to tell the transaction manager that the transaction runs Language Environment/370 application programs.
3. Adds the length of the language interface work area to the total user storage length for that transaction.

This forces the transaction manager to acquire extra storage, during task initialization, as an extension to the language interface work area. For the first occurrence only, DFHAPLI acquires the thread work area.

Further areas known as run-unit work areas (RUWAs) are required at run time if the transaction includes one or more programs that are Language Environment/370 enabled. The length of an RUWA varies for each program. The lengths required for work areas above and below the 16MB line by Language Environment/370 are notified to CICS during the processing to establish ownership type for that program; thereafter they can be found in the program's installed resource definition. CICS adds to the length for the RUWA above the 16MB line a fixed amount for its own purposes before acquiring the storage.

Storage acquisition

During task initialization, the transaction manager acquires an area of storage, the language interface work area, which is large enough to hold all required data for calls to Language Environment/370. This area is contiguous with the EXEC interface storage (EIS), and its address is saved in TCACEEPT in the TCA.

The thread work area is usually contiguous with the language interface work area. Its address is always held in CEE_TWA in the language interface work area.

For every link level entered during the execution of the application, a run-unit work area must be acquired by CICS and its address passed to Language Environment/370 during run-unit initialization. Its address is placed in EIORUSTG in the EXEC interface storage (EIS).

Control blocks

The main control block is the language interface work area. This area is shared by any additional VS COBOL II or C/370 programs that form part of the task. It is addressed by TCACEEPT in the TCA. For programs supported by Language Environment/370, the work area is mapped by the Language_Interface_Workarea DSECT.

Modules

The CICS-AD/Cycle Language Environment/370 interface is accessed in the language interface program (DFHAPLI) in response to calls from the following modules:

`DFHSIJ1, DFHEIP, DFHEDFX, and DFHSTP.`

Exits

No global user exit points are provided for this interface.

Trace

Trace entries are made on entry to and exit from DFHAPLI.

Point IDs AP 1940 to AP 1945, with a trace level of PC 1, correspond to these trace entries.

The function information is always interpreted.

For entry trace records, the program name and link level are also interpreted where applicable.

For exit trace records, the returned reason code is interpreted.

Also, all calls into and out of the language environments are traced at level 1. The point IDs are: AP1948 to AP 1952.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

(The *CICS Trace Entries* includes tables that show, for entry and exit trace records, the ERTLI function together with any other data items traced.)

The ERTLI function named in the DFHAPLI entry trace is the function requested on the call, while that named in the DFHAPLI exit trace is the ERTLI function most recently processed. There are some situations in which a trace record made on entry to DFHAPLI is not matched by a corresponding exit trace for the same ERTLI function. In particular, after making a call to Language Environment/370 for thread initialization, DFHAPLI does ***not*** return to the caller, but proceeds with "run-unit initialization" and "run-unit begin invocation" before finally returning. Another example is the successful execution of a "perform GOTO" function, which results in DFHAPLI not returning to the caller.

Note: ERTLI refers to the Extended Run-Time Language Interface. This is an extension of the Run-Time Language Interface (RTLI) protocols that were defined to assist communication between CICS and both VS COBOL II and C/370. ERTLI includes communication between CICS and Language Environment/370.

External interfaces

This section describes the parameter lists and work areas used for the functions provided by the CICS-AD/Cycle Language Environment/370 interface.

CICS-AD/Cycle Language Environment/370 interface parameter lists

The following tables show the layout and contents of the parameter lists for the functions provided by the Language Environment/370 interface module CEECCICS.

Table 9. CICS-Language Environment/370 PARTITION_INITIALIZATION parameter list

No.	Parameter name	Description	Receiver field	Data length
1	FUNCTION	F'10' (= Partition initialization)		F'word
2	RSNCODE	Reason code	Yes	F'word
3	SYSEIB	Address of system EIB		4
4	PREASA	Preallocated save area		240
5	PTOKEN	Language Environment/370 partition token	Yes	8
6	EIBLEN	Length of CICS EIB		F'word
7	TWALEN	Thread work area length	Yes	F'word
8	CELLEVEL	Language Environment/370-CICS interface level	Yes	F'word
9	GETCAA	Get-CAA routine address		4
10	SETCAA	Set-CAA routine address		4
11	LANGDEF	Language modules defined		32
12	LANGBITS	Language availability bits	Yes	F'word

Table 10. CICS-Language Environment/370 ESTABLISH_OWNERSHIP_TYPE parameter list

No.	Parameter name	Description	Receiver field	Data length
1	FUNCTION	F'50' (= Establish ownership type)		F'word
2	RSNCODE	Reason code	Yes	F'word
3	SYSEIB	Address of system EIB		4
4	PREASA	Preallocated save area		240
5	PTOKEN	Language Environment/370 partition token		8
6	reserved			
7	reserved			
8	PGMINFO1	CICS-Language Environment/370 program information		44
9	PGMINFO2	Language Environment/370-CICS program information	Yes	20

Table 11. CICS-Language Environment/370 THREAD_INITIALIZATION parameter list

No.	Parameter name	Description	Receiver field	Data length
1	FUNCTION	F'20' (= Thread initialization)		F'word
2	RSNCODE	Reason code	Yes	F'word
3	SYSEIB	Address of system EIB		4
4	PREASA	Preallocated save area		240
5	PTOKEN	Language Environment/370 partition token		8
6	TTOKEN	Thread token	Yes	8
7	PREATWA	Address of preallocated thread work area		4
8	PGMINFO1	CICS-Language Environment/370 program information		44
9	PGMINFO2	Language Environment/370-CICS program information		20

Table 12. CICS-Language Environment/370 RUNUNIT_INITIALIZATION parameter list

No.	Parameter name	Description	Receiver field	Data length
1	FUNCTION	F'30' (= Run-unit initialization)		F'word
2	RSNCODE	Reason code	Yes	F'word
3	SYSEIB	Address of system EIB		4
4	PREASA	Preallocated save area		240
5	PTOKEN	Language Environment/370 partition token		8
6	TTOKEN	Thread token		8
7	RTOKEN	Run-unit token	Yes	8
8	PGMINFO1	CICS-Language Environment/370 program information		44
9	PGMINFO2	Language Environment/370-CICS program information		20

Table 13. CICS-Language Environment/370 RUNUNIT_BEGIN_INVOCATION parameter list

No.	Parameter name	Description	Receiver field	Data length
1	FUNCTION	F'32' (= Run-unit begin invocation)		F'word
2	RSNCODE	Reason code	Yes	F'word
3	SYSEIB	Address of system EIB		4
4	PREASA	Preallocated save area		240
5	PTOKEN	Language Environment/370 partition token		8
6	TTOKEN	Thread token		8
7	RTOKEN	Run-unit token		8
8	PGMINFO1	CICS-Language Environment/370 program information		44
9	PGMINFO2	Language Environment/370-CICS program information		20
10	IOINFO	Input/output queue details		18
11	RSA	RSA at last EXEC CICS command		F'word

Table 14. CICS-Language Environment/370 DETERMINE_WORKING_STORAGE parameter list

No.	Parameter name	Description	Receiver field	Data length
1	FUNCTION	F'60' (= Determine working storage)		F'word
2	RSNCODE	Reason code	Yes	F'word
3	SYSEIB	Address of system EIB		4
4	PREASA	Preallocated save area		240
5	PTOKEN	Language Environment/370 partition token		8
6	TTOKEN	Thread token		8
7	RTOKEN	Run-unit token		8
8	LANG	Program language bits		F'word
9	PGMRSA	Register save area address		4
10	WSA	Working storage address	Yes	4
11	WSL	Working storage length	Yes	F'word
12	SSA	Static storage address (reserved)	Yes	4
13	SSL	Static storage length (reserved)	Yes	F'word
14	EP	Program entry point	Yes	4

Table 15. CICS-Language Environment/370 PERFORM_GOTO parameter list

No.	Parameter name	Description	Receiver field	Data length
1	FUNCTION	F'70' (= Perform GOTO)		F'word
2	RSNCODE	Reason code	Yes	F'word
3	SYSEIB	Address of system EIB		4
4	PREASA	Preallocated save area		240
5	PTOKEN	Language Environment/370 partition token		8
6	TTOKEN	Thread token		8
7	RTOKEN	Run-unit token		8
8	LANG	Program language bits		F'word
9	LABEL	Label argument at Handle		F'word
10	RSA	RSA at last EXEC CICS command		F'word
11	CALLERR	Cross call error flag	Yes	F'word
12	ABCODE	Address of TACB abend code		F'word
13	R13	Register 13 value at abend		F'word

Table 16. CICS-Language Environment/370 RUNUNIT_END_INVOCATION parameter list

No.	Parameter name	Description	Receiver field	Data length
1	FUNCTION	F'33' (= Run-unit end invocation)		F'word
2	RSNCODE	Reason code	Yes	F'word
3	SYSEIB	Address of system EIB		4
4	PREASA	Preallocated save area		240
5	PTOKEN	Language Environment/370 partition token		8
6	TTOKEN	Thread token		8
7	RTOKEN	Run-unit token		8
8	PGMINFO1	CICS-Language Environment/370 program information		44
9	PGMINFO2	Language Environment/370-CICS program information		20
10	PTB	Program termination block		64
11	RSA	RSA at last EXEC CICS command		F'word

Table 17. CICS-Language Environment/370 RUNUNIT_TERMINATION parameter list

No.	Parameter name	Description	Receiver field	Data length
1	FUNCTION	F'31' (= Run-unit termination)		F'word
2	RSNCODE	Reason code	Yes	F'word
3	SYSEIB	Address of system EIB		4
4	PREASA	Preallocated save area		240
5	PTOKEN	Language Environment/370 partition token		8
6	TTOKEN	Thread token		8
7	RTOKEN	Run-unit token	Yes	8

Table 18. CICS-Language Environment/370 THREAD_TERMINATION parameter list

No.	Parameter name	Description	Receiver field	Data length
1	FUNCTION	F'21' (= Thread termination)		F'word
2	RSNCODE	Reason code	Yes	F'word
3	SYSEIB	Address of system EIB		4
4	PREASA	Preallocated save area		240
5	PTOKEN	Language Environment/370 partition token		8
6	TTOKEN	Thread token	Yes	8

Table 19. CICS-Language Environment/370 PARTITION_TERMINATION parameter list

No.	Parameter name	Description	Receiver field	Data length
1	FUNCTION	F'11' (= Partition termination)		F'word
2	RSNCODE	Reason code	Yes	F'word
3	SYSEIB	Address of system EIB		4
4	PREASA	Preallocated save area		240
5	PTOKEN	Language Environment/370 partition token		8

Work areas

The following sections describe the work areas required during the lifetime of any task that includes one or more programs that use the CICS-Language Environment/370 interface.

IOINFO: The IOINFO area, which is built by DFHAPLI in the CICS-Language Environment/370 work area, is passed to Language Environment/370 on a RUNUNIT_BEGIN_INVOCATION call.

CICS applications cannot use the SYSIN and SYSPRINT data streams because such usage would conflict with the way CICS handles I/O. However, an application may require a general input or output data stream in some situations, for example, where it is necessary to output a message to a program and the program has not been written to expect such output under normal operation.

Three such data streams are architected for this purpose: input, output (normal), and error output. The destinations must be either spools or queues. CICS uses queues, so the file type is always set to 'Q'. Table 20 shows the transient data queue names that are passed to Language Environment/370 (abbreviated here to LE/370). For completeness, the table also shows the equivalent transient data queue names that are passed to C/370 when CICS interfaces directly with C/370.

Table 20. Transient data queues for use by Language Environment/370 (and C/370)

File type	LE/370 queue name	C/370 queue name
Input	CESI	CCSI
Output	CESO	CCSO
Error output	CESE	CCSE

Each data stream is identified by a 6-byte control block, and the three control blocks are concatenated to form the IOINFO area, which CICS passes to Language Environment/370.

IOINFO has this format (in assembler-language code):

```
IOINFO    DS    0CL18    Input/output queue details

STD_IN    DS    0CL6     Standard input file
QORS_IN   DS    CL1      ..file type - 'Q' = transient data
TDQ_IN    DS    CL4      ..queue name
SPO_IN    DS    CL1      ..spool class - not used

STD_OUT   DS    0CL6     Standard output file
QORS_OUT DS     CL1      ..file type - 'Q' = transient data
TDQ_OUT   DS    CL4      ..queue name
SPO_OUT   DS    CL1      ..spool class - not used

STD_ERR   DS    0CL6     Standard error output file
QORS_ERR DS     CL1      ..file type - 'Q' = transient data
TDQ_ERR   DS    CL4      ..queue name
SPO_ERR   DS    CL1      ..spool class - not used
```

PGMINFO1: The PGMINFO1 area, which is built by DFHAPLI in the CICS-Language Environment/370 work area, is passed to Language Environment/370 during these interface calls:

ESTABLISH_OWNERSHIP_TYPE
THREAD_INITIALIZATION
RUNUNIT_INITIALIZATION
RUNUNIT_BEGIN_INVOCATION
RUNUNIT_END_INVOCATION

When both CICS and LE are capable of supporting it, the separate calls to LE for Rununit Initialisation and Rununit Begin Invocation are combined into a single call. This single call is a Rununit Initialisation call with additional parameters indicating

1. make the combined call
2. whether CICS believes the RUWA being passed has already been passed to LE, and so need not be completely initialised by LE/370

PGMINFO1 has this format (in assembler-language code):

```
PGMINFO1      DS    0F
P1_LENGTH     DS    F         Length of PGMINFO1
RULANG        DS    XL4       Language as defined by user
ASSEMBLER     EQU   X'80'     ..Assembler
C             EQU   X'40'     ..C
COBOL         EQU   X'20'     ..COBOL
PLI           EQU   X'10'     ..PL/I
LE370         EQU   X'04'     ..Language Environment/370

RULOADMOD     DS    0F
RULOADA       DS    A         Run-unit load module address
RULOADL       DS    F         Run-unit load module length

ENTRY_STATIC  DS    0F
RUENTRY       DS    A         Run-unit entry point address
RUSTATIC      DS    A         Modified entry address
RWA_31        DS    A         Address of run-unit storage
                                above 16MB
RWA_24        DS    A         Address of run-unit storage
                                below 16MB
APAL          DS    A         Application argument list
                                address
RTOPTS        DS    A         Run-time options
RTOPTSL       DS    F         Length of run-time options
PGMINFO1L     EQU   *-PGMINFO1
```

PGMINFO2

The PGMINFO2 area, which forms part of the PPT entry for the running program, is filled in by Language Environment/370 on successful completion of an ESTABLISH_OWNERSHIP_TYPE call; and is subsequently passed by CICS to Language Environment/370 during these interface calls:

THREAD_INITIALIZATION
RUNUNIT INITIALIZATION
RUNUNIT_BEGIN_INVOCATION
RUNUNIT_END_INVOCATION

PGMINFO2 has this format (in assembler-language code):

```
PGMINFO2   DS    0F
PRGINLEN   DS    FL4       Length of PGMINFO2 extension
PLBRWA31   DS    F         Length of 31-bit RUWA
PLBRWAA    EQU   X'80'     ..31-bit storage required (C/370)
PLBRWAL    DS    FL3       ..Length of 31-bit RUWA
PLBRWA24   DS    F         Length of 24-bit RUWA

PLBLANG    DS    0CL4      Language availability byte
PLBLANG1   DS    X
PLBCEEEN   EQU   X'80'     ..Language Environment/370
                               enabled
PLBCEELA   EQU   X'40'     ..Language Environment/370
                               language known
PLBMIXED   EQU   X'20'     ..Mixed/single language
PLBCOMPT   EQU   X'10'     ..Compatibility
PLBEXECU   EQU   X'08'     ..Language Environment/370
                               executable
PLBASSEM   EQU   X'04'     ..Assembler-language program
PLBC370    EQU   X'02'     ..C/370 program
PLBCOBL2   EQU   X'01'     ..VS COBOL II program
PLBLANG2   DS    X
PLBOSCOB   EQU   X'80'     ..OS/VS COBOL program
PLBPLI     EQU   X'40'     ..OS PLI program
PLBTYPE3   DS    X         Reserved
PLBTYPE4   DS    X         Reserved
PLBMEMID   DS    FL4       Language member ID
PLBED      EQU   *-PGMINFO2
```

Program termination block

The program termination block (PTB), which is built by DFHAPLI in the CICS-Language Environment/370 work area, is passed to Language Environment/370 on a RUNUNIT_END_INVOCATION call.

It has this format (in Assembler-language code):

```
CELINFO    DS    0F
PCHK       DS    0CL32     Abend information
           DS    CL8
PCHK_PSW   DS    CL8       ..PSW
PCHKINTS   DS    0CL8      ..Interrupt data
PCHK_LEN   DS    XL2       ....Instruction length
PCHK_INT   DS    XL2       ....Interrupt code
PCHK_ADR   DS    FL4       ..Exception address
PCHK_GR    DS    AL4       ..A(GP registers at abend)
PCHK_FR    DS    AL4       ..A(FP registers at abend)
PCHK_AR    DS    AL4       ..A(AX registers at abend)
PCHK_EX    DS    AL4       ..A(Registers at the last time
                               a CICS command was issued)
CNTCODE    DS    0CL4      Continuation code
CONT1      EQU   X'40'    ..retry using registers
CONT2      EQU   X'20'    ..retry using PSW
           DS    BL3      Reserved
RTRY       DS    0CL20
RTRY_AD    DS    FL4      ..Retry address
RTRY_PM    DS    AL4      ..A(Program mask)
RTRY_GR    DS    AL4      ..A(GP registers)
RTRY_FR    DS    AL4      ..A(FP registers)
RTRY_AR    DS    AL4      ..A(AX registers)
```

Chapter 14. CICS catalog domains (GC/LC)

The two CICS catalog domains, namely the local catalog (LC) domain and the global catalog (GC) domain, are repositories used by other domains to hold information to allow an orderly restart. They enable CICS code to read, write, and purge records on the local and global catalog data sets so that a record of the CICS state can be maintained when CICS is not running.

These domains use a common set of programs to provide a domain interface to VSAM KSDS data sets for the local catalog (DFHLCD) and for the global catalog (DFHGCD). They also conceal, from the user domain, the underlying VSAM operations.

The local catalog is initialized with the DFHCCUTL utility to contain information that is relevant to a particular CICS system, including a list of domains.

The global catalog is used to hold information that is applicable to a whole CICS system. Thus, in an XRF system consisting of one active and one alternate CICS system, there are two local catalogs and one global catalog. Conversely, in a non-XRF system, there is one local catalog and one global catalog.

The descriptions that follow relate to the common set of programs for both the local and the global catalog domains.

CICS catalog domains’ specific gate

Table 21 summarizes the CICS catalog domains’ specific gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and whether or not the functions are available through the exit programming interface (XPI).

Table 21. CICS catalog domains’ specific gate

Gate	Trace[1]	Function	XPI
CCCC	CC 2010	ADD	NO
	CC 2050	DELETE	NO
		GET	NO
		WRITE	NO
		GET_UPDATE	NO
		PUT_REPLACE	NO
		START_BROWSE	NO
		GET_NEXT	NO
		END_BROWSE	NO
		TYPE_PURGE	NO
		START_WRITE	NO
		WRITE_NEXT	NO
		END_WRITE	NO

[1] The domain identifier part of the point ID, shown in the table as CC, appears in a trace as either LC (local catalog domain) or GC (global catalog domain).

In many of the functions to be described, an input parameter NAME is listed. This name is used in the construction of a VSAM key which is then used to identify a specific record in the catalog. The record may, or may not, already exist. The key is a string concatenation of the calling domain, the type, and the name. The type is a block of records for a domain. The choice of type and name for a specific domain is at the discretion of the calling domain.

CCCC gate, ADD function

The ADD function of the CCCC gate is used to add a record.

Input parameters

DATA_IN is the data to be added to the record.

TYPE identifies a block of data.

NAME is used to construct a record key, together with the domain and the type.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUPLICATE, INVALID_DATA_LENGTH, IO_ERROR, CATALOG_FULL

CCCC gate, DELETE function

The DELETE function of the CCCC gate is used to delete a record.

Input parameters

TYPE identifies a block of data.

NAME is used to construct a record key, together with the domain and the type.

[WRITE_TOKEN] is an optional token corresponding to a START_WRITE. This avoids the need for additional connects or disconnects.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	RECORD_NOT_FOUND, IO_ERROR, BAD_TOKEN

CCCC gate, GET function

The GET function of the CCCC gate is used to get a record.

Input parameters

DATA_OUT If the response is OK, this contains a copy of the specified record.

TYPE identifies a block of data.

NAME is used to construct a record key, together with the domain and the type.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	RECORD_NOT_FOUND, INVALID_DATA_LENGTH, IO_ERROR

CCCC gate, WRITE function

The WRITE function of the CCCC gate is used to write a record.

Input parameters

DATA_OUT is the data to be written to the specified record.

TYPE identifies a block of data.

NAME is used to construct a record key, together with the domain and the type.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_DATA_LENGTH, IO_ERROR, CATALOG_FULL

CCCC gate, GET_UPDATE function

The GET_UPDATE function of the CCCC gate is used to get a record and to establish a thread. This thread, identified by a token, is used in a corresponding PUT_REPLACE.

Input parameters

DATA_OUT If response is OK, this contains a copy of the record.

TYPE identifies a block of data.

NAME is used to construct a record key, together with the domain and the type.

Output parameters

UPDATE_TOKEN Token to be used by the corresponding PUT_REPLACE.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	RECORD_NOT_FOUND, INVALID_DATA_LENGTH, IO_ERROR

CCCC gate, PUT_REPLACE function

The PUT_REPLACE function of the CCCC gate is used to replace a record.

Input parameters

DATA_IN is the data to be copied to the record.

UPDATE_TOKEN is the token obtained from a previous GET_UPDATE, used to identify an existing record in the catalog.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BAD_TOKEN, INVALID_DATA_LENGTH, IO_ERROR, CATALOG_FULL

CCCC gate, START_BROWSE function

The START_BROWSE function of the CCCC gate is used to start a browse session.

Input parameters

TYPE identifies a block of data. The browse positions itself before the first record for that type.

Output parameters

BROWSE_TOKEN is the token identifying this browse session.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

```
IO_ERROR
```

CCCC gate, GET_NEXT function

The GET_NEXT function of the CCCC gate is used to get the next record.

Input parameters

BROWSE_TOKEN is the token identifying this browse session.

DATA_OUT is a copy of the next record within the browsed type.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_DATA_LENGTH, BAD_TOKEN, BROWSE_END, IO_ERROR

CCCC gate, END_BROWSE function

The END_BROWSE function of the CCCC gate is used to end a browse session.

Input parameters

BROWSE_TOKEN is the token identifying this browse session.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BAD_TOKEN, IO_ERROR

CCCC gate, TYPE_PURGE function

The TYPE_PURGE function of the CCCC gate is used to purge records. This deletes all records within the specified TYPE block for that domain.

Input parameters

TYPE identifies a block of data.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	TYPE_NOT_FOUND, IO_ERROR

CCCC gate, START_WRITE function

The START_WRITE function of the CCCC gate is used to start a write session.

Input parameters: None.

Output parameters

WRITE_TOKEN is the token identifying a unique file string (thread).

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

```
IO_ERROR
```

CCCC gate, WRITE_NEXT function

The WRITE_NEXT function of the CCCC gate is used to write the next record.

Input parameters

WRITE_TOKEN is the token corresponding to the token from START_WRITE.

DATA_IN is the data to be copied to the record.

TYPE identifies a block of data.

NAME is used to construct a record key, together with the domain and the type.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_DATA_LENGTH, IO_ERROR, CATALOG_FULL, BAD_TOKEN

CCCC gate, END_WRITE function

The END_WRITE function of the CCCC gate is used to end a write session.

Input parameters

WRITE_TOKEN Token corresponding to a START_WRITE.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	IO_ERROR, BAD_TOKEN

CICS catalog domains' generic gate

Table 22 summarizes the CICS catalog domains' generic gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and the generic formats for calls to the gates.

Table 22. CICS catalog domains' generic gate

Gate	Trace[1]	Function	Format
DMDM	CC 1010 CC 1040	PRE_INITIALISE INITIALISE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM

[1] The domain identifier part of the point ID, shown in the table as CC, appears in a trace as either LC (local catalog domain) or GC (global catalog domain).

Descriptions of these functions and their input and output parameters are given in the section dealing with the corresponding generic formats. This is in format DMDM—see "Domain manager domain's generic formats" on page 195.

In preinitialization processing, the local catalog domain opens the CICS local catalog, DFHLCD. (There is no preinitialization processing for the global catalog domain.)

In initialization processing, the global catalog domain opens the CICS global catalog, DFHGCD.

In quiesce processing, the local and global catalog domains close their respective catalog data sets.

In termination processing, the CICS catalog domains perform no termination processing. They do not close either the local catalog or the global catalog; the operating system closes these data sets.

Modules

Module	Function
DFHCCCC	Handles the following functions: ADD DELETE GET WRITE GET_UPDATE PUT_REPLACE START_BROWSE GET_NEXT END_BROWSE TYPE_PURGE START_WRITE WRITE_NEXT END_WRITE
DFHCCDM	Handles the initialization and termination of the CICS catalog domains.
DFHCCDUF	Catalog dump formatting routine.
DFHCCTRI	Trace interpreter routine for the catalog domains.
DFHCCUTL	Offline utility to initialize the local catalog.

Exits

No global user exit points are provided in these domains.

Trace

The point IDs for the local catalog domain are of the form LC xxxx; the corresponding trace levels are LC 1 and Exc.

The point IDs for the global catalog domain are of the form GC xxxx; the corresponding trace levels are GC 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 15. CICS-C/370 interface

This section describes the run-time interface between CICS and C/370 that supports the execution of CICS application programs written in the C language. The design has much in common with CICS support for VS COBOL II.

Design overview

If IBM SAA AD/Cycle Language Environment/370 is installed and is able to support the running of C/370 application programs, CICS interfaces with AD/Cycle Language Environment/370 and not directly with C/370.

Otherwise, communication between CICS and C/370 is made by calling a special C/370 interface module (EDCCICS) and passing to it a parameter list (addressed by register 1), which consists of an indication of the function to be performed and a set of address pointers to data values or areas.

Module EDCCICS is distributed in the C/370 library, but must be copied to an authorized library defined in the STEPLIB concatenation of the CICS startup job stream (see the *CICS System Definition Guide*).

Table 23 lists the functions that are driven via this interface and shows the name of the CICS module initiating each function call. The format of each distinct call parameter list is given in "External interfaces" on page 131.

Table 23. CICS-C/370 interface calls

Function	Module	C/370 call
Initialize Languages	DFHSIJ1	Partition Initialization
Terminate Languages	DFHSTP	Partition Termination
Establish Language	DFHPGLK, DFHPGLU, DFHPGPG	Determine Program Type
Start Program	DFHPGLK, DFHPGLU	Thread Initialization Run Unit Initialization Run Unit Termination Thread Termination
Find Program Attributes	DFHEDFX	Working Storage Locate

The logical relationship between the different calls is shown in Figure 37.

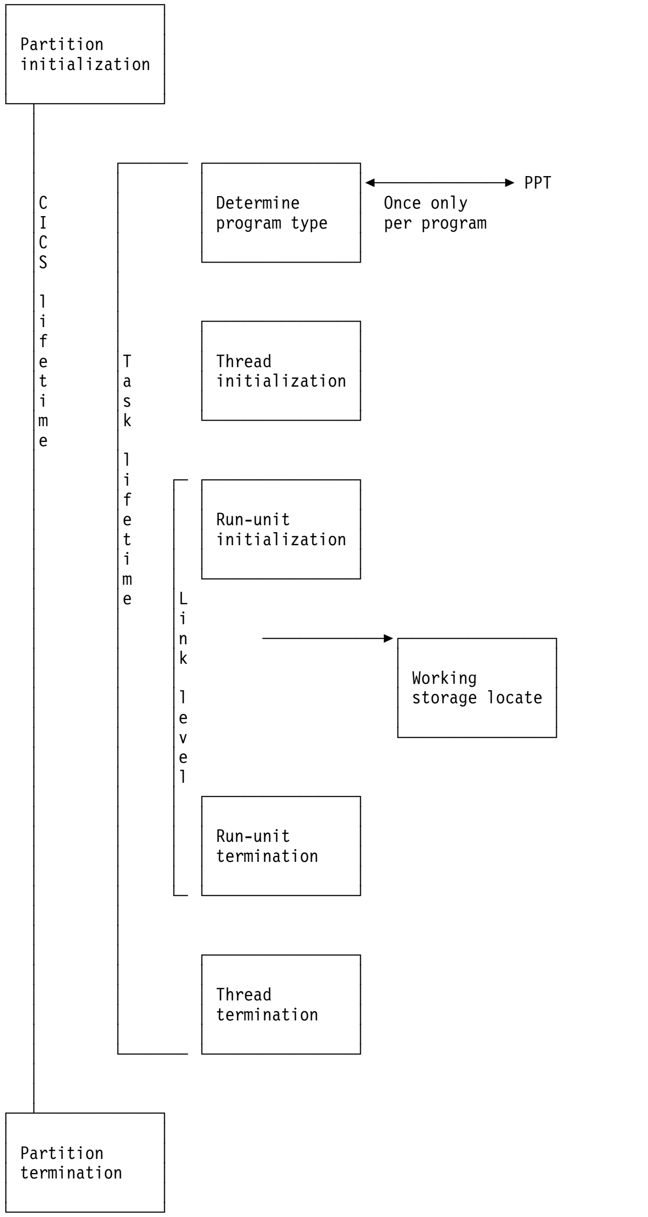


Figure 37. CICS-C/370 interface components

Note: The actual passing of control to EDCCICS is made from the CICS language interface program (DFHAPLI), which provides a single point of contact between CICS and C/370. Other modules call DFHAPLI to perform the desired function.

All calls to DFHAPLI use either the DFHAPLIM or DFHLILIM domain calls.

Establishing the connection

The procedure for establishing the initial connection with C/370 is as follows:

1. **Try to establish connection to Language Environment/370.** At CICS startup, DFHSIJ1 invokes DFHAPLI for "partition initialization". DFHAPLI attempts to perform Language Environment/370 partition initialization. If this is successful, and Language Environment/370 indicates that it can support the running of C/370 programs, no further processing takes place for this call to DFHAPLI. Otherwise, processing continues as follows.
2. **Load EDCCICS.** DFHAPLI issues an MVS LOAD macro.
3. **Initialize contact with C/370.** Contact is made with C/370 by having CICS drive the partition initialization function. DFHAPLI attempts C/370 partition initialization only if the earlier load of EDCCICS was successful; otherwise, the logic is bypassed.

   If the C/370 partition initialization function completes, a flag is set; if it fails, CICS issues error message DFHAP1202.

Application program contact with C/370. Whenever a C program runs directly under CICS, the application's attempt to make contact with C/370 fails if the "C is initialized" flag is not set. CICS then abends the transaction with abend code APCK and sets the transaction disabled.

Storage for the transaction

During the process of interfacing between CICS and C/370, storage is required for the following:

- Parameter list for CICS-C/370 calls
- Register save area for use by DFHAPLI
- Register save area for use by C/370
- C/370 special work area
- C/370 reason code
- C/370 input/output queue details
- Thread storage
- Run-unit storage.

The lengths of the last two areas are initially unknown to CICS. The length of a thread work area is a constant value that is notified to CICS by C/370 during the partition initialization processing. The length of a run-unit work area varies for each program. It is notified to CICS by C/370 during the "determine program type" processing for that program; thereafter it can be found in the program language block (PLB) entry.

The determine program type call is made by the program manager domain which calls DFHAPLI when program fetch completes successfully. The information returned by C/370 is valid while the program is not refreshed with the NEWCOPY option; in that event, a new determine program type call must be made.

Storage acquisition

For partition initialization and partition termination, the necessary storage for the calls is taken from the functional module's own storage areas.

All other calls are application program related. Sufficient storage for these calls is acquired by CICS before the first task-related call to C/370, and is retained throughout the lifetime of the task. The storage area caters for all the required storage detailed above except for run-unit storage, which is acquired separately. The storage area is contiguous with the EXEC interface storage (EIS).

The address of this storage area for calls is held in TCACEEPT in the TCA.

During the current CICS lifetime, on the first occasion only that a unique C program is executed, a special "determine program type" call is made to C/370. The purpose of this call is to verify that the program is in fact written in C, and to tell CICS the length of the run-unit work area that has to be provided before control is actually passed to the program.

Thus, for every link level entered during the execution of the application, a run-unit storage area must be acquired by CICS and its address passed to C/370 during the run-unit initialization process. The length of this area will have been saved into the PLB entry by C/370 as part of the determine program type function. CICS places the address of the run-unit area into EIORUSTG from where it is freed during the processing of run-unit termination.

Control blocks

The main control block is the combined CICS-C/370 work area and call parameter list, also known as the "language interface work area". This area is shared by any additional programs that are supported by Language Environment/370, and form part of the same task. It is addressed by TCACEEPT in the TCA. For C programs running directly under CICS, the work area is mapped by the LANGUAGE_INTERFACE_WORKAREA dsect.

Modules

The CICS-C/370 interface is accessed in the language interface program (DFHAPLI) in response to calls from the following modules:

DFHSIJ1, DFHEDFX, DFHPGLK, DFHPGLU, DFHPGPG, and DFHSTP.

Exits

No global user exit points are provided for this interface.

Trace

Trace entries are made on entry to and exit from DFHAPLI for C/370. Also, calls to and returns from the interface module EDCCICS are traced.

Point IDs AP 1940 to AP 1945, with a trace level of PC 1, correspond to these trace entries (as for the CICS-Language Environment/370 interface).

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

External interfaces

The DFHAPLI module builds the parameter lists that are required for invoking unique C/370 functions, and passes control to the C/370 interface module, EDCCICS.

The DFHAPLI module supports the following C/370 interface functions:

PARTITION_INITIALIZATION
DETERMINE_PROGRAM_TYPE
THREAD_INITIALIZATION
RUNUNIT_INITIALIZATION
WORKING_STORAGE_LOCATE
RUNUNIT_TERMINATION
THREAD_TERMINATION
PARTITION_TERMINATION

CICS-C/370 interface parameter lists

The following tables show the layout and contents of the parameter lists for the functions provided by the C/370 interface module EDCCICS.

Table 24. CICS-C/370 PARTITION_INITIALIZATION parameter list

Offset	Data addressed by the pointer	CICS field name	Data length
00	F'10' (= Partition initialization)		F'word
04	Reason code	C_REASON_CODE	F'word
08	Address of system EIB		4
0C	240-byte work area	C_WORKAREA	240
10	C/370 partition token storage area (receiver)	CSACELPT	8
14	Reserved		
18	F'85' (Length of EIB)		F'word
1C	Length of preallocated thread storage (receiver)	CSACELTL	F'word
20	C/370 interface level storage area (receiver)	CSACELIL	F'word

Table 25. CICS-C/370 DETERMINE_PROGRAM_TYPE parameter list

Offset	Data addressed by the pointer	CICS field name	Data length
00	F'50' (= Determine program type)		F'word
04	Reason code	C_REASON_CODE	F'word
08	Address of system EIB		4
0C	240-byte work area	C_WORKAREA	240
10	C/370 partition token storage area	CSACELPT	8
14	C/370 thread token storage area	EIOCTHRT	8
18	Program load point	TCAPCLA	4
1C	Program entry point	TCAPCRS	4
20	Program type (receiver)		F'word
24	Run-unit work area length (receiver)	PPTCISA	F'word

Table 26. CICS-C/370 THREAD_INITIALIZATION parameter list

Offset	Data addressed by the pointer	CICS field name	Data length
00	F'20' (= Thread initialization)		F'word
04	Reason code	C_REASON_CODE	F'word
08	Address of system EIB		4
0C	240-byte work area	C_WORKAREA	240
10	C/370 partition token storage area	CSACELPT	8
14	C/370 thread token storage area (receiver)	EIOCTHRT	8
18	Preallocated thread work area		F'word

Table 27. CICS-C/370 RUNUNIT_INITIALIZATION parameter list

Offset	Data addressed by the pointer	CICS field name	Data length
00	F'32' (= Run-unit initialization)		F'word
04	Reason code	C_REASON_CODE	F'word
08	Address of system EIB		4
0C	240-byte work area	C_WORKAREA	240
10	C/370 partition token storage area	CSACELPT	8
14	C/370 thread token storage area	EIOCTHRT	8
18	C/370 run-unit token storage area (receiver)	EIORUNTK	8
1C	Preallocated run-unit work area	EIORUSTG	F'word
20	Run-unit entry address	EIOARG4	4
24	Application program argument list	EISARG1	F'word
28	Input/output queue details	C_IOINFO (see page 122)	18

Table 28. CICS-C/370 WORKING_STORAGE_LOCATE parameter list

Offset	Data addressed by the pointer	CICS field name	Data length
00	F'60' (= Working storage locate)		F'word
04	Reason code	C_REASON_CODE	F'word
08	Address of system EIB		4
0C	240-byte work area	C_WORKAREA	240
10	C/370 partition token storage area	CSACELPT	8
14	C/370 thread token storage area	EIOCTHRT	8
18	Application RSA address	EISARSA	4
1C	Working storage address (receiver)	EDFUASTG	4
20	Working storage length (receiver)	EDFWSLN	F'word

Table 29. CICS-C/370 RUNUNIT_TERMINATION parameter list

Offset	Data addressed by the pointer	CICS field name	Data length
00	F'31' (= Run-unit termination)		F'word
04	Reason code	C_REASON_CODE	F'word
08	Address of system EIB		4
0C	240-byte work area	C_WORKAREA	240
10	C/370 partition token storage area	CSACELPT	8
14	C/370 thread token storage area	EIOCTHRT	8
18	C/370 run-unit token storage area	EIORUNTK	8
1C	Termination data	CELINFO (see page 123)	64

Table 30. CICS-C/370 THREAD_TERMINATION parameter list

Offset	Data addressed by the pointer	CICS field name	Data length
00	F'21' (= Thread termination)		F'word
04	Reason code	C_REASON_CODE	F'word
08	Address of system EIB		4
0C	240-byte work area	C_WORKAREA	240
10	C/370 partition token storage area	CSACELPT	8
14	C/370 thread token storage area	EIOCTHRT	8

Table 31. CICS-C/370 PARTITION_TERMINATION parameter list

Offset	Data addressed by the pointer	CICS field name	Data length
00	F'11' (= Partition termination)		F'word
04	Reason code	C_REASON_CODE	F'word
08	Address of system EIB		4
0C	240-byte work area	C_WORKAREA	240
10	C/370 partition token storage area	CSACELPT	8
14	Reserved		

Chapter 16. CICS-DB2 Attachment Facility

The CICS-DB2 Attachment facility allows applications programs to access and update data held in DB2 tables managed by the DB2 for OS/390 product. It also allows applications to send operator commands to a DB2 subsystem.

Design overview

The CICS-DB2 Attachment facility allows connection to a DB2 subsystem using the CICS resource manager interface (RMI) also known as the task related user exit interface. The Attachment facility interfaces to DB2 through a series of requests to three components of DB2, each of which processes specific types of requests:

- Subsystem Support Subcomponent (SSSC) for thread and system control requests
- Advanced Database Management Facility (ADMF) for SQL requests
- Instumentation Facility Component (IFC) for IFI requests

There no are DB2 release dependencies within the attachment facility, it can connect to a DB2 subsystem running any supported level of DB2.

The architecture of the CICS-DB2 interface is shown in Figure 38:

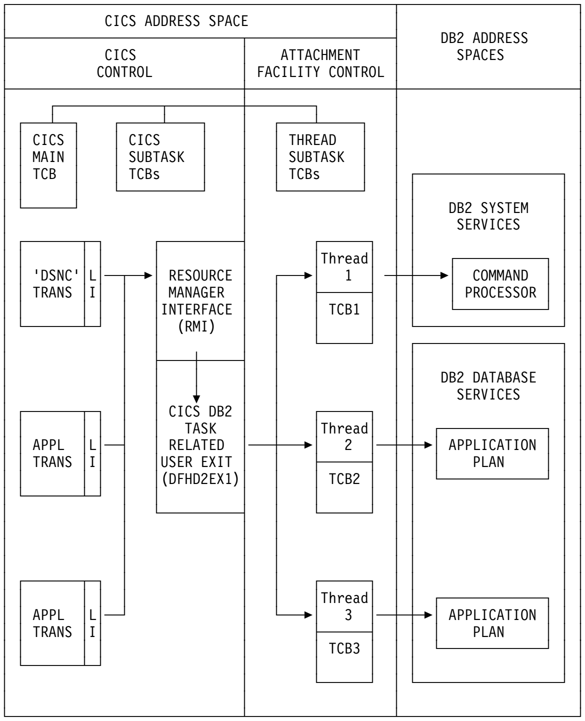


Figure 38. Overview of the CICS DB2 attachment facility

CICS Initialization

During CICS Initialization the following modules are invoked:

CICS-DB2 initialization gate DFHD2IN1: DFHD2IN1 first receives control from DFHSII1 duiring CICS initialization by means of a DFHROINM INITIALISE call. When invoked with this function DFHD2IN1 attaches a system task CSSY to run program DFHD2IN2.

DFHD2IN1 is invoked a second time later by DFHSII1 by means of a DFHROINM WAIT_FOR_INITIALIZATION call for which DFHD2IN1 issues a CICS wait to wait for DFHD2IN2 processing to complete.

CICS-DB2 recovery task DFHD2IN2: DFHD2IN2 runs under CICS system task CSSY attached by DFHD2IN1. DFHD2IN2 links to program DFHD2RP, the CICS-DB2 restart program. On return from DFHD2RP, DFHD2IN2 posts the ecb waited on by DFHD2IN1 so that CICS Initialization can continue.

CICS-DB2 restart program DFHD2RP: DFHD2RP runs under system task CSSY during CICS initialization. DFHD2RP performs the following functions:

- Adds storage manager subpools for the DFHD2ENT, DFHD2TRN and DFHD2CSB control blocks.
- Issues lock manager domain ADD_LOCK requests to add the necessary locks required by the CICS-DB2 Attachment facility to manage the dynamic chains of DFHD2LOT and DFHD2CSB control blocks, plus locks to manipulate the DFHD2GLB, DFHD2ENT and DFHD2TRN control blocks.
- Loads CICS-DB2 modules DFHD2CC, DFHD2STR, DFHD2STP and DFHD2TM
- Activates the DFHD2TM gate with the kernel.
- For cold and Initial CICS starts:
  - Purges the Global catalog of DFHD2GLB, DFHD2ENT and DFHD2TRN control blocks
- For warm and emergency CICS starts:
  - Installs DFHD2GLB, DFHD2ENT and DFHD2TRN blocks found on the global catalog

CICS-DB2 Attachment startup

The CICS-DB2 Attachment facility can be started using one of the following methods:

- specifying program DFHD2CM0 in PLTPI
- specifying SIT parameter DB2CONN=YES
- Issuing the DSNC STRT command

- Issuing the CEMT or EXEC CICS SET DB2CONN CONNECTED command

All of the above ways result in an EXEC CICS SET DB2CONN CONNECTED command being issued and the CICS-DB2 startup program DFHD2STR getting control.

CICS-DB2 startup program DFHD2STR: The startup program starts by reading a temporary storage queue to obtain any parameters passed if a DSNC STRT command has been issued. It also retrieves any parameters specified via the INITPARM SIT parameter by linking to program DFHD2INI.

Next DFHD2STR must ensure the necessary DFHD2GLB block is installed. If a DFHD2GLB is already installed, representing an installed DB2CONN, then it is checked to make sure interface is currently shut before startup can proceed. If no DFHD2GLB block exists, then program DFHD2CNV is called to locate and load a macro RCT, and then convert it to RDO form, installing the necessary control blocks.

The remainder of DFHD2STR processing is as follows:

- Initialise the DFHD2GLB and set the state to 'connecting'
- MVS load the DB2 program request handler
- Attach a CICS system task to run the CICS DB2 service task CEX2
- Issue an MVS Attach for the CICS-DB2 master subtask program DFHD2MSB
- Wait for DFHD2MSB initialization processing to complete
- Enable the CICS-DB2 TRUE DFHD2EX1
- Set the status of the connection to 'connected'
- Process any indoubts passed from DB2
- Update state in the temporary storage queue to pass back to a DSNC STRT command

CICS-DB2 Attachment shutdown

The CICS-DB2 Attachment facility can be stopped using one of the following methods:

- Issuing the DSNC STOP command
- Issuing the CEMT or EXEC CICS SET DB2CONN NOT CONNECTED command
- Running the CDBQ or CDBF transactions
- Shutting down CICS

All of the above ways result in an EXEC CICS SET DB2CONN NOTCONNECTED command being issued and the CICS-DB2 shutdown program DFHD2STP getting control.

CICS-DB2 Shutdown program DFHD2STP:
Processing in DFHD2STP is as follows:

- If CDB2SHUT is set in the dump table, take a system dump (serviceability aid)
- post CICS-DB2 service task CEX2 to terminate all subtasks then terminate itself. Wait for service task to complete.
- Post master subtask DFHD2MSB to terminate. Wait for it to terminate
- Detach master subtask TCB.
- Call DFHD2CC to write out shutdown statistics
- If the CICS-DB2 attachment is to go into 'standbymode':
  - Re-initialise the DFHD2GLB, set the state to 'connecting'
  - Post any tasks who are waiting for shutdown to complete
  - Issues 'Waiting for DB2 attach' message
- If the CICS-DB2 attachment is not to go into 'standbymode':
  - Disable the CICS-DB2 TRUE DFHD2EX1
  - MVS delete the program request handler
  - Re-initialise the DFHD2GLB, set the state to 'shut'
  - Discard the control blocks if they originated from a macro RCT conversion
  - Issue the shutdown complete message and post any tasks who are waiting for shutdown to complete

CICS-DB2 mainline processing

CICS-DB2 Task Related User Exit (TRUE) DFHD2EX1: Control is passed to the TRUE via the CICS RMI. The TRUE manages the relationship between a CICS task represented by a LOT control block, and a CICS-DB2 subtask represented by a CSB control block. DFHD2EX1 uses parameters set in the DB2CONN and DB2ENTRY definitions to manage use of the CICS DB2 threads, each thread running under a subtask. It is the subtask running program DFHD2EX3 which issues requests to DB2 on behalf of a CICS task. A wait/post protocol is executed between the CICS task running in the CICS-DB2 TRUE, and the subtask in program DFHD2EX3.

The CICS-DB2 TRUE DFHD2EX1 gets invoked by the RMI for the following events:

- EXEC SQL commands and DB2 IFI commands from application programs
- syncpoint
- end of task

- INQUIRE EXITPROGRAM commands for the DB2 TRUE with the CONNECTST or QUALIFIER keywords (RMI SPI calls)
- EDF - when EDFing EXEC SQL commands
- CICS shutdown

CICS-DB2 Master subtask program DFHD2MSB: The DFHD2MSB TCB is attached by DFHD2STR during startup of the Attachment facility. It runs as a 'daughter' of the main CICS TCB. It is 'mother' to all the subtask TCBs which process the DB2 work. The DFHD2MSB TCB is detached by DFHD2STP during CICS-DB2 Attachment shutdown.

The main functions of DFHD2MSB are:

- To issue the initial IDENTIFY to DB2 to connect CICS to DB2
- To find out from DB2 what indoubts it has
- To service resynchronisation requests from CICS to DB2
- To provide a shutdown listening exit to DB2 to listen out for DB2 shutdown
- To attach thread subtasks as required
- To detach thread subtasks as required
- To provide a recovery routine to cleanup if a thread subtask fails

CICS-DB2 subtask program DFHD2EX3: A CICS-DB2 subtask TCB is attached by DFHD2MSB when required by DFHD2EX1. It runs as a daughter of the DFHD2MSB TCB and a granddaughter of the main CICS TCB. A CICS-DB2 subtask TCB normally remains active for the lifetime of the CICS Attachment facility and terminates as part of CICS-DB2 Attachment facility shutdown. Exception conditions that cause a subtask TCB to be detached are:

- if the DB2CONN TCBLIMIT parameter is lowered
- if a CICS task is forcepurged whilst its associated subtask is active in DB2
- If a failure occurs during syncpoint processing during the indoubt window requiring the thread to be released.

The DFHD2EX3 program issues requests to DB2 using the DB2 SSSC, ADMF and IFC interfaces communicating via the DB2 program request handler DSNAPRH. In order to process DB2 requests a TCB first has to IDENTIFY to DB2, secondly it has to SIGNON to DB2 to establish authorization ids to DB2. Thirdly a thread has to be created. Once a thread has been created API and syncpoint requests can flow to DB2. Subsequent SIGNON requests can occur for a thread to change authorization ids to DB2 or for the purposes of DB2 cutting accounting records (partial SIGNON) When a thread is nolonger required it is terminated. The TCB remains identified and signed on to DB2 and awaits another request requiring it to create a thread again.

Each DB2 subtask runs an instance of program DFHD2EX3 and each is represented by a DFHD2CSB control block. A CSB control block is anchored to one of three CSB chains depending on its state (an active thread within a UOW, a thread waiting for work, or an identified, signed on TCB with no thread). The CICS-DB2 TRUE DFHD2EX1 manages the CSB chains.

CICS-DB2 service task program DFHD2EX2: The CICS-DB2 service task program DFHD2EX2 runs as a CICS system task under transaction CEX2. Its mains functions are:

- To wait for DB2 to startup if DB2 is down when connection is attempted if STANDBYMODE=RECONNECT or CONNECT is specified in the DB2CONN.
- To initiate shutdown of the CICS-DB2 Attachment facility if posted to do so by DFHD2MSB.
- To perform the protected thread purge cycle.
- To terminate all subtasks during CICS-DB2 Attachment facility shutdown.

CICS-DB2 PLTPI program DFHD2CM0: Used in PLTPI or as a result of DB2CONN=YES being set in the SIT. It issues an EXEC CICS SET DB2CONN CONNECTED command to start up the CICS DB2 Attachment facility.

CICS-DB2 Comand processor DFHD2CM1: DFHD2CM1 processes commands issues via the DSNC command. The following commands are processed:

- DSNC STRT - EXEC CICS SET DB2CONN CONNECTED command issued
- DSNC STOP - EXEC CICS SET DB2CONN NOTCONNECTED command issued
- DSNC MODIFY DEST - EXEC CICS SET DB2CONN MSGQUEUEn command issued
- DSNC MODIFY TRAN - EXEC CICS SET DB2CONN THREADLIMIT or EXEC CICS SET DB2ENTRY THREADLIMIT command issued.
- DSNC DISC - call passed to DFHD2CC to disconnect threads
- DSNC DISP PLAN - call passed to DFHD2CC to display information on threads for a particular DB2 plan
- DSNC DISP TRAN - call passed to DFHD2CC to display information on threads for a transaction.
- DSNC DISP STAT - call passed to DFHD2CC to write out statistics
- DSNC -db2command - DB2 IFI ccommand issued to send operator command to the connected DB2 subsystem.

CICS-DB2 shutdown quiesce program DFHD2CM2: Runs under transaction CDBQ. Issues an EXEC CICS SET DB2CONN NOTCONNECTED WAIT command to shutdown the CICS-DB2 Attachment facility.

CICS-DB2 shutdown force program DFHD2CM3: Runs under transaction CDBF. Issues an EXEC CICS SET DB2CONN NOTCONNECTED FORCE command to shutdown the CICS-DB2 Attachment facility.

CICS-DB2 Table manager DFHD2TM: Handles installs, discards, inquire and set requests for the DFHD2GLB, DFHD2ENT and DFHD2TRN control blocks representing the DB2CONN, DB2ENTRY and DB2TRAN resources. Callers of DFHD2TM are:

- DFHAMD2 - for CEDA install and EXEC CICS CREATE
- DFHD2CNV - to install DB2 objects as a result of dynamic conversion from a macro RCT.
- DFHD2EX1 - to complete disablement of a DB2ENTRY or to complete Attachment facility shutdown
- DFHD2RP - to install objects from the Global Catalog during CICS restart
- DFHD2STP - to discard DB2 objects during Attachment shutdown if they originated from a macro RCT.
- DFHEIQD2 - for EXEC CICS INQUIRE,SET and DISCARD of DB2 objects
- DFHESE - for inquiry during EXEC CICS QUERY SECURITY processing.

CICS DB2 statistics program DFHD2ST: Called by AP domain statistics program DFHAPST to process CICS-DB2 statistics for EXEC CICS COLLECT STATISTICS and EXEC CICS PERFORM STATISTICS commands.

CICS DB2 connection control program DFHD2CC: DFHD2CC proceses the following requests:

- Start_db2_attachment - request routed on to DFHD2STR
- Stop_db2_attachment - request routed on to DFHD2STP
- Write_db2_statistics - statistics collected from control blocks and are written out to the terminal, to transient data or to SMF.
- disconnect_threads - CSB control blocks searched and marked so that threads are terminated when they are next released.
- display_plan and display_tran - thread information collected from control blocks and output to the terminal.

CICS DB2 EDF processor DFHD2EDF: Receives control from CICS-DB2 TRUE DFHD2EX1 when the TRUE is invoked for an EDF request. DFHD2EDF uses the RMI provided parameters to format the screen to be output by EDF before and after an EXEC SQL request is issued.

Control blocks

DFHD2SS (CICS-DB2 static storage)

CICS-DB2 static storage (D2SS) is acquired by DFHSIB1 and anchored off field SSZDB2 in the static storage address list DFHSSADS. The static storage is initialized by the CICS-DB2 restart program DFHD2RP. Its lifetime is that of the CICS region. CICS-DB2 static storage holds information such as storage manager, lock manager and directory manager tokens acquired during restart processing before any other CICS-DB2 control blocks are installed.

DFHD2GLB (CICS-DB2 Global block)

The DFHD2GLB block represents an installed DB2CONN definition. It is getmained by DFHD2TM when a DB2CONN is installed and freemained by DFHD2TM when a DB2CONN is discarded. It holds CICS-DB2 state data global to the connection and also the state data for pool threads and commands threads. The pool and command sections of the DFHD2GLB are mapped by a common type definition DFHD2RCT which is also used to map the DFHD2ENT control block.

The DFHD2GLB block is anchored off CICS-DB2 static storage in field D2S_DFHD2GLB.

DFHD2ENT (CICS-DB2 DB2ENTRY block)

The DFHD2ENT block represents an installed DB2ENTRY definition. It is getmained by DFHD2TM when a DB2ENTRY is installed and freemained by DFHD2TM when a DB2ENTRY is discarded. It uses a type definition DFHD2RCT in common with the pool and command sections of the DFHD2GLB block to achieve a common layout for all three areas. A DFHD2ENT block is located using a directory manager index that is keyed off the RDO name of the DB2ENTRY.

DFHD2TRN (CICS-DB2 DB2TRAN block)

The DFHD2TRN block represents an installed DB2TRAN definition. It is getmained by DFHD2TM when a DB2TRAN is installed and freemained by DFHD2TM when a DB2TRAN is discarded. A DB2TRAN can be located in two ways. Firstly by a directory manager index keyed off the RDO name of the DB2TRAN. Secondly by a directory manager index keyed off the transaction id associated with the DB2TRAN.

DFHD2CSB (CICS-DB2 subtask block)

The DFHD2CSB block represents a CICS-DB2 subtask running program DFHDEX3. A DFHD2CSB is getmained by DFHD2EX1 prior to the subtask being attached. It is passed to the subtask DFHD2EX3 as an attach parm. A DFHD2CSB is freemained by DFHD2EX1 after the DFHD2EX3 program has returned to MVS. A DFHD2EX3 block is anchored off one of several CSB chains from a DB2ENTRY or the DFHD2GLB depending on the state of the TCB and the DB2 thread.

DFHD2GWA (CICS-DB2 global work area)

The DFHD2GWA block is the global work area of the CICS-DB2 task related user exit (TRUE) DFHD2EX1. It is getmained when the TRUE is enabled, and freemained when the TRUE is disabled. The D2GWA holds a chain of LOT control blocks representing the tasks currently using the CICS-DB2 interface.

DFHD2LOT (CICS-DB2 life of task block)

The DFHD2LOT block is the task local work area of the CICS-DB2 task related user exit (TRUE) DFHD2EX1. It is getmained by DFHERM when a task first calls the CICS-DB2 TRUE. It is freemained by DFHERM at end of task. Its address is passed to DFHD2EX1 by DFHERM in parameter UEPTAA in the DFHUEPAR RMI parameter list.

The DFHD2LOT holds CICS-DB2 state information for a CICS task using the CICS-DB2 interface.

Modules

Module	Description
DFHD2CC	CICS-DB2 connection control program
DFHD2CM0	CICS-DB2 PLTPI startup program
DFHD2CM1	CICS-DB2 command processor
DFHD2CM2	CICS-DB2 quiesce shutdown program
DFHD2CM3	CICS-DB2 force shutdown program
DFHD2EDF	CICS-DB2 EDF processor
DFHD2EX1	CICS-DB2 task related user exit (TRUE)
DFHD2EX2	CICS-DB2 service task program
DFHD2EX3	CICS-DB2 subtask program
DFHD2INI	CICS-DB2 Initparm processor
DFHD2IN1	CICS-DB2 initialization gate
DFHD2IN2	CICS-DB2 recovery task
DFHD2MSB	CICS-DB2 master subtask program
DFHD2RP	CICS-DB2 restart program
DFHD2STP	CICS-DB2 shutdown program
DFHD2STR	CICS-DB2 startup program
DFHD2ST	CICS-DB2 statistics program
DFHD2TM	CICS-DB2 table manager
DSNCUEXT	CICS-DB2 sample dynamic plan exit

Exits

There are no Global user exits provided by the CICS DB2 Interface.

The CICS DB2 interface does however provide a dynamic plan 'exit' in the form of a user replaceable module. A sample default exit is provided called DSNCUEXT. A dynamic plan exit allows the name of the plan to chosen dynamically at execution time. For further information about dynamic plan exits see the CICS DB2 Guide.

Trace

The CICS-DB2 Attachment facility outputs trace entries in the range AP 3100 to AP 33FF. Trace output from the CICS-DB2 TRUE DFHD2EX1 and GTF trace from the CICS-DB2 subtask is controlled by the RI (RMI) trace flag. Trace from the rest of the attachment and other CICS-DB2 modules is controlled by the FC (File Control) trace flag.

Statistics

A limited set of CICS-DB2 statistics can be obtained by issuing the DSNC DISP STAT command, which will output the statistics to a CICS terminal. The same format of statistics is output to a nominated transient data queue when the CICS-DB2 Attachment facility is shut down For more information see the *CICS DB2 Guide*.

A more comprehensive set of CICS-DB2 statistics can be obtained by issuing an EXEC CICS PERFORM STATISTICS RECORD command with the DB2 keyword, or by issuing the EXEC CICS COLLECT STATISTICS command with the DB2CONN or DB2ENTRY keywords. CICS-DB2 Global statistics are mapped by DSECT DFHD2GDS. CICS-DB2 resource statistics are mapped by DSECT DFHD2RDS. For more information see the *CICS Performance Guide*.

Chapter 17. Command interpreter

The command interpreter demonstrates to the application programmer the syntax of CICS commands and the effects of their execution. It can also be used to perform simple one-off tasks whose nature does not justify the writing of a permanent application.

Design overview

The command interpreter is invoked by the CECI transaction and is an interactive, display-oriented tool that checks the syntax of CICS commands and executes them. Another transaction, CECS, performs only syntax checking.

The user enters a command that is analyzed in the same way as it would be by the command translator, which processes it as if it were part of an application program. The results of this analysis, including any messages, an indication of defaults assumed, and the entire syntax of the command, are then displayed.

When the command is syntactically valid, the user can request its execution. The interpreter calls DFHEIP, passing a parameter list precisely as would be passed during the execution of a program that contained the command.

The interpreter does all this using the same command-language tables as are used by the command translator. These tables contain data that define the syntax of CICS commands and the contents of the parameter lists required by DFHEIP to execute them.

Modules

Module	Function
DFHECIP	Invoked by CECI. Checks that the terminal is suitable. Obtains and initializes working storage. Loads the language tables. Links to DFHECID
DFHECSP	Same as DFHECIP, but invoked by CECS
DFHECID	Receives data from the terminal and sends back a display. Analyzes commands. Constructs parameter lists for DFHEIP, which it calls. Deals with PF keys
DFHEITAB	Command-language table (application programmer commands)
DFHEITBS	Command-language table (system programmer commands).

Exits

No global user exit points are provided for this function.

Trace

No trace points are provided for this function.

Chapter 18. CSD utility program (DFHCSDUP)

The CSD utility program, DFHCSDUP, provides offline services for you to list and modify the resource definitions in the CICS system definition (CSD) file. DFHCSDUP can be invoked as a batch program, or from a user-written program running either in batch mode or under TSO. The second method provides a more flexible interface to the utility, allowing for the specification of up to five user exit routines to be called at various points during DFHCSDUP processing.

Further information about using DFHCSDUP is given in the *CICS Resource Definition Guide*, the *CICS Operations and Utilities Guide*, and the *CICS Customization Guide*.

The following commands can be used with DFHCSDUP:

```
ADD
ALTER
APPEND
COPY
DEFINE
DELETE
EXTRACT
INITIALIZE
LIST
MIGRATE
REMOVE
SERVICE
UPGRADE
VERIFY
```

These commands are described in the *CICS Resource Definition Guide* and the *CICS Operations and Utilities Guide*.

Design overview

When DFHCSDUP is invoked, control passes to the utility command processor (DFHCUCP), which validates commands and invokes the appropriate routine to execute the requested function. Unless DFHCSDUP has been invoked from a user program specifying a get-command exit, DFHCUCP takes a command from the input data set, using DFHCUCB to obtain the command and DFHCUCAB to analyze and parameterize it. When supplied, the get-command exit is invoked from the point during DFHCUCB's processing where commands would otherwise be read from SYSIN (or an alternatively named input data set when DFHCSDUP is invoked from a user program).

Some syntax errors are diagnosed and reported by DFHCUCAB, and further contextual validation takes place in DFHCUCV. Valid commands are then passed to the relevant service routine for execution; for example, a MIGRATE command is handled by DFHCUMIG. If command execution is successful, the next command is processed.

All commands are validated, but the execution of commands from the input data set stops when an incorrect command is encountered, and execution of subsequent commands is also suppressed if an error of severity 8 or higher occurs when the command is executed. When commands are supplied by a get-command exit, however, DFHCSDUP attempts to execute all commands, even if an error is detected in the command syntax or during processing (unless the error is serious enough to warrant an ABEND).

If errors occur while processing commands, error messages in the DFH51xx, DFH52xx, DFH55xx, and DFH56xx series are written to SYSPRINT (or an alternatively named output data set when DFHCSDUP is invoked from a user program).

An ESTAE environment is established by DFHCUCP shortly after the start of DFHCSDUP processing. If an operating system abend subsequently occurs, control passes to the ESTAE exit routine, which then returns to MVS requesting a dump and scheduling a retry routine to get control. This retry routine attempts cleanup processing before returning to the caller of DFHCSDUP with a return code of '16'.

To protect the integrity of the CSD, DFHCUCP issues a STAX macro to defer the handling of any attention interrupts that may occur in a TSO environment until all processing associated with the current command has been completed.

DFHCSDUP uses batch versions of RDO routines from the parameter utility program (DFHPUP) and the CSD management program (DFHDMP) to read, write, and update resource definitions on the CSD file. All CSD control functions use the batch environment adapter (DFHDMPBA), which performs environment-dependent VSAM operations on the CSD file. DFHDMPBA also processes all interactions with operating system services.

Modules

DFHCSDUP is link-edited from a number of object modules, including batch versions of routines from DFHPUP and DFHDMP.

Exits

When invoked as a conventional batch program, DFHCSDUP supports only one user exit: the EXTRACT exit, which is invoked at various stages during the processing of an EXTRACT command. The name of the user-written program to get control must be specified by the USERPROGRAM keyword of the EXTRACT command. Details of selected CSD objects are passed to the user exit program so that users can analyze the contents of their CSD in any way they may choose.

When invoked from a user program, DFHCSDUP supports the following five user exits, the addresses of which can be specified in the EXITS parameter of DFHCSDUP’s entry linkage:

1. Initialization exit—invoked by DFHCUCP
2. Termination exit—invoked by DFHCUCP
3. EXTRACT exit—invoked by DFHCULIS
4. Get-command exit—invoked by DFHCUCB
5. Put-message exit—invoked by DFHBEP.

Note: A user exit routine specified by the USERPROGRAM keyword of an EXTRACT command is used in preference to any EXTRACT exit routine specified on the entry linkage.

For further information about these user exits, see the *CICS Customization Guide*.

Trace

Trace points are not applicable to offline utilities.

Statistics

The following statistics are maintained by DFHCSDUP, and are written, when appropriate, to SYSPRINT (or alternatively named output data set):

CMDSEXOK	Commands executed OK
CMDSINER	Commands in error
CMDSNOTX	Commands not executed
CMDSWARN	Commands with warning messages.

All the above statistics are kept in DFHCUCP’s static storage and are always output at the end of processing.

All the following statistics are kept in DFHCUMIG’s static storage and the appropriate statistics are also output to SYSPRINT (or its replacement). For example, if a user migrates an FCT, only TOTFILE and TOTLSRP are output.

TOTCONS	Total connections migrated
TOTFILE	Total files migrated
TOTLSRP	Total LSR pools migrated
TOTMAPS	Total map sets migrated
TOTPGMS	Total programs migrated
TOTPRFG	Total profiles generated
TOTPRFM	Total profiles migrated
TOTPSTS	Total partition sets migrated
TOTSESS	Total sessions migrated
TOTTRAS	Total transactions migrated
TOTTRMS	Total terminals migrated
TOTTYPS	Total typeterms migrated

Chapter 19. Database control (DBCTL)

An overall description of DL/I database support is given in Chapter 25, “DL/I database support” on page 177. This section gives information that is specific to database control (DBCTL).

Design overview

The CICS support that enables connection to DBCTL, via the database resource adapter (DRA), is based on the CICS resource manager interface (RMI), also known as the task-related user exit interface. However, because it is necessary to provide compatibility with the existing CICS-DL/I implementation (in terms of link-edit stubs, API return codes, and so on), a limited amount of support within CICS itself is provided, but there are no DBCTL release dependencies within the CICS modules.

The main components of the CICS-DBCTL interface are shown in Figure 39:

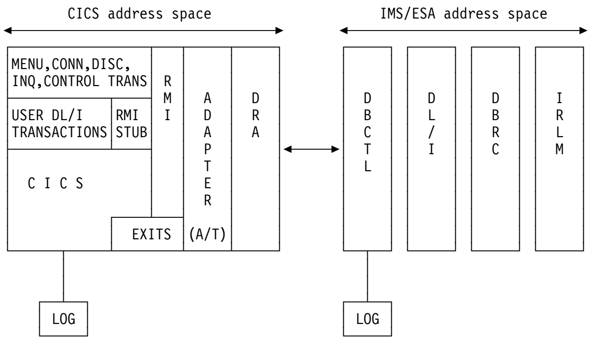


Figure 39. The major components of the CICS-DBCTL interface

- The connection process (CICS-DBCTL)

  CICS-DBCTL connection and disconnection programs
  These programs are used for establishing and terminating the connection with the DRA.

  CICS-DBCTL control program
  This program is responsible for resolving in-doubt units of work after a CICS or DBCTL failure. It also outputs messages when DBCTL notifies CICS of a change in the status of the CICS-DBCTL interface.

  When the CICS disconnects from DBCTL, the control program is responsible for invoking the disable program which performs cleanup.

  DRA control exit
  This exit is invoked by the DRA, when connection has been established with the DBCTL address space, to initiate the resynchronization process, that is, to initiate the resolution of in-doubt units of work. It is also invoked to handle cases where connection to DBCTL cannot be achieved or when the connection has failed.

  DBCTL user-replaceable program
  This program is invoked whenever CICS successfully connects to DBCTL and whenever CICS disconnects from DBCTL.

  Disable program
  This program is invoked when CICS disconnects from DBCTL.

- The DBCTL call processor program

  The function of this program is to issue an RMI call to DBCTL and to maintain compatibility with the existing CICS-DL/I interface in areas such as application program return codes, and so on.

- The interface layer

  The adapter
  The adapter’s primary responsibility is interfacing the RMI and DRA parameter lists. Other responsibilities include the issuing of DRA initialization and termination calls, when invoked by the CICS connection and disconnection programs, and the management of CICS tasks, in order to effect an orderly shutdown of the CICS-DBCTL interface.

  DRA suspend and resume exits
  These exits are invoked by the DRA in order to suspend and resume a CICS task while a DL/I call is processed by DBCTL.

  Adapter exits
  There are four exits for use by the adapter:

  – The statistics exit

- The token exit
- The monitoring exit
- The status exit.

Details of these components are described in the following sections.

Note: CICS documentation uses the term "connecting and disconnecting from DBCTL". The DRA documentation refers to "initializing and terminating the CICS-DBCTL interface". In general, these two terms are synonymous.

The connection process

Connection and disconnection programs: In order to initialize, terminate, and inquire on the status of the interface, a set of four programs is available:

1. Menu program
2. Connection program
3. Disconnection program
4. Inquiry program.

Menu program (DFHDBME): This permits a terminal user to display a menu, which offers the option of connecting and disconnecting from DBCTL.

The menu program passes control to either the connection or the disconnection program, as appropriate, using the COMMAREA to pass any overrides and parameters.

In the case of connection, it offers the ability to supply the suffix of the DRA startup parameter table and the name of the DBCTL region. The DRA startup parameter table contains various parameters, mostly relating to the initialization of the CICS-DBCTL interface, including the name of the DBCTL region and the minimum and maximum number of CICS-DBCTL threads. It also contains the length of time in seconds that the DRA waits after an unsuccessful attempt to connect to DBCTL, before attempting to connect again.

For disconnection, it offers the ability to specify whether an orderly or immediate disconnection from DBCTL is required.

The menu program is intended for use by CICS operators or network controllers, that is, users with special privileges.

BMS maps are used for both the menu and the inquiry programs. It should be noted that the bottom half of the menu screen includes all the items which appear on the inquiry screen, and the values are displayed on entry to the menu program, if they are known. The DRA startup table suffix is not included on the inquiry screen because the DRA startup table contains the application group name which is used for security checking.

After a connection request has been issued, it is possible to issue a disconnection request (orderly or immediate) from the menu program while the connection process is still in progress. After an orderly disconnection request has been issued, it is also possible to issue an immediate disconnection request while the orderly disconnection process is in progress. This has the effect of upgrading the orderly disconnection to an immediate disconnection.

Connection program (DFHDBCON): This program invokes the adapter requesting connection to DBCTL.

This program can be invoked either from the menu program or from the CICS PLT. It issues an ATTACH request of the CICS control program that later carries out resynchronization of in-doubt units of work with DBCTL. The control program then issues a WAIT request.

The connection program continues by loading, activating (using the EXEC CICS ENABLE command), and then calling the adapter (using a DFHRMCAL request). A set of parameters is passed to the adapter which includes:

- The CICS applid
- The DRA startup parameter table suffix (optional)
- The DBCTL ID (optional)
- A set of exit addresses.

As a result of the DFHRMCAL request issued from the connection program, the adapter loads the DRA startup/router module from the CICS STEPLIB library and passes control to it, supplying it with various parameters including the CICS applid, DRA startup parameter table suffix, and DBCTL ID. The DRA startup/router module loads the DRA startup table. It then initiates the processes required to establish the DRA and then returns control to the adapter which, in turn, returns control to the connection program which then terminates. Until this point is reached, any DBCTL requests issued from CICS tasks are rejected by the CICS RMI stub (the DBCTL call processor).

The DRA startup/router module is responsible for establishing the DRA environment, using the parameters specified in the DRA startup table in the CICS STEPLIB library, overridden by any parameters passed to it.

The DRA establishes contact with the DBCTL address space and then invokes the control exit to initiate the resynchronization process.

Disconnection program (DFHDBDSC): This program invokes the adapter requesting disconnection from DBCTL.

The disconnection program is used to terminate the DRA environment. Two types of disconnection are available:

Orderly disconnection
All existing CICS tasks using DBCTL are allowed to run to completion.

Immediate disconnection
Existing DL/I requests are allowed to complete but no further DL/I requests are accepted.

In both cases a DBCTL U113 abend is avoided. (DBCTL can issue a U113 abend if CICS terminates while there is an active DL/I thread running on its behalf in DBCTL. The thread remains active for the duration of the PSB schedule, but DBCTL would issue a U113 abend if the thread is doing something for the CICS task.)

The disconnection program calls the adapter, using DFHRMCAL, supplying a parameter to indicate the type of termination required.

In the case of immediate disconnection, the adapter issues a DRA TERM call and returns to the disconnection program only when all existing DL/I threads have completed. In the case of orderly disconnection, the adapter assumes responsibility for managing CICS tasks, that is, it continues to accept requests for current tasks using DBCTL until they terminate, but does not allow new CICS tasks to use DBCTL. When the adapter detects that the count of permitted tasks has reached zero, it issues a DRA TERM call.

The disconnection program finally posts the control program to notify it of the fact that the CICS-DBCTL interface has been terminated. The control program then terminates after starting the disable program. The disable program issues a DISABLE command for the adapter, and performs cleanup.

It should be noted that the terminal used to invoke the disconnection program is released after the input to the menu screen has been validated, enabling the terminal operator to use other programs. Any further messages from the disconnection process are generated centrally.

Inquiry program (DFHDBIQ): This program enables the user to inquire on the status of the interface. It is intended for a wider audience than the menu program; for example, application programmers.

Control program (DFHDBCT): The control program is invoked in the following circumstances:

- When the control exit is invoked by the adapter on behalf of the DRA
- When a CEMT FORCEPURGE command is issued for a CICS task executing in DBCTL
- When the disconnection program has received a response from the adapter as a result of a CICS-DBCTL interface termination request.

Its function in all cases is to issue messages. It then issues a WAIT after every invocation. Also, it has some special functions in three cases:

1. When contact has been made with DBCTL and resynchronization of in-doubts is required.

   In this case, the control program issues the command:

   ```
   EXEC CICS RESYNC ENTRYNAME(adapter)
   IDLIST(DBCTL's in-doubts) ...
   ```

   This causes CICS to create tasks for each in-doubt unit of work. Each task performs resynchronization and then informs the adapter via the CICS syncpoint manager as to whether the task has committed or backed out. The adapter then notifies the DRA on a task basis.

   The following is a list of the possible calls to the adapter from the CICS syncpoint manager:

   - Prepare to commit
   - Commit unconditionally[1]
   - Backout[1]
   - Unit of recovery is lost to CICS cold start[2]
   - DBCTL should not be in-doubt about this unit of recovery[2].

   Notes:

   [1] These items can be issued as a result of a RESYNC request.

   [2] These items can be issued as a result of a RESYNC request only.

2. When /CHECKPOINT FREEZE has been requested.

   In this case, the control program invokes the disconnection program requesting an orderly disconnection from DBCTL. Generally, an orderly disconnection from DBCTL allows CICS tasks already using DBCTL to continue until task termination. However, when a /CHECKPOINT FREEZE has been requested, DBCTL prevents any PSB schedules from taking place. Thus, in this case, some tasks might be terminated before end of task is reached with a 'DBCTL not available' return code, if they issue a subsequent PSB schedule request.

3. When the disconnection program invokes the control program.

   In this case, the control program starts the disable program.

DRA control exit (DFHDBCTX): The control exit is invoked in the DRA environment in the following circumstances:

- When contact has been established with the DBCTL address space, in order to initiate resynchronization.

  The control exit is invoked in the DRA environment whenever contact has been established with DBCTL, whether invoked by the user or due to the DRA automatically reestablishing contact after a DBCTL failure. The control exit receives an input parameter list that includes the DBCTL ID, DBCTL's list of in-doubt units of work, and the DBCTL RSE name. The control exit posts the control program, which actually performs the resynchronization.

- When the MVS subsystem interface (SSI) rejects the IDENTIFY request to DBCTL, thereby causing the IDENTIFY to fail.

  This could occur if the DRA was trying to issue an IDENTIFY request to a DBCTL subsystem that was not running. In this case the control exit sets a response code of ‘0’. The first time in a connection attempt that the DRA receives a ‘0’ response after an MVS SSI failure, the DRA outputs message DFS690A inviting the operator to reply WAIT or CANCEL. On subsequent failures when a response code of ‘0’ is returned, the DRA waits for the length of time specified in the DRA startup table before attempting the IDENTIFY request again.

- When DBCTL rejects the IDENTIFY request to DBCTL; for example, incorrect application group name (AGN) supplied.

  In this case, the control exit asks the DRA to terminate.
- When the operator replies CANCEL to the DFS690A message during DRA initialization, because contact cannot be established with DBCTL.

  In this case, the control exit notifies the DRA to terminate immediately.
- When DBCTL abnormally terminates.

  In this case, the control exit invokes the control program and then it asks the DRA to issue an IDENTIFY request to DBCTL.
- When the DRA abnormally terminates.

  In this case, it is not possible to access DBCTL from the same CICS session without initializing the CICS-DBCTL interface using the menu program.
- When a /CHECKPOINT FREEZE request has been issued to DBCTL.

  Note that /CHECKPOINT FREEZE is the command used to close down a DBCTL subsystem. In this case the control exit invokes the control program which, in turn, invokes the disconnection program requesting an orderly disconnection from DBCTL. The control exit notifies the DRA to wait for a termination request.

DBCTL user-replaceable program (DFHDBUEX):

The DBCTL user-replaceable program, DFHDBUEX, is invoked whenever CICS successfully connects or disconnects from DBCTL. It provides the opportunity for the customer to supply code to enable and disable CICS-DBCTL transactions at these times.

The program runs as a CICS application and can thus issue EXEC CICS requests. The program is invoked with a CICS COMMAREA containing the following parameters:

- Request type: CONNECT | DISCONNECT
- Reason for disconnection: MENU DISCONNECTION | /CHECKPOINT FREEZE | DRA FAILURE | DBCTL FAILURE
- DRA startup table suffix
- DBCTL ID.

See the *CICS Customization Guide* for information about the DFHDBUEX program.

Disable program (DFHDBDI): The disable program, DFHDBDI, is invoked when CICS disconnects from DBCTL. It performs cleanup, which includes disabling the adapter.

The DBCTL call processor program (DFHDLIDP):

Among the functions of the DBCTL call processor program, DFHDLIDP, are:

Issuing DFHRMCAL requests to the adapter: DL/I requests issued from application programs that have been routed to this module are passed on to the adapter. The DBCTL call processor constructs a register 1 parameter list that includes the DL/I parameter list and a thread token. It then issues a DFHRMCAL request.

It is the responsibility of this module to generate the thread token required by the DRA.

Maintaining return code compatibility: If any calls are made to the RMI before the first part of the connection process has completed, that is, before the DFHDBCON program has received a “successful” response code from the DRA via the adapter, error return codes are set in the task control area (TCA) to indicate that DBCTL is unavailable. These codes are put in the user interface block (UIB) by the DL/I call router program, DFHDLI.

Similarly, the DBCTL call processor informs application programs when DBCTL is no longer available; for example, after a DBCTL abend.

Another function of the call processor is to set up the TCA fields, TCADLRC and TCADLTR, with response and reason codes respectively for the call. This ensures that the application program continues to receive responses indicating normal response, NOTOPEN, and INVREQ conditions, with the appropriate response and reason codes in the corresponding UIB fields, UIBFCTR and UIBDLTR, after NOTOPEN and INVREQ conditions have been raised.

Initiating PC abends: If an ‘unsuccessful’ return code is passed back to CICS as a result of a DBCTL request, indicating that the CICS thread must be abended, the DBCTL call processor issues a PC ABEND, which invokes syncpoint processing to back out changes made to recoverable resources. Various abend codes can be issued. Note that, in the case of a deadlock abend (abend code ADCD) it may be possible to restart the program.

Exception trace entries are output in the case of transaction abends.

Writing CICS messages: For any thread abend in DBCTL, a CICS message is written indicating the abend code passed back to CICS in the field PAPLRETC. Similarly, for any scheduling failures, where the application program receives the UIBRCODE field (UIBFCTR and UIBDLTR fields combined) set to `X'0805'`, the scheduling failure subcode is contained in a CICS message.

The interface layer

Adapter (DFHDBAT): Control is passed to the adapter via the CICS RMI. It is the responsibility of the adapter to construct the DRA INIT, DRA TERM, and DRA THREAD parameter lists from the RMI parameter list passed to it. It must also transform the DRA parameter list passed back after a DL/I call to the format expected by CICS.

Part of the DRA parameter list requires two tokens to be generated by CICS:

1. A thread token
2. A recovery token.

The thread token is generated by the DBCTL call processor, and enables a CICS unit of work to be related to a DBCTL unit of work. It is used by the asynchronous RESUME exit to identify the CICS thread to be resumed after a DL/I call.

The 16-byte recovery token is constructed by concatenating an 8-byte unique CICS subsystem name (the CICS applid) with the 8-byte CICS RMI recovery token (also known as the unit of work ID).

A further responsibility of the adapter is to manage CICS tasks when an orderly termination of the CICS-DRA interface has been requested by means of the CICS termination program. In this case, it continues to accept DL/I requests from CICS tasks currently using DBCTL, but does not allow new CICS tasks to use DBCTL. When the adapter detects that the count of current tasks has reached zero, it issues a DRA TERM call to shut down the interface.

Table 32 summarizes the types of invocations of the adapter code from CICS, and how the adapter reacts to the individual invocation.

Table 33 summarizes the types of invocations of the adapter code from the DRA, and how the adapter reacts to each individual invocation.

Table 34 on page 148 summarizes the cases when the adapter invokes the adapter exits.

Table 32. CICS-adapter request summary

Invocation	Invoker	Adapter action
Initialize	Connection program	Issues DRA INIT
Terminate-Orderly	Disconnection program	Issues DRA TERM after waiting for CICS-DBCTL tasks to quiesce
Terminate-Fast	Disconnection program	Issues DRA TERM
PSB Schedule	DBCTL call processor	Issues THREAD SCHED
DL/I request	DBCTL call processor	Issues THREAD DLI
Prepare	CICS syncpoint manager	Issues THREAD PREP
Commit	CICS syncpoint manager	Issues THREAD COMTERM
Abort	CICS syncpoint manager	Issues THREAD ABTTERM
Lost To CICS cold start	CICS syncpoint manager	Issues COLD request
DBCTL should not be in doubt	CICS syncpoint manager	Issues UNKNOWN request
Task is terminating	CICS task manager	Issues TERMTHRD
Force Purge Task	Control program	Issues PURGE THREAD
Orderly CICS Term	CICS termination	Issues DRA TERM after waiting for CICS-DBCTL tasks to quiesce
Immediate CICS Term	CICS termination	Issues DRA TERM
CICS is abending	CICS termination	Issues DRA TERM
CICS has been canceled	CICS termination	Returns to CICS

Table 33. DRA-adapter request summary

Invocation from the DRA	Adapter action
CICS-DBCTL connection is complete	Invoke the control exit
MVS SSI has rejected the IDENTIFY request to DBCTL	Invoke the control exit
DBCTL has rejected the IDENTIFY request	Invoke the control exit
Operator has replied CANCEL to message DFS690A	Invoke the control exit
DBCTL has terminated abnormally	Invoke the control exit
DRA has terminated abnormally	Invoke the control exit
/CHECKPOINT FREEZE has been issued	Invoke the control exit
PSB schedule, DL/I, syncpoint, thread termination, thread purge, or interface termination request is to be suspended	Invoke the suspend exit
PSB schedule, DL/I, syncpoint, thread termination, thread purge, or interface termination request is to be resumed	Invoke the resume exit

Table 34. Adapter exit summary

Circumstances	Adapter action
Successful completion of THREAD SCHED request	Invoke the monitoring exit
Completion of THREAD COMTERM or THREAD ABTTERM request	Invoke the monitoring exit
DRA thread failure	Invoke the status exit
Resynchronization request issued from CICS recovery manager	Invoke the token exit
CICS orderly or immediate term	Invoke the token exit
CICS ABEND	Invoke the token exit
Completion of DRA TERM issued as a result of a termination request from disconnection program	Invoke the statistics exit
Completion of DRA TERM issued as a result of a CICS orderly termination request	Invoke the statistics exit

Suspend exit (DFHDBSPX): The suspend exit is invoked by the adapter on behalf of the DRA so that a CICS thread can be suspended during the processing of a DL/I call. The suspend exit outputs a trace entry immediately before issuing a WAIT, and a trace entry immediately after it is posted by the resume exit.

The suspend exit is also invoked by the adapter when a disconnection request from the menu is being processed.

Resume exit (DFHDBREX): The resume exit is invoked asynchronously by the adapter on behalf of the DRA, and it is executed in the DRA environment. It handles both normal resume and abnormal resume after an abend of the thread. The resume exit issues an MVS POST.

When a thread fails, the resume exit is invoked and an 'unsuccessful' return code is passed back to the DBCTL call processor, indicating that CICS must issue an abend for that thread (task).

Adapter exits: The following sections describe the adapter exits.

The adapter statistics exit (DFHDBSTX): The statistics exit is invoked by the adapter when the CICS-DBCTL interface has been terminated by the CICS operator using the menu program to request disconnection from DBCTL. The exit is also invoked by the adapter when CICS is terminated in an orderly way.

The function of the exit is to invoke the CICS statistics domain supplying the data that has been returned from the DRA relating to the individual CICS-DBCTL session.

For a /CHECKPOINT FREEZE command, the exit is not invoked, but the statistics domain is called by DFHCDBCT.

The adapter token exit (DFHDBTOX): The token exit is invoked by the adapter when a task is encountered which has not been allocated a thread token, that is, it has not been through the DBCTL call processor module. This occurs for resynchronization tasks and for the CICS termination invocation.

The adapter monitoring exit (DFHDBMOX): The monitoring exit is invoked by the adapter when monitoring data has been returned by DBCTL as a result of a PSB schedule request, and a CICS SYNCPOINT or DLI TERM request. The exit passes the data on to the CICS monitoring domain to update the tasks monitoring information.

The adapter status exit (DFHDBSSX): The status exit is invoked by the adapter in the event of a DRA thread failure, so that resources owned by the failing thread can be transferred to CICS, which then releases the transferred resources during syncpoint processing.

DBCTL system definition

DBCTL system definition is described in the IMS *System Definition Reference*.

DBCTL PSB scheduling

When a CICS task requests the scheduling of a DL/I PSB by means of an EXEC DLI SCHEDULE request or DL/I PCB call, and the request is for a DBCTL PSB, control is passed to DFHDLIDP.

Database calls

For DBCTL, DFHDLIDP invokes the CICS RMI to pass control to DBCTL.

DBCTL PSB termination

DBCTL PSB termination is performed during the syncpoint when the resource manager interface (RMI) communicates with DBCTL.

System termination

Support is provided to close down the CICS-DBCTL interface during CICS termination. This should avoid the possibility of causing DBCTL to terminate with a U113 abend because of CICS terminating while DL/I threads are running on its behalf in DBCTL.

To provide the support, there is an extension to the RMI to invoke active adapters at CICS termination.

If CICS termination hangs because the CICS-DBCTL interface does not close down, the operator should type in a /DISPLAY ACTIVE command on the DBCTL console and identify the threads corresponding to the CICS system being terminated. This is possible because the threads' recovery tokens, which are displayed, start with the CICS applid. The operator should then issue /STOP THREAD requests for each thread.

Control blocks

The following diagram shows the major control blocks used to support the CICS-DBCTL interface:

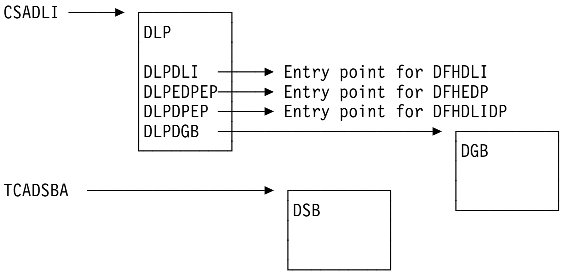


Figure 40. Some control blocks used for DBCTL support

The DL/I interface parameter list (DLP) is described in "DL/I interface parameter list (DLP)" on page 178.

The DBCTL global block (DGB) is acquired, from storage above the 16MB line, when the CICS-DBCTL interface is first initialized. It lasts for the remainder of the CICS execution.

The DBCTL scheduling block (DSB) is acquired, from storage above the 16MB line, when a task issues a PSB schedule request to DBCTL; that is, the PSB used does not appear in the remote PDIR. The DSB is freed at task termination.

See the *CICS Data Areas* manual for a detailed description of these control blocks.

Modules

Module	Description
DFHDBAT	Adapter
DFHDBCON	Initialization program
DFHDBCT	Control program
DFHDBCTX	Control exit
DFHDBDI	Disable program
DFHDBDSC	Termination program
DFHDBIE	Inquiry screens
DFHDBIQ	Inquiry program
DFHDBME	Menu program
DFHDBMOX	Monitoring exit
DFHDBNE	Menu screens
DFHDBREX	Resume exit
DFHDBSPX	Suspend exit
DFHDBSSX	Status exit
DFHDBSTX	Statistics exit
DFHDBTOX	Token exit
DFHDBUEX	DBCTL user exit
DFHDLI	DL/I router program
DFHDLIDP	DBCTL call processor

Exits

The following global user exit points are provided for DBCTL:

- In DFHDBCR: XXDFB and XXDTO
- In DFHDBCT: XXDFA.

For further information about these exit points, see the *CICS Customization Guide* and the *CICS IMS Database Control Guide*.

Chapter 20. Data interchange program

The data interchange program (DFHDIP) supports the batch controller functions of the IBM 3790 Communication System and the IBM 3770 Data Communication System. Support is provided for the transmit, print, message, user, and dump data sets of the 3790 system.

Design overview

The data interchange program is designed as a function manager for Systems Network Architecture (SNA) devices. It is invoked via DFHEDI for command-level requests, or internally by the basic mapping support (BMS) routines using the DFHDI macro. DFHDIP performs the following actions:

1. Determines whether a new output destination has been specified (it retains information about the previous destinations in the data interchange control block) and, if so, builds appropriate FMHs to select the new destination, and outputs these FMHs to the SNA device via terminal control.
2. Invokes the appropriate subroutine to perform the desired function:

   ADD Builds ADD FMH, transmits it and the user data

   REPLACE Builds REPLACE FMH, transmits it and the user data

   ERASE Builds ERASE FMH and RECID FMH and transmits them

   NOTE Builds NOTE FMH, transmits it, and returns the reply to the user

   QUERY Builds QUERY FMH, transmits it, and outputs END FMH

   SEND Outputs user data

   WAIT Waits for completion of the I/O

   END Builds END FMH and transmits it

   ABORT Builds ABORT FMH and transmits it

   ATTACH Removes FMH from initial input

   DETACH Frees the storage used by DFHDIP

   RECEIVE Reads a complete record from the logical device.
3. Sets the appropriate return code.

Figure 41 shows the data interchange program interfaces.

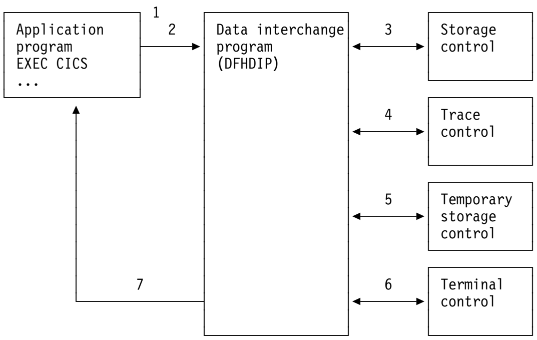


Figure 41. Data interchange program interfaces

Notes:

1. The application program invokes DFHEDI (via DFHEIP) which then communicates with DFHDIP by setting fields in the TCA.
2. DFHDIP receives control.
3. If no storage has been obtained for the data interchange block (DIB), storage control is invoked. The storage is chained to the TCTTE. Significant status information, such as the currently selected destination, is remembered in the data interchange block, which is freed at the end of task processing.
4. A trace entry is made.
5. If logging is present (protected task and message integrity) and if a destination change or function change occurs on output, temporary-storage control is invoked to write the DIB to recoverable temporary storage.
6. Terminal control is invoked to output any built FMH and also to output the user data. (DFHTC TYPE=WRITE is issued.) For input requests, DFHTC TYPE=READ requests are issued to obtain a non-null input record.
7. Any errors obtained from the device are decoded and placed in the TCA return code slot. If no errors were detected, a return code of '0' (zero) is returned.

Modules

DFHEDI, DFHDIP

Exits

No global user exit points are provided for this function.

Trace

The following point ID is provided for the data interchange program:

- AP 00D7, for which the trace level is DI 1.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 21. Directory manager domain (DD)

The directory manager domain (also sometimes known simply as "directory manager") manages directories of named tokens.

Directory manager domain's specific gates

Table 35 summarizes the directory manager domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, and the functions provided by the gates.

Table 35. Directory manager domain's specific gates

Gate	Trace	Function
DDDI	DD 0201 DD 0202	CREATE_DIRECTORY ADD_ENTRY DELETE_ENTRY REPLACE_DATA
DDLO	DD 0301 DD 0302	LOCATE
DDBR	DD 0401 DD 0402	START_BROWSE GET_NEXT_ENTRY END_BROWSE

DDDI gate, CREATE_DIRECTORY function

The CREATE_DIRECTORY function of the DDDI gate is used to create a new directory with entry names of a given length.

Input parameters

DIRECTORY_NAME is the four_character name of the directory to be created.

NAME_LENGTH is the length of entry names in the directory. This value must be a multiple of four, and less than 256.

Output parameters

DIRECTORY_TOKEN is the directory token

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	DUPLICATE_DIRECTORY, INVALID_NAME_LEN

DDDI gate, ADD_ENTRY function

The ADD_ENTRY function of the DDDI gate is used to add an entry to a directory.

Input parameters

DIRECTORY_TOKEN is the token for the directory.

ENTRY_NAME is the address of the entry name. The length is fixed for the directory.

DATA_TOKEN is the data to be associated with the entry name in the directory.

SUSPEND indicates whether Storage Manager GETMAIN requests should be conditional or unconditional. Takes one of the values:

YES|NO

Output parameters

DUPLICATE_DATA_TOKEN is the data currently associated with the entry name if it already exists in the directory.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUPLICATE, INSUFFICIENT_STORAGE
INVALID	INVALID_DIRECTORY

DDDI gate, DELETE_ENTRY function

The DELETE_ENTRY function of the DDDI gate is used to delete an entry from a directory.

Input parameters

DIRECTORY_TOKEN is the token for the directory.

ENTRY_NAME is the address of the entry name. The length is fixed for the directory.

Output parameters

DATA_TOKEN is the data associated with the entry name when it was deleted.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
INVALID	INVALID_DIRECTORY

DDDI gate, REPLACE_DATA function

The REPLACE_DATA function of the DDDI gate is used to replace the data associated with an existing entry name in a directory.

Input parameters

DIRECTORY_TOKEN is the token for the directory.

ENTRY_NAME is the address of the entry name. The length is fixed for the directory.

NEW_DATA_TOKEN is the new data to be associated with the entry name.

PRIOR_DATA_TOKEN is an optional parameter that indicates the data expected to be associated with the entry name just prior to it being replaced.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND, DATA_CHANGED
INVALID	INVALID_DIRECTORY

DDLO gate, LOCATE function

The LOCATE function of the DDLO gate is used to locate the data associated with an existing entry name in a directory.

Input parameters

DIRECTORY_TOKEN is the token for the directory.

ENTRY_NAME is the address of the entry name. The length is fixed for the directory.

Output parameters

DATA_TOKEN is the data associated with the entry name.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
INVALID	INVALID_DIRECTORY

DDBR gate, START_BROWSE function

The START_BROWSE function of the DDBR gate is used to start an alphabetical browse through all of the entries in a directory.

Input parameters

DIRECTORY_TOKEN is the token for the directory.

AT_NAME is the address of an entry name at which the browse is to start. The first name found will be the first which is greater than or equal to this in alphabetical order.

TASK_RELATED is an optional parameter which indicates whether the browse will end at task end. It can be one of these values:

`YES|NO`

if not specified this parameter defaults to `YES`.

Output parameters

BROWSE_TOKEN is the token for this browse.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_DIRECTORY

DDBR gate, GET_NEXT_ENTRY function

The GET_NEXT_ENTRY function of the DDBR gate is used to get the next entry name in alphabetical order in a directory.

Input parameters

DIRECTORY_TOKEN is the token for the directory.

BROWSE_TOKEN is the token for the browse.

ENTRY_NAME is a buffer in which the entry name will be returned.

Output parameters

DATA_TOKEN is the token associated with the entry name.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BROWSE_END

RESPONSE	Possible REASON values
INVALID	INVALID_DIRECTORY, INVALID_BROWSE, INVALID_NAME

DDBR gate, END_BROWSE function

The END_BROWSE function of the DDBR gate is used to end a browse on a directory.

Input parameters

DIRECTORY_TOKEN is the token for the directory.

BROWSE_TOKEN is the token for the browse.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_DIRECTORY, INVALID_BROWSE

Directory manager domain’s generic gates

Table 36 summarizes the directory manager domain’s generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 36. Directory manager domain’s generic gates

Gate	Trace	Function	Format
DDDM	DD 0101 DD 0102	PRE_INITIALISE INITIALISE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—“Domain manager domain’s generic formats” on page 195

In preinitialization the directory manager adds its general subpool and global lock.

In initialization, quiesce, and termination processing, the directory manager domain performs only internal routines.

Exits

No global user exit points are provided in this domain.

Trace

The point IDs for the directory manager domain are of the form DD xxxx; the corresponding trace levels are DD 1, DD 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 22. Dispatcher domain (DS)

The dispatcher domain is concerned with the attaching, running, and detaching of tasks, and the posting of TCBs with the following modes (names: concurrent (CO), ONC/RPC-owning (RP), quasi-reentrant (QR), resource-owning (RO), file-owning (FO), secondary LU usage (SZ), open key 8 (L8), JVM key 8 (J8), sockets (SO), sockets listener (SL), or secure sockets key 8 (S8).

Dispatcher domain's specific gates

Table 37 summarizes the dispatcher domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 37. Dispatcher domain's specific gates

Gate	Trace	Function	XPI
DSAT	DS 0002 DS 0003	ATTACH CHANGE_MODE CHANGE_PRIORITY SET_PRIORITY CANCEL_TASK FREE_SUBSPACE_TCBS DELETE_SUBSPACE_TCBS TCB_POOL_MANAGEMENT	NO NO YES NO NO NO NO NO
DSBR	DS 0010 DS 0011	START_BROWSE END_BROWSE GET_NEXT INQUIRE_TASK SET_TASK	NO NO NO NO NO
DSIT	DS 0008 DS 0009	INQUIRE_DISPATCHER SET_DISPATCHER ACTIVATE_MODE ADD_TCB DELETE_TCB FREE_TCB PROCESS_DEAD_TCBS	NO NO NO NO NO NO
DSSR	DS 0004 DS 0005	ADD_SUSPEND DELETE_SUSPEND INQUIRE_SUSPEND_TOKEN SUSPEND RESUME WAIT_MVS WAIT_OLDW WAIT_OLDC	YES YES NO YES YES YES NO NO

DSAT gate, ATTACH function

The ATTACH function of the DSAT gate is used to attach a new task.

- The transaction manager uses the function to attach system or nonsystem tasks that have PCT entries.
- Other parts of CICS use the function to attach system tasks that do not have PCT entries.

This function is used to attach a new task, and add it to the appropriate Dispatcher queue.

When the task is first dispatched, the calling domain receives the TASK_REPLY call at its DSAT gate (see "DSAT format, TASK_REPLY function" on page 167).

Input parameters

PRIORITY affects a task's dispatching precedence. It can have a value in the range 0 (low priority) through 255 (high priority).

USER_TOKEN is the token by which the task to be attached is known to the caller.

[TIMEOUT] is the deadlock time-out interval, in milliseconds.

TYPE is the type of task. It can have either of these values:

```
SYSTEM|NON_SYSTEM
```

[MODE] specifies the mode in which the task is to run. It can have any of these values:

```
CO (concurrent)
FO (file-owning)
QR (quasi-reentrant)
RO (resource-owning)
RP (ONC/RPC-owning)
SZ (secondary LU usage)
```

[TASK_REPLY_GATE_INDEX] is used when a gate other than the attaching domain's default gate is to receive a resultant TASK_REPLY.

[SPECIAL_TYPE(SMSY)] identifies the special task SMSY.

[TRANSACTION_TOKEN] identifies the transaction associated with the attached task.

Output parameters

TASK_TOKEN is the token by which the attached task is known to the dispatcher.

RESPONSE is the dispatcher's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOOP, ABEND, INSUFFICIENT_STORAGE

DSAT gate, CHANGE_MODE function

The CHANGE_MODE function of DSAT gate is used to select the mode in which the task is to run.

Input parameters

MODE is the mode to be used by the task. It can have any of these values:

```
CO (concurrent)
FO (file-owning)
J8 (JVM key 8)
L8 (open key 8)
QR (quasi-reentrant)
RO (resource-owning)
RP (ONC/RPC-owning)
SL (sockets listener)
SO (sockets)
SZ (secondary LU usage)
S8 (secure sockets key 8)
```

[CONDITIONAL] states whether the CHANGE_MODE should be conditional on the current load on the CPU. It can have either of these values:

```
YES|NO
```

MODENAME 2-character mode name with values as for MODE t

MODENAME_TOKEN token representing modename. More efficient than using MODENAME. The token is returned by ACTIVATE_MODE and by CHANGE_MODE (see OLD_MODENAME_TOKEN below)

TCB_TOKEN token representing the TCB instance to which to switch. The token is returned by CHANGE_MODE (see OLD_TCB_TOKEN below)

Output parameters

OLD_MODE is the mode used by the task when the CHANGE_MODE request was issued. It can have any of these values:

```
CO (concurrent)
FO (file-owning)
J8 (JVM key 8)
L8 (open key 8)
QR (quasi-reentrant)
RO (resource-owning)
RP (ONC/RPC-owning)
SL (sockets listener)
SO (sockets)
SZ (secondary LU usage)
S8 (secure sockets key 8)
```

RESPONSE is the dispatcher’s response to the call. It can have any one of these values:

```
OK|DISASTER|INVALID|KERNERROR
```

DSAT gate, CHANGE_PRIORITY function

The CHANGE_PRIORITY function of DSAT gate has two effects:

1. It changes the dispatch priority of the issuing task.
2. It causes control to be given up to another task.

Input parameters

[PRIORITY] is the new priority. It can have a value in the range 0 (low priority) through 255 (high priority).

Output parameters

[OLD_PRIORITY] is the task’s former priority. It can have a value in the range 0 (low priority) through 255 (high priority).

OLD_MODENAME is the mode used by the task when the CHANGE_MODE request was issued. It can have the same values as OLD_MODE. OLD_MODENAME is preferred to OLD_MODE.

OLD_MODENAME_TOKEN is a token representing the mode used by the task when the CHANGE_MODE request was issued.

OLD_TCB_TOKEN is a token representing the TCB used by the task when the CHANGE_MODE request was issued.

RESPONSE is the dispatcher’s response to the call. It can have any one of these values:

```
OK|DISASTER|EXCEPTION|INVALID|
KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	**Possible REASON values**
EXCEPTION	MODE_NOT ACTIVE, NO_TCBS_ACTIVE, INSUFFICIENT_STORAGE, TCB_FAILED, TOO_FEW_TCBS
PURGED	TIMED_PUT, TASK_CANCELLED
DISASTER	LOCK_FAILED, ACTIVATE_MODE_FAILED, ADD_TCB_FAILED, SUSPEND_FAILED
INVALID	INVALID_MODENAME, INVALID_MODENAME_TOKEN, INVALID_TCB_TOKEN

DSAT gate, SET_PRIORITY function

The SET_PRIORITY function of DSAT gate changes the priority of the issuing task, or the task specified by the TASK_TOKEN parameter.

Input parameters

PRIORITY is the new priority. It can have a value in the range 0 (low priority) through 255 (high priority).

[TASK_TOKEN] identifies the task whose priority is to be changed.

[SPECIAL_TYPE(IMMEDIATE_SHUTDOWN_TASK)] identifies the special task “IMMEDIATE_SHUTDOWN_TASK”:

Output parameters

[OLD_PRIORITY] is the task’s former priority. It can have a value in the range 0 (low priority) through 255 (high priority).

[RESPONSE] is the dispatcher’s response to the call. It can have any one of these values:

```
OK|DISASTER|EXCEPTION|INVALID|KERNERROR
```

[REASON] is returned when RESPONSE is EXCEPTION. It has the value:

INVALID_TASK_TOKEN

DSAT gate, CANCEL_TASK function

The CANCEL_TASK function of DSAT gate causes a specified task to be canceled.

Input parameters

TASK_TOKEN is the token representing the task to be canceled.

CANCEL_TYPE can have either of these values:

FORCE_CANCEL|NORMAL_CANCEL

Output parameters

RESPONSE is the dispatcher’s response to the call. It can have any one of these values:

OK|DISASTER|EXCEPTION|INVALID|KERNERROR

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_TASK_TOKEN, INVALID_STATE, NOT_PURGEABLE, CANCEL_INHIBITED INVALID_STATE_PURGE

DSAT gate, FREE_SUBSPACE_TCBS function

The FREE_SUBSPACE_TCBS function of DSAT gate releases any open subspace TCBs owned by the task, and makes them available for use by another task executing with the same subspace, or deletes the TCBs if the task is 'unclean'.

Input parameters: None

Output parameters

OPEN_TCBS_USED_AND_KEPT is a bit string indicating which TCB modes were used by the task, of and are now available to other tasks

OPEN_TCBS_USED_AND_LOST is a bit string indicating which TCB modes were used by the task, of and have now been deleted because the task was 'unclean'

RESPONSE is the dispatcher’s response to the call. It can have any one of these values:

OK|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOCK_FAILED NCEL_INHIBITED
INVALID	NOT_SUBSPACE_ELIGIBLE NCEL_INHIBITED

DSAT gate, DELETE_SUBSPACE_TCBS function

The DELETE_SUBSPACE_TCBS function of DSAT gate deletes any open TCBs associated with the given subspace.

Input parameters

SUBSPACE_TOKEN indicates the subspace whose associated open TCBs are to be deleted

Output parameters

RESPONSE is the dispatcher’s response to the call. It can have any one of these values:

OK|DISASTER|EXCEPTION|KERNERROR

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOCK_FAILED NCEL_INHIBITED
EXCEPTION	TOO_FEW_TCBS NCEL_INHIBITED

DSAT gate, TCB_POOL_MANAGEMENT function

The TCB_POOL_MANAGEMENT function of DSAT gate deletes unallocated TCBs which are excess to current requirements.

Input parameters: None

Output parameters

RESPONSE is the dispatcher’s response to the call. It can have any one of these values:

OK|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOCK_FAILED NCEL_INHIBITED

DSBR gate, START_BROWSE function

The START_BROWSE function of DSBR gate starts a browse session with the dispatcher.

Input parameters: None.

Output parameters

BROWSE_TOKEN is the token representing this browse session.

RESPONSE is the dispatcher's response to the call. It can have any one of these values:

OK|DISASTER|PURGED

DSBR gate, END_BROWSE function

The END_BROWSE function of DSBR gate ends a browse session with the dispatcher.

Input parameters

BROWSE_TOKEN is the token identifying the browse session to be ended.

Output parameters

RESPONSE is the dispatcher's response to the call. It can have any one of these values:

OK|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is INVALID. It has this value:

INVALID_BROWSE_TOKEN

DSBR gate, GET_NEXT function

The GET_NEXT function of DSBR gate returns information about the next task.

Input parameters

BROWSE_TOKEN is the token identifying the browse session.

Output parameters

TASK_TOKEN is the token by which the task is known to the dispatcher.

DOMAIN_INDEX is the 2-character index identifying the domain that made the ATTACH call for the task.

OPEN_MODES is a 32-bit string which indicates which modes of open TCBs were used by this task.

PRIORITY is the task's dispatch priority. It can have a value in the range 0 (low priority) through 255 (high priority).

TYPE is the type of task. It can have either of these values:

SYSTEM|NON_SYSTEM

STATE is the state of the task. It can have any one of these values:

READY|RUNNING|SUSPENDED

[RESOURCE_NAME] is the name of the resource that the task is waiting for, if the task is suspended.

[RESOURCE_TYPE] is the type of resource that the task is waiting for, if the task is suspended.

[RESOURCE_TIME] is the interval of time that has passed since the task last issued a suspend or wait.

USER_TOKEN is the token by which the task is known to the caller that made the ATTACH request for the task.

SUSPEND_TOKEN is the token by which the dispatcher recognizes a task to be suspended or resumed.

MODE is the mode in which the task is to run. It can have any one of these values:

```
CO (concurrent)
FO (file-owning)
J8 (JVM key 8)
L8 (open key 8)
QR (quasi-reentrant)
RO (resource-owning)
RP (ONC/RPC-owning)
SL (sockets listener)
SO (sockets)
SZ (secondary LU usage)
S8 (secure sockets key 8)
```

RESPONSE is the dispatcher's response to the call. It can have any one of these values:

OK|DISASTER|EXCEPTION|INVALID|KERNERROR

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	END or INVALID_BROWSE_TOKEN

DSBR gate, INQUIRE_TASK function

The INQUIRE_TASK function of DSBR gate returns information about a specified task.

Input parameters

INPUT_TASK_TOKEN is the token for the task to be inquired on.

Output parameters

TASK_TOKEN is the token by which the task is known to the dispatcher.

DOMAIN_INDEX is the 2-character index identifying the domain that made the ATTACH call for the task.

OPEN_MODES is a 32-bit string which indicates which modes of open TCBs were used by this task.

PRIORITY is the task's dispatch priority. It can have a value in the range 0 (low priority) through 255 (high priority).

TYPE is the type of task. It can have either of these values:

SYSTEM|NON_SYSTEM

STATE is the state of the task. It can have any one of these values:

READY|RUNNING|SUSPENDED

[RESOURCE_NAME] is the name of the resource that the task is waiting for, if the task is suspended.

[RESOURCE_TYPE] is the type of resource that the task is waiting for, if the task is suspended.

[RESOURCE_TIME] is the interval of time that has passed since the task last issued a suspend or wait.

USER_TOKEN is the token by which the task is known to the caller that made the ATTACH request for the task.

SUSPEND_TOKEN is the token by which the dispatcher recognizes a task to be suspended or resumed.

MODE is the mode in which the task is to run. It can have any one of these values:

```
CO (concurrent)
FO (file-owning)
J8 (JVM key 8)
L8 (open key 8)
QR (quasi-reentrant)
RO (resource-owning)
RP (ONC/RPC-owning)
SL (sockets listener)
SO (sockets)
SZ (secondary LU usage)
S8 (secure sockets key 8)
```

RESPONSE is the dispatcher's response to the call. It can have any one of these values:

```
OK|DISASTER|EXCEPTION|INVALID|KERNERROR
```

[REASON] is returned when RESPONSE is INVALID. It has this value:

```
INVALID_TASK_TOKEN
```

DSBR gate, SET_TASK function

The SET_TASK function of DSBR gate marks the task as "unclean" so that open TCBs will be freed at task termination.

Input parameters

CLEANLINESS specifies that the task is to marked "unclean". It can take only the value UNCLEAN

DSIT gate, INQUIRE_DISPATCHER function

The INQUIRE_DISPATCHER function of DSIT gate returns information about the current state of the dispatcher.

Input parameters: None.

Output parameters

[NUMBER_OF_SUBTASKS] is the number of subtasks for concurrent mode.

[SCAN_DELAY_INTERVAL] is the delay before terminal control is dispatched after a terminal is posted by the access method.

[MAXIMUM_WAIT_INTERVAL] is the maximum delay before terminal control is dispatched.

[PRIORITY_MULTIPLIER] determines how the priority of new tasks is to be penalized in 'storage getting short' and 'storage critical' situations.

[QR_BATCHING_VALUE] is the number of POSTs for BATCH=YES waits in quasi-reentrant mode.

[MAXOPENTCBS] is the current maximum number of Open TCBs allowed.

[ACTOPENTCBS] is the number of Open TCBs being used by current tasks.

[RP_TCB_ATTACHED] indicates whether or not the RP TCB is attached. It can have either of these values:

```
YES|NO
```

[SZ_TCB_ATTACHED] indicates whether or not the SZ TCB is attached. It can have either of these values:

```
YES|NO
```

RESPONSE is the dispatcher's response to the call. It can have either of these values:

```
OK|DISASTER
```

DSIT gate, SET_DISPATCHER function

The SET_DISPATCHER function of DSIT gate sets the state of the dispatcher.

Input parameters

[NUMBER_OF_SUBTASKS] is the number of subtasks for concurrent mode.

[SCAN_DELAY_INTERVAL] is the delay before terminal control is dispatched after a terminal is posted by the access method.

[MAXIMUM_WAIT_INTERVAL] is the maximum delay before terminal control is dispatched.

[PRIORITY_MULTIPLIER] determines how quickly a task's priority increases as it waits to be dispatched. The faster it increases the less likely a low priority task is to be held up for long periods by higher priority tasks in a busy system.

[QR_BATCHING_VALUE] is the number of POSTs for BATCH=YES waits in quasi reentrant mode.

[MAXOPENTCBS] is the maximum number of Open TCBs CICS will allow to exist.

Output parameters

RESPONSE is the dispatcher's response to the call. It can be any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	MAXWAIT_LESSTHAN_SCANDELAY, MAXOPENTCBS_OUT_OF_RANGE

DSIT gate, ACTIVATE_MODE function

The ACTIVATE_MODE function creates a mode to which TCBs can be added (by ADD_TCB) so that tasks can CHANGE_MODE to the TCBs.

Input parameters

[MODE] is the mode to be activated. MODE and MODENAME are mutually exclusive but one must be specified. Mode is a single byte whose values correspond to the pre 1.3 modes QR, RO, FO, CO, SZ and RP.

[MODENAME] is the eight character string that becomes the block name of the sub dispatcher block created by ACTIVATE_MODE.

[IDENTITY] is the name of the mode to be activated. It is a two byte character string.

[EXEC_CAPABLE] indicates whether TCBs in this mode are to be set up to support the use of EXEC CICS commands by code running on them.

[LE_ENVIRONMENT] indicates whether LE is to run in native MVS mode or in CICS mode on TCBs in this mode.

[TCB_KEY] indicates the key to be specified on ATTACHes of TCBs in this mode.

[INHERIT_SUBSPACE] indicates whether TCBs in this mode will be able to run application code in a subspace.

[ESSENTIAL_TCB] indicates whether CICS is to be brought down if a TCB in this mode suffers a non recoverable abend.

[PRTY_RELATIVE_TO_QR] allows TCBs in this mode to have a different priority to that of the QR TCB.

[MULTIPLE_TCBS] indicates whether this mode allows more than one TCB.

[OPEN] indicates whether TCBs in this mode are to be managed by the Dispatcher domain as "Open TCBs".

Output parameters

[MODENAME_TOKEN] is a token that identifies this modename.

RESPONSE is the dispatcher's response to the call. It can be any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	MODE_ALREADY_ACTIVE, INSUFFICIENT_STORAGE, MODENAME_ALREADY_ACTIVE, RESERVED_MODENAME, MODE_LIMIT_REACHED

DSIT gate, ADD_TCB function

The ADD_TCB function adds a TCB to a particular mode.

Input parameters

[MODENAME] specifies the name of the mode the TCB is to be added to. MODENAME and MODENAME_TOKEN are mutually exclusive but one of them must be coded.

[MODENAME_TOKEN] identifies mode the TCB is to be added by using the token returned by the ACTIVATE_MODE.

[IDENTITY] is an eight character string to placed in the Dispatcher's block that represents the TCB.

Output parameters

[TCB_TOKEN] is a token that uniquely idenifies this TCB.

RESPONSE is the dispatcher's response to the call. It can be any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INSUFFICIENT_STORAGE, RESERVED_MODENAME

DSIT gate, DELETE_TCB function

The DELETE_TCB function is used by the caller to tell the Dispatcher that the TCB is to be shutdown and that the associated control blocks can be freed. If an attempt is made to shut down an essential TCB, an EXCEPTION response is returned with a reason of NOT_SUPPORTED.

NB no quiescing of tasks on the TCB is performed.

Input parameters

[TCB_TOKEN] is a token that uniquely identifies the TCB.

Output parameters

RESPONSE is the dispatcher's response to the call. It can be any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_SUPPORTED

DSIT gate, FREE_TCB function

The FREE_TCB function is issued by the Kernel and tells the Dispatcher that a given TCB has terminated and been DETACHed.

Input parameters

[TCB_TOKEN] is a token that uniquely identifies the TCB.

Output parameters

RESPONSE is the dispatcher's response to the call. It can be any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	TASK_NOT_TERMINATED

DSIT gate, PROCESS_DEAD_TCBS function

The PROCESS_DEAD_TCBS function is issued by the SM system task each time it runs to tell the Dispatcher to process any TCBs it finds on its dead TCB chain. Such TCBs will be in an MVS WAIT issued by their ESTAE exit after suffering a non recoverable abend.

Input parameters: NONE

Output parameters

RESPONSE is the dispatcher's response to the call. It can be any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR
```

DSSR gate, ADD_SUSPEND function

The ADD_SUSPEND function of DSSR gate returns a suspend token which is used to identify a task to be suspended or resumed.

Input parameters

[RESOURCE_NAME] is the name of the resource that the task is suspended on.

[RESOURCE_TYPE] is the type of resource that the task is suspended on.

Output parameters

SUSPEND_TOKEN is the token that is used to identify the task to be suspended or resumed.

RESPONSE is the dispatcher's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR
```

[REASON] is returned when RESPONSE is DISASTER. It has this value:

```
INSUFFICIENT_STORAGE
```

DSSR gate, DELETE_SUSPEND function

The DELETE_SUSPEND function of DSSR gate discards a suspend token.

Input parameters

SUSPEND_TOKEN is the suspend token to be deleted.

Output parameters

RESPONSE is the dispatcher's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR
```

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_SUSPEND_TOKEN, SUSPEND_TOKEN_IN_USE

DSSR gate, INQUIRE_SUSPEND_TOKEN function

The INQUIRE_SUSPEND_TOKEN function of DSSR gate can be used to obtain the default suspend token for a task.

Input parameters: None.

Output parameters

SUSPEND_TOKEN is the default suspend token for a task.

RESPONSE is the dispatcher's response to the call. It can have either of these values:

OK|DISASTER

DSSR gate, SUSPEND function

The SUSPEND function of DSSR gate causes a running task to be suspended.

Input parameters

Note: [INTERVAL] and [DEADLOCK_ACTION] are ***mutually exclusive*** parameters.

SUSPEND_TOKEN is the token identifying the task to be suspended.

PURGEABLE is the purgeable status of the task. It can have either of these values:

YES|NO

[INTERVAL] is an interval (in units as specified by TIME_UNIT) after which the task is given back control if it has not been resumed by a DSSR RESUME call.

[DEADLOCK_ACTION] describes whether the suspended task should be purged if deadlock is detected, and if so, how it should be purged. It can have any one of these values:

DELAYED|IMMEDIATE|INHIBIT

[RESOURCE_NAME] is the name of the resource that the task is suspended on.

[RESOURCE_TYPE] is the type of resource that the task is suspended on.

[TIME_UNIT] identifies the time units specified on the INTERVAL and DELAY parameters where present. It can have either of these values:

SECOND|MILLI_SECOND

[DELAY] is an interval (in units as specified by TIME_UNIT) during which the task is not dispatched if CICS has other work to do.

[RETRY] indicates whether or not the dispatcher is to retry the suspend operation, if the running task is not suspended by a preceding suspend operation. It can have either of these values:

YES|NO

[WLM_WAIT_TYPE] indicates the reasonfor task's wait state to the MVS workload manager. It can have any of these values:

LOCK|IO|CONV|CMDRESP|DISTRIB|
SESS_LOCALMVS|SESS_NETWORK|
SESS_SYSPLEX|TIMER|OTHER_PRODUCT|
MISC|IDLE

Output parameters

[COMPLETION_CODE] is a completion code supplied by the resumed task.

RESPONSE is the dispatcher's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|
KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID or PURGED. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_SUSPEND_TOKEN, ALREADY_SUSPENDED, CLEAN_UP_PENDING
PURGED	TASK_CANCELLED, TIMED_OUT

DSSR gate, RESUME function

The RESUME function of DSSR gate causes a suspended task to be resumed.

Input parameters

SUSPEND_TOKEN is the token identifying the task to be resumed.

[COMPLETION_CODE] is a completion code to be passed from the resumed task to the suspended task.

Output parameters

RESPONSE is the dispatcher's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|
KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	TASK_CANCELLED, TIMED_OUT
INVALID	INVALID_SUSPEND_TOKEN, ALREADY_RESUMED

DSSR gate, WAIT_MVS function

The WAIT_MVS function of DSSR gate causes a task to wait on an ECB, or list of ECBs, to be posted via the MVS POST service.

Input parameters

Note: ECB_ADDRESS and ECB_LIST_ADDRESS are ***mutually exclusive*** parameters; [INTERVAL] and [DEADLOCK_ACTION] are also ***mutually exclusive***.

ECB_ADDRESS is the address of the ECB for the task.

ECB_LIST_ADDRESS is the address of a list of ECBs for the task.

PURGEABLE is the purgeable status of the task. It can have either of these values:

`YES|NO`

[INTERVAL] is an interval (in units as specified by TIME_UNIT) after which the task is given back control if it has not been resumed by a DSSR RESUME call.

[DEADLOCK_ACTION] describes whether the suspended task should be purged if deadlock is detected, and if so, how it should be purged. It can have any one of these values:

`DELAYED|IMMEDIATE|INHIBIT`

[RESOURCE_NAME] is the name of the resource that the task is suspended on.

[RESOURCE_TYPE] is the type of resource that the task is suspended on.

[BATCH] states whether requests are to be batched. It can have either of these values:

`YES|NO`

[TIME_UNIT] identifies the time units specified on the INTERVAL and DELAY parameters where present. It can have either of these values:

`SECOND|MILLI_SECOND`

[DELAY] is an interval (in units as specified by TIME_UNIT) during which the task is not dispatched if CICS has other work to do.

[RETRY] indicates whether or not the dispatcher is to retry the suspend operation, if the running task is not suspended by a preceding suspend operation. It can have either of these values:

`YES|NO`

[WLM_WAIT_TYPE] indicates the reasonfor task's wait state to the MVS workload manager. It can have any of these values:

```
LOCK|IO|CONV|CMDRESP|DISTRIB|
SESS_LOCALMVS|SESS_NETWORK|
SESS_SYSPLEX|TIMER|OTHER_PRODUCT|
MISC|IDLE
```

Output parameters

RESPONSE is the dispatcher's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|
KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is INVALID or PURGED. Possible values are:

RESPONSE	Possible REASON values
INVALID	ALREADY_WAITING, INVALID_ECB_ADDR
PURGED	TASK_CANCELLED, TIMED_OUT

DSSR gate, WAIT_OLDW function

The WAIT_OLDW function of DSSR gate causes a task to wait on an ECB, or list of ECBs, that may be posted via the MVS POST service or by setting the POST bit (`X'40'` in the first byte). This is supported only in QR mode.

Input parameters

Note: ECB_ADDRESS and ECB_LIST_ADDRESS are ***mutually exclusive*** parameters; [INTERVAL] and [DEADLOCK_ACTION] are also ***mutually exclusive***.

ECB_ADDRESS is the address of the ECB for the task.

ECB_LIST_ADDRESS is the address of a list of ECBs for the task.

PURGEABLE is the purgeable status of the task. It can have either of these values:

`YES|NO`

[INTERVAL] is an interval (in units as specified by TIME_UNIT) after which the task is given back control if it has not been resumed by a DSSR RESUME call.

[DEADLOCK_ACTION] describes whether the suspended task should be purged if deadlock is detected, and if so, how it should be purged. It can have any one of these values:

`DELAYED|IMMEDIATE|INHIBIT`

[RESOURCE_NAME] is the name of the resource that the task is suspended on.

[RESOURCE_TYPE] is the type of resource that the task is suspended on.

[SPECIAL_TYPE(CSTP)] identifies the special task CSTP.

[TIME_UNIT] identifies the time units specified on the INTERVAL and DELAY parameters where present. It can have either of these values:

`SECOND|MILLI_SECOND`

[DELAY] is an interval (in units as specified by TIME_UNIT) during which the task is not dispatched if CICS has other work to do.

[RETRY] indicates whether or not the dispatcher is to retry the suspend operation, if the running task is not suspended by a preceding suspend operation. It can have either of these values:

YES|NO

[WLM_WAIT_TYPE] indicates the reason for task's wait state to the MVS workload manager. It can have any of these values:

LOCK|IO|CONV|CMDRESP|DISTRIB|
SESS_LOCALMVS|SESS_NETWORK|
SESS_SYSPLEX|TIMER|OTHER_PRODUCT|
MISC|IDLE

Output parameters

RESPONSE is the dispatcher's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|
KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID or PURGED. Possible values are:

RESPONSE	Possible REASON values
PURGED	TASK_CANCELLED, TIMED_OUT
INVALID	ALREADY_WAITING, INVALID_ECB_ADDR, INVALID_MODE

DSSR gate, WAIT_OLDC function

The WAIT_OLDC function of DSSR gate causes a task to wait on an ECB that must be posted by setting the X'40' bit rather than via the MVS POST service. This is supported only in QR mode.

Input parameters

Note: [INTERVAL] and [DEADLOCK_ACTION] are ***mutually exclusive*** parameters.

ECB_ADDRESS is the address of the ECB for the task.

PURGEABLE is the purgeable status of the task. It can have either of these values:

YES|NO

[INTERVAL]
is an interval (in units as specified by TIME_UNIT) after which the task is given back control if it has not been resumed by a DSSR RESUME call.

[DEADLOCK_ACTION] describes whether the suspended task should be purged if deadlock is detected, and if so, how it should be purged. It can have any one of these values:

DELAYED|IMMEDIATE|INHIBIT

[RESOURCE_NAME] is the name of the resource that the task is suspended on.

[RESOURCE_TYPE] is the type of resource that the task is suspended on.

[TIME_UNIT] identifies the time units specified on the INTERVAL and DELAY parameters where present. It can have either of these values:

SECOND|MILLI_SECOND

[DELAY] is an interval (in units as specified by TIME_UNIT) during which the task is not dispatched if CICS has other work to do.

[RETRY] indicates whether or not the dispatcher is to retry the suspend operation, if the running task is not suspended by a preceding suspend operation. It can have either of these values:

YES|NO

[WLM_WAIT_TYPE] indicates the reason for task's wait state to the MVS workload manager. It can have any of these values:

LOCK|IO|CONV|CMDRESP|DISTRIB|
SESS_LOCALMVS|SESS_NETWORK|
SESS_SYSPLEX|TIMER|OTHER_PRODUCT|
MISC|IDLE

Output parameters

RESPONSE is the dispatcher's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|
KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID or PURGED. Possible values are:

RESPONSE	Possible REASON values
INVALID	ALREADY_WAITING, INVALID_ECB_ADDR, INVALID_MODE
PURGED	TASK_CANCELLED, TIMED_OUT

Dispatcher domain's generic gates

Table 38 summarizes the dispatcher domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 38 (Page 1 of 2). Dispatcher domain's generic gates

Gate	Trace	Function	Format
DMDM	DS 0006 DS 0007	PRE_INITIALISE INITIALISE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
KEDS	DS 0012 DS 0013	TCB_REPLY TASK_REPLY	KEDS

Table 38 (Page 2 of 2). Dispatcher domain's generic gates

Gate	Trace	Function	Format
SMNT	DS 0145 DS 0113	STORAGE_NOTIFY	SMNT
STST	DS 0020 DS 0021	COLLECT_STATISTICS COLLECT_RESOURCE_STATS	STST
APUE	DS 0121 DS 0122	SET_EXIT_STATUS	APUE

For descriptions of these functions and their input and output parameters, you need to refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format APUE—"Application domain's generic formats" on page 42

Format DMDM—"Domain manager domain's generic formats" on page 195

Format KEDS—"Kernel domain's generic formats" on page 368

Format STST—"Statistics domain's generic format" on page 521

Format SMNT—"Storage manager domain's generic format" on page 536

In preinitialization processing, the dispatcher domain sets the initial dispatching options:

- The priority aging value (PRTYAGE)
- Whether or not tasks are to be run in concurrent mode (SUBTSKS)
- The terminal scan delay interval (ICVTSD)
- The region exit time (ICV).

For a cold start, the information comes from the system initialization parameters (given in parentheses); for any other type of start, the information comes from the local catalog, but is then modified by any relevant system initialization parameters.

Dispatcher domain's generic formats

Table 39 describes the generic formats owned by the dispatcher domain and shows the functions performed on the calls.

Table 39. Generic formats owned by dispatcher domain

Format	Calling module	Function
DSAT	DFHDSKE DFHDSDS4	TASK_REPLY PURGE_INHIBIT_QUERY

In the descriptions of the formats that follow, the "input" parameters are input not to the dispatcher, but to the domain being called by the dispatcher. Similarly, the "output" parameters are output by the domain that was called by the dispatcher, in response to the call.

DSAT format, TASK_REPLY function

The TASK_REPLY function of DSAT format is used to notify the domain that attached a task that the task has had its first dispatch.

Input parameters

USER_TOKEN is the token by which the task that has been dispatched is known to the called domain.

TASK_TOKEN is the token by which the task that has been dispatched is known to the dispatcher.

SUSPEND_TOKEN is the suspend token that the task can be suspended against by default.

Output parameters

RESPONSE is the called domain's response to the call. It can have any one of these values:

`OK|DISASTER|INVALID|KERNERROR`

DSAT format, PURGE_INHIBIT_QUERY function

The PURGE_INHIBIT_QUERY function of DSAT format is used by the dispatcher to see if a task selected for purge can be purged. Its main purpose is to find out from the AP domain whether the task is currently purgeable by the system.

Input parameters

USER_TOKEN is the token by which the task that has been dispatched is known to the called domain.

TASK_TOKEN is the token by which the task that has been dispatched is known to the dispatcher.

Output parameters

PURGE_INHIBITED_RESPONSE states whether the task can be purged. It can have either of these values:

`YES|NO`

RESPONSE always has the value OK.

Modules

Module	Function
DFHDSAT	Receives calls to the dispatcher DSAT gate. This gate carries out such work as: ATTACH—Create new task CHANGE_MODE—Change mode of running task CHANGE_PRIORITY—Change priority of running task and release control SET_PRIORITY—Change priority of running task or other task and keep running CANCEL_TASK—Cancel specified task.

Module	Function
DFHDSBR	Handles the following requests: START_BROWSE GET_NEXT END_BROWSE INQUIRE_TASK
DFHDSDM	Handles the following dispatcher requests: DMDM PRE_INITIALISE DMDM INITIALISE_DOMAIN DMDM QUIESCE_DOMAIN DMDM TERMINATE_DOMAIN
DFHDSIT	Handles the following dispatcher requests: INQUIRE_DISPATCHER SET_DISPATCHER
DFHDSKE	Handles kernel DS requirements, and handles the following requests: KEDS TCB_REPLY KEDS TASK_REPLY
DFHDSSM	Receives the STORAGE_NOTIFY call from the storage manager domain.
DFHDSSR	Handles the following requests: ADD_SUSPEND DELETE_SUSPEND INQUIRE_SUSPEND_TOKEN SUSPEND RESUME WAIT_MVS WAIT_OLDW WAIT_OLDC
DFHDSST	Receives statistics calls from the ST domain
DFHDSUE	Receives the user exit gate call from the AP domain

Exits

There are two global user exit points in the dispatcher domain: XDSAWT and XDSBWT. For further information about these, see the *CICS Customization Guide*.

Trace

The point IDs for the dispatcher domain are of the form DS xxxx; the corresponding trace levels are DS 1, DS 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 23. Distributed program link

Distributed program link enables a program (the **client program**) in one CICS region to issue an EXEC CICS LINK command to link to a program (the **server program**) running in another CICS region (the **resource region**). The link can be through intermediate CICS regions.

The communication in distributed program link processing is, from the CICS side, synchronous, which means that it occurs during a single invocation of the client program, and that requests and replies between two programs can be directly correlated.

The *CICS Intercommunication Guide* includes information about distributed program link processing. Guidance information about designing and developing distributed applications is given in the *CICS Distributed Transaction Programming Guide*.

Figure 42 gives an overview of distributed program link operation.

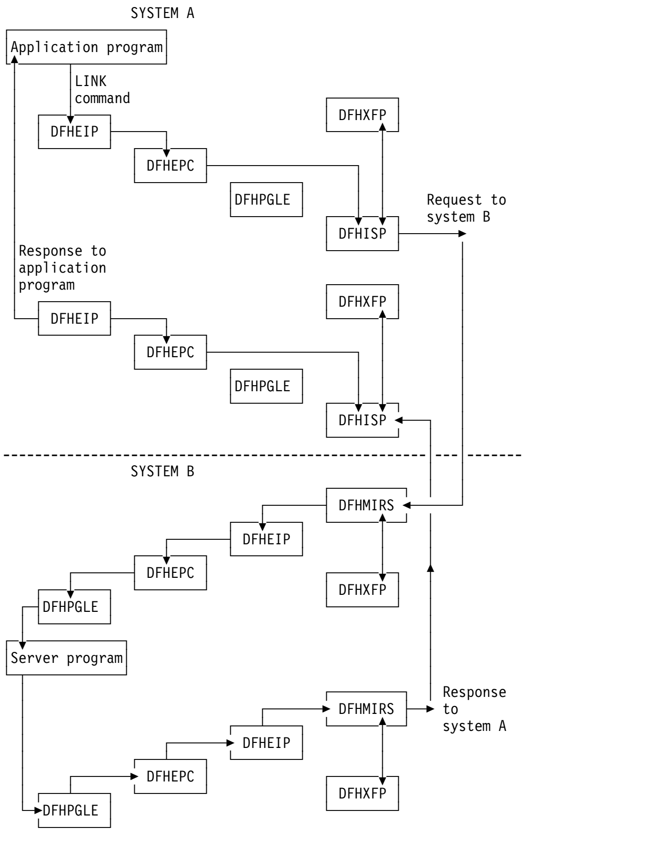


Figure 42. Overview of program link

The DFHEIP module is described in Chapter 33, “EXEC interface” on page 241. This routes all program control requests to DFHEPC. DFHEPC passes all remote LINK requests to the program manager domain (PGLE_LINK_EXEC request). For local programs, program manager links to the program and, on return, it returns to DFHEPC. For remote programs, program manager returns to DFHEPC with and exception response, with a reason code indicating “remote program”, and DFHEPC passes the request to the intersystems program, DFHISP. The operation of DFHISP for distributed program link is the same as for function shipping, but only the DFHXFP transformations are used. (See Chapter 40, “Function shipping” on page 333.) The operation of DFHPEP is described in Chapter 59, “Program control” on page 433; the interface to DFHPGLE LINK_EXEC is described in Chapter 61, “Program manager domain (PG)” on page 437.

CICS handles session failures and systems failures for distributed program link processing by returning a TERMERR condition to the program that issued the LINK request.

If the server program terminates abnormally and does not handle the abend itself, DFHMIRS returns the abend code to the program that issued the LINK request. This code is the last abend code to occur in the server program, which may have handled other abends before terminating.

A client program using distributed program link can specify that a SYNCPOINT is to be taken in the resource region on successful completion of the server program. That is, any resources updated by the server program (or any associated program) are treated as if they are a separate unit of work.

Modules

The following modules are involved in the distributed program link:

DFHEIP EXEC interface (see Chapter 33, “EXEC interface” on page 241)

DFHEPC DFHEIP program control interface (see Chapter 59, “Program control” on page 433)

DFHISP ISC converse (see Chapter 40, “Function shipping” on page 333)

DFHMIRS Mirror transaction (see Chapter 40, “Function shipping” on page 333)

DFHPGLE PG domain - link exec function (see Chapter 61, “Program manager domain (PG)” on page 437)

DFHXFP Online data transformation program (see page 880)

Exits

There are two global user exit points in DFHEPC: XPCREQ and XPCREQC.

Trace

No trace points are provided for this function.

Chapter 24. Distributed transaction processing

Distributed transaction processing enables a CICS transaction to communicate with a transaction running in another system. The transactions are designed and coded explicitly to communicate with each other, and thereby to use the intersystem link with maximum efficiency.

The communication in distributed transaction processing is, from the CICS side, synchronous, which means that it occurs during a single invocation of the CICS transaction and that requests and replies between two transactions can be directly correlated.

The *CICS Intercommunication Guide* tells you about multiregion operation and intersystem communication, and also includes some information about distributed transaction processing. Guidance information about designing and developing distributed applications is given in the *CICS Distributed Transaction Programming Guide*.

Design overview

CICS handles session failures and systems failures for distributed transaction processing in the same way as for CICS function shipping. See the relevant sections in Chapter 40, "Function shipping" on page 333 for further information.

Distributed transaction processing with MRO and LU6.1

Figure 43 gives an overview of the modules involved with distributed transaction processing for MRO and LU6.1 ISC.

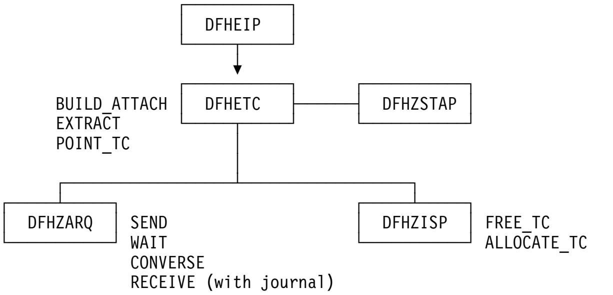


Figure 43. Distributed transaction processing for MRO and LU6.1

The DFHEIP module is described in Chapter 33, "EXEC interface" on page 241. This routes all terminal control requests to DFHETC. DFHETC handles BUILD_ATTACH, EXTRACT, and POINT_TC requests itself, and routes all other requests to DFHZARQ except for FREE_TC and ALLOCATE_TC requests, which are routed to DFHZISP. If the request requires that the user conversation state be returned, DFHETC calls DFHZSTAP. All these modules are described in detail under "Modules" on page 172.

Mapped and unmapped conversations (LU6.2)

In **mapped** conversations, the data passed to and received from the LU6.2 application programming interface (API) is simply user data. Mapped conversations use the normal CICS API. Application programs and function shipping requests written for LU6.1 operate using mapped conversations when transferred to LU6.2.

Figure 44 gives an overview of the modules involved with the processing of mapped conversations in LU6.2. ISC.

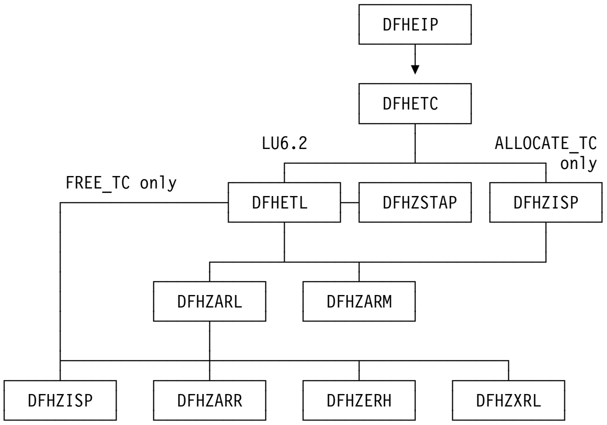


Figure 44. Distributed transaction processing for mapped conversations in LU6.2

The DFHEIP module is described in Chapter 33, "EXEC interface" on page 241. This routes all terminal control requests to DFHETC. DFHETC routes all requests relating to an LU6.2 session to DFHETL except for ALLOCATE_TC requests, which are routed to DFHZISP.

In turn, DFHETL calls DFHZARL to process most requests; it calls DFHZISP to handle FREE_TC requests, and DFHZARM to handle the receipt of unrecognized or unsupported IDs. If the request requires that the user conversation state be returned, DFHETL calls DFHZSTAP.

DFHZARL's processing depends on the type of request; for example, it calls DFHZISP to allocate a TCTTE, DFHZARR to receive data, and DFHZERH for outbound or inbound FMH7 processing. If the request needs to be transaction routed, DFHZARL calls DFHZXRL to route the request to the terminal-owning region (see Chapter 95, "Transaction routing" on page 653).

With the exception of DFHZXRL, all these modules are described in detail under "Modules" on page 172.

Unmapped conversations (also known as **basic** conversations), are used principally for communication with device-level products that do not support mapped conversations, and which possibly do not have an API open to the user. In unmapped conversations, the data passed to and received from the LU6.2 API contains GDS headers.

Figure 45 gives an overview of the modules involved with the processing of unmapped conversations in LU6.2 ISC.

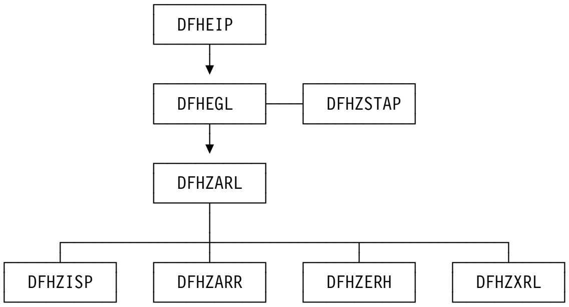


Figure 45. Distributed transaction processing for unmapped conversations in LU6.2

The DFHEIP module is described in Chapter 33, "EXEC interface" on page 241. This passes control to DFHEGL to process GDS commands. DFHEGL routes all GDS conversation-related commands directly to DFHZARL. Some validation of application-provided parameters is performed, and errors are reflected back to the application. If the request requires that the user conversation state be returned, DFHEGL calls DFHZSTAP.

DFHZARL's processing depends on the type of request; for example, it calls DFHZISP to allocate a TCTTE, DFHZARR to receive data, and DFHZERH for outbound or inbound FMH7 processing. If the request needs to be transaction routed, DFHZARL calls DFHZXRL to route the request to the terminal-owning region (see Chapter 95, "Transaction routing" on page 653).

With the exception of DFHZXRL, all these modules are described in detail in the next section.

Modules

DFHEGL

DFHEGL processes GDS commands. It is an EXEC interface processor module, and receives control directly from DFHEIP. The TCTTE for the session is located and checked for validity. All GDS conversation-related commands are mapped into a DFHLUC macro call and routed directly to DFHZARL. There is no mapping or unmapping of data, state indicators are not maintained, and there are no FMHs to process.

DFHETC and DFHETL

DFHEIP routes all terminal control requests to DFHETC (the EXEC interface processor for terminal control). DFHETC handles BUILD_ATTACH, EXTRACT, and POINT_TC requests itself. It routes all other requests relating to an MRO or LU6.1 session to DFHZARQ except for FREE_TC and ALLOCATE_TC requests, which are routed to DFHZISP. It routes all other requests relating to an LU6.2 session to DFHETL except for ALLOCATE_TC, which is routed to DFHZISP.

DFHETL performs the following actions:

1. Maps an application request into a form suitable for the DFHZCP and DFHZCC application request modules. This includes mapping application data into GDS records.
2. Detects errors and returns error codes to the application.
3. Unmaps data from GDS records.
4. Maintains state indicators.

For ISSUE CONFIRMATION, CONNECT PROCESS, EXTRACT PROCESS, ISSUE ERROR, ISSUE ABEND, and ISSUE SIGNAL commands, DFHETL:

1. Maps application requests into DFHLUC macro calls.
2. Updates state indicators in the TCTTE (for example, the TCTTE indicator that shows that a CONNECT PROCESS command has been issued).

For SEND and CONVERSE commands, DFHETL:

1. Obtains storage for the processing of outbound application data.
2. Creates attach FMHs, if appropriate.
3. Calls DFHZARL to transmit data.

For RECEIVE commands, DFHETL:

1. Obtains storage for the processing of inbound data.
2. Calls DFHZARL to receive inbound data.
3. Extracts inbound FMHs, as appropriate.
4. Unmaps inbound data.
5. Validates LLs and rejects them if not valid.
6. Manages the passing of data back to the application.
7. If the application issues a RECEIVE NOTRUNCATE request in order to receive only part of the chain, retains the residual data for subsequent RECEIVE requests. DFHETL receives one complete chain of data at a time from DFHZARL.

For WAIT commands, DFHETL calls DFHZARL.

For FREE commands, DFHETL:

1. Checks that the terminal is in the correct state to be freed.

2. Frees the storage used to hold RECEIVE data and the ETCB.
3. Calls DFHZISP to free the session.

DFHZARL

DFHZARL is always invoked via the DFHLUC macro. The DFHLUCDS DSECT maps a parameter list that is set up to pass information to and return information from DFHZARL. DFHZARL manages data in buffers, not in TIOAs. SEND commands cause data to be assembled by DFHZARL into a buffer until a WAIT, or other event, causes the data in the buffer to be transmitted.

DFHZARL invokes DFHZSDL to send data to VTAM, by placing requests on the activate chain. However, for optimization, DFHZARL can invoke DFHZSDL directly. Receive requests are handled by DFHZARR.

DFHZARL invokes DFHZUSR to manage the conversation state. The LU6.2 states for each session are stored in the TCTTE for that session.

If the request needs to be transaction routed, DFHZARL calls DFHZXRL to route the request to the terminal-owning region (see Chapter 95, "Transaction routing" on page 653).

Details of DFHZARL's processing for the principal functions of the DFHLUC macro that is used to invoke DFHZARL are given below.

INITIAL_CALL function: This function is requested by DFHZSUP. DFHZARL acquires LU6.2 send and receive buffers. If the transaction is being started as a result of an ATTACH request received from a remote system, DFHZARL transfers any data received with the attach header from the TIOA into the receive buffer.

ALLOCATE function: DFHZARL performs the following actions:

1. If the request passed the address of a profile entry, puts this address in the TCA. If the request passed the name of a profile, calls transaction manager to locate the entry and then puts the address of the entry in the TCA.
2. If the request passed a netname rather than a specific sysid, calls DFHZLOC to locate the TCTTE for the netname and then puts the sysid into the DFHLUC parameter list (as if the caller had the specified sysid).
3. Copies the DFHLUC parameter list to LIFO storage.
4. Calls DFHZISP to allocate a TCTTE.
5. Addresses the TCTTE allocated.
6. Acquires LU6.2 send and receive buffers.
7. Sets the user state machine (DFHZUSRM), request=ALLOCATE_RESOURCE.
8. Returns results to the caller.

SEND function: DFHZARL performs the following actions:

1. Checks the user state machine (DFHZUSRM).
2. Checks the LL count and maintains a record of the outstanding LL count.
3. If the command is SEND LAST, INVITE, or CONFIRM, and the outstanding LL count is nonzero, issues an error message.
4. Sets the user state machine (DFHZUSRM).
5. Issues RECEIVE IMMEDIATE requests, as required, to pick up any negative responses sent by the partner program.

The caller must specify WAIT in the request to force the data to be sent immediately. SEND CONFIRM has an implicit WAIT, and control is not returned until a response has been received, when the state machine is set.

For a SEND request with WAIT, DFHZARL then:

1. Sets the user state machine (DFHZUSRM), request=WAIT.
2. Invokes DFHZSDL for transmission of the data in application area or send buffer.

For a SEND request without WAIT, DFHZARL then:

1. If there is sufficient space in the send buffer for all the data, transfers the data from the application area to the send buffer, and returns control to the caller.
2. Saves the INVITE and LAST indicators.
3. If the send buffer cannot hold all the data, invokes DFHZSDL for an implicit SEND.

If data or a CONFIRM command was sent (or both), DFHZARL then:

1. Checks for a signal received.
2. Checks for exception (negative) response received. If found, calls DFHZERH to handle the error. On return, sets the state machine.
3. Returns results to the caller.

When an implicit send is required, DFHZARL passes the data to DFHZSDL for transmission, passing the address of the data in the send buffer and in the application buffer. The total length of data passed to DFHZSDL is a multiple of the request unit size. On return to DFHZARL, the remaining data is transferred to the send buffer.
The parameters passed to DFHZARL, such as INVITE and LAST, are not transmitted by DFHZSDL.

RECEIVE function: DFHZARL passes the DFHLUC parameter list, specifying the type of receive required, to DFHZARR for processing (see "DFHZARR" on page 175).

ISSUE ERROR or ABEND function: DFHZARL is called as a result of an ISSUE ERROR or ISSUE ABEND command, and performs the following actions:

1. Sets the user state machine
2. Calls DFHZERH.

DFHZARM

DFHETL may invoke DFHZARM to provide service functions. DFHZARQ passes control to DFHZARM instead of initiating DFHZSDS, DFHZRVS, and so on, if DFHZARQ finds that it is an LU6.2 session. This applies to the SEND, WAIT, RECEIVE, and SIGNAL commands. The same applies to DFHZISP for the FREE command.

DFHZARM translates the data stream to and from a format suitable for invoking DFHZARL. In particular:

- An LU6.2 attach FMH may have to be requested.
- Data must be passed in GDS record format (structured fields preceded by an LLID).

DFHZARM is invoked via the DFHLUCM macro, which has seven executable options:

DFHLUCM TYPE =
- SEND
- RECEIVE
- WAIT
- SIGNAL
- FREE
- INVALID_ID

DFHLUCM TYPE=STORAGE defines the storage in LIFO for passing primary input and output. The DSECT name is DFHLUMDS. TCTTE contains the secondary input and output. The principal functions are described in the following sections.

SEND function: DFHZARM performs the following actions:

1. Maps the data into GDS record format. The IDs used are:
   - X'12F1'
   - X'12F2'
   - X'12FF'.
2. Examines bits set in the TCTTE by DFHZARL to determine which DFC to apply.
3. Invokes DFHZARL (using a DFHLUC TYPE=SEND,LIST=... macro call) to pass the GDS records and DFC indicators.
4. Updates the state bits in TCTTE as necessary.
5. Interrogates the LU6.2 ATTACH_FMH_BUILT bit in the TCTTE, which was set by DFHZSUP or DFHETL. This bit indicates whether this is first SEND. If an LU6.2 attach header has not already been built as a result of a CONNECT PROCESS command, DFHZARM issues CONNECT_PROCESS to DFHZARL, assuming synclevel 2, before sending the data.

RECEIVE function: DFHZARM performs the following actions:

1. Calls DFHZARL using TYPE=BUFFER. Two calls are made. On the first call, the first 4 bytes (LLID) are retrieved into LIFO. These are examined and the LL is used to determine the TIOA size and to specify the length required in the second call.
2. On the second call, retrieves the remainder of the data directly into the TIOA. If the LL indicates concatenated data, a series of calls is made to retrieve all the data.

FREE function: The FREE function is used, for example, by DFHZISP to ensure that I/O has completed and CEB sent, using null data if necessary.

INVALID_ID function: The INVALID_ID function is used by DFHETL and DFHZARM itself. It handles the receipt of unrecognized or unsupported IDs. DFHZARM calls DFHZARL with ISSUE_ERROR (X'0889010x'), and sends a record with ID X'12F4' followed by the unrecognized ID. If the remote system responds, DFHZARM turns the flows around so that the local system can try again.

LU6.1 chains: An LU6.1 chain corresponds to one SEND command. LU6.2 chains are bigger, so:

- For outbound data, DFHZARM maps one SEND into one structured field (concatenated if necessary).
- For inbound data, DFHZARM retrieves one (possibly concatenated) field and calls it a chain, thus preserving compatibility.

DFHZARQ

DFHETC routes SEND, WAIT, CONVERSE, and some RECEIVE commands to DFHZARQ. RECEIVE commands are passed to DFHZARQ if input journaling is in effect. Otherwise, the call is routed to DFHZARL directly.

DFHZARQ passes control to DFHZARM instead of initiating DFHZSDS, DFHZRVS, and so on, if DFHZARQ finds that it is an LU6.2 session. This applies to the SEND, WAIT, RECEIVE, and SIGNAL commands.

Reasons for calling DFHZARQ are:

- To avoid duplication of existing code
- So that DFHZCP performs journaling of outbound data
- To perform an implicit CONNECT PROCESS if SEND or CONVERSE is the next session-related command after ALLOCATE
- To enable the SNA change direction (CD) and end bracket (EB) indicators to flow with the data.

DFHZARR

DFHZARR is called by DFHZARL to handle receive requests. Details of the processing follow.

RECEIVE function: This function must be able to handle receipt of the following:

- Application data
- FMH7s and ER1s (negative responses)
- PS_headers (Prepares, Request_commits)
- Indicators such as CD, CEB, and RQD2
- Signal.

Figure 46 gives an overview of the modules involved with the processing of receive requests. These modules are described in Chapter 106, "CICS executable modules" on page 845.

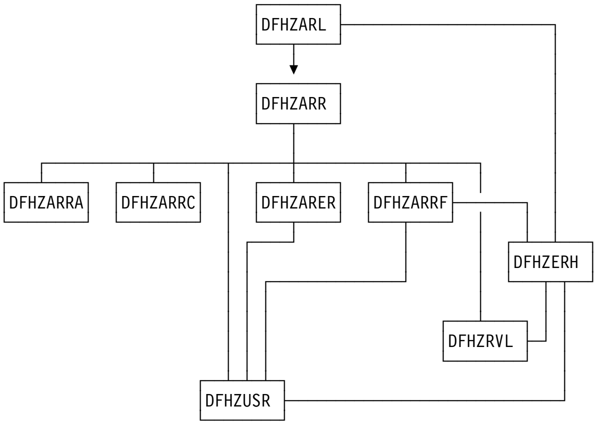


Figure 46. Distributed transaction processing of LU6.2 receive requests

DFHZARL passes the DFHLUC parameter list, specifying the type of receive required, to DFHZARR.

DFHZARR then performs the following actions:

1. Checks that request is valid; if not, returns error codes.
2. Initializes the application and LU6.2 receive buffers (by calls to DFHZARRA and the DFHZARR0 subroutine of DFHZARR respectively).
3. Calls DFHZARRC to determine what to process next.
4. Depending on DFHZARRC's response, calls the relevant subroutine.
5. If "enough" (or all that can be) has not been received, loops back to step 3; otherwise step 6.
6. Tests for (and returns) signal when it has been received.

The results of the receive are passed back to the caller in the DFHLUC parameter list.

To control this processing, DFHZARR uses the variables **receive_type** and **what_next**, as follows.

receive_type can have the following values:

RECEIVE_WAIT
Request was a receive and wait.

RECEIVE_IMMEDIATE
Request was a receive immediate.

LOOK_AHEAD
All the allowed user data has been received, but only one receive immediate call to the DFHZARR1 subroutine of DFHZARR is permitted to attempt to pick up indicators such as CD, CEB, or a PS_header.

NO_MORE_RECEIVES
No more calls to DFHZARR1 are permitted, but processing may continue with what has already been received.

NO_RECEIVE_LOOK_AHEAD
All the allowed user data has been received. An attempt must be made to pick up indicators such as CD, CEB, or a PS_header without a call to DFHZARR1. This value is only required for a receive immediate request.

RECEIVE_COMPLETE
Receive processing is finished.

The first two values are possible initial values of receive_type, and the other four are used as the receive progresses.

what_next is an output of DFHZARRC, and represents what is next to be processed. It can have the following values:

DATA_RECORD
Application data

FMH_RECORD
FMH7 in the buffer

PS_HEADER_RECORD
Prepare or Request_commit

PARTIAL_LL
First byte of a logical record only, therefore cannot tell whether it is a DATA_RECORD or PS_HEADER_RECORD

CD Change Direction

CEB Conditional End Bracket

RQD2 RQD2 without CD or CEB

RQD2_CD RQD2 with CD

RQD2_CEB
RQD2 with CEB

ER1 Negative response

EMPTY_BUFFER
Nothing available to receive.

DFHZERH

DFHZERH is called by DFHZARL or DFHZARRF, when it is required to transmit error information or when error information has been received.

Outbound errors: For outbound errors, DFHZERH is invoked by DFHZARL following an ISSUE_ERROR, ISSUE_ABEND, or SYNC_ROLLBACK request.

An FMH7 must be transmitted, but can only be transmitted if the session is in the send state.

If the session is in the receive state, DFHZERH:

1. Sends a negative response
2. Purges the remaining data to end of chain.

In all cases, DFHZERH then:

1. Checks that the session is still in bracket
2. Clears the send buffers
3. Calls DFHZARL to send the FMH7.

Inbound errors: For inbound errors, DFHZERH is invoked by DFHZARL or DFHZARRF when a process-level exception response or an FMH7 has been received.

If an exception response is received while in the send state, DFHZERH purges the present output buffer and sends ‘LIC,CD,RQE1’ to put the conversation into receive state—so that the following FMH7 can be received.

If an FMH7 is received, DFHZERH examines the associated sense code and any GDS error log data, then returns to its caller.

DFHZISP

DFHZISP is called by DFHETC to perform ALLOCATE_TC requests. (ALLOCATE commands are passed to DFHZISP because DFHETC cannot check the session type until the session is allocated.)

DFHZISP is also called to perform FREE_TC requests.

DFHZSTAP

DFHZSTAP provides a means of determining the conversation state of an MRO or LU6.2 session from the application side. This function is required if the application issues an EXEC CICS EXTRACT ATTRIBUTES command with the STATE option, or a conversation-based command with the STATE option.

For MRO, modules that invoke MVS services via the DFHTC macro also update the conversation state information with a DFHZCNVM TYPE=PUT macro call. When an application requires the conversation state of a session, DFHETC calls DFHZSTAP using a DFHZSTAM TYPE=GETCURRSTATE macro, which returns a value representing the conversation state of the session.

For LU6.2, DFHZUSR is called to maintain the user conversation state machine. (See Chapter 100, “VTAM LU6.2” on page 691 for further details.) When an application requires the conversation state of a session, DFHETL (mapped) or DFHEGL (unmapped) calls DFHZSTAP using a DFHZSTAM TYPE=GETCURRSTATE macro. DFHZSTAP examines the DFHZUSR state machine and maps the information into a value representing the conversation state of the session.

Exits

No global user exit points are provided for this function.

Trace

The following point IDs are provided for distributed transaction processing:

- AP FDxx, for which the trace level is TC 1
- AP FExx (LU6.2 application receive requests), for which the trace levels are TC 2 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 25. DL/I database support

Facilities for accessing DL/I databases and database control (DBCTL) support are available only with IMS/ESA.

Within a single CICS system, the following types of support can be available:

- DBCTL support present. For specific information about DBCTL, see Chapter 19, "Database control (DBCTL)" on page 143.
- Remote DL/I and DBCTL support present (the PDIR system initialization parameter is specified). For specific information about remote DL/I, see Chapter 65, "Remote DL/I" on page 483.

The rest of this section covers DL/I database support in general.

Design overview

The following types of DL/I requests can be made by a CICS system:

- EXEC DLI statements (converted into standard CALL DLI statements by DFHEDP)
- CALL DLI statements.

CICS support for DL/I is provided as follows:

1. A router component

   This component determines whether the call is using a remote or DBCTL PSB, and passes control to the appropriate call processor. This component is described in more detail later in this section.

2. A DL/I call processor

   This component is subdivided into:

   - A remote DL/I call processor
   - A DBCTL DL/I call processor.

   Each call processor deals with a specific interface that is described in the appropriate section of this book for the remote DL/I function and the DBCTL function.

Figure 47 shows the relationships between the components of the CICS-DL/I interface.

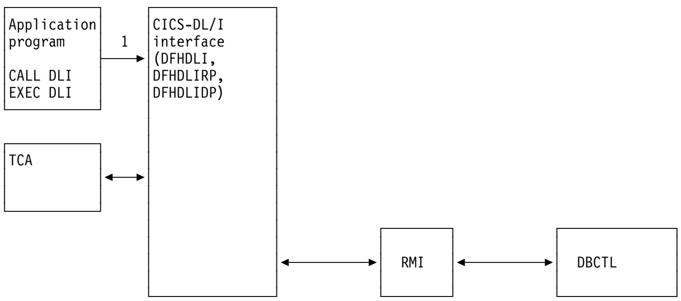


Figure 47. CICS-DL/I interfaces

Notes:

1. When DL/I functions are requested by an application program or a CICS control module through execution of a CALL or CALLDLI macro, DFHDLI sets the required fields in the TCA. EXEC DLI statements are converted into standard CALL DLI statements by DFHEDP.

   If the request is for a remote database, DFHDLI passes control to DFHDLIRP. If the request is for a DBCTL database, DFHDLI passes control to DFHDLIDP.

   In addition to processing DL/I input/output requests, the DL/I interface, on request, schedules and terminates DL/I program specification blocks (PSBs).

The remainder of this section is concerned with the router component.

The router component (DFHDLI)

The router component receives a request in standard CALL DLI parameter lists. At schedule time, it determines whether the request is a remote or DBCTL request.

Amongst the functions of the router are the following:

Deciding where to process a request: At PSB schedule time, the router determines whether the DL/I requests issued from the application program should be routed to DBCTL or another CICS system (remote). The presence (or absence) of the PSB used in the PDIR determines where the call gets routed.

If no PDIR exists (that is, the PDIR=NO system initialization parameter is specified or is allowed to default), the request is routed to the DBCTL call processor.

If a PDIR has been specified, the router module scans the PDIR. All entries in the PDIR have a SYSIDNT option specified. If the PSB is not found in the PDIR, or if the PDIR entry specifies a SYSIDNT that is the SYSIDNT of the CICS system that is currently running, the request is routed to the DBCTL call processor. Otherwise, the request is routed to the remote call processor.

All DL/I requests are routed to the same DL/I call processor as the corresponding PSB schedule request in the same unit of work.

Initiating synchronization processing: The router provides special handling of the DL/I TERM call. When the router detects a TERM call, it forces a syncpoint, causing CICS to carry out syncpoint processing for the task.

Generating CICS trace records: The router module generates CICS trace records at DL/I call entry and DL/I call exit.

Control blocks

DL/I database support uses the control blocks DIB, DLP, and UIB, which are shown in Figure 48.

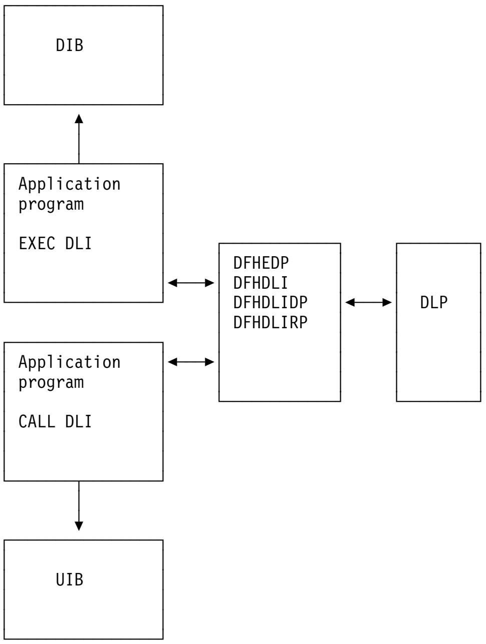


Figure 48. Control blocks for DL/I database support

DL/I interface block (DIB)

When an application program issues EXEC DLI requests, it uses the user DL/I interface block (DIB) instead of the user interface block (UIB). On return, DFHEDP extracts data from the UIB to place in the DIB. The storage for the user DIB is part of the application program. The definition of the user DIB is automatically inserted by the CICS translator for an EXEC DLI application program.

DL/I interface parameter list (DLP)

The DL/I interface parameter list (DLP) is a global DL/I interface control block that lasts for the duration of a CICS session, and contains information relating to the type of DL/I support present in the CICS system. The DLP is created during CICS startup and is addressed by CSADLI in the CSA optional features list.

Figure 49 illustrates the DL/I parameter interface list (DLP) that is used.

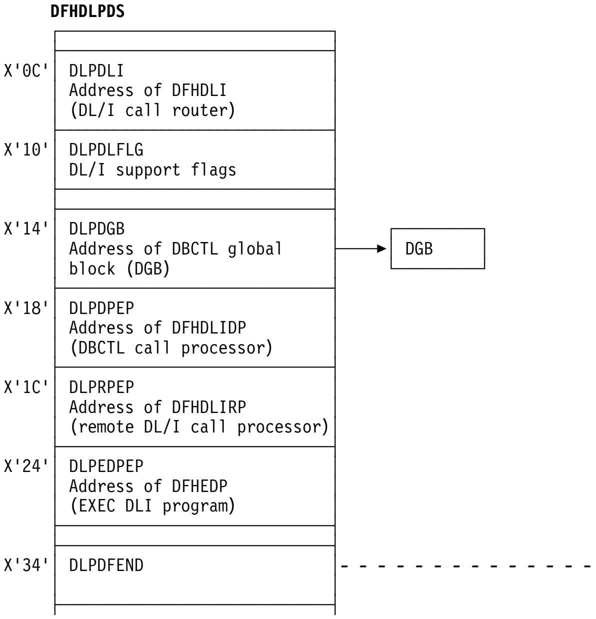


Figure 49. DL/I parameter interface list (DLP)

User interface block (UIB)

The user interface block (UIB) is the control block used by the CALL and CALL DL/I interfaces to pass response codes and the PCB address list to application programs using CALL DL/I services. The UIB is acquired when a task issues its first PSB schedule request specifying that it requires a UIB. The UIB is freed at task termination. TCADLIBA points to the UIB.

See the *CICS Data Areas* manual for a detailed description of these control blocks.

Modules

Figure 50 on page 179 shows the module flow of DL/I requests to the DL/I call processors. Three main CICS-DL/I interface modules process DL/I requests from application programs. The first module, DFHDLI, determines what sort of DL/I request is being made and then passes control to one of two call processors. These are the DBCTL DL/I call processor, DFHDLIDP, and the remote call processor, DFHDLIRP.

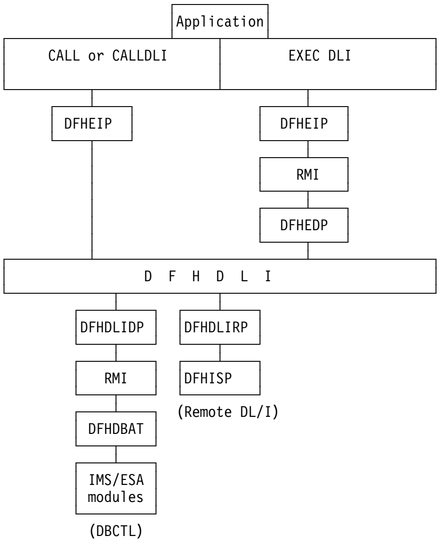


Figure 50. Module flow of DL/I requests to the DL/I call processors

The common CICS-DL/I interface modules consist of the following:

- DFHDLI—contains the code for routing requests to DFHDLIRP and DFHDLIDP
- DFHDLIDP—contains the code for DBCTL requests.
- DFHDLIRP—contains the code for remote DL/I requests

Exits

The following global user exit points are provided in DFHDLI: XDLIPRE and XDLIPOST. For further information about these, see the *CICS Customization Guide* and the *CICS IMS Database Control Guide*.

Trace

The following point ID is provided for DL/I and DBCTL:

- AP 03xx, for which the trace levels are FC 1, FC 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 26. Document Handler domain (DH)

The document handler domain manages CICS Documents.

Document Handler domain's specific gates

Table 40 summarizes the document handler domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 40. Document Handler domain's specific gates

Gate	Trace	Function	XPI
DHDH	DH 0120 DH 0121 DH 0122 DH 0123 DH 0124 DH 0125 DH 0126 DH 0127 DH 0128 DH 0129 DH 012A	CREATE_DOCUMENT INSERT_DATA INSERT_BOOKMARK REPLACE_DATA DELETE_DOCUMENT DELETE_DATA DELETE_BOOKMARK RETRIEVE_WITH_CTLINFO RETRIEVE_WITHOUT_CTLINFO INQUIRE_DOCUMENT	NO NO NO NO NO NO NO NO NO NO
DHSL	DH 0200 DH 0201 DH 0202 DH 0203 DH 0204 DH 0205 DH 0206 DH 0207 DH 0208 DH 0209 DH 020A	SET_SYMBOL_VALUE_BY_API, SET_SYMBOL_VALUE_BY_SSI, ADD_SYMBOL_LIST EXPORT_SYMBOL_LIST IMPORT_SYMBOL_LIST	NO NO NO NO NO
DHTM	DH 0401 DH 0402 DH 0403 DH 0404 DH 0405 DH 0406 DH 0407 DH 0408 DH 0409 DH 040A DH 0411 DH 0412 DH 0413 DH 0414 DH 0415 DH 0416 DH 0417 DH 0418	INITIALIZE_DOCTEMPLATES ADD_REPLACE_DOCTEMPLATE DELETE_DOCTEMPLATE INQUIRE_DOCTEMPLATE INQUIRE_TEMPLATE_STATUS START_BROWSE GET_NEXT END_BROWSE READ_TEMPLATE	NO NO NO NO NO NO NO NO NO
DHRP	DH 0C01 DH 0C02 DH 0C03 DH 0C04 DH 0C05 DH 0C06 DH 0C07 DH 0C08	RECOVER_DEFINITIONS	NO

DHDH gate, CREATE_DOCUMENT function

The CREATE_DOCUMENT function of the DHDH gate is used to create a new CICS document.

Input parameters

[TEXT] is a buffer containing a block of text to be added to the document.

[BINARY] is a buffer containing a block of binary data to be added to the document.

[TEMPLATE_BUFFER] is a buffer containing a template to be added to the document.

[TEMPLATE_NAME] is the name of an RDO defined DOCTEMPLATE which is to be added to the document.

[SOURCE_DOCUMENT] is the document token of an existing document created by the same CICS task which is to be added to the document.

[RETRIEVED_DOCUMENT] is a buffer containing a document in a retrieved format which is to be added to the document.

[HOST_CODEPAGE] is the character encoding for the block of data being added to the document. This parameter is taken into account for the TEXT and TEMPLATE_BUFFER options and ignored for all other options.

[SYMBOL_LIST] is a buffer containing a list of symbols to be added to the symbol table of the document.

[TEMPLATE_IN_ERROR] is a buffer which is used by the Document Handler domain to return the name of a DOCTEMPLATE in which an error has been detected. This parameter is only meaningful when specified with the TEMPLATE_NAME option or the TEMPLATE_BUFFER option where the template in the TEMPLATE_BUFFER option contains an embedded template.

Output parameters

DOCUMENT_TOKEN is the token identifying the newly created document.

ERROR_OFFSET is the offset into a template where a syntax error has been detected.

RETRIEVE_SIZE is the maximum size in bytes that a retrieved copy of the document can be.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	CODEPAGE_NOT_SPECIFIED INVALID_HOST_CODEPAGE INVALID_TEMPLATE_SYNTAX TEMPLATE_NOT_FOUND SOURCE_DOC_NOT_FOUND INVALID_RETRIEVE_FORMAT SYMBOL_NAME_INVALID SYMBOL_VALUE_INVALID EMBED_DEPTH_EXCEEDED INVALID_TEMPLATE_LENGTH

DHDH gate, INSERT_DATA function

The INSERT_DATA function of the DHDH gate is used to insert a block of data into an existing document.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document into which the data will be inserted.

[TEXT] is a buffer containing a block of text to be added to the document.

[BINARY] is a buffer containing a block of binary data to be added to the document.

[TEMPLATE_BUFFER] is a buffer containing a template to be added to the document.

[TEMPLATE_NAME] is the name of an RDO defined DOCTEMPLATE which is to be added to the document.

[SYMBOL] is the name of a symbol defined in the symbol table. The value associated with the symbol will be added to the document.

[SOURCE_DOCUMENT] is the document token of an existing document created by the same CICS task which is to be added to the document.

[RETRIEVED_DOCUMENT] is a buffer containing a document in a retrieved format which is to be added to the document.

[HOST_CODEPAGE] is the character encoding for the block of data being added to the document. This parameter is taken into account for the TEXT, SYMBOL and TEMPLATE_BUFFER options and ignored for all other options.

[INSERT_POINT] identifies the beginning or end as the position at which data should be inserted into a document. It can have either of these values:

`START|END`

[INSERT_AT] is the name of a bookmark which identifies the position at which the data should be inserted.

[TEMPLATE_IN_ERROR] is a buffer which is used by the Document Handler domain to return the name of a DOCTEMPLATE in which an error has been detected. This parameter is only meaningful when specified with the TEMPLATE_NAME option or the TEMPLATE_BUFFER option where the template in the TEMPLATE_BUFFER option contains an embedded template.

Output parameters

ERROR_OFFSET is the offset into a template where a syntax error has been detected.

RETRIEVE_SIZE is the maximum size in bytes that a retrieved copy of the document can be.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	CODEPAGE_NOT_SPECIFIED INVALID_HOST_CODEPAGE EMBED_DEPTH_EXCEEDED INSERTPOINT_NOT_FOUND INVALID_TEMPLATE_SYNTAX TEMPLATE_NOT_FOUND SOURCE_DOC_NOT_FOUND INVALID_RETRIEVE_FORMAT SYMBOL_NOT_FOUND INVALID_TEMPLATE_LENGTH
INVALID	DOCUMENT_NOT_FOUND

DHDH gate, INSERT_BOOKMARK function

The INSERT_BOOKMARK function of the DHDH gate is used to insert a bookmark into an existing document.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document into which the bookmark will be inserted.

BOOKMARK_NAME is the 16 byte name of a bookmark to be added to the document.

[INSERT_POINT] identifies the beginning or end as the position at which the bookmark should be inserted into a document. It can have either of these values:

`START|END`

[INSERT_AT] is the name of a bookmark which identifies the position at which the bookmark should be inserted.

Output parameters

RETRIEVE_SIZE is the maximum size in bytes that a retrieved copy of the document can be.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INSERTPOINT_NOT_FOUND INVALID_BOOKMARK_NAME DUPLICATE_BOOKMARK
INVALID	DOCUMENT_NOT_FOUND

DHDH gate, REPLACE_DATA function

The REPLACE_DATA function of the DHDH gate is used to replace the data between 2 bookmarks in an existing document.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document into which the data will be inserted.

[TEXT] is a buffer containing a block of text to be added to the document.

[BINARY] is a buffer containing a block of binary data to be added to the document.

[TEMPLATE_BUFFER] is a buffer containing a template to be added to the document.

[TEMPLATE_NAME] is the name of an RDO defined DOCTEMPLATE which is to be added to the document.

[SYMBOL] is the name of a symbol defined in the symbol table. The value associated with the symbol will be added to the document.

[SOURCE_DOCUMENT] is the document token of an existing document created by the same CICS task which is to be added to the document.

[RETRIEVED_DOCUMENT] is a buffer containing a document in a retrieved format which is to be added to the document.

[HOST_CODEPAGE] is the character encoding for the block of data being added to the document. This parameter is taken into account for the TEXT, SYMBOL and TEMPLATE_BUFFER options and ignored for all other options.

[FROM_POSITION] identifies the beginning or end of the document as the start of the data which is to be replaced in the document. It can have either of these values:

START|END

[FROM_BOOKMARK] is the name of a bookmark which identifies the start of the data which is to be replaced.

[TO_POSITION] identifies the beginning or end of the document as the end of the data which is to be replaced in the document. It can have either of these values:

START|END

[TO_BOOKMARK] is the name of a bookmark which identifies the end of the data which is to be replaced.

[TEMPLATE_IN_ERROR] is a buffer which is used by the Document Handler domain to return the name of a DOCTEMPLATE in which an error has been detected. This parameter is only meaningful when specified with the TEMPLATE_NAME option or the TEMPLATE_BUFFER option where the template in the TEMPLATE_BUFFER option contains an embedded template.

Output parameters

ERROR_OFFSET is the offset into a template where a syntax error has been detected.

RETRIEVE_SIZE is the maximum size in bytes that a retrieved copy of the document can be.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	CODEPAGE_NOT_SPECIFIED INVALID_HOST_CODEPAGE EMBED_DEPTH_EXCEEDED INVALID_TEMPLATE_SYNTAX TEMPLATE_NOT_FOUND SOURCE_DOC_NOT_FOUND INVALID_RETRIEVE_FORMAT SYMBOL_NOT_FOUND FROM_BOOKMARK_NOT_FOUND TO_BOOKMARK_NOT_FOUND INVALID_TEMPLATE_LENGTH
INVALID	DOCUMENT_NOT_FOUND

DHDH gate, DELETE_DOCUMENT function

The DELETE_DOCUMENT function of the DHDH gate is used to delete a document.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document to be deleted.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	DOCUMENT_NOT_FOUND

DHDH gate, DELETE_DATA function

The DELETE_DATA function of the DHDH gate is used to delete the data between 2 bookmarks in an existing document.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document from which the data will be deleted.

[FROM_POSITION] identifies the beginning or end of the document as the start of the data which is to be deleted from the document. It can have either of these values:

```
START|END
```

[FROM_BOOKMARK] is the name of a bookmark which identifies the start of the data which is to be deleted.

[TO_POSITION] identifies the beginning or end of the document as the end of the data which is to be deleted from the document. It can have either of these values:

```
START|END
```

[TO_BOOKMARK] is the name of a bookmark which identifies the end of the data which is to be deleted.

Output parameters

RETRIEVE_SIZE is the maximum size in bytes that a retrieved copy of the document can be.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	FROM_BOOKMARK_NOT_FOUND TO_BOOKMARK_NOT_FOUND INVALID_BOOKMARK_SEQUENCE
INVALID	DOCUMENT_NOT_FOUND

DHDH gate, DELETE_BOOKMARK function

The DELETE_BOOKMARK function of the DHDH gate is used to delete a bookmark in an existing document.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document from which the bookmark will be deleted.

BOOKMARK_NAME is the name of the bookmark to be deleted from the document.

Output parameters

RETRIEVE_SIZE is the maximum size in bytes that a retrieved copy of the document can be.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BOOKMARK_NOT_FOUND
INVALID	DOCUMENT_NOT_FOUND

DHDH gate, RETRIEVE_WITH_CTLINFO function

The RETRIEVE_WITH_CTLINFO function of the DHDH gate is used to retrieve a copy of an existing document. The retrieved copy will contain embedded control information.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document to be retrieved.

DOCUMENT_BUFFER is a buffer into which the Document Handler domain will place the copy of the document.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	DOCUMENT_NOT_FOUND

DHDH gate, RETRIEVE_WITHOUT_CTLINFO function

The RETRIEVE_WITHOUT_CTLINFO function of the DHDH gate is used to retrieve a copy of an existing document. The retrieved copy will only contain the data in the document.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document to be retrieved.

DOCUMENT_BUFFER is a buffer into which the Document Handler domain will place the copy of the document.

[CLIENT_CODEPAGE] is the character encoding that the retrieved document should be converted to when it is placed in the buffer.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_HOST_CODEPAGE INVALID_CLIENT_CODEPAGE
INVALID	DOCUMENT_NOT_FOUND

DHDH gate, INQUIRE_DOCUMENT function

The INQUIRE_DOCUMENT function of the DHDH gate is used to obtain information about the document.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document to be queried.

Output parameters

[DOCUMENT_SIZE] is the size of the data in a document.

[RETRIEVE_SIZE] is the maximum size in bytes that a retrieved copy of the document can be.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	DOCUMENT_NOT_FOUND

DHSL gate, SET_SYMBOL_VALUE_BY_API function

The SET_SYMBOL_VALUE_BY_API function of the DHSL gate is used to set the value of a symbol in the symbol table. If the symbol does not exist in the table, it will be added. If the symbol does exist in the table, it will always be replaced.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document that owns the symbol table.

SYMBOL_NAME is the name of the symbol in the symbol table.

VALUE is the value to be associated with the symbol.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	GETMAIN_ERROR SYMBOL_NAME_INVALID
INVALID	DOCUMENT_NOT_FOUND

DHSL gate, SET_SYMBOL_VALUE_BY_SSI function

The SET_SYMBOL_VALUE_BY_SSI function of the DHSL gate is used to set the value of a symbol in the symbol table. If the symbol does not exist in the table, it will be added. If the symbol does exist in the table, it will only be replaced if it was previously set using the SET_SYMBOL_VALUE_BY_SSI function.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document that owns the symbol table.

SYMBOL_NAME is the name of the symbol in the symbol table.

VALUE is the value to be associated with the symbol.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	GETMAIN_ERROR SYMBOL_NAME_INVALID
INVALID	DOCUMENT_NOT_FOUND

DHSL gate, ADD_SYMBOL_LIST function

The ADD_SYMBOL_LIST function of the DHSL gate is used to add a list of symbols to the symbol table at one time.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document that owns the symbol table.

SYMBOL_LIST is a buffer containing a list of symbols to be added to the symbol table of the document.

Output parameters

ERROR_OFFSET is the offset into the symbol list where a syntax error has been detected.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	GETMAIN_ERROR SYMBOL_NAME_INVALID SYMBOL_VALUE_INVALID
INVALID	DOCUMENT_NOT_FOUND

DHSL gate, EXPORT_SYMBOL_LIST function

The EXPORT_SYMBOL_LIST function of the DHSL gate is used to export all the symbols in the symbol table in a form that can be re-imported with IMPORT_SYMBOL_LIST.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document that owns the symbol table.

SYMBOL_LIST_BUFFER is a buffer that is to contain the exported symbol list.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	DOCUMENT_NOT_FOUND

DHSL gate, IMPORT_SYMBOL_LIST function

The IMPORT_SYMBOL_LIST function of the DHSL gate is used to import all the symbols in the symbol table that were exported with EXPORT_SYMBOL_LIST.

Input parameters

DOCUMENT_TOKEN is the token which identifies the document that owns the symbol table.

SYMBOL_LIST_BUFFER is a buffer that contains the symbol list to be added to the symbol table. This list should have been created using and the EXPORT_SYMBOL_LIST function.

Output parameters

ERROR_OFFSET is the offset into the list where a syntax error has been detected.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SYMBOL_NAME_INVALID SYMBOL_VALUE_INVALID
INVALID	DOCUMENT_NOT_FOUND

DHTM gate, INITIALIZE_DOCTEMPLATES function

The INITIALIZE_DOCTEMPLATES function of the DHSL gate is used to initialize the state required by the template manager.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DIRECTORY_ERROR

DHTM gate, ADD_REPLACE_DOCTEMPLATE function

The ADD_REPLACE_DOCTEMPLATE function of the DHTM gate is used to install a document template into the currently executing CICS system.

Input parameters

DOCTEMPLATE is the name of the DOCTEMPLATE resource that is to be added.

TEMPLATE_NAME is the name by which the DOCTEMPLATE is known outside of RDO.

RESOURCE_TYPE specifies the type of resource containing the DOCTEMPLATE. It can have one of the following values:

PDS_MEMBER|FILE|PROGRAM|TSQUEUE|TDQUEUE|EXITPGM

RESOURCE_NAME is the name of the resource containing the DOCTEMPLATE.

[DDNAME] is the DDNAME of the PDS containing the DOCTEMPLATE resource if the resource resides on a PDS.

Output parameters

[DATASET] is the dataset name of the PDS containing the DOCTEMPLATE resource if the resource resides on a PDS.

[DOCTEMPLATE_IN_USE] is the name of the DOCTEMPLATE definition that uses the same TEMPLATE_NAME as the resource being defined.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is INVALID, DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_RESOURCE_TYPE
DISASTER	DIRECTORY_ERROR
EXCEPTION	GETMAIN_FAILED NAME_IN_USE NOT_FOUND DDNAME_NOT_FOUND MEMBER_NOT_FOUND

DHTM gate, READ_TEMPLATE function

The READ_TEMPLATE function of the DHTM gate is used to read a named template into a buffer provided by the caller.

Input parameters

TEMPLATE_NAME is the name of a previously installed document template.

TEMPLATE_BUFFER is the buffer into which the template is to be read.

Output parameters

[DOCTEMPLATE] is the name of the DOCTEMPLATE resource as it is known to RDO.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DIRECTORY_ERROR INVALID_RESOURCE_TYPE
EXCEPTION	NOT_FOUND NOT_USABLE TRUNCATED

DHTM gate, INQUIRE_DOCTEMPLATE function

The INQUIRE_DOCTEMPLATE function of the DHTM gate returns information about a previously installed document template.

Input parameters

DOCTEMPLATE is the name of the DOCTEMPLATE as known to RDO.

Output parameters

TEMPLATE_NAME is the full name of the template as known outside RDO.

RESOURCE_TYPE is the CICS or non-CICS resource type associated with the template. It can have one of the following values:

```
PDS_MEMBER|FILE|PROGRAM|TSQUEUE|TDQUEUE|EXITPGM
```

RESOURCE_NAME is the name of the CICS or non-CICS resource.

DATASET is the dataset name of the template PDS if the RESOURCE_TYPE indicates a PDS.

DDNAME is the DDNAME of the template PDS if the RESOURCE_TYPE indicates a PDS.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DIRECTORY_ERROR
EXCEPTION	NOT_FOUND

DHTM gate, INQUIRE_TEMPLATE_STATUS function

The INQUIRE_TEMPLATE_STATUS function of the DHTM gate is used to inquire the install status of one or more templates.

Input parameters

TEMPLATE_NAME_LIST is a list of template names whose install status is sought.

TEMPLATE_STATUS_LIST is a list of install status indicators for the templates named in the TEMPLATE_NAME_LIST

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

DHTM gate, DELETE_DOCTEMPLATE function

The DELETE_DOCTEMPLATE function of the DHTM gate deletes a previously installed DOCTEMPLATE.

Input parameters

DOCTEMPLATE is the name of the DOCTEMPLATE as known to RDO.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DIRECTORY_ERROR
EXCEPTION	NOT_FOUND

DHTM gate, START_BROWSE function

The START_BROWSE function of the DHTM gate is used to initiate a browse of installed DOCTEMPLATE definitions.

Output parameters

BROWSE_TOKEN is a token identifying this DOCTEMPLATE browse.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

DHTM gate, GET_NEXT function

The GET_NEXT function of the DHTM gate returns information about the next installed DOCTEMPLATE in the browse.

Input parameters

BROWSE_TOKEN is the token identifying this browse of the DOCTEMPLATE definitions.

Output parameters

DOCTEMPLATE is the name of the DOCTEMPLATE as known to RDO.

TEMPLATE_NAME is the full name of the template as known outside RDO.

RESOURCE_TYPE is the CICS or non-CICS resource type associated with the template. It can have one of the following values:

PDS_MEMBER|FILE|PROGRAM|TSQUEUE|TDQUEUE|EXITPGM

RESOURCE_NAME is the name of the CICS or non-CICS resource.

DATASET is the dataset name of the template PDS if the RESOURCE_TYPE indicates a PDS.

DDNAME is the DDNAME of the template PDS if the RESOURCE_TYPE indicates a PDS.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_BROWSE_TOKEN
EXCEPTION	BROWSE_END

DHTM gate, END_BROWSE function

The END_BROWSE function of the DHTM gate is used to terminate a browse of installed DOCTEMPLATE definitions.

Input parameters

BROWSE_TOKEN is the token identifying this browse of the DOCTEMPLATE definitions.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_BROWSE_TOKEN

DHRP gate, RECOVER_DEFINITIONS function

The RECOVER_DEFINITIONS function of the DHRP gate is used to purge/recover DOCTEMPLATE definitions from the global catalog depending upon the CICS start type.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	INVALID_BROWSE_TOKEN CATALOG_BROWSE_FAILURE CATALOG_PURGE_FAILURE LOGIC_ERROR WAIT_PHASE_FAILURE ABEND

Document Handler domain's generic gates

Table 41 on page 189 summarizes the document handler domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 41. Document Handler domain’s generic gates

Gate	Trace	Function	Format
DMDM	DH 0101 DH 0102 DH 0103 DH 0104 DH 0105 DH 0106 DH 0107 DH 0108	INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
APUE	DH 0D01 DH 0D02 DH 0D03 DH 0D04 DH 0D05 DH 0D06 DH 0D07 DH 0D08	SET_EXIT_STATUS	APUE
RMRO	DH 0301 DH 0302 DH 0303 DH 0304 DH 0305 DH 0308	PERFORM_PREPARE PERFORM_COMMIT PERFORM_SHUNT PERFORM_UNSHUNT START_BACKOUT END_BACKOUT	RMRO
RMDE	DH 0301 DH 0302 DH 0303 DH 0304 DH 0306 DH 0308	START_DELIVERY DELIVER_RECOVERY END_DELIVERY	RMDE
RMKP	DH 0301 DH 0302 DH 0303 DH 0304 DH 0307 DH 0308	TAKE_KEYPOINT	RMKP

For descriptions of these functions and their input and output parameters, refer to the §s dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—“Domain manager domain’s generic formats” on page 195

Format APUE—“Application domain’s generic formats” on page 42

Format RMRO—“Recovery Manager domain’s call back formats” on page 474

Format RMDE—“Recovery Manager domain’s call back formats” on page 474

Format RMKP—“Recovery Manager domain’s call back formats” on page 474

Modules

Module	Function
DFHDHDM	Handles the following requests: INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHDHDH	Handles the following requests: CREATE_DOCUMENT INSERT_DATA INSERT_BOOKMARK REPLACE_DATA DELETE_DOCUMENT DELETE_DATA DELETE_BOOKMARK RETRIEVE_WITH_CTLINFO RETRIEVE_WITHOUT_CTLINFO INQUIRE_DOCUMENT
DFHDHSL	Handles the following requests: SET_SYMBOL_VALUE_BY_API, SET_SYMBOL_VALUE_BY_SSI, ADD_SYMBOL_LIST EXPORT_SYMBOL_LIST IMPORT_SYMBOL_LIST
DFHDHTM	Handles the following requests: INITIALIZE_DOCTEMPLATES ADD_REPLACE_DOCTEMPLATE DELETE_DOCTEMPLATE INQUIRE_DOCTEMPLATE INQUIRE_TEMPLATE_STATUS START_BROWSE GET_NEXT END_BROWSE READ_TEMPLATE
DFHDHRM	Handles the following requests: PERFORM_PREPARE PERFORM_COMMIT PERFORM_SHUNT PERFORM_UNSHUNT START_BACKOUT END_BACKOUT START_DELIVERY DELIVER_RECOVERY END_DELIVERY TAKE_KEYPOINT
DFHDHUE	Handles the following requests: SET_EXIT_STATUS
DFHDHPB	Processes data supplied on the BINARY parameter of CREATE_DOCUMENT, INSERT_DATA and REPLACE_DATA calls of DFHDHDH.
DFHDHPD	Processes data supplied on the SOURCE_DOCUMENT parameter of CREATE_DOCUMENT, INSERT_DATA and REPLACE_DATA calls of DFHDHDH.
DFHDHPM	Processes data supplied on the TEMPLATE_NAME parameter of CREATE_DOCUMENT, INSERT_DATA and REPLACE_DATA calls of DFHDHDH.
DFHDHPS	Processes data supplied on the SYMBOL parameter of INSERT_DATA and REPLACE_DATA calls of DFHDHDH.
DFHDHPT	Processes data supplied on the TEXT parameter of CREATE_DOCUMENT, INSERT_DATA and REPLACE_DATA calls of DFHDHDH.
DFHDHPU	Processes data supplied on the TEMPLATE_BUFFER parameter of CREATE_DOCUMENT, INSERT_DATA and REPLACE_DATA calls of DFHDHDH.
DFHDHPX	Processes data supplied on the RETRIEVED_DOCUMENT parameter of CREATE_DOCUMENT, INSERT_DATA and REPLACE_DATA calls of DFHDHDH.
DFHDHPR	Reads templates held as member's of partitioned datasets.

Module	Function
DFHDHEI	Reads templates held on CICS resources.
DFHDHPR	Reads PDS members containing templates.
DFHDHDUF	DH domain offline dump formatting routine
DFHDHTRI	Interprets DH domain trace entries

Exits

No global user exit points are provided in this domain.

Trace

The point IDs for the document handler domain are of the form DH xxxx; the corresponding trace levels are DH 1, DH ,.2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 27. Domain manager domain (DM)

The domain manager domain (also sometimes known simply as "domain manager") is responsible for maintaining, through the use of catalog services, permanent information about individual domains.

Each domain has certain permanent characteristics. These are stored on the local catalog and include the name, token, and ID; these characteristics are unique for each domain. Each domain also has volatile characteristics (including the phase number and the status), which are not stored on the catalog.

The domain manager attaches initialization and termination tasks for other domains. It maintains phase information of the other domains to allow controlled introduction and withdrawal of domain services during initialization and termination. For each domain, a phase number denotes the set of services that are available from the domain. An increased phase number would correspond to an increased set of available functions.

During initialization, the system phase is the minimum of the phase numbers of the active domains. During shutdown, the system phase is the maximum of the phase numbers of the active domains.

The domain manager also maintains and manages a queue of waiting domains (called "waiters"); these waiting domains are waiting for a specific domain to reach a certain phase or for the system phase to reach a certain level.

Domain manager domain's specific gates

Table 42 summarizes the domain manager domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 42. Domain manager domain's specific gates

Gate	Trace	Function	XPI
DMDM	DM 0001	ADD_DOMAIN	NO
	DM 0002	QUIESCE_SYSTEM	NO
		SET_PHASE	NO
		WAIT_PHASE	NO
DMIQ	DM 0003	START_BROWSE	NO
	DM 0004	GET_NEXT	NO
		END_BROWSE	NO
		INQ_DOMAIN_BY_NAME	NO
		INQ_DOMAIN_BY_TOKEN	NO
		INQ_DOMAIN_BY_ID	NO
DMEN	DM 0210	LISTEN	NO
	DM 0211	DELETE	NO
		NOTIFY_SMSVSAM_OPERATIONAL	NO

DMEN gate, LISTEN function

The LISTEN function of the DMEN gate is issued to register an interest in an event notification facility (ENF) event. The MVS event notification facility is a generalized communication facility which allows subsystems to broadcast notification of events.

If a domain wishes to be notified of particular ENF events, it must register the events that it wishes to be notified of with Domain Manager using the LISTEN interface.

When an ENF event occurs domain manager will invoke the named listen gate of all domains that registered for that event.

Input parameters

EVENT is the event that the caller is registering an interest in, and can have any of these values:

`SMSVSAM_OPERATIONAL`

LISTEN_GATE is the gate number of the gate at which the caller wishes to be notified when the event occurs.

Output parameters

RESPONSE is DFHDMEN's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when response is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_EVENT, DUPLICATE_LISTEN

DMEN gate, DELETE function

The DELETE function of the DMEN gate is used to deregister an interest in an ENF event.

If a domain is registered with domain manager for notification of an ENF event and that domain no longer wishes to receive notification of that event then it can deregister its interest in the event using the DELETE interface.

Input parameters

EVENT is the event which the caller wishes to deregister its interest in. It can have any of these values:

`SMSVSAM_OPERATIONAL`

LISTEN_GATE is the gate number of the gate which the caller specified as its listen gate when it registered an interest in this event.

Output parameters

RESPONSE is DFHDMEN's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when response is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LISTEN_NOT_ACTIVE

DMEN gate, NOTIFY_SMSVSAM_OPERATIONAL function

Domains that have registered their interest in ENF events are invoked at their identified listen gates when the ENF event occurs. A unique DMEN notify function is provided for each event to allow event specific parameters to be specified in a meaningful way.

The NOTIFY_SMSVSAM_OPERATIONAL function of the DMEN gate is used to notify domains which have registered an interest in it of the occurrence of the SMSVSAM operational event.

Input parameters

NOTIFY_PLIST is a parameter list specific to the ENF event being notified, which was supplied by the subsystem issuing the ENF signal.

Output parameters

RESPONSE is DFHDMEN's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when response is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	RESTART_RLS_FAILED

DMDM gate, ADD_DOMAIN function

The ADD_DOMAIN function of the DMDM gate adds a new domain to the DM table (on the CICS catalog) of all domains. Because the add is placed on the catalog, it survives system failure. A delete is required to remove the entry.

Input parameters

DOMAIN_NAME is a unique string, 1 through 8 characters, which is the name of the domain.

PROGRAM_NAME is a unique string, 1 through 8 characters, which is the name of the initialization module for the specified domain.

DOMAIN_TOKEN is the unique index that corresponds to the new table entry for the domain.

DOMAIN_ID is the unique character pair, usually an abbreviated form of the domain name.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|KERNERROR|DISASTER`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOADER_ERROR, ABEND, LOOP
EXCEPTION	DUPLICATE_DOMAIN_NAME, PROGRAM_NOT_FOUND, INSUFFICIENT_STORAGE, DUPLICATE_DOMAIN_TOKEN

DMDM gate, QUIESCE_SYSTEM function

The QUIESCE_SYSTEM function of the DMDM gate is used to call the domain manager to cause a normal shutdown of the system.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|INVALID|KERNERROR|DISASTER`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	INSUFFICIENT_STORAGE, ABEND, LOOP
INVALID	SYSTEM_INITIALIZING

DMDM gate, SET_PHASE function

When a domain issues SET_PHASE during initialization, it is declaring that it is now prepared to support a given set of services.

When a domain issues SET_PHASE during quiesce, it is asserting that it still needs the set of services identified by that phase number.

The system phase is the minimum of all active domains' phases during initialization, and the maximum during quiesce.

Input parameters

PHASE specifies the set of services that are to be available.

STATUS is either ACTIVE or INACTIVE.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|INVALID|KERNERROR|DISASTER
```

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND|LOOP
INVALID	SYSTEM_NOT_INITIALIZING, SYSTEM_NOT_QUIESCING, INVALID_PHASE

DMDM gate, WAIT_PHASE function

The WAIT_PHASE function of the DMDM gate is used to wait until the services required to carry on the work are available.

A WAIT_PHASE for a given phase is understood by CICS as a SET_PHASE for at least the phase specified in the phase parameter of WAIT_PHASE.

Input parameters

PHASE specifies the set of services that are to be available.

STATUS specifies the required status. It is either ACTIVE or INACTIVE.

[DOMAIN_TOKEN] specifies the domain. If this is omitted, a wait on the system phase is actioned, rather than for a particular domain.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|KERNERROR|DISASTER
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	DOMAIN_TOKEN_NOT_ACTIVE (This can be returned only if the DOMAIN_TOKEN option is specified.)
INVALID	SYSTEM_NOT_INITIALIZING, SYSTEM_NOT_QUIESCING, INVALID_PHASE

DMIQ gate, START_BROWSE function

The START_BROWSE function of the DMIQ gate is used to create a browse thread. The GET_NEXT function request issued after this command returns the first domain in the active domain list.

Input parameters: None.

Output parameters

BROWSE_TOKEN is the token identifying this browse session.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|INVALID|KERNERROR|DISASTER
```

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

DMIQ gate, GET_NEXT function

The GET_NEXT function of the DMIQ gate is used to return the next available record or an END indication.

Input parameters

BROWSE_TOKEN is the token identifying this browse session.

Output parameters

DOMAIN_NAME is a unique string, 1 through 8 characters, which is the name of the domain.

PROGRAM_NAME is a unique string, 1 through 8 characters, which is the name of the initialization module for the specified domain.

DOMAIN_TOKEN is the unique index that corresponds to the new table entry for the domain.

DOMAIN_ID is the unique character pair, usually an abbreviated form of the domain name.

DOMAIN_STATUS is ACTIVE or INACTIVE.

DOMAIN_PHASE is the current phase level for that domain.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|KERNERROR|DISASTER
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	END_LIST
INVALID	BROWSE_TOKEN_NOT_FOUND

DMIQ gate, END_BROWSE function

The END_BROWSE function of the DMIQ gate is used to release the browse thread at any time.

Input parameters

BROWSE_TOKEN is the token identifying this browse session.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|INVALID|KERNERROR|DISASTER`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	BROWSE_TOKEN_NOT_FOUND

DMIQ gate, INQ_DOMAIN_BY_NAME function

The INQ_DOMAIN_BY_NAME function of the DMIQ gate is used to get the domain's token, ID, status, and phase for the specified domain name.

Input parameters

DOMAIN_NAME is the unique name of an existing domain.

Output parameters

DOMAIN_TOKEN is the unique index that corresponds to the table entry for the domain.

DOMAIN_ID is the unique character pair, usually an abbreviated form of the domain name.

DOMAIN_STATUS is ACTIVE or INACTIVE.

DOMAIN_PHASE is the current phase level for that domain.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|INVALID|KERNERROR|DISASTER`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	DOMAIN_NAME_NOT_FOUND

DMIQ gate, INQ_DOMAIN_BY_TOKEN function

The INQ_DOMAIN_BY_TOKEN function of the DMIQ gate is used to get the domain's name, ID, status, and phase for the specified domain token.

Input parameters

DOMAIN_TOKEN is the unique index that corresponds to the table entry for the domain.

Output parameters

DOMAIN_NAME is a unique string, 1 through 8 characters, which is the name of the domain.

DOMAIN_ID is the unique character pair, usually an abbreviated form of the domain name.

DOMAIN_STATUS is ACTIVE or INACTIVE.

DOMAIN_PHASE is the current phase level for that domain.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|INVALID|KERNERROR|DISASTER`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	DOMAIN_TOKEN_NOT_FOUND

DMIQ gate, INQ_DOMAIN_BY_ID function

The INQ_DOMAIN_BY_ID function of the DMIQ gate is used to get the domain's token, name, status, and phase for the specified domain ID.

Input parameters

DOMAIN_ID is the unique character pair, usually an abbreviated form of the domain name.

Output parameters

DOMAIN_TOKEN is the unique index that corresponds to the table entry for the domain.

DOMAIN_NAME is a unique string, 1 through 8 characters, which is the name of the domain.

DOMAIN_STATUS is ACTIVE or INACTIVE.

DOMAIN_PHASE is the current phase level for that domain.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|INVALID|KERNERROR|DISASTER`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	DOMAIN_ID_NOT_FOUND

Domain manager domain's generic gates

Table 43 summarizes the domain manager domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 43. Domain manager domain's generic gates

Gate	Trace	Function	Format
DSAT	None	TASK_REPLY	DSAT

For descriptions of the DSAT function and its input and output parameters, refer to the section dealing with the corresponding generic format:

Functions and parameters

Format DSAT—"Dispatcher domain's generic formats" on page 167

Domain manager domain's generic formats

Table 44 describes the generic formats owned by the domain manager domain and shows the functions performed on the calls.

Table 44. Generic formats owned by the domain manager domain

Format	Calling module	Function
DMDM	DFHKETCB DFHDMDS DFHDMDS DFHKETCB	PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN

In the descriptions of the formats that follow, the "input" parameters are input not to the domain manager domain, but to the domain being called by the domain manager. Similarly, the "output" parameters are output by the domain that was called by the domain manager, in response to the call.

DMDM format, PRE_INITIALIZE function

The DFHKETCB module issues a preinitialization call to each of the following domains: LC, PA, TR, ME, DU, LM, SM, DD, DS, XM, LD, and DM.

Apart from the LD, and DM domains, preinitialization takes place under the job-step TCB; for LD, and DM, it takes place under the resource-owning (RO) TCB.

In preinitialization processing, the domain manager domain reads information about domains from the local catalog, and passes it to the kernel. It then attaches the initialization tasks for all the other domains.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|INVALID|KERNERROR|DISASTER`

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	INSUFFICIENT_STORAGE, ABEND, LOOP

DMDM format, INITIALIZE_DOMAIN function

The domain manager domain issues an INITIALIZE_DOMAIN function call to a domain. In initialization processing, the domain manager domain performs only internal routines.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|INVALID|KERNERROR|DISASTER`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	INSUFFICIENT_STORAGE, ABEND, LOOP
INVALID	ALREADY_INITIALIZED

DMDM format, QUIESCE_DOMAIN function

The domain manager domain issues a QUIESCE_DOMAIN function call to a domain when the system is required to shut down normally. The domain manager domain initiates quiesce processing by attaching the quiesce task for each domain.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|INVALID|KERNERROR|DISASTER`

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	INSUFFICIENT_STORAGE, ABEND, LOOP

DMDM format, TERMINATE_DOMAIN function

The domain manager domain issues a TERMINATE_DOMAIN function call to a domain when the system is required to shut down quickly. This call is always issued under the job-step TCB.

The domain manager domain does no termination processing.

Input parameters

CLEAN_UP indicates whether or not the TERMINATE_DOMAIN function request is being issued under a cleanup-only ESTAE exit. It can have either of these values:

YES|NO

YES implies restrictions for termination logic, specifically that an ATTACH request cannot be issued.

CANCEL indicates whether or not the termination is happening because of an operator CANCEL command. It can have either of these values:

YES|NO

YES means that attached subtasks are no longer dispatchable.

TERMINATION_TYPE indicates whether the termination is happening because of either a quiesce or an abnormal shutdown. It can have either of these values:

QUIESCE|IMMEDIATE

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|INVALID|KERNERROR|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

Modules

Module	Function
DFHDMDM	Handles the following requests: INITIALIZE_DOMAIN PRE_INITIALIZE QUIESCE_DOMAIN QUIESCE_SYSTEM TERMINATE_DOMAIN SET_PHASE WAIT_PHASE ADD_DOMAIN
DFHDMDS	Handles the TASK_REPLY request
DFHDMDUF	Formats the DM domain control blocks in a CICS system dump
DFHDMEN	Handles LISTEN, DELETE, NOTIFY_SMSVSAM_OPERATIONAL
DFHDMENF	Broadcasts ENF events to interested domains
DFHDMIQ	Handles the following requests: START_BROWSE GET_NEXT END_BROWSE INQUIRE_DOMAIN_BY_ID INQUIRE_DOMAIN_BY_NAME INQUIRE_DOMAIN_BY_TOKEN
DFHDMSVC	Provides authorized services for the DM ENF support
DFHDMTRI	Interprets DM domain trace entries
DFHDMWQ	Handles the following requests: INITIALIZE SET_UP_WAIT RESUME_WAITERS RESUME_DOMAIN_WAITERS RESUME_PHASE_WAITERS

Exits

No global user exit points are provided in this domain.

Trace

The point IDs for the domain manager domain are of the form DM xxxx; the corresponding trace levels are DM 1, DM 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 28. Dump domain (DU)

The dump domain is responsible for producing storage dumps and for handling the associated data sets and status in the CICS system. Two types of dump are produced:

Transaction dumps
These are written to the CICS-managed BSAM data sets DFHDMPA and DFHDMPB. They consist of the storage areas related to a particular transaction.

System dumps
CICS uses the MVS SDUMP facility to dump the entire CICS region to an MVS SYS1.DUMP data set.

The two dump tables (one for each dump type) are indexed by the dump code and contain details of the options required for each request.

Design overview

Figure 51 gives an overview of the dump domain architecture.

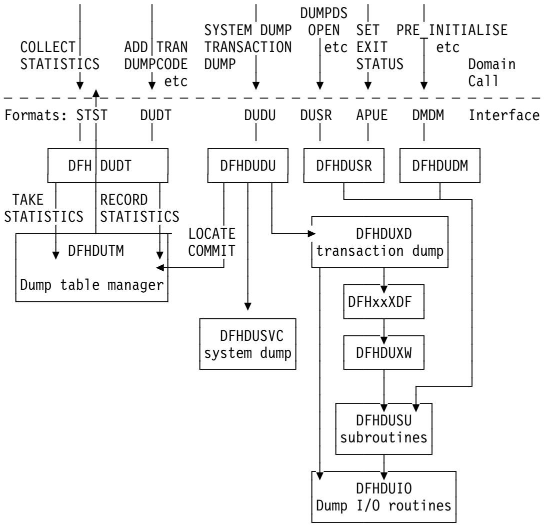


Figure 51. CICS dump domain structure

Dump domain’s specific gates

Table 45 summarizes the dump domain’s specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 45. Dump domain’s specific gates

Gate	Trace	Function	XPI
DUDT	DU 0500	ADD_TRAN_DUMPCODE	NO
	DU 0501	DELETE_TRAN_DUMPCODE	NO
		INQUIRE_TRAN_DUMPCODE	NO
		SET_TRAN_DUMPCODE	NO
		STARTBR_TRAN_DUMPCODE	NO
		GETNEXT_TRAN_DUMPCODE	NO
		ENDBR_TRAN_DUMPCODE	NO
		ADD_SYSTEM_DUMPCODE	NO
		DELETE_SYSTEM_DUMPCODE	NO
		INQUIRE_SYSTEM_DUMPCODE	NO
		SET_SYSTEM_DUMPCODE	NO
		STARTBR_SYSTEM_DUMPCODE	NO
		GETNEXT_SYSTEM_DUMPCODE	NO
		ENDBR_SYSTEM_DUMPCODE	NO
DUDU	DU 0101	TRANSACTION_DUMP	YES
	DU 0102	SYSTEM_DUMP	YES
DUSR	DU 0301	DUMPDS_OPEN	NO
	DU 0302	DUMPDS_CLOSE	NO
		DUMPDS_SWITCH	NO
		INQUIRE_CURRENT_DUMPDS	NO
		INQUIRE_DUMPDS_OPEN_STATUS	NO
		INQUIRE_DUMPDS_AUTOSWITCH	NO
		SET_DUMPDS_AUTOSWITCH	NO
		SET_DUMPTABLE_DEFAULTS	NO
		INQUIRE_INITIAL_DUMPDS	NO
		SET_INITIAL_DUMPDS	NO
		INQUIRE_SYSTEM_DUMP	NO
		SET_SYSTEM_DUMP	NO
		INQUIRE_RETRY_TIME	NO
		SET_RETRY_TIME	NO
		SET_CONNECT_TOKEN	

DUDT gate, ADD_TRAN_DUMPCODE function

The ADD_TRAN_DUMPCODE function of the DUDT gate is invoked to add a new dump code to the transaction dump table.

Input parameters

DUMPSCOPE indicates whether an SDUMP request is to be sent to all MVS images in the sysplex which are running CICS systems connected via XCF/MRO to the system on which the command is issued. It can have either of the following values:

```
LOCAL|RELATED
```

LOCAL
indicates that the SDUMP request is not sent to MVS images in the sysplex which are running XCF/MRO connected CICS systems

RELATED
indicates that, when an SDUMP is initiated for the dump code, the request is sent to all MVS images in the sysplex which are running one or more CICS systems connected via XCF/MRO to the CICS on which the SDUMP is initiated.

TRANSACTION_DUMPCODE is the transaction dump code.

TRANSACTION_DUMP states whether a transaction dump is required for this dump code. It can have either of these values:

YES|NO

SYSTEM_DUMP states whether a system dump is required for this dump code. It can have either of these values:

YES|NO

TERMINATE_CICS states whether CICS is to be terminated for this dump code. It can have either of these values:

YES|NO

MAXIMUM_DUMPS is the maximum number of times the dump code action can be taken.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUPLICATE_DUMPCODE, INVALID_DUMPCODE, CATALOG_FULL, INSUFFICIENT_STORAGE, IO_ERROR

Process flow

1. Issue LMLM LOCK for DUTABLE lock.
2. Issue DUDT ADD_TRAN_DUMPCODE call to DFHDUTM.
3. Issue LMLM UNLOCK for DUTABLE lock.

DFHDUTM process flow

1. Validate the dump code to be added. Transaction dump codes are 4 bytes and must not contain leading or embedded blanks. If the dump code is not valid, return to the caller indicating the exception.
2. Scan the transaction dump table to find the correct place to insert the dump code in collating sequence. If an entry already exists for that dump code, return to the caller indicating duplicate dump code. If the entry is about to use the last available entry in the dump table block, obtain a new block and initialize it with null values. Create a dump table entry in the next available entry, indicated by TDTFREEHEAD pointer in the anchor block, using the parameter values passed by the caller. Set up the NEXT and PREV pointers of the new entry and higher and lower entries to include the new entry in the correct sequence in the table.
3. Write the dump code information to the global catalog.

DUDT gate, DELETE_TRAN_DUMPCODE function

The DELETE_TRAN_DUMPCODE function of the DUDT gate is invoked to delete an existing dump code from the transaction dump table.

Input parameters

TRANSACTION_DUMPCODE is the transaction dump code.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUMPCODE_NOT_FOUND, IO_ERROR

Process flow

1. Issue LMLM LOCK for DUTABLE lock.
2. Issue DUDT DELETE_TRAN_DUMPCODE call to DFHDUTM.
3. Issue LMLM UNLOCK for DUTABLE lock.

DFHDUTM process flow

1. Locate the dump code in the transaction dump table. If it cannot be found, return to the caller indicating DUMPCODE_NOT_FOUND exception.
2. Adjust the NEXT and PREV of the higher and lower entries in the table to bypass this entry, and set its NEXT and PREV pointers to 0.
3. Delete the information for the dump code from the global catalog. If the attempt to delete from the catalog indicates that the record is not found, it is assumed that the dump code was present on the dump table as a result of a LOCATE_TRAN_DUMPCODE subroutine call that does not update the catalog.

DUDT LOCATE_TRAN_DUMPCODE process flow

1. Validate the dump code for which a dump has been requested (see ADD_TRAN_DUMPCODE).
2. Search the transaction dump table for the dump code. If it is found, set up the return DUDT parameters to indicate whether CICS is to be terminated, and whether a system or transaction dump is to be taken, using values taken from the dump table entry.

   If the dump code does not exist on the dump table, an entry is added, using default values (see the *CICS Problem Determination Guide*) and the DUDT return parameters are set up dependent on these default values. (This default entry is not added to the global catalog.)

DUDT gate, INQUIRE_TRAN_DUMPCODE function

The INQUIRE_TRAN_DUMPCODE function of the DUDT gate is invoked to inquire on a dump code in the transaction dump table.

Input parameters

TRANSACTION_DUMPCODE is the transaction dump code.

Output parameters

[DUMPSCOPE] indicates whether an SDUMP request is to be sent to all MVS images in the sysplex which are running CICS systems connected via XCF/MRO to the system on which the command is issued. It can have either of the following values:

```
LOCAL|RELATED
```

LOCAL
indicates that the SDUMP request is not sent to MVS images in the sysplex which are running XCF/MRO connected CICS systems

RELATED
indicates that, when an SDUMP is initiated for the dump code, the request is sent to all MVS images in the sysplex which are running one or more CICS systems connected via XCF/MRO to the CICS on which the SDUMP is initiated.

[TRANSACTION_DUMP] states whether a transaction dump is required for this dump code. It can have either of these values:

```
YES|NO
```

[SYSTEM_DUMP] states whether a system dump is required for this dump code. It can have either of these values:

```
YES|NO
```

[TERMINATE_CICS] states whether CICS is to be terminated for this dump code. It can have either of these values:

```
YES|NO
```

[MAXIMUM_DUMPS] is the maximum number of times the dump code action can be taken.

[COUNT] is the number of times the dump code action has been taken.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

```
DUMPCODE_NOT_FOUND
```

Process flow

1. Issue LMLM LOCK for DUTABLE lock.
2. Issue DUDT INQUIRE_TRAN_DUMPCODE call to DFHDUTM.
3. Issue LMLM UNLOCK for DUTABLE lock.

DFHDUTM process flow

1. Locate the dump code in the transaction dump code table. If it cannot be found, return to the caller indicating DUMPCODE_NOT_FOUND exception.
2. Return the dump code table entry information to the caller in the DUDT parameters.

DUDT gate, SET_TRAN_DUMPCODE function

The SET_TRAN_DUMPCODE function of the DUDT gate is invoked to set options for a dump code in the transaction dump table.

Input parameters

[DUMPSCOPE] indicates whether an SDUMP request is to be sent to all MVS images in the sysplex which are running CICS systems connected via XCF/MRO to the system on which the command is issued. It can have either of the following values:

```
LOCAL|RELATED
```

LOCAL
indicates that the SDUMP request is not sent to MVS images in the sysplex which are running XCF/MRO connected CICS systems

RELATED
indicates that, when an SDUMP is initiated for the dump code, the request is sent to all MVS images in the sysplex which are running one or more CICS systems connected via XCF/MRO to the CICS on which the SDUMP is initiated.

TRANSACTION_DUMPCODE is the transaction dump code.

[TRANSACTION_DUMP] states whether a transaction dump is required for this dump code. It can have either of these values:

```
YES|NO
```

[SYSTEM_DUMP] states whether a system dump is required for this dump code. It can have either of these values:

```
YES|NO
```

[TERMINATE_CICS] states whether CICS is to be terminated for this dump code. It can have either of these values:

```
YES|NO
```

[MAXIMUM_DUMPS] is the maximum number of times the dump code action can be taken.

[RESET_COUNT] states whether COUNT is to be reset to zero. It can have either of these values:

YES|NO

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUMPCODE_NOT_FOUND, CATALOG_FULL, IO_ERROR

Process flow

1. Issue LMLM LOCK for DUTABLE lock.
2. Issue DUDT SET_TRAN_DUMPCODE call to DFHDUTM.
3. Issue LMLM UNLOCK for DUTABLE lock.

DFHDUTM process flow

1. Locate the dump code in the transaction dump code table. If it cannot be found, return to the caller indicating DUMPCODE_NOT_FOUND exception.
2. Change the values on the dump code table entry for any passed in the DUDT parameter list (some or all may be changed). If the RESET_COUNT parameter is present, set the count of the number of dumps taken for this dump code to zero.
3. Make the same changes to the dump code information about the global catalog. If the attempt to delete from the catalog indicates that the record is not found, it is assumed that the dump code was present on the dump table as a result of a LOCATE_TRAN_DUMPCODE subroutine call that does not update the catalog. See "DUDT LOCATE_TRAN_DUMPCODE process flow" on page 198 for a description of the process flow of this function.

DUDT gate, STARTBR_TRAN_DUMPCODE function

The STARTBR_TRAN_DUMPCODE function of the DUDT gate is invoked to start a browse session on the transaction dump table.

Input parameters: None.

Output parameters

BROWSE_TOKEN is the token identifying the browse session.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

INSUFFICIENT_STORAGE

Process flow

1. Issue LMLM LOCK for DUTABLE lock.
2. Issue DUDT STARTBR_TRAN_DUMPCODE call to DFHDUTM.
3. Issue LMLM UNLOCK for DUTABLE lock.

DFHDUTM process flow

1. Add a new browse token to the end of the browse token table. Set the value of the last dump code used to null in the browse token table entry.
2. Return the browse token to the caller.

DUDT gate, GETNEXT_TRAN_DUMPCODE function

The GETNEXT_TRAN_DUMPCODE function of the DUDT gate is invoked in a browse session to get the next entry in the transaction dump table.

Input parameters

BROWSE_TOKEN is the token identifying the browse session.

Output parameters

[DUMPSCOPE] indicates whether an SDUMP request is to be sent to all MVS images in the sysplex which are running CICS systems connected via XCF/MRO to the system on which the command is issued. It can have either of the following values:

LOCAL|RELATED

LOCAL
indicates that the SDUMP request is not sent to MVS images in the sysplex which are running XCF/MRO connected CICS systems

RELATED
indicates that, when an SDUMP is initiated for the dump code, the request is sent to all MVS images in the sysplex which are running one or more CICS systems connected via XCF/MRO to the CICS on which the SDUMP is initiated.

[TRANSACTION_DUMPCODE] is the transaction dump code.

[TRANSACTION_DUMP] states whether a transaction dump is required for this dump code. It can have either of these values:

`YES|NO`

[SYSTEM_DUMP] states whether a system dump is required for this dump code. It can have either of these values:

`YES|NO`

[TERMINATE_CICS] states whether CICS is to be terminated for this dump code. It can have either of these values:

`YES|NO`

[MAXIMUM_DUMPS] is the maximum number of times the dump code action can be taken.

[COUNT] is the number of times the dump code action has been taken.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	END_BROWSE
INVALID	INVALID_BROWSE_TOKEN

Process flow

1. Issue LMLM LOCK for DUTABLE lock.
2. Issue DUDT GETNEXT_TRAN_DUMPCODE call to DFHDUTM.
3. Issue LMLM UNLOCK for DUTABLE lock.

DFHDUTM process flow

1. Search the browse token table for the browse token passed in the DUDT parameters. If the browse token cannot be found, perform error handling (exception trace, message, and dump) and return to the caller.
2. Obtain the value of the last dump code read by this browse session from the browse token table entry, and scan the dump table for a higher dump code entry. If there are no more entries, return END_BROWSE exception to the call; otherwise return the details of the dump code table entry in the parameters and save the value of the dump code in the browse token table entry.

DUDT gate, ENDBR_TRAN_DUMPCODE function

The ENDBR_TRAN_DUMPCODE function of the DUDT gate is invoked to end a browse session on the transaction dump table.

Input parameters

BROWSE_TOKEN is the token identifying the browse session.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is INVALID. It has this value:

`INVALID_BROWSE_TOKEN`

Process flow

1. Issue LMLM LOCK for DUTABLE lock.
2. Issue DUDT ENDBR_TRAN_DUMPCODE call to DFHDUTM.
3. Issue LMLM UNLOCK for DUTABLE lock.

DFHDUTM process flow

1. Search the browse token table for the browse token passed in the DUDT parameters. If the browse token cannot be found, perform error handling (exception trace, message, and dump) and return to the caller.
2. Set the browse token table entry to nulls and adjust the NEXT and PREV pointers to bypass the entry.

DUDT gate, ADD_SYSTEM_DUMPCODE function

The ADD_SYSTEM_DUMPCODE function of the DUDT gate is invoked to add a new dump code to the system dump table.

Input parameters

DAEOPTION states whether a dump produced for this dumpcode is eligible for suppression by the MVS Dump Analysis and Elimination (DAE) component. It can have either of these values:

`YES|NO`

DUMPSCOPE indicates whether an SDUMP request is to be sent to all MVS images in the sysplex which are running CICS systems connected via XCF/MRO to the system on which the command is issued. It can have either of the following values:

`LOCAL|RELATED`

LOCAL
indicates that the SDUMP request is not sent to MVS images in the sysplex which are running XCF/MRO connected CICS systems

RELATED
indicates that, when an SDUMP is initiated for the dump code, the request is sent to all MVS images in the sysplex which are running one or more CICS systems connected via XCF/MRO to the CICS on which the SDUMP is initiated.

SYSTEM_DUMPCODE is the system dump code.

SYSTEM_DUMP states whether a system dump is required for this dump code. It can have either of these values:

`YES|NO`

TERMINATE_CICS states whether CICS is to be terminated for this dump code. It can have either of these values:

`YES|NO`

MAXIMUM_DUMPS is the maximum number of times the dump code action can be taken.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUPLICATE_DUMPCODE, INVALID_DUMPCODE, CATALOG_FULL, INSUFFICIENT_STORAGE, IO_ERROR

Process flow

1. Acquire KE system dump lock.
2. Issue DUDT ADD_SYSTEM_DUMPCODE call to DFHDUTM.
3. Release KE system dump lock.

DFHDUTM process flow

1. Validate the dump code to be added. System dump codes are 4 bytes and must not contain leading or embedded blanks. If the dump code is not valid, return to the caller indicating the exception.
2. Scan the system dump table to find the correct place to insert the dump code in collating sequence. If an entry already exists for that dump code, return to the caller indicating duplicate dump code. If the entry is about to use the last available entry in the dump table block, obtain a new block and initialize it with null values. Create a dump table entry in the next available entry, indicated by TDTFREEHEAD pointer in the anchor block, using the parameter values passed by the caller. Set up the NEXT and PREV pointers of the new entry and higher and lower entries to include the new entry in the correct sequence in the table.
3. Write the dump code information to the global catalog.

DUDT gate, DELETE_SYSTEM_DUMPCODE function

The DELETE_SYSTEM_DUMPCODE function of the DUDT gate is invoked to delete an existing dump code from the system dump table.

Input parameters

SYSTEM_DUMPCODE is the system dump code.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUMPCODE_NOT_FOUND, IO_ERROR

Process flow

1. Acquire KE system dump lock.
2. Issue DUDT DELETE_SYSTEM_DUMPCODE call to DFHDUTM.
3. Release KE system dump lock.

DFHDUTM process flow

1. Locate the dump code in the system dump table. If it cannot be found, return to the caller indicating DUMPCODE_NOT_FOUND exception.
2. Adjust the NEXT and PREV of the higher and lower entries in the table to bypass this entry, and set its NEXT and PREV pointers to 0.
3. Delete the information for the dump table from the global catalog. If the attempt to delete from the catalog indicates that the record is not found, it is assumed that the dump code was present on the dump table as a result of a LOCATE_SYSTEM_DUMPCODE subroutine call that does not update the catalog.

DUDT LOCATE_SYSTEM_DUMPCODE process flow

1. Validate the dump code for which a dump has been requested (see ADD_SYSTEM_DUMPCODE).
2. Search the system dump table for the dump code. If it is found, set up the return DUDT parameters to indicate whether CICS is to be terminated, and whether a system dump is to be taken, using values taken from the dump table entry.

   If the dump code does not exist on the dump table, an entry is added, using default values (see the *CICS Problem Determination Guide*) and the DUDT return parameters are set up dependent on these default values. (This default entry is not added to the global catalog.)

DUDT gate, INQUIRE_SYSTEM_DUMPCODE function

The INQUIRE_SYSTEM_DUMPCODE function of the DUDT gate is invoked to inquire on a dump code in the system dump table.

Input parameters

SYSTEM_DUMPCODE is the system dump code.

Output parameters

DAEOPTION states whether a dump produced for this dumpcode is eligible for suppression by the MVS Dump Analysis and Elimination (DAE) component. It can have either of these values:

```
YES|NO
```

DUMPSCOPE indicates whether an SDUMP request is to be sent to all MVS images in the sysplex which are running CICS systems connected via XCF/MRO to the system on which the command is issued. It can have either of the following values:

```
LOCAL|RELATED
```

LOCAL
indicates that the SDUMP request is not sent to MVS images in the sysplex which are running XCF/MRO connected CICS systems

RELATED
indicates that, when an SDUMP is initiated for the dump code, the request is sent to all MVS images in the sysplex which are running one or more CICS systems connected via XCF/MRO to the CICS on which the SDUMP is initiated.

[SYSTEM_DUMP] states whether a system dump is required for this dump code. It can have either of these values:

```
YES|NO
```

[TERMINATE_CICS] states whether CICS is to be terminated for this dump code. It can have either of these values:

```
YES|NO
```

[MAXIMUM_DUMPS] is the maximum number of times the dump code action can be taken.

[COUNT] is the number of times the dump code action has been taken.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

```
DUMPCODE_NOT_FOUND
```

Process flow

1. Acquire KE system dump lock.
2. Issue DUDT INQUIRE_SYSTEM_DUMPCODE call to DFHDUTM.
3. Release KE system dump lock.

DFHDUTM process flow

1. Locate the dump code in the system dump code table. If it cannot be found, return to the caller indicating DUMPCODE_NOT_FOUND exception.
2. Return the dump code table entry information to the caller in the DUDT parameters.

DUDT gate, SET_SYSTEM_DUMPCODE function

The SET_SYSTEM_DUMPCODE function of the DUDT gate is invoked to set options for a dump code in the system dump table.

Input parameters

[DAEOPTION] states whether a dump produced for this dumpcode is eligible for suppression by the MVS Dump Analysis and Elimination (DAE) component. It can have either of these values:

```
YES|NO
```

[DUMPSCOPE] indicates whether an SDUMP request is to be sent to all MVS images in the sysplex which are running CICS systems connected via XCF/MRO to the system on which the command is issued. It can have either of the following values:

```
LOCAL|RELATED
```

LOCAL
indicates that the SDUMP request is not sent to MVS images in the sysplex which are running XCF/MRO connected CICS systems

RELATED
indicates that, when an SDUMP is initiated for the dump code, the request is sent to all MVS images in the sysplex which are running one or more CICS systems connected via XCF/MRO to the CICS on which the SDUMP is initiated.

SYSTEM_DUMPCODE is the system dump code.

[SYSTEM_DUMP] states whether a system dump is required for this dump code. It can have either of these values:

```
YES|NO
```

[TERMINATE_CICS] states whether CICS is to be terminated for this dump code. It can have either of these values:

YES|NO

[MAXIMUM_DUMPS] is the maximum number of times the dump code action can be taken.

[RESET_COUNT] states whether COUNT is to be reset to zero. It can have either of these values:

YES|NO

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUMPCODE_NOT_FOUND, CATALOG_FULL, IO_ERROR

Process flow

1. Acquire KE system dump lock.
2. Issue DUDT SET_SYSTEM_DUMPCODE call to DFHDUTM.
3. Release KE system dump lock.

DFHDUTM process flow

1. Locate the dump code in the system dump code table. If it cannot be found, return to the caller indicating DUMPCODE_NOT_FOUND exception.
2. Change the values on the dump code table entry for any passed in the DUDT parameter list (some or all may be changed). If the RESET_COUNT parameter is present, set the count of the number of dumps taken for this dump code to zero.
3. Make the same changes to the dump code information about the global catalog. If the attempt to delete from the catalog indicates that the record is not found, it is assumed that the dump code was present on the dump table as a result of a LOCATE_SYSTEM_DUMPCODE subroutine call that does not update the catalog. See "DUDT LOCATE_SYSTEM_DUMPCODE process flow" on page 202 for a description of the process flow of this function.

DUDT gate, STARTBR_SYSTEM_DUMPCODE function

The STARTBR_SYSTEM_DUMPCODE function of the DUDT gate is invoked to start a browse session on the system dump table.

Input parameters: None.

Output parameters

BROWSE_TOKEN is the token identifying the browse session.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

INSUFFICIENT_STORAGE

Process flow

1. Acquire KE system dump lock.
2. Issue DUDT STARTBR_SYSTEM_DUMPCODE call to DFHDUTM.
3. Release KE system dump lock.

DFHDUTM process flow

1. Add a new browse token to the end of the browse token table. Set the value of the last dump code used to null in the browse token table entry.
2. Return the browse token to the caller.

DUDT gate, GETNEXT_SYSTEM_DUMPCODE function

The GETNEXT_SYSTEM_DUMPCODE function of the DUDT gate is invoked in a browse session to get the next entry in the system dump table.

Input parameters

BROWSE_TOKEN is the token identifying the browse session.

Output parameters

[DAEOPTION] states whether a dump produced for this dumpcode is eligible for suppression by the MVS Dump Analysis and Elimination (DAE) component. It can have either of these values:

YES|NO

[DUMPSCOPE] indicates whether an SDUMP request is to be sent to all MVS images in the sysplex which are running CICS systems connected via XCF/MRO to the system on which the command is issued. It can have either of the following values:

LOCAL|RELATED

LOCAL
indicates that the SDUMP request is not sent to MVS images in the sysplex which are running XCF/MRO connected CICS systems

RELATED
indicates that, when an SDUMP is initiated for the dump code, the request is sent to all MVS images in the sysplex which are running one or more CICS systems connected via XCF/MRO to the CICS on which the SDUMP is initiated.

[SYSTEM_DUMPCODE] is the system dump code.

[SYSTEM_DUMP] states whether a system dump is required for this dump code. It can have either of these values:

`YES|NO`

[TERMINATE_CICS] states whether CICS is to be terminated for this dump code. It can have either of these values:

`YES|NO`

[MAXIMUM_DUMPS] is the maximum number of times the dump code action can be taken.

[COUNT] is the number of times the dump code action has been taken.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	END_BROWSE
INVALID	INVALID_BROWSE_TOKEN

Process flow

1. Acquire KE system dump lock.
2. Issue DUDT GETNEXT_SYSTEM_DUMPCODE call to DFHDUTM.
3. Release KE system dump lock.

DFHDUTM process flow

1. Search the browse token table for the browse token passed in the DUDT parameters. If the browse token cannot be found, perform error handling (exception trace, message, and dump) and return to the caller.
2. Obtain the value of the last dump code read by this browse session from the browse token table entry, and scan the dump table for a higher dump code entry. If there are no more entries, return END_BROWSE exception to the call; otherwise return the details of the dump code table entry in the parameters and save the value of the dump code in the browse token table entry.

DUDT gate, ENDBR_SYSTEM_DUMPCODE function

The ENDBR_SYSTEM_DUMPCODE function of the DUDT gate is invoked to end a browse on the system dump table.

Input parameters

BROWSE_TOKEN is the token identifying the browse session.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is INVALID. It has this value:

`INVALID_BROWSE_TOKEN`

Process flow

1. Acquire KE system dump lock.
2. Issue DUDT ENDBR_SYSTEM_DUMPCODE call to DFHDUTM.
3. Release KE system dump lock.

DFHDUTM process flow

1. Search the browse token table for the browse token passed in the DUDT parameters. If the browse token cannot be found, perform error handling (exception trace, message, and dump) and return to the caller.
2. Set the browse token table entry to nulls and adjust the NEXT and PREV pointers to bypass the entry.

DUDU gate, TRANSACTION_DUMP function

The TRANSACTION_DUMP function of the DUDU gate is invoked to take a transaction dump.

Input parameters

Note: The [SEGMENT] and [SEGMENT_LIST] parameters are ***mutually exclusive***.

TRANSACTION_DUMPCODE is a 4-character identifier for this dump request, used to index the transaction dump table to determine the options to be used.

The following set of optional input parameters indicates which parts of storage are to be included in the transaction dump. Each parameter can have either of these values: YES|NO.

[CSA] – common system area

[TCA] – task control area

[PROGRAM] – program storage

[TRT] – internal trace table

[TERMINAL] – terminal-related storage areas

[TRANSACTION] – transaction-related storage areas

[SIT] – system initialization table

[PPT] – processing program table

[PCT] – program control table

[TCT] – terminal control table

[FCT] – file control table

[DCT] – destination control table.

[SEGMENT] specifies the address and length of a single block of storage to be dumped.

[SEGMENT_LIST] specifies the address and length of a list of length-address pairs of storage blocks to be dumped. SEGMENT and SEGMENT_LIST may not be specified together.

[INDIRECT_CALL] states whether the call is indirect, that is, whether the actual requester of the dump is not the immediate caller of the dump domain. It can have either of these values:

`YES|NO`

Output parameters

DUMPID is a character string of the form "rrrr/cccc" giving a unique identification to this dump request. "rrrr" is the run number of this CICS instance. Leading zeros are removed. The run number is incremented every time CICS is initialized. "cccc" is the count of this dump request within this CICS run.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. It can have any one of these values:

FESTAE_FAILED
The MVS FESTAE macro failed to set up a functional recovery routine during the processing of the system dump request.

IWMWQWRK_FAILED
An MVS IWMWQWRK macro call to Workload Manager returned a warning or error response during the processing of the system dump request.

INVALID_SVC_CALL
DFHDUSVC received a request for an invalid function.

INVALID_PROBDESC
The MVS PROBDESC parameters, which CICS creates and passes to MVS on an SDUMP call, contained invalid data.

OPEN_ERROR
Failed to open the CICS dump data set during an autoswitch.

NOT_OPEN
The dump data set is currently closed.

INVALID_DUMPCODE
The transaction dump code failed validation.

PARTIAL_TRANSACTION_DUMP
There was insufficient space in the current dump data set for this dump. Autoswitching had not been requested.

SUPPRESSED_BY_DUMPOPTION
A system dump requested through the dump table for this transaction dump code was suppressed because the DUMP=NO system initialization parameter had been specified.

SUPPRESSED_BY_DUMPTABLE
The dump table specified that no dump was required for this dump code.

SUPPRESSED_BY_USEREXIT
The XDUREQ user exit requested suppression of this dump.

PARTIAL_SYSTEM_DUMP
A system dump requested through the dump table for this transaction dump code was incomplete because of insufficient space on the SYS1.DUMP data set.

SDUMP_FAILED
A system dump requested through the dump table for this transaction dump code failed because of an MVS or I/O failure.

SDUMP_BUSY
A system dump requested through the dump table for this transaction dump code failed because another address space was in the process of taking an SDUMP.

SDUMP_NOT_AUTHORIZED
A system dump requested through the dump table for this transaction dump code failed because the CICS authorized function control block (AFCB) indicates that CICS use of SDUMP is not authorized.

INSUFFICIENT_STORAGE
A system dump requested through the dump table for this transaction dump code failed because CICS failed to acquire the necessary storage to build the SDUMP parameter list.

NO_DATASET
A system dump requested through the dump table for this transaction dump code failed because there were no SYS1.DUMP data sets available.

Process flow

1. Issue LMLM LOCK for DUTABLE lock.
2. Issue DUDT LOCATE_TRAN_DUMPCODE call to DFHDUTM. If the dump table is not available, CICS takes a system dump and terminates.
3. Issue LMLM UNLOCK for DUTABLE lock.

4. If XDUREQ exit active, issue APEX INVOKE_USER_EXIT.
5. If XDUREQ exit not active or it was active and the return code was zero:
   - If dump table indicates that a system dump is required for this transaction dump code and the DUMP=NO system initialization parameter was not specified. invoke CICS SVC to take system dump, retrying as necessary if SDUMP is busy.
   - If dump table indicates that a transaction dump is required, call DFHDUXD with a DUDD format parameter list to take a transaction dump.
6. If XDUREQC exit active, issue APEX INVOKE_USER_EXIT.
7. Issue LMLM LOCK for DUTABLE lock.
8. Issue DUDT COMMIT_TRAN_DUMPCODE call to DFHDUTM.
9. Issue LMLM UNLOCK for DUTABLE lock.
10. Issue KEDD PERFORM_SYSTEM_ACTION to terminate CICS if the dump table indicated that termination was required for this dump code.

DUDD TAKE_DUMP process flow: In DFHDUXD:

1. If dump data set is closed or is a dummy data set, and the XDUOUT exit is not active, return to caller.
2. Issue LMLM LOCK for dump data set lock.
3. Invoke transaction dump formatting routines (DFHxxXDF), with DUXF FORMAT function, in turn to dump required areas to the transaction dump data set. If, at any point, the DUXF FORMAT function returns a response of EXCEPTION and a reason of RESTART, an autoswitch has occurred and the DUXF FORMAT calls have to be issued again.
4. Issue LMLM UNLOCK for dump data set lock.
5. If DFHDUXD is terminating with a DISASTER response and XDUOUT is active, issue APEX INVOKE_USER_EXIT for XDUOUT, passing the abnormal termination indication.

DUDT COMMIT_TRAN_DUMPCODE process flow: The DUDT COMMIT_TRAN_DUMPCODE function updates statistics for the dump code, according to whether or not the dump domain took the requested dumps.

1. Locate the entry on the transaction dump table. Return to the caller, indicating exception if the entry is not found.
2. Increment the global system dump statistics in the DUA and the system dump statistics on the dump table entry, for either dump-taken or dump-suppressed depending on the input system-dump parameter.
3. Increment the global transaction dump statistics in the DUA and the transaction dump statistics for either dump-taken or dump-suppressed depending on the input transaction-dump parameter.

DUDU gate, SYSTEM_DUMP function

The SYSTEM_DUMP function of the DUDU gate is invoked to take a system dump.

Input parameters

SYSTEM_DUMPCODE is an 8-character identifier for this dump request, used to index the system dump table to determine the options to be used.

[MESSAGE_TEXT] specifies the address and length of the message text associated with this system dump.

[TITLE] specifies the address and length of a title to be associated with this dump.

[CALLER] specifies the address and length of a character string to appear as the caller of this dump.

[SYMPTOM_RECORD] specifies the address and length of the symptom record associated with this dump.

[SYMPTOM_STRING] specifies the address and length of the symptom string associated with this dump.

[TERMINATE_CICS] states whether CICS is to be terminated after the dump if there is no entry in the dump table for this dump code; that is, it overrides the termination default of NO. It can have either of these values:

YES|NO

[INDIRECT_CALL] states whether the call is indirect, that is, whether the actual requester of the dump is not the immediate caller of the dump domain. It can have either of these values:

YES|NO

Output parameters

DUMPID is a character string of the form "rrrr/cccc" giving a unique identification to this dump request. "rrrr" is the run number of this CICS instance. Leading zeros are removed. The run number is incremented every time CICS is initialized. "cccc" is the count of this dump request within this CICS run.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. It can have any one of these values:

INVALID_DUMPCODE
The system dump code failed validation.

SUPPRESSED_BY_DUMPOPTION
A system dump requested through the dump table for this system dump code was suppressed because

the DUMP=NO system initialization parameter had been specified.

SUPPRESSED_BY_DUMPTABLE
The dump table specified that no dump was required for this dump code.

SUPPRESSED_BY_USEREXIT
The XDUREQ user exit requested suppression of this dump.

PARTIAL_SYSTEM_DUMP
A system dump requested through the dump table for this system dump code was incomplete because of insufficient space on the SYS1.DUMP data set.

SDUMP_FAILED
A system dump requested through the dump table for this system dump code failed because of an MVS or I/O failure.

SDUMP_BUSY
A system dump requested through the dump table for this system dump code failed because another address space was in the process of taking an SDUMP.

SDUMP_NOT_AUTHORIZED
A system dump requested through the dump table for this system dump code failed because the CICS authorized function control block (AFCB) indicates that CICS use of SDUMP is not authorized.

INSUFFICIENT_STORAGE
A system dump requested through the dump table for this system dump code failed because CICS failed to acquire the necessary storage to build the SDUMP parameter list.

NO_DATASET
A system dump requested through the dump table for this system dump code failed because there were no SYS1.DUMP data sets available.

Process flow

1. Acquire KE system dump lock.
2. If the DUMP=YES system initialization parameter was specified:
   - Issue DUDT LOCATE_SYSTEM_DUMPCODE call to DFHDUTM.
   - If dump table indicates system dump required:
     – If XDUREQ exit active, issue APEX INVOKE_USER_EXIT.
     – If XDUREQ exit not active or it was active and the return code was zero, invoke CICS SVC to take system dump, retrying as necessary if SDUMP is busy.
     – If XDUREQC exit active, issue APEX INVOKE_USER_EXIT.
3. Issue DUDT COMMIT_SYSTEM_DUMPCODE call to DFHDUTM.
4. Release KE system dump lock.
5. Issue KEDD PERFORM_SYSTEM_ACTION to terminate CICS if the dump table indicated that termination was required for this dump code.

DUDT COMMIT_SYSTEM_DUMPCODE process flow: The COMMIT_SYSTEM_DUMPCODE function of the DUDT gate updates statistics for the dump code, according to whether or not the dump domain took the requested dumps.

- Locate the entry on the system dump table. Return to the caller, indicating exception if the entry is not found.
- Increment the global system dump statistics and the system dump statistics on the dump table entry, for either dump-taken or dump-suppressed depending on the input system-dump parameter.

DUSR gate, CROSS_SYSTEM_DUMP_AVAIL function

The CROSS_SYSTEM_DUMP_AVAIL function of the DUSR gate is used to inform the dump domain about the DUMP_AVAIL token which links CICS with the MVS workload manager.

Input parameters

CROSS_SYSTEM_DUMP_AVAIL is the CICS to MVS workload manager token.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|DISASTER|INVALID|KERNERROR|PURGED`

Process flow

- Set the CICS to MVS workload manager connect token in the DUA.

DUSR gate, DUMPDS_OPEN function

The DUMPDS_OPEN function of the DUSR gate is invoked to open the CICS dump data set.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

`OPEN_ERROR`

which indicates that the MVS OPEN of the dump data set failed.

Process flow

1. Issue LMLM LOCK for dump data set lock.
2. Call DUSU OPEN function.
3. Issue LMLM UNLOCK for dump data set lock.

DUSR gate, DUMPDS_CLOSE function

The DUMPDS_CLOSE function of the DUSR gate is invoked to close the CICS dump data set.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

Process flow

1. Issue LMLM LOCK for dump data set lock.
2. Call DUSU CLOSE function.
3. Issue LMLM UNLOCK for dump data set lock.

DUSR gate, DUMPDS_SWITCH function

The DUMPDS_SWITCH function of the DUSR gate is invoked to switch to the alternate CICS dump data set.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

```
OPEN_ERROR
```

which indicates that the MVS OPEN of the dump data set failed.

Process flow

1. Issue LMLM LOCK for dump data set lock.
2. Call DUSU SWITCH function.
3. Issue LMLM UNLOCK for dump data set lock.

DUSU SWITCH process flow

1. Process as for DUSU CLOSE.
2. Switch current data set name in the DUA.
3. Process as for DUSU OPEN.

DUSU OPEN process flow

1. Return if the DUA indicates already open.
2. Call DUIO OPEN function.
3. Update status on catalog.

DUSU CLOSE process flow

1. If data set is open:
   - Call DUIO ALLOC_STG function to get storage for DYNALLOC parameter list.
   - Issue DYNALLOC to get data set name for current dump data set.
2. Call DUIO CLOSE function.
3. If XDUCLSE exit is active, call APEX INVOKE_USER_EXIT.
4. Set status in the DUA to closed.
5. Free DYNALLOC parameter list if necessary.

DUIO OPEN process flow

1. Return if the DUA indicates transaction dump data set is already open.
2. Issue MVS GETMAIN for DU Open Block if it is not yet allocated.
3. Issue MVS OPEN.
4. Set status to open in the DUA.
5. Write end-of-data record.

DUIO uses the DCB OPEN exit to complete the DCB with block size and LRECL, and to determine the size of the buffer to be used by CICS. The DCB abend exit and the SYNAD routine are also activated to detect any errors that may occur during OPEN.

DUIO CLOSE process flow

1. Return if already closed.
2. Issue MVS CLOSE.
3. Issue MVS FREEPOOL to release buffers.
4. If this close is not for a switch, free the DU open block.
5. Set status to closed in the DUA.

DUIO ALLOC_STG process flow

1. Issue MVS GETMAIN for requested storage.
2. Clear acquired area to hexadecimal zeros.

DUSR gate, INQUIRE_CURRENT_DUMPDS function

The INQUIRE_CURRENT_DUMPDS function of the DUSR gate returns the name of the current dump data set.

Input parameters: None.

Output parameters

CURRENT_DUMPDS is the name of the current dump data set. It can have either of these values:

```
DFHDMPA|DFHDMPB
```

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

DUSR gate, INQUIRE_DUMPDS_OPEN_STATUS function

The INQUIRE_DUMPDS_OPEN_STATUS function of the DUSR gate returns an indication of whether the current dump data set is open or closed.

Input parameters: None.

Output parameters

OPEN_STATUS is the open status of the current dump data set. It can have either of these values:

```
OPEN|CLOSED
```

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

DUSR gate, INQUIRE_DUMPDS_AUTOSWITCH function

The INQUIRE_DUMPDS_AUTOSWITCH function of the DUSR gate returns an indication of whether autoswitching is active or not.

Input parameters: None.

Output parameters

AUTOSWITCH is the dump data set autoswitch status. It can have either of these values:

```
ON|OFF
```

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

DUSR gate, SET_DUMPDS_AUTOSWITCH function

The SET_DUMPDS_AUTOSWITCH function of the DUSR gate is used to set autoswitching on or off.

Input parameters

AUTOSWITCH is the dump data set autoswitch status. It can have either of these values:

```
ON|OFF
```

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

Process flow

1. Set new autoswitch value in the DUA.
2. Call DUSU UPDATE_CATALOGUE function, to write the DU state record to local catalog, using the current status from the DUA.

DUSR gate, INQUIRE_INITIAL_DUMPDS function

The INQUIRE_INITIAL_DUMPDS function of the DUSR gate returns the setting of the initial dump data set.

Input parameters: None.

Output parameters

INITIAL_DUMPDS is the initial dump data set. It can have any one of these values:

DFHDMPA Open DFHDMPA first when CICS is next initialized.

DFHDMPB Open DFHDMPB first when CICS is next initialized.

AUTO When CICS is next initialized, open the extent that was not active when CICS last terminated.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

DUSR gate, SET_INITIAL_DUMPDS function

The SET_INITIAL_DUMPDS function of the DUSR gate is used to change the setting of the initial dump data set.

Input parameters

INITIAL_DUMPDS is the initial dump data set. It can have any one of these values:

DFHDMPA Open DFHDMPA first when CICS is next initialized.

DFHDMPB Open DFHDMPB first when CICS is next initialized.

AUTO When CICS is next initialized, open the extent that was not active when CICS last terminated.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

Process flow

1. Set new initial dump data set value in the DUA.
2. Call DUSU UPDATE_CATALOGUE function, to write the DU state record to local catalog, using the current status from the DUA.

DUSR gate, SET_DUMPTABLE_DEFAULTS function

The SET_DUMPTABLE_DEFAULTS function of the DUSR gate is invoked during system initialization tp update the DUA with the DAE option specified in a SIT or as a SIT override.

Input parameters

DAE_DEFAULT indicates whether temporary dump table entries added by CICS will indicate DAE (dump eligible for DAE suppression) of NODAE (dump will not be suppressed by DAE). It can have either of the values:

DAE|NODAE

SYDUMAX_DEFAULT is taken from system initialization parameter (SIT=SYDUMAX), which specifies the maximum number of system dumps which can be taken per dump table entry.

TRDUMAX_DEFAULT is taken from system initialization parameter (SIT=TRDUMAX), which specifies the maximum number of transaction dumps which can be taken per dump table entry.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|DISASTER|INVALID|KERNERROR|PURGED`

Process flow

1. Set DAE_DEFAULT flag value in the DUA. 1 indicates DAE, 0 indicates NODAE.
2. Call DUSU UPDATE_CATALOGUE function, to write the DU state record to local catalog, using the current status from the DUA.

DUSR gate, INQUIRE_SYSTEM_DUMP function

The INQUIRE_SYSTEM_DUMP function of the DUSR gate returns the setting of the system dump suppression flag.

Input parameters: None.

Output parameters

SYSTEM_DUMP is the system dump option, indicating whether or not SDUMPs are to be taken by this CICS system. It can have either of these values:

`YES|NO`

where NO means that SDUMPs are not taken by this CICS system.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

DUSR gate, SET_SYSTEM_DUMP function

The SET_SYSTEM_DUMP function of the DUSR gate is used to change the setting of the system dump suppression flag.

Input parameters

SYSTEM_DUMP is the system dump option, indicating whether or not SDUMPs are to be taken by this CICS system. It can have either of these values:

`YES|NO`

where NO means that SDUMPs are not taken by this CICS system.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

Process flow

- Set new system dump suppression flag value in the DUA.
- Call DUSU UPDATE_CATALOGUE function, to write the DU state record to local catalog, using the current status from the DUA.

DUSR gate, INQUIRE_RETRY_TIME function

The INQUIRE_RETRY_TIME function of the DUSR gate returns the value of the SDUMP retry time.

Input parameters: None.

Output parameters

RETRY_TIME is the value in seconds of the time interval for which CICS should retry SDUMP requests that fail because another SDUMP is in progress within the MVS system. The SDUMP is retried at intervals of five seconds for the specified total time.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

DUSR gate, SET_RETRY_TIME function

The SET_RETRY_TIME function of the DUSR gate is invoked to set the SDUMP retry time.

Input parameters

RETRY_TIME is the value in seconds of the time interval for which CICS should retry SDUMP requests that fail because another SDUMP is in progress within the MVS system. The SDUMP is retried at intervals of five seconds for the specified total time.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

Process flow

1. Set new SDUMP retry time in the DUA.
2. Call DUSU UPDATE_CATALOGUE function, to write the DU state record to local catalog, using the current status from the DUA.

Miscellaneous process flows

DUIO format, WRITE function

1. If the first record in the block to be written is a dump header:
   - Issue MVS NOTE to get location of last record written (an end-of-data record).
   - Issue MVS POINT to position for overwrite of the end-of-data record.
2. Issue MVS WRITE.
3. Issue DSSR WAIT_MVS on the I/O ECB.
4. Issue MVS CHECK for I/O completion. This drives the DCB abend exit if an error or end-of-extent is encountered and results in an error or END_OF_EXTENT response from DUIO.

DUSU format, WRITE function

1. Call DUIO WRITE function if the dump data set is open and is not a dummy.
2. If an end-of-extent occurred:
   - If autoswitch is not active, close data set as for DUSU CLOSE above.
   - If autoswitch is active, turn autoswitch off and process as for DUSU SWITCH.

DUXF format, FORMAT function: This is the format of the parameter list passed to the transaction dump formatting routines (DFHxxXDF). There is a SUB_FUNCTION parameter which indicates the areas to be dumped. Each formatting routine is responsible for handling a subset of the subfunctions. The subfunctions and corresponding formatting modules are listed below in the order of the subfunction invocation from DFHDUXD.

Module	Subfunction
DFHXDXDF	DUXF_FORMAT_DUMP_HEADER
DFHXDXDF	DUXF_FORMAT_SHORT_SYMPTOM_STRIN
DFHXDXDF	DUXF_FORMAT_CICS_SERVICE_LEVEL
DFHXDXDF	DUXF_FORMAT_PSW_REGISTERS
DFHSAXDF	DUXF_FORMAT_TCA
DFHPCXDF	DUXF_FORMAT_LIFO
DFHSAXDF	DUXF_FORMAT_COMM_AREAS
DFHSAXDF	DUXF_FORMAT_CSA
DFHTRXDF	DUXF_FORMAT_TRT
DFHXDXDF	DUXF_FORMAT_SEGMENT
DFHXDXDF	DUXF_FORMAT_SEGMENT_LIST
DFHSAXDF	DUXF_FORMAT_TRANSACTION_STORAGE
DFHSAXDF	DUXF_FORMAT_FCA
DFHTCXDF	DUXF_FORMAT_TCTTE
DFHPCXDF	DUXF_FORMAT_PROGRAM
DFHSAXDF	DUXF_FORMAT_DCT
DFHFCXDF	DUXF_FORMAT_FCT
DFHTCXDF	DUXF_FORMAT_TCT
DFHXRXDF	DUXF_FORMAT_XRF
DFHPCXDF	DUXF_FORMAT_PCT
DFHPCXDF	DUXF_FORMAT_PPT
DFHSAXDF	DUXF_FORMAT_SIT
DFHDLXDF	DUXF_FORMAT_DLI
DFHPCXDF	DUXF_FORMAT_MODULE_INDEX
DFHXDXDF	DUXF_FORMAT_DUMP_TRAILER

DUXW format, HEX function

1. Construct record in buffer indicating that this data should be formatted as hexadecimal.
2. If buffer is full, call DUSU WRITE to output it.
3. If XDUOUT exit is active, call APEX INVOKE_USER_EXIT.

DUXW format, NON_HEX function

1. Construct record in buffer indicating that this data should be printed as-is; that is, it is already a character string.
2. If buffer is full, call DUSU WRITE to output it.
3. If XDUOUT exit is active, call APEX INVOKE_USER_EXIT.

Dump domain's generic gates

Table 46 summarizes the dump domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 46 (Page 1 of 2). Dump domain's generic gates

Gate	Trace	Function	Format
DMDM	DU 0001 DU 0002	PRE_INITIALISE INITIALISE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
APUE	DU 0301 DU 0302	SET_EXIT_STATUS	APUE

Table 46 (Page 2 of 2). Dump domain’s generic gates

Gate	Trace	Function	Format
STST	DU 0500 DU 0501	COLLECT_STATISTICS COLLECT_RESOURCE_STATS	STST

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format APUE—“Application domain’s generic formats” on page 42

Format DMDM—“Domain manager domain’s generic formats” on page 195

Format STST—“Statistics domain’s generic format” on page 521

In preinitialization processing, the dump domain establishes the initial dumping status:

- System dumping is enabled or suppressed, as required.
- The next transaction dump data set to be used is flagged.
- The transaction dump data set autoswitch status is set on or off, as required.
- The dump retry interval is established.
- The system dump table is initialized to empty.

For a cold start, the information comes from the system initialization parameters; for any other type of start, the information comes from the local catalog, but is then modified by any relevant system initialization parameters.

In initialization processing, the dump domain loads the transaction dump table and the system dump table from the global catalog.

In quiesce processing, the dump domain performs only internal routines.

In termination processing, the dump domain closes the transaction dump data set.

DMDM PRE_INITIALIZE function

The PRE_INITIALIZE function of the DMDM gate performs the following functions:

1. Issue MVS GETMAIN for DU anchor block (DUA) and initialize it.
2. Read DU state record from the local catalog and set values in the DUA.
3. Initialize to empty the system dump table.
4. Issue MVS GETMAIN for DU statistics buffer.
5. Acquire startup information from the parameter manager (PA) domain and set it in the DUA.
6. Inform the kernel that DU system dump is available by issuing KEDD ADD_GATE for the DFHDUDU gate.

DMDM INITIALIZE_DOMAIN function

The INITIALIZE_DOMAIN function of the DMDM gate performs the following functions:

1. Load the system dump table from the global catalog.
2. Load the transaction dump table from the global catalog.
3. Issue LMLM ADD_LOCK for the dump data set lock (DUDATSET).
4. Issue LMLM ADD_LOCK for the dump table lock (DUTABLE).
5. Issue LMLM UNLOCK for DUTABLE lock.
6. Issue KEDD ADD_GATE for the DU STST, DUDT, and APUE gates.
7. Initialize transaction dump, including loading DFHDUIO, and indicate that the dump table is available to the DUDU TRANSACTION_DUMP function.
8. Update DU state record on catalog.
9. Issue LMLM UNLOCK for DUDATSET lock, thereby making the transaction dump function available.

DMDM QUIESCE_DOMAIN function

The QUIESCE_DOMAIN function of the DMDM gate issues a DMDM WAIT_PHASE function request to ensure all statistics are collected.

DMDM TERMINATE_DOMAIN function

The TERMINATE_DOMAIN function of the DMDM gate issues a DUSU CLOSE request to close the transaction dump data set.

APUE SET_EXIT_STATUS function

The SET_EXIT_STATUS function of the APUE gate sets the exit status flag in the DUA for the specified exit.

STST COLLECT_STATISTICS function

The COLLECT_STATISTICS function of the STST gate is called from the statistics domain. The process flow is:

1. Issue LMLM LOCK for DUTABLE lock on the transaction dump table.
2. Acquire KE system dump lock.
3. Issue STST COLLECT_STATISTICS call to DFHDUTM.
4. Release DUTABLE lock and system dump lock.

DFHDUTM process flow: If the COLLECT_STATISTICS parameters requested DATA, the following statistics records are written to the statistics domain:

1. If the RESOURCE_TYPE is not specified or is SYSDUMP, a DFHSDGPS global system dump statistics record is created, using global system dump counts (taken and suppressed) from the DUA. The KE system lock is released while a STATS_PUT request is made to the statistics domain. The lock is obtained again on successful completion of the STATS_PUT.
2. If the RESOURCE_TYPE is not specified or is TRANDUMP, a DFHTDGPS global transaction dump statistics record is created, using global transaction dump counts (taken and suppressed) from the DUA. The DUTABLE lock is released while a RECORD_STATISTICS request is made to the statistics domain. The lock is obtained again on successful completion of the RECORD_STATISTICS.
3. If the RESOURCE_TYPE is not specified or is SYSDUMP, a DFHSDRPS statistics detail record is written for every dump code found on the system dump table. The records contain the statistics for that dump code held on the dump table entry. The DFHSDRPS records are buffered and full buffers are written out using a RECORD_STATISTICS call to the statistics domain.
4. If the RESOURCE_TYPE is not specified or is TRANDUMP, a DFHTDRPS statistics detail record is written for every dump code found on the transaction dump table. The records contain the statistics for that dump code held on the dump table entry. The DFHTDRPS records are buffered and full buffers are written out using a RECORD_STATISTICS call to the statistics domain.

The global system and transaction dump counts (taken and suppressed) in the DUA are also reset to zero. The last_reset_time is also updated in the DUA at this time.

STST COLLECT_RESOURCE_STATS function

The COLLECT_RESOURCE_STATS function of the STST gate is called from an EXEC CICS command. The process flow is:

1. Issue LMLM LOCK for DUTABLE lock on the transaction dump table.
2. Acquire KE system dump lock.
3. Issue STST COLLECT_RESOURCE_STATS call to DFHDUTM.
4. Release DUTABLE lock and system dump lock.

DFHDUTM process flow

1. Validate RESOURCE_TYPE for either SYSDUMP or TRANDUMP. Perform error processing and return INVALID to the caller if it is neither of these.
2. If the RESOURCE_ID has not been passed, format a global statistics record, using counts of dumps taken and suppressed from the DUA, for either system or transaction dumps, depending on the RESOURCE_TYPE. Return this record to the caller in the RESOURCE_STATISTICS_DATA parameter.
3. If the RESOURCE_ID is present, it should contain a dump code. Search the relevant dump table (depending on RESOURCE_TYPE). Return ID_NOT_FOUND exception to the caller if the dump code cannot be found. If the dump code is found, format either a DFHTDRPS or a DFHSDRPS statistics record using the dumps taken and suppressed statistics on the dump table entry. This record is formatted in the next available space in the RESOURCE_STATISTICS_DATA buffer.

Control blocks

Dump domain anchor block (DUA)

There is one DU anchor block in the system. It is created when DU is initialized, and lasts for the lifetime of the system. It contains information relating to the status of the domain, and pointers to other control blocks.

Dump domain open block.

This contains the data areas associated with the dump data set DCB, namely the ECB, DCB itself, DECB, and the output buffer. It resides below the 16MB line. It is allocated when the data set is opened, and freed when either an explicit close is issued or the end of the current data set is reached and autoswitching is not active.

System dump table (SDT)

Storage for this table is obtained during dump domain preinitialization. The table is then initialized with null table entries. During dump domain initialization, the table is loaded with any values held on the global catalog for system dump codes that were explicitly added during previous CICS runs. Any system dumps taken before this point in initialization use default dump values (see the *CICS Problem Determination Guide* for information held for each dump code, and the default values).

Table entries are added during a CICS run either explicitly via CEMT or EXEC CICS commands, or implicitly, with default values, if a dump is requested for which an entry does not exist. These entries can be changed or deleted via CEMT or EXEC CICS commands. Explicitly added entries are written to the global catalog. Further blocks of storage are obtained if necessary as each block fills up. Storage for deleted entries is not reused, because activity on the table is low.

The DU domain anchor block contains pointers to the table, to the first and last active entries in the table, and to the next available entry. The table contains forward and backward pointers so that the table can be accessed in dump code sequence, and additional blocks are chained off the header of the previous block.

Transaction dump table (TDT)

Storage for this table is obtained during dump domain initialization and the table is then loaded with any values held on the global catalog which were explicitly added during previous CICS runs.

Table entries are added during a CICS run either explicitly via CEMT or EXEC CICS commands, or implicitly, with default values, if a dump is requested for which an entry does not exist. These entries can be changed or deleted via CEMT or EXEC CICS commands. Explicitly added entries are written to the global catalog. Further blocks of storage are obtained if necessary as each block fills up. Storage for deleted entries is not reused, because activity on the table is low.

The DU domain anchor (DUA) block contains pointers to the table, to the first and last active entries in the table, and to the next available entry. The table contains forward and backward pointers so that the table can be accessed in dump code sequence, and additional blocks are chained off the header of the previous block.

Browse token table (BTT)

This table holds browse tokens for both system and transaction dump tables. Each browse session started on either dump table is allocated a token that is held in this table, along with the dump code of the last dump table entry obtained by the browse session.

Storage for this table is obtained when the first dump table browse session of a CICS run is started. More storage is obtained when the table is full. Storage for deleted entries is not reused.

The structure of the table is the same as for the dump tables, as shown in Figure 52.

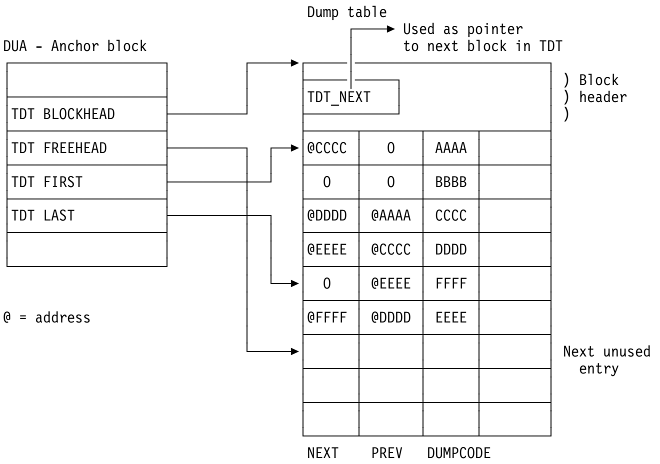


Figure 52. Format of the system and transaction dump tables and browse token table

Notes:

1. This example is for the transaction dump table, but it also applies to the SDT and the BTT.
2. The global catalog contained records for dump codes AAAA, BBBB, CCCC, DDDD, and FFFF.
3. Dump code BBBB has been deleted by an EXEC CICS command, so the NEXT and PREV pointers have been set to zero.
4. Dump code EEEE has been added during this CICS run and the pointers in entries for DDDD and FFFF adjusted to include EEEE in the correct sequence.
5. In this example, the first table block is not full, so TDT_NEXT in the block header is zero.

For a detailed description of these control blocks, see the *CICS Data Areas* manual.

Modules

Module	Function
DFHAPTRV	System dump formatting program, ZC Install
DFHAPTRY	System dump formatting program, XM related
DFHAPTRX	System dump formatting program, ZC persistent sessions
DFHDUDM	Processes requests to the DMDM gate of the dump domain
DFHDUDT	Processes requests to the DUDT gate of the dump domain
DFHDUDU	Processes requests to the DUDU gate of the dump domain
DFHDUIO	Processes domain subroutine requests of format DUIO
DFHDUSR	Processes requests to the DUSR and APUE gates of the dump domain
DFHDUSU	Processes domain subroutine requests of format DUSU
DFHDUSVC	System dump
DFHDUTM	Dump table manager
DFHDUXD	Invoked by DFHDUDU with a DUDD format parameter list to control the transaction dump process
DFHDUXW	Processes domain subroutine requests of format DUXW

Transaction dump formatting routines

The following routines are invoked by DFHDUXD to dump the storage areas associated with a particular CICS component. They are passed a DUXF format parameter list. They are all part of the DFHSIP load module.

Routine	Function
DFHDLXDF	DL/I related areas
DFHFCXDF	File control related areas
DFHPCXDF	Program related areas
DFHSAXDF	Common areas such as CSA, TCA, and so on
DFHSMXDF	Task subpools
DFHTCXDF	Terminal control related areas
DFHTRXDF	The internal trace table
DFHXDXDF	Information such as register contents, headers, and so on
DFHXRXDF	XRF related areas.

Copy books

Copy book	Function
DFHDUDCC	Contains the definitions of all DU control blocks.
DFHDUXDC	Provides common definitions for the transaction dump formatting routines DFHxxXDF.
DFHDUXDS	Common routine for the transaction dump formatting routines to convert responses from DFHDUXW into responses for DFHDUXD.
DFHDUXDV	Common abend recovery routine for the transaction dump formatting routines.

Exits

The dump domain exits are listed below. See the *CICS Customization Guide* for details of each exit.

XDUREQ The dump request exit, driven for each transaction and system dump request.

XDUREQ The dump request close exit, driven after a transaction or system dump has been taken (or failed or supressed).

XDUOUT The output exit, driven before each buffer is written to the transaction dump data set.

XDUCLSE The dump data set close exit, driven after each close of a transaction dump data set.

Trace

The point IDs for the dump domain are of the form DU xxxx; the corresponding trace levels are DU 1, DU 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Dumps

A formatted system dump contains the DU anchor (DUA) block and the DU open block.

System dumps requested by DU fall into two categories:

Dump code DUnnnn
For these there is a preceding console message DFHDUnnnn. See the *CICS Messages and Codes* manual for details.

Dump code KERNDUMP
If an error occurs in DFHDUDM during PRE_INITIALIZE processing, that is, before the system dump function is available, DU uses MVS WTO to write message DFHDU0103, and the kernel dump function to take an SDUMP.

Chapter 29. Dump utility program (DFHDU530)

The dump utility program (DFHDU530) runs offline (in batch mode) to produce a printout of the CICS transaction dumps from a CICS transaction dump data set (DFHDMPA or DFHDMPB).

Design overview

DFHDU530 operates in batch mode while one of the dump data sets is closed. Each area, program, and table entry is identified, formatted, and printed separately, with both actual and relative addresses to facilitate analysis. You can select single or double spacing of dumps when the dump utility program is executed.

The CICS dump data set (DFHDMPA or DFHDMPB) contains a number of CICS transaction dumps. These are produced as the result of a transaction abend or a user-application EXEC CICS DUMP TRANSACTION request.

DFHDU530 runs as a stand-alone program in batch mode to format and print the contents of a transaction dump data set. Parameters specified on the SYSIN data set can be used to print only selected dumps or an index of the dumps in the data set.

For further details about DFHDU530, see the *CICS Operations and Utilities Guide*.

Data sets

There are three sources of data for DFHDU530:

Parameters on JCL EXEC statement
A character string of keywords that can be specified to control the layout and format of the dumps.

SYSIN
Records specifying the criteria to be used in selecting which of the dumps on the data set are to be printed.

DFHDMPDS
The transaction dump data set.

There are two output files:

DFHPRINT
The print file for the formatted transaction dump.

DFHTINDX
The print file for the index of dumps on the data set.

Processing

Figure 53 shows the dump utility program interfaces.

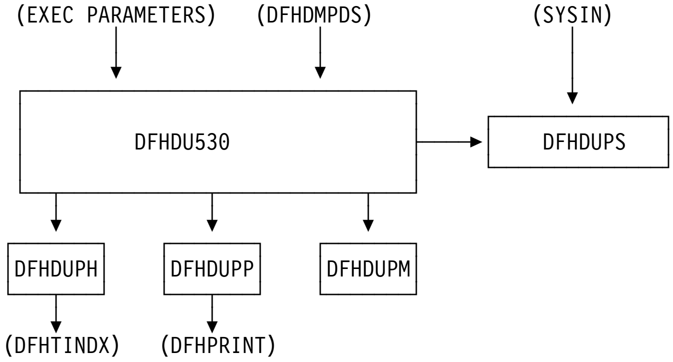


Figure 53. Dump utility program interfaces

The overall flow of the processing within DFHDU530 is as follows. Unless otherwise indicated, all processing is performed by DFHDUPR, the main component of DFHDU530.

1. Process the EXEC parameters if they are present.
2. Call DFHDUPP to open the print data set DFHPRINT.
3. Open the dump data set DFHDMPDS.
4. Read the dumps from DFHDMPDS. For each dump there are four categories of records:

   Dump header record
   Call DFHDUPS to see whether this dump is required for printing. On the first time through, DFHDUPS reads the selective print information from SYSIN. DFHDUPS also calls DFHDUPH to add the dump to the dump index data set DFHTINDX. DFHDUPH opens DFHTINDX on its first invocation.

   Module index records
   DFHDUPM is called to accumulate the module index information in a table in main storage.

   Other data records
   The data is formatted into print lines and DFHDUPP is invoked to write them to DFHPRINT.

   Dump trailer record
   DFHDUPM is invoked to sort and format the module index records. DFHDUPP is called to write them to DFHPRINT.

5. When the end of the dump data set is encountered:
   a. DFHDUPP is called to close DFHPRINT.
   b. DFHDUPH is called to close DFHTINDX.
   c. DFHDUPR closes DFHDMPDS.
6. DFHDU530 terminates.

Modules

Module	Function
DFHDUPR	Controlling routine, responsible for reading information from the dump data set DFHDMPDS.
DFHDUPS	Receives the address of a dump header record from the dump data set, and decides whether this dump fulfils the criteria for printing. On first entry, reads and stores the selective print parameters from SYSIN.
DFHDUPP	Is responsible for all access to the print file DFHPRINT, namely for OPEN, CLOSE, and PUT requests.
DFHDUPH	Writes line to dump index for each dump header record encountered. On first entry, opens the index file DFHTINDX.
DFHDUPM	Invoked for each module index entry found to save information. Invoked when dump trailer record found to format and print the complete module index.

Copy books

Copy book	Function
DFHDUPSC	Contains the definition of the parameter list passed to DFHDUPS.
DFHDUPMC	Contains the definition of the parameter list passed to DFHDUPM.
DFHDUPPC	Contains the definition of the parameter list passed to DFHDUPP.

Exits

Global user exit points are not applicable to offline utilities.

Trace

Trace points are not applicable to offline utilities.

Chapter 30. Dynamic allocation sample program (IBM 3270 only)

Any data set defined to file control can be allocated to CICS dynamically when the file is opened, rather than at CICS job initiation time. This allocation takes place automatically if job control statements for the data set are not included in the CICS job stream, and if both the data set name and the disposition have been specified in the file control table when the data set is opened.

The dynamic allocation sample program provides an alternative way to perform dynamic allocation. When used with a terminal of the IBM 3270 Information Display System, it gives the user access to the functions of DYNALLOC (SVC 99) in MVS. This can be used, in conjunction with master terminal functions and suitable operating procedures, to allocate and deallocate any file that CICS can dynamically open and close.

Design overview

The program runs as a CICS transaction, using CICS functions at the command level wherever possible. It does not modify any CICS control blocks. Only the DYNALLOC function is available through the program; any manipulation of the environment before or after the DYNALLOC request must be done by other means.

CICS supplies sample resource definitions for the program load module, DFH99, and the transaction, ADYN, that invokes it. These definitions are in the group DFH$UTIL. Note that DFH99 ***must*** be defined with EXECKEY(CICS).

The flow in a normal invocation is as follows. The main program, DFH99M, receives control from CICS, and carries out initialization. This includes determining the screen size and allocating input and output buffer sections, and issuing initial messages. It then invokes DFH99GI to get the input command from the terminal. Upon return, if the command was null, the main program terminates, issuing a final message.

The command obtained has its start and end addresses stored in the global communication area, COMM. The main program allocates storage for tokenized text, and calls DFH99TK to tokenize the command. If errors were detected at this stage, further analysis of the command is bypassed.

Following successful tokenizing, the main program calls DFH99FP to analyze the verb keyword. DFH99FP calls DFH99LK to look up the verb keyword in the table, DFH99T. DFH99LK calls DFH99MT if an abbreviation is possible. Upon finding the matching verb, DFH99FP puts the address of the operand section of the table into COMM, and puts the function code into the DYNALLOC request block.

The main program now calls DFH99KO to process the operand keywords. Each keyword in turn is looked up in the table by calling DFH99LK, and the value coded for the keyword is checked against the attributes in the table. DFH99KO then starts off a text unit with the appropriate code, and, depending on the attributes the value should have, calls a conversion routine

- For character and numeric strings, DFH99CC is called. It validates the string, and puts its length and value into the text unit.
- For binary variables, DFH99BC is called. It validates the value, converts it to binary of the required length, and puts its length and value into the text unit.
- For keyword values, DFH99KC is called. It looks up the value in the description part of the keyword table using DFH99LK, and puts the coded equivalent value and its length into the text unit.

When a keyword specifying a returned value is encountered, DFH99KO makes an entry on the returned value chain, which is anchored in COMM. This addresses the keyword entry in DFH99T, the text unit where the value is returned, and the next entry. In this case the conversion routine is still called, but it only reserves storage in the text unit, setting the length to the maximum and the value to zeros.

When all the operand keywords have been processed, DFH99KO returns to the main program, which calls DFH99DY to issue the DYNALLOC request.

DFH99DY sets up the remaining parts of the parameter list, and if no errors too severe have been detected, a subtask is attached to issue the DYNALLOC SVC. A WAIT EVENT is then issued against the subtask termination ECB. When the subtask ends, and CICS dispatches the program again, the DYNALLOC return code is captured from the subtask ECB, with the error and reason codes from the DYNALLOC request block, and a message is issued to give these values to the terminal.

DFH99DY then returns to the main program, which calls DFH99RP to process returned values. DFH99RP scans the returned value chain, and for each element issues a message containing the keyword and the value found in the text unit. If a returned value corresponds to a keyword value, DFH99KR is called to look up the value in the description, and issue the message.

Processing of the command is now complete, and the main program is reinitialized for the next one, and loops back to the point where it calls DFH99GI.

Messages are issued at many places, using macros. The macro expansion ends with a call to DFH99MP, which ensures that a new line is started for each new message, and calls DFH99ML, the message editor. Input to the message editor is a list of tokens, and each one is picked up in turn and converted to displayable text. For each piece of text, DFH99TX is called, which inserts the text into the output buffer, starting a new line if necessary. This ensures that a word is never split over two lines.

When the command has been processed, the main program calls DFH99MP with no parameters, which causes it to send the output buffer to the terminal, and initialize it to empty.

Control blocks

The sample program does not have any control blocks.

Modules

Module	Function
DFH99BC	Convert to binary target
DFH99CC	Character and number string conversion
DFH99DY	Issue SVC 99 and analyze result
DFH99FP	Process function keyword
DFH99GI	Format display and get input
DFH99KC	Keyword value conversion
DFH99KH	List keywords for help
DFH99KO	Process operator keywords
DFH99KR	Convert returned value to keyword
DFH99LK	Search key set for given token
DFH99ML	Build message text from token list
DFH99MM	Main control program (entry point DFH99M)
DFH99MP	Message filing routine
DFH99MT	Match abbreviation with keyword
DFH99RP	Process returned values
DFH99T	Table of keywords
DFH99TK	Tokenize input command
DFH99TX	Text display routine
DFH99VH	List description for help

Exits

No global user exit points are provided for this function.

Trace

This sample program makes no entries in the trace, over and above the normal entries one would see for a CICS user transaction.

External interfaces

SVC 99—MVS DYNALLOC SVC.

Chapter 31. Enqueue Domain (NQ)

The NQ domain provides UOW based locking services. This is provided to the local clients FC, TD and TS. It also services the EXEC CICS ENQ/DEQ requests.

The most common functions provided by the NQ domain are:

CREATE_ENQUEUE_POOL This function creates a separate enqueue pool for the caller. A token is returned which the caller specifies on all requests associated with that pool.

DEACTIVATE This function converts an active enqueue into retained state. The caller must already own the enqueue.

REACQUIRE_ENQUEUE NQ domain doesn't recover enqueues over a CICS restart. Instead resource owners use this function to reacquire enqueues that were held by inflight and indoubt UOWs.

ENQUEUE This functions obtains an enqueue from the specified enqueue pool in active state.

DEQUEUE This functions releases an active enqueue owned by the current UOW from the specified enqueue pool.

INQUIRE_NQRNAME This function calls INQ_NQRNAME to see if an enqueue name entry exists in NQRNAME_LIST. If the name is either an exact or generic match, INQUIRE_NQRNAME returns the 4-character SCOPE name, enqmodel STATE and ann OK RESPONSE. Otherwise it returns an EXCEPTION REASON(NQRNAME_NOT_FOUND).

ADD_REPLACE_ENQMODEL This function adds an enqmodel definition to both the NQRN directory (keyed by enqmodel name, and to the NQRNAME_LIST (keyed by the variable length NQRNAME). If the enqmodel already exists the entry is replaced.

DISCARD_ENQMODEL Remove an enqmodel definition from both the NQRN directory and from the NQRNAME_LIST. If the enqmodel is not installed, exception 'ENQMODEL_NOT_FOUND' is returned.

INQUIRE_ENQMODEL Uses directory DDLO_LOCATE to retrieve information about a specified enqmodel definition in the NQRN directory.

If found, it returns the 1 to 255 character NQRNAME, the 4-character SCOPE name, the enqmodel STATE and ann OK RESPONSE. Otherwise it returns an EXCEPTION REASON(ENQMODEL_NOT_FOUND).

SET_ENQMODEL This function uses directory DDLO_LOCATE to see if an enqmodel entry exists in the NQRN directory. If found, it enables or disables the entry. Otherwise it returns an EXCEPTION REASON(ENQMODEL_NOT_FOUND).

Enqueue domain's specific gates

Table 47 summarizes the NQ domain's specific gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate and the functions provided by the gate. The DFHNQEDX XPI macro provides ENQUEUE and DEQUEUE functions for the NQ domain.

Table 47. NQ domain’s specific gates

Gate	Trace	Function
NQNQ	NQ 0201 NQ 0202	CREATE_ENQUEUE_POOL DEACTIVATE REACQUIRE_ENQUEUE SET_NQRNAME_LIST DEQUEUE_TASK
NQED	NQ 0301 NQ 0302	ENQUEUE DEQUEUE
NQIB	NQ 0401 NQ 0402	INQUIRE_ENQUEUE START_BROWSE_ENQUEUE GET_NEXT_ENQUEUE END_BROWSE_ENQUEUE
NQRN	NQ 0601 NQ 0602	INQUIRE_NQRNAME ADD_REPLACE_ENQMODEL DISCARD_ENQMODEL REMOVE_ENQMODEL INQUIRE_ENQMODEL START_BROWSE_ENQMODEL GET_NEXT_ENQMODEL END_BROWSE_ENQMODEL SET_ENQMODEL COMMIT_ENQMODEL RESTORE_DIRECTORY
NQIE	NQ FF50 NQ FF51	INTERPRET_ENQUEUE

NQNQ gate, CREATE_ENQUEUE_POOL function

This function creates a separate enqueue pool for the caller. A token is returned which the caller specifies on all requests associated with that pool.

Input parameters:

POOL_NAME The eight character name of the new enqueue pool.

EXPECTED_NAME_LENGTH The expected length for enqueue names in the pool.

For pools with fixed length enqueue names this should be the length of the names that are going to be enqueued upon.

For pools that are to contain variable length enqueue names this should be a length that would satisfy 'most' of the requests to be made in the pool.

Note that is no maximum length for enqueue names. However, requests will only be handled inline if the length of the enqueue name is less than or equal to the EXPECTED_NAME_LENGTH. The inline macro only copes with names of less than or equal to 256 characters. For this reason an error will be diagnosed if a value of greater than 256 is specified for this parameter.

SHUNT_ACTION Indicates the **default** action that is to be performed to UOW lifetime enqueues in this pool if their owning UOW is shunted. Note that most enqueue pools will require the same action to be performed for all enqueues in that pool. However, the ENQUEUE function allows this default to be overridden for particular enqueue requests.

The possible values are as follows:

RELEASE The enqueue(s) will be released if the owning UOW is shunted.

RETAIN The enqueue(s) will be retained if the owning UOW is shunted.

IGNORE The shunt will be ignored. The enqueue(s) will remain in the same state as currently held in.

Transaction lifetime enqueues are automatically released when a shunt occurs.

ERROR_LEVEL Indicates the severity of the error response that is to be returned for the following errors made while using this pool:

- DEQUEUE
  - Enqueue_not_owned
  - Enqueue_locked
- REACQUIRE_ENQUEUE
  - Enqueue_locked
  - Enqueue_active
- DEACTIVATE
  - Enqueue_not_owned
  - Enqueue_not_active

The possible values for ERROR_LEVEL are as follows:

EXCEPTION_RESPONSE The above errors are to be returned with an exception response.

INVALID_RESPONSE The above errors are to be returned with an invalid response. (i.e. FFDC is to be performed).

Note: It is expected that only the EXEC and the KC enqueue pools will specify EXCEPTION_RESPONSE since the DFHKC service previously used by them allowed these sorts of error to go by undetected.

EXEC_INTERPRETER Indicates how enqueues belonging to the enqueue pool are to be interpreted by the EXEC CICS INQUIRE UOWENQ command.

The possible values are as follows:

NONE No interpreter has been supplied so enqueues belonging to this pool will be ignored by the INQUIRE UOWENQ command.

DEFAULT Enqueues are to be returned by the INQUIRE UOWENQ command. The default NQ domain interpreter will be called to perform the interpretation. This will map the outputs of the INQUIRE UOWENQ command as follows:

TYPE Will be the CVDA corresponding to the ENQUEUE_TYPE parameter supplied on this call.

RESOURCE Will be ENQUEUE_NAME1 as supplied on the NQED_ENQUEUE function.

QUALIFIER Will be ENQUEUE_NAME2 if supplied on the NQED_ENQUEUE function. If not then no QUALIFIER data will be returned.

OWN Enqueues are to be returned by the INQUIRE UOWENQ command. A routine provided by the pool owner will perform the interpretation. In this case the entry point of the routine must be passed in the INTERPRETER_ADDR parameter.

Note: The routine will be called by a kernel subroutine call, not by a domain call. Consequently it will execute in the domain of the caller (i.e. AP domain).

OWN_INTERPRETER_ADDRESS Entry point of interpreter routine for this pool. Should only be supplied for pools which specify a value of OWN for the EXEC_INTERPRETER parameter.

ENQUEUE_TYPE The enqueue type that is to be returned by the default interpreter. Should only be supplied for pools which specify a value of DEFAULT for the EXEC_INTERPRETER parameter.

The possible values are as follows and these map onto the CVDA values for the TYPE field as detailed under the EXEC CICS INQUIRE UOWENQ command.

- DATASET
- EXECENQ
- EXECENQADDR
- EXECENQPLEX
- FILE
- TDQUEUE
- TSQUEUE
- DISPATCHER

Output parameters:

POOL_TOKEN Token returned which identifies the newly created enqueue pool.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

RESPONSE	Possible REASON values
INVALID	INTERPRETER_ADDR_EXPECTED, ENQUEUE_TYPE_EXPECTED, DUPLICATE_POOL_NAME, INVALID_NAME_LENGTH

NQNQ gate, DEACTIVATE function

This function converts an active enqueue into retained state. The caller must already own the enqueue.

Input parameters:

POOL_TOKEN Token representing enqueue pool from which the enqueue is to be deactivated.

ENQUEUE_TOKEN Token representing the enqueue that is to be deactivated.

Slightly better performance is achieved for callers that use the token method for this function.

ENQUEUE_NAME1 A block (addr,len) identifying the name of the enqueue to be deactivated.

Or alternatively identifies the prefix of the enqueue name which when combined with the ENQUEUE_NAME2 parameter forms the name of the enqueue to be deactivated.

ENQUEUE_NAME2 A block (addr,len) identifying the second half of the enqueue name.

Output parameters:

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	ENQUEUE_NOT_OWNED, ENQUEUE_NOT_ACTIVE
INVALID	ENQUEUE_NOT_OWNED, ENQUEUE_NOT_ACTIVE, TRANSACTION_ENQUEUE, INVALID_POOL_TOKEN

NQNQ gate, REACQUIRE_ENQUEUE function

NQ domain doesn't recover enqueues over a CICS restart. Instead resource owners use this function to reacquire enqueues that were held by inflight and indoubt UOWs.

The enqueue can be reacquired in either active or retained state. The calling UOW must currently be shunted.

No MAX_LIFETIME input is provided since such enqueues are only ever associated with a single UOW.

The same rules as documented for the mainline ENQUEUE function apply to the shunt action that will be associated with the reacquired enqueue.

Input parameters:

POOL_TOKEN Token representing enqueue pool from which the enqueue is to be allocated from.

ENQUEUE_NAME1 A block (addr,len) identifying the name of the enqueue.

Or alternatively identifies the prefix of the enqueue name which when combined with the ENQUEUE_NAME2 parameter forms the name being enqueued on.

ENQUEUE_NAME2 A block (addr,len) identifying the second half of the enqueue name.

STATE The state that the enqueue is to be reacquired in.

The possible states are as follows:

ACTIVE The enqueue is to be reacquired in active state.

RETAINED The enqueue is to be reacquired in retained state.

SHUNT_ACTION Indicates the action that is to be performed if the UOW reacquiring the enqueue is shunted again. This parameter acts as an override, if not supplied then the default shunt action specified when the pool was created is assumed for this request.

The possible overrides are as follows:

RELEASE The enqueue will be released if the UOW is shunted again.

RETAIN The enqueue will be retained if the UOW is shunted again.

IGNORE The shunt will be ignored. The enqueue will remain in the same state as it is currently held in.

Output parameters:

ENQUEUE_TOKEN Token returned to represent the enqueue that has been successfully reacquired.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	ENQUEUE_LOCKED, ENQUEUE_ACTIVE
INVALID	ENQUEUE_LOCKED, ENQUEUE_ACTIVE, CALLER_NOT_SHUNTED, INVALID_POOL_TOKEN

NQNQ gate, SET_NQRNAME_LIST function

This function is called from three places in dfhnqrn:

discard_enqmodel IF nqrmodel delete is set THEN the specified nqrmodel is removed from nqrname_list.

Add_replace_enqmodel IF nqrmodel add is set THEN the specified nqrmodel is added to nqrname_list.

set_nqrmodel IF neither delete or add is set THEN the specified nqrmodel is set disabled.

Input parameters:

MODEL_TOKEN The address of the nqrmodel to be set or added to nqrname_list.

POOL_TOKEN The pool to be searched for matching enqueues

POOL_TWO An optional second pool to be searched for matching enqueues

Output parameters:

FREE_TOKEN Address of Model being removed.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or PURGED. Possible values are:

NQRMODEL_NOT_FOUND The nqrmodel could not be found in nqrname_list

FREE_NQRMODEL A nqrmodel has been removed and must be freemained. Its address is in free_token.

NQED gate, ENQUEUE function

This functions obtains an enqueue from the specified enqueue pool in active state.

Input parameters:

POOL_TOKEN Token representing enqueue pool from which the enqueue is to be allocated.

ENQUEUE_NAME1 A block (addr,len) identifying the name being enqueued on.

Or alternatively identifies the prefix of the enqueue name which when combined with the ENQUEUE_NAME2 parameter forms the name being enqueued on.

ENQUEUE_NAME2 A block (addr,len) identifying the second half of the enqueue name.

MAX_LIFETIME Indicates the maximum duration that the enqueue is to be held for. The possible values are as follows:

UOW The enqueue will be released if it is held when the current UOW commits.
This is the default value when not supplied on the call.

TRANSACTION The enqueue will be released if it is held when the last UOW in the current transaction commits.

DISPATCHER_TASK The enqueue will be released if it is held when a DEQUEUE_ALL request is issued by the owning dispatcher task.
This is the only value permitted when POOL_TOKEN is not supplied on the call.

WAIT Indicates whether the caller wishes to wait if the requested enqueue is currently held in the pool by a different UOW. The possible values are as follows:

YES The caller will be suspended if the enqueue is busy. This is the default value when not supplied on the call.

NO The ENQUEUE_BUSY exception is returned to the caller if the enqueue is busy.

Note that callers specifying WAIT(NO) should still expect to suspend for the NQ domain lock.

SHUNT_ACTION Indicates the action that is to be performed if this UOW is shunted whilst it owns the enqueue. This parameter acts as an override, if not supplied then the default shunt action specified when the pool was created is assumed for this enqueue request.

The shunt action is only applicable to UOW lifetime enqueues. An error is diagnosed if this parameter is supplied on a request for a transaction lifetime enqueue.

The possible overrides are as follows:

RELEASE The enqueue will be released if the UOW is shunted.

RETAIN The enqueue will be retained if the UOW is shunted.

IGNORE The shunt will be ignored. The enqueue will remain in the same state as it is currently held in.

Output parameters:

ENQUEUE_TOKEN Token returned to represent the enqueue that has been successfully returned.

The token can then be used on the corresponding DEQUEUE request.

DUPLICATE_REQUEST When an OK is returned this indicates whether the caller already owned the enqueue or not:

YES The caller already owned the enqueue.

NO The caller didn't already own the enqueue.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, PURGED or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	ENQUEUE_BUSY, ENQUEUE_LOCKED ENQUEUE_DISABLED LIMIT_EXCEEDED SYSENQ_FAILURE
PURGED	TASK_CANCELLED, TIMED_OUT
INVALID	SHUNT_ACTION_NOT_EXPECTED, INVALID_POOL_TOKEN

NQED gate, DEQUEUE function

This functions releases an active enqueue owned by the current UOW from the specified enqueue pool.

Input parameters:

POOL_TOKEN Token representing enqueue pool from which the enqueue is to be released.

ENQUEUE_TOKEN Token representing the enqueue that is to be released.

Slightly better performance is achieved for callers that use the token method for releasing their enqueues.

ENQUEUE_NAME1 A block (addr,len) identifying the name of the enqueue being released.

Or alternatively identifies the prefix of the enqueue name which when combined with the ENQUEUE_NAME2 parameter forms the name of the enqueue being released.

ENQUEUE_NAME2 A block (addr,len) identifying the second half of the enqueue name.

MAX_LIFETIME Indicates the maximum duration of the enqueue being released. The possible values are as follows:

UOW The enqueue was acquired with a duration of the current UOW.
This is the default value when not supplied on the call.

TRANSACTION The enqueue was acquired with a duration of the last UOW of the current transaction.

Output parameters:

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	ENQUEUE_NOT_OWNED, ENQUEUE_LOCKED
INVALID	ENQUEUE_NOT_OWNED, ENQUEUE_LOCKED, INVALID_POOL_TOKEN

NQIB gate, INQUIRE_ENQUEUE function

This functions returns information about a particular enqueue. Note that the pool containing the enqueue must be passed since it is a logical extension to the enqueue name.

For inquiries by token it is the caller's responsibility to ensure that the enqueue which the token represents is still held.

Input parameters:

POOL_TOKEN The token identifying the pool from which the enqueue being inquired about belongs.

ENQUEUE_TOKEN Token representing the enqueue that is being inquired upon.

ENQUEUE_NAME1 A block (addr,len) identifying the name of the enqueue be inquired upon.

Or alternatively identifies the prefix of the enqueue name which when combined with the ENQUEUE_NAME2 parameter forms the name of the enqueue being inquired upon.

ENQUEUE_NAME2 A block (addr,len) identifying the second half of the enqueue name.

Output parameters:

ENQUEUE_NAME_OUT A buffer into which the enqueue name is returned. The caller specifies the address and maximum length of the data area into which the enqueue name will be returned. If the enqueue name is too big for the buffer then the data is truncated and an OK response is returned. The actual length of the name is returned in enqueue_name_out_n.

Typically this parameter will only be of interest to callers inquiring by enqueue token.

POOL_NAME The name of the pool containing the enqueue.

STATE The state that the enqueue is held in.

ACTIVE The enqueue is held in active state.

RETAINED The enqueue is held in retained state.

LOCAL_UOWID The local UOWID of the UOW which owns the enqueue

UOW_LIFETIME The number of times the enqueue is held with UOW lifetime.

TRANSACTION_LIFETIME The number of times the enqueue is held with TRANSACTION lifetime.

NUM_WAITERS The number of transactions waiting for this enqueue.

NUM_LOCKED_FAILURES Returns the number of failed requests for this enqueue whilst it is held in retained state.

SHUNT_ACTION The action that would be performed to this enqueue should its owning UOW be shunted.

The possible values are as follows:

RELEASE The enqueue will be released.

RETAIN The enqueue will be retained.

IGNORE The shunt will be ignored and the enqueue will remain in the same state.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	ENQUEUE_NOT_FOUND
INVALID	INVALID_POOL_TOKEN

NQIB gate, START_BROWSE_ENQUEUE function

This function initiates a browse of all enqueues currently in the system or currently associated with a given UOW.

The browse returns both enqueue owners and enqueue waiters. The RELATION output parameter on GET_NEXT_ENQUEUE indicates whether the data being returned is associated with the enqueue owner or a UOW waiting for that enqueue.

When a system wide browse is initiated the first enqueue in the system is returned with RELATION(OWNER). If the enqueue has any waiters then the same enqueue will be returned again for each of the waiters but this time with RELATION(WAITER). The data returned will be that associated with that particular waiter. After the last waiter has been returned the next owned enqueue will be returned.

If the browse is restricted to only a particular UOW then only the enqueues that UOW owns will be returned. If the UOW is waiting for an enqueue this will also be returned.

The order in which the enqueues are returned is undefined, however enqueue waiters are always returned consecutively after their enqueue owner

As with other types of CICS browses the state isn't locked for the duration of the browse. Thus for example, there is no guarantee that the owner returned on a previous GET_NEXT_ENQUEUE is still the owner by the time each of its waiters are returned.

Input parameters:

LOCAL_UOWID Identifies the unit of work if the browse is to be restricted to only those enqueues owned and being waited for by a particular UOW.

If omitted then browse will return all enqueue owners and waiters in the system.

STABLE_ENQUEUES Specifies that the caller will complete the browse without issuing any further ENQ or DEQ requests. Applies only if LOCAL_UOWID is also specified and names the caller's own UOWID.

Output parameters:

BROWSE_TOKEN Token to be used by the caller on subsequent operations associated with this browse.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	NO_UOW_ENVIRONMENT

NQIB gate, GET_NEXT_ENQUEUE function

This functions returns information about the next enqueue owner or waiter in a browse.

Input parameters:

BROWSE_TOKEN The token for the current browse.

Output parameters:

ENQUEUE_NAME_OUT A buffer into which the enqueue name is returned. The caller specifies the address and maximum length of the data area into which the enqueue name will be returned. If the enqueue name is too big for the buffer then the data is truncated and an OK response is returned. The actual length of the name is returned in enqueue_name_out_n.

RELATION Indicates whether the data being returned is associated with owner or a UOW waiting for the enqueue.

OWNER The data is associated with the owner of the returned enqueue.

WAITER The data is associated with a waiter of the returned enqueue.

POOL_NAME The name of the pool containing the enqueue.

STATE The state that the enqueue is held in.

ACTIVE The enqueue is held in active state.

RETAINED The enqueue is held in retained state.

LOCAL_UOWID The local UOWID of the UOW which owns or is waiting for the enqueue.

UOW_LIFETIME For an enqueue returned with RELATION(OWNER) the number of times it is held with UOW lifetime.

For an enqueue returned with RELATION(WAITER) a count of one indicates that the enqueue was requested with UOW lifetime.

TRANSACTION_LIFETIME For an enqueue returned with RELATION(OWNER) the number of times it is held with TRANSACTION lifetime.

For an enqueue returned with RELATION(WAITER) a count of one indicates that the enqueue was requested with TRANSACTION lifetime.

NUM_WAITERS The number of transactions waiting for this enqueue.

NUM_LOCKED_FAILURES Returns the number of failed requests for this enqueue whilst it is held in retained state.

SHUNT_ACTION The action that would be performed to this enqueue should its owning UOW be shunted.

The possible values are as follows:

RELEASE The enqueue will be released.

RETAIN The enqueue will be retained.

IGNORE The shunt will be ignored and the enqueue will remain in the same state.

INTERPRETER_ADDRESS The address of a routine which should be called with the INTERPRET_ENQUEUE function in order to interpret the enqueue for the EXEC CICS INQUIRE UOWENQ command.

If a zero address is returned then the enqueue isn't to be returned by the INQUIRE UOWENQ command.

POOL_TOKEN Token which identifies the pool which the enqueue owner or waiter belongs.

ENQUEUE_NAME2_LENGTH The length of the second part of the enqueue name if the enqueue was originally specified in two parts (i.e. ENQUEUE_NAME1 and ENQUEUE_NAME2).

If the ENQUEUE_NAME2 parameter wasn't originally specified for this enqueue then zero will be returned.

ENQUEUE_TOKEN Token returned only when the enqueue is owned by the caller. Parameter is set to zero for all other enqueues returned on the browse.

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	BROWSE_END
INVALID	INVALID_BROWSE_TOKEN

NQIB gate, END_BROWSE_ENQUEUE function

This functions terminates a browse of the enqueues.

Input parameters:

BROWSE_TOKEN The token for the browse that is to be terminated.

Output parameters:

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_BROWSE_TOKEN

NQRN gate, ENQUEUE function

This function calls INQ_NQRNAME to see if an enqueue name entry exists in NQRNAME_LIST.

If the name is either an exact or generic match, INQUIRE_NQRNAME returns the 4-character SCOPE name, enqmodel STATE and ann OK RESPONSE. Otherwise it returns an EXCEPTION REASON(NQRNAME_NOT_FOUND).

Input parameters:

NQRNAME A buffer giving a 1 to 255 char name and length of the resource to be located.

MSG0105 YES|NO, indicating whether message DFHNQ0105 is to be issued if the matching enqmodel is disabled or in the waiting state.

Output parameters:

SCOPE The 4-character scope identifier for the resource. Four blanks indicates that the enqueue has local scope.

STATE

ENABLED Matching ENQ/DEQ requests should be processed.

DISABLED Matching ENQ/DEQ requests should be rejected, and the issuing task abended abcode ENQ_DISABLED.

WAITING Matching ENQ/DEQ requests should be rejected, and the issuing task abended abcode ENQ_DISABLED. There are INSTALL/CREATE/DISCARD requests waiting to be processed.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, PURGED or INVALID. Possible values are:

NQRNAME_NOT_FOUND The name does not exist in the table.

ACQUIRE_LOCK_FAILED Attempt to acquire a shared NQRNAME lock failed.

RELEASE_LOCK_FAILED Attempt to release a shared NQRNAME lock failed.

NQRN gate, ADD_REPLACE_ENQMODEL function

This function adds an enqmodel definition to both the NQRN directory (keyed by enqmodel name, and to the NQRNAME_LIST (keyed by the variable length NQRNAME).

If the enqmodel already exists the entry is replaced. The replace is a discard then add operation.

If an attempt is made to create a deep enqmodel nesting, or if another enqmodel with the same nqrname is already installed, then msg NQ0106 is issued and a 'DUPLICATE_NQRNAME' exception is returned.

Input parameters:

CALLER COLDINST, RDOINST or RESTART indicating A cold start, An online install or The input is in the MODEL_TOKEN respectively.

CATALOG YES or NO indicating whether the record should be cataloged.

ENQMODEL The 8-character identifier of the resource to be added.

MODEL_TOKEN The address of the record obtained from the catalogue to be restored.

SCOPE The 4-character scope identifier for the resource. If ommitted or specified as blanks, matching ENQs will have LOCAL scope.

STATE ENABLED|DISABLED is the state in which to install the enqmodel. If ommitted, ENABLED is assumed.

NQRNAME A buffer giving the 1 to 255 character name and length of the ENQ name or stem* to be added.

Output parameters:

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, PURGED or INVALID. Possible values are:

INVALID_PARAMETERS One of the input parameters is invalid

DUPLICATE_NQRNAME An attempt has been made to create a deep enqmodel nesting, or another enqmodel with the same nqrname is already installed.

DUPLICATE_ENABLED An attempt to create an enabled enqmodel failed, because a less specific enqmodel is enabled.

CATALOG_WRITE_FAILED COMMIT was specified but the record was not written to the catalogue.

GETMAIN_FAILED The getmain for the NQRN storage failed.

DIRECTORY_ADD_FAILED The DFHDDDIM ADD_ENTRY failed to add the ENQMODEL entry.

DIRECTORY_DELETE_FAILED The DFHDDDIM DELETE_ENTRY failed to delete the ENQMODEL entry.

ACQUIRE_LOCK_FAILED Attempt to acquire an exclusive NQRNAME lock failed.

RELEASE_LOCK_FAILED Attempt to release an exclusive NQRNAME lock failed.

NQRN gate, DISCARD_ENQMODEL function

Remove an enqmodel definition from both the NQRN directory and from the NQRNAME_LIST.

If the enqmodel is not installed, an 'ENQMODEL_NOT_FOUND' exception is returned.

The ENQMODEL is put into the WAITING state until there are no enqueues in the local system which match the ENQNAME pattern. It is then removed from the local system.

Input parameters:

ENQMODEL The 8-character identifier of the resource to be DELETED.

Output parameters:

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

ENQMODEL_NOT_FOUND The name is not in the NQRN directory.

CATALOG_DELETE_FAILED An attempt to delete the ENQMODEL ENTRY from the GCD failed.

ACQUIRE_LOCK_FAILED Attempt to acquire an exclusive NQRNAME lock failed.

RELEASE_LOCK_FAILED Attempt to release an exclusive NQRNAME lock failed.

NQRN gate, INQUIRE_ENQMODEL function

Uses directory DDLO_LOCATE to retrieve information about a specified enqmodel definition in the NQRN directory.

If found, it returns the 1 to 255 character NQRNAME, the 4-character SCOPE name, the enqmodel STATE and ann OK RESPONSE. Otherwise it returns an EXCEPTION REASON(ENQMODEL_NOT_FOUND).

Input parameters:

ENQMODEL The 8-character identifier of the entry to be returned.

Output parameters:

NQRNAME A buffer returning the 1 to 255 character name and length of the ENQ name or generic stem*

SCOPE Returns the 4-character scope identifier for the resource. Four blanks indicates that the enqueue has local scope.

STATE

ENABLED Matching ENQ/DEQ requests should be processed.
DISABLED Matching ENQ/DEQ requests should be rejected, and the issuing task abended abcode ENQ_DISABLED.
WAITING Matching ENQ/DEQ requests should be rejected, and the issuing task abended abcode ENQ_DISABLED. There are INSTALL/CREATE/DISCARD requests waiting to be processed.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

ENQMODEL_NOT_FOUND The name does not exist in the directory.

DIRECTORY_LOCATE_FAILED Directory DDLO_LOCATE failed with something other than NOT_FOUND.

ACQUIRE_LOCK_FAILED Attempt to acquire a shared NQRNAME lock failed.

RELEASE_LOCK_FAILED Attempt to release a shared NQRNAME lock failed.

NQRN gate, SET_ENQMODEL function

This function uses directory DDLO_LOCATE to see if an enqmodel entry exists in the NQRN directory. If found, it calls SET_ENQMODEL to enable or disable the entry. Otherwise it returns an EXCEPTION REASON(ENQMODEL_NOT_FOUND).

Enqmodels forming nested generic nqrnames must be enabled in order, from the most to the least specific. I.e. A more specific enqmodel may not be enabled if a less specific enqmodel is enabled. If attempted, msg NQ0107 is issued and EXCEPTION 'DUPLICATE_ENABLED' is returned to the caller.

You cannot enable/disable an enqmodel which is in the waiting state. If attempted, EXCEPTION 'ENQMODEL_WAITING' is returned to the caller.

Input parameters:

ENQMODEL The 8-character identifier of the entry to be enabled/disabled.

STATE

ENABLED The enqmodel is to be enabled.
DISABLED The enqmodel is to be disabled.

Output parameters:

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

ENQMODEL_NOT_FOUND The name does not exist in the directory.

ENQMODEL_WAITING The enqmodel is in the WAITING state.

DUPLICATE_ENABLED Attempt to enable/disable an enqmodel failed, because a less specific enqmodel is enabled.

DIRECTORY_LOCATE_FAILED A DDLO_LOCATE failed with something other than NOT_FOUND.

CATALOG_UPDATE_FAILED Attempt to update the enqmodel on the global catalog failed.

ACQUIRE_LOCK_FAILED Attempt to acquire an exclusive NQRNAME lock failed.

RELEASE_LOCK_FAILED Attempt to release an exclusive NQRNAME lock failed.

NQIE gate, INTERPRET_ENQUEUE function

This function interprets the passed enqueue prior to it being returned by the EXEC CICS INQUIRE UOWENQ command. The function takes the enqueue to be interpreted as input and returns ENQUEUE_TYPE, RESOURCE and QUALIFIER to the caller (EXEC layer).

Each enqueue pool can either

- not have an interpreter and consequently not have its enqueues returned by the INQUIRE UOWENQ command
- rely upon a default interpreter supplied by NQ domain, (DFHNQIE)
- supply its own interpreter routine.

This is specified when the pool is created.

Input parameters:

POOL_NAME Name of the pool containing the enqueue to be interpreted.

Note that an interpreter may interpret enqueues from more than one pool.

POOL_TOKEN Token corresponding to the pool containing the enqueue to be interpreted

ENQUEUE_NAME A block (addr,len) identifying the full name of the enqueue to be interpreted.

ENQUEUE_NAME2_LENGTH The length of the second part of the enqueue name if the enqueue was originally specified in two parts (i.e. ENQUEUE_NAME1 and ENQUEUE_NAME2).

If the ENQUEUE_NAME2 parameter wasn't originally specified for this enqueue then this will contain zero.

Output parameters:

RESOURCE_BUFFER A buffer into which the data for the RESOURCE field is returned. The caller specifies the address and maximum length of the data area into which the RESOURCE data will be returned. If the data is too big for the buffer then the data is truncated and an OK response is returned. The actual length of the name is returned in resource_buffer_n.

QUALIFIER_BUFFER A buffer into which the data for the QUALIFIER field is returned. The caller specifies the address and maximum length of the data area into which the QUALIFIER data will be returned. If the data is too big for the buffer then the data is truncated and an OK response is returned. The actual length of the name is returned in qualifer_buffer_n.

If there is no QUALIFIER data then no data should be returned and the length of the data (qualifier_buffer_n) be returned as zero.

ENQUEUE_TYPE The TYPE of the enqueue being returned.

The possible values are as follows and these map onto the CVDA values for the TYPE field as detailed under the EXEC CICS INQUIRE UOWENQ command.

- DATASET
- EXECENQ
- EXECENQADDR
- FILE
- TDQUEUE
- TSQUEUE

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_ENQUEUE

Enqueue domain's generic gates

Table 48 summarizes the NQ domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 48. NQ domain's generic gates

Gate	Trace	Function	Format
DMDM	NQ 0101 NQ 0102	INITIALISE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
STST	NQ 0501 NQ 0502	COLLECT_STATISTICS COLLECT_RESOURCE_STATS	STST
RMRO	NQ 0201 NQ 0202	PERFORM_PREPARE PERFORM_COMMIT PERFORM_SHUNT PERFORM_UNSHUNT	RMRO

For descriptions of these functions and their input and output parameters, refer to the §s dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—Chapter 27, "Domain manager domain (DM)" on page 191

Format STST—"System programming command flows" on page 323

Format RMRO—Chapter 63, "Recovery Manager Domain (RM)" on page 457

PERFORM_PREPARE is a no-op. PERFORM_COMMIT releases enqueues. PERFORM_SHUNT make active enqueues retained. PERFORM_UNSHUNT makes retained enquires active.

The Domain Manager gates perform normal internal state initialisation and termination functions.

Modules

Module	Function
DFHNQDM	Handles the following requests: INITIALISE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHNQDUF	Formats the NQ domain control blocks in a CICS system.
DFHNQNQ	Handles the following requests: CREATE_ENQUEUE_POOL REACQUIRE_ENQUEUE DEACTIVATE SET_NQRNAME_LIST DEQUEUE_TASK
DFHNQED	Handles the following requests: ENQUEUE DEQUEUE
DFHNQEDI	Inline version of DFHNQED.
DFHNQIB	Handles the following requests: INQUIRE_ENQUEUE START_BROWSE_ENQUEUE GET_NEXT_ENQUEUE END_BROWSE_ENQUEUE
DFHNQRN	Handles the following requests: INQUIRE_NQRNAME ADD_REPLACE_ENQMODEL DISCARD_ENQMODEL REMOVE_ENQMODEL INQUIRE_ENQMODEL START_BROWSE_ENQMODEL GET_NEXT_ENQMODEL END_BROWSE_ENQMODEL SET_ENQMODEL COMMIT_ENQMODEL RESTORE_DIRECTORY
DFHNQIE	Handles the following requests: INTERPRET_ENQUEUE
DFHNQST	Handles the following requests: COLLECT_STATISTICS COLLECT_RESOURCE_STATS
DFHNQTRI	Provides a trace interpretation routine for CICS dumps and traces.

Exits

The XNQEREQ and XNQEREQC global user exit points are invoked respectivly before and after each EXEC ENQ or DEQ request to the NQ domain.

Trace

The point IDs for the NQ domain are of the form NQ xxxx; the corresponding trace levels are NQ 1, NQ 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 32. Event manager domain (EM)

The event manager domain manages event and timer objects created within CICS BTS activities. For further information regarding these objects see the *CICS Business Transaction Services* manual.

Event manager domain's specific gates

Table 49 summarizes the event manager domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and whether or not the functions are available through the exit programming interface (XPI).

Table 49. Event manager domain's specific gates

Gate	Trace	Function	XPI
EMEM	EM 0201	ADD_SUBEVENT	NO
	EM 0202	CHECK_TIMER	NO
		DEFINE_ATOMIC_EVENT	NO
		DEFINE_COMPOSITE_EVENT	NO
		DEFINE_TIMER	NO
		DELETE_EVENT	NO
		DELETE_TIMER	NO
		FIRE_EVENT	NO
		FORCE_TIMER	NO
		INQUIRE_STATUS	NO
		REMOVE_SUBEVENT	NO
		RESET_EVENT	NO
		RETRIEVE_REATTACH_EVENT	NO
		RETRIEVE_SUBEVENT	NO
		TEST_EVENT	NO
EMBR	EM 0301	INQUIRE_EVENT	NO
	EM 0302	START_BROWSE_EVENT	NO
		GET_NEXT_EVENT	NO
		END_BROWSE_EVENT	NO
		INQUIRE_TIMER	NO
		START_BROWSE_TIMER	NO
		GET_NEXT_TIMER	NO
		END_BROWSE_TIMER	NO

EMEM gate, ADD_SUBEVENT function

The ADD_SUBEVENT function adds a subevent to an existing composite event.

Input parameters

EVENT is the name of the composite event.

SUBEVENT is the name of the subevent.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, EVENT_NOT_FOUND, INVALID_EVENT_TYPE, SUBEVENT_NOT_FOUND, INVALID_SUBEVENT

EMEM gate, CHECK_TIMER function

The CHECK_TIMER function returns the status of a timer.

Input parameters

TIMER_NAME is the name of the timer.

Output parameters

TIMER_STATUS returns the status of the timer. It can have one of these values:

EXPIRED|FORCED|UNEXPIRED

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, TIMER_NOT_FOUND

EMEM gate, DEFINE_ATOMIC_EVENT function

The DEFINE_ATOMIC_EVENT function defines an atomic event of type ACTIVITY or INPUT.

Input parameters

EVENT is the name of the event.

EVENT_TYPE is the type of the event. It can have one of these values:

ACTIVITY|INPUT

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, INVALID_EVENT_NAME, DUPLICATE_EVENT

EMEM gate, DEFINE_COMPOSITE_EVENT function

The DEFINE_COMPOSITE_EVENT function defines a composite event with an associated predicate which may be AND or OR. Up to eight subevents may be provided.

Input parameters

EVENT is the name of the composite event.

PREDICATE is the predicate type. It may have either one of these values:

`AND|OR`

SUBEVENT_LIST is an optional list of up to 8 subevents.

Output parameters

SUBEVENT_IN_ERROR returns the number of the first subevent which is in error (if any).

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, INVALID_EVENT_NAME, SUBEVENT_NOT_FOUND, INVALID_SUBEVENT, DUPLICATE_EVENT

EMEM gate, DEFINE_TIMER function

The DEFINE_TIMER function defines a timer.

Input parameters

TIMER_NAME is the name of the timer.

EVENT is the optional name of an event to be associated with the timer.

AFTER indicates whether or not the timer is an interval. It may have either of these values:

`YES|NO`

AT indicates whether or not the timer is a time. It may have either of these values:

`YES|NO`

DAYS is the number of days for an interval.

HOURS is the number of hours for an interval or time.

MINUTES is the number of minutes for an interval or time.

SECONDS is the number of seconds for an interval or time.

ON indicates whether or not a date has been specified. It may have either of these values:

`YES|NO`

YEAR is the year.

MONTH is the month.

DAYOFMONTH is the day of the month.

DAYOFYEAR is the day of the year.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, INVALID_TIMER_NAME, DUPLICATE_TIMER, INVALID_EVENT_NAME, DUPLICATE_EVENT, INVALID_INTERVAL, INVALID_TIME

EMEM gate, DELETE_EVENT function

The DELETE_EVENT function deletes an event.

Input parameters

EVENT is the name of the event to be deleted.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, EVENT_NOT_FOUND, INVALID_EVENT_TYPE

EMEM gate, DELETE_TIMER function

The DELETE_TIMER function deletes a timer.

Input parameters

TIMER is the name of the timer to be deleted.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, TIMER_NOT_FOUND

EMEM gate, FIRE_EVENT function

The FIRE_EVENT function causes an event to fire.

Input parameters

EVENT is the name of the event to be fired.

EVENT_VERSION is an optional version number for the event.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, EVENT_NOT_FOUND, INVALID_EVENT_TYPE, ALREADY_FIRED, VERSION_NOT_FOUND

EMEM gate, FORCE_TIMER function

The FORCE_TIMER function causes a timer to expire early.

Input parameters

TIMER is the name of the timer to be forced.

ACQUIRED_PROCESS indicates whether or not the timer to be forced is owned by the acquired process. It may have either of these values:

`YES|NO`

ACQUIRED_ACTIVITY indicates whether or not the timer to be forced is owned by the acquired activity. It may have either of these values:

`YES|NO`

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, NO_ACQUIRED_PROCESS, NO_ACQUIRED_ACTIVITY, INVALID_ACTIVITY, TIMER_NOT_FOUND

EMEM gate, INQUIRE_STATUS function

The INQUIRE_STATUS function returns the status of the event pool for the current activity.

Output parameters

PENDING_EVENTS indicates whether any events are pending. It may have either of these values:

`YES|NO`

PENDING_ACTIVITY_EVENTS indicates whether any activity events are pending. It may have either of these values:

`YES|NO`

REATTACH indicates whether the task should be reattached. It may have either of these values:

`YES|NO`

EVENTS_PROCESSED indicates whether any events were processed during this activation. It may have either of these values:

`YES|NO`

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY

EMEM gate, REMOVE_SUBEVENT function

The REMOVE_SUBEVENT function removes a subevent from the named composite event.

Input parameters

EVENT is the name of the composite event.

SUBEVENT is the name of the subevent.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, EVENT_NOT_FOUND, INVALID_EVENT_TYPE, SUBEVENT_NOT_FOUND, INVALID_SUBEVENT

EMEM gate, RETRIEVE_REATTACH_EVENT function

The RETRIEVE_REATTACH_EVENT function retrieves the next event from the current activity's reattach queue.

Output parameters

EVENT is the name of the retrieved reattach event.

EVENT_TYPE is the type of the retrieved reattach event. It may have one of the following values:

ACTIVITY|COMPOSITE|INPUT|SYSTEM|TIMER

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, END_EVENTS

EMEM gate, RETRIEVE_SUBEVENT function

The RETRIEVE_SUBEVENT function retrieves the next event from the named composite event's subevent queue.

Input parameters

EVENT is the name of the composite event.

Output parameters

SUBEVENT is the name of the subevent.

EVENT_TYPE is the type of the retrieved reattach event. It may have one of the following values:

ACTIVITY|COMPOSITE|INPUT|SYSTEM|TIMER

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, EVENT_NOT_FOUND, INVALID_EVENT_TYPE, END_SUBEVENTS, NO_SUBEVENTS

EMEM gate, TEST_EVENT function

The TEST_EVENT function returns the fire status of the named event.

Input parameters

EVENT is the name of the event to be tested.

Output parameters

FIRED returns the fire status of the event. It may have either of these values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_CURRENT_ACTIVITY, EVENT_NOT_FOUND

EMBR gate, INQUIRE_EVENT function

The INQUIRE_EVENT function returns information about the named event.

Input parameters

EVENT is the name of the event being inquired upon.

Output parameters

EVENT_TYPE is the type of the event. It can have one of these values:

ACTIVITY|COMPOSITE|INPUT|SYSTEM|TIMER

FIRED returns the fire status of the event. It may have either of these values:

YES|NO

PREDICATE is the predicate type (for composite events only). It may have either one of these values:

AND|OR

PARENT is the name of the parent (if the event is a subevent).

TIMER_NAME is the name of the associated timer (if the event is of type timer).

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_ACTIVITY_ID, NO_CURRENT_ACTIVITY, FILE_NOT_AUTH, EVENT_NOT_FOUND, READ_FAILURE, FILE_UNAVAILABLE

EMBR gate, START_BROWSE_EVENT function

The START_BROWSE_EVENT function starts an event browse and returns a token to be used for the browse.

Input parameters

ACTIVITY_ID is an optional activity id for the activity whose event pool is to be browsed.

Output parameters

BROWSE_TOKEN returns a token which is used to identify the browse.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_ACTIVITY_ID, FILE_NOT_AUTH, NO_CURRENT_ACTIVITY, READ_FAILURE, FILE_UNAVAILABLE

EMBR gate, GET_NEXT_EVENT function

The GET_NEXT_EVENT function returns the next name in the browse specified by the browse token, and returns the attributes associated with the event.

Input parameters

BROWSE_TOKEN is a token which identifies the browse.

Output parameters

EVENT is the name of the event.

EVENT_TYPE is the type of the event. It can have one of these values:

`ACTIVITY|COMPOSITE|INPUT|SYSTEM|TIMER`

FIRED returns the fire status of the event. It may have either of these values:

`YES|NO`

PREDICATE is the predicate type (for composite events only). It may have either one of these values:

`AND|OR`

PARENT is the name of the parent (if the event is a subevent).

TIMER_NAME is the name of the associated timer (if the event is of type timer).

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_BROWSE_TOKEN, BROWSE_END

EMBR gate, END_BROWSE_EVENT function

The END_BROWSE_EVENT function ends the event browse identified by the browse token.

Input parameters

BROWSE_TOKEN is a token which identifies the browse.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_BROWSE_TOKEN

EMBR gate, INQUIRE_TIMER function

The INQUIRE_TIMER function returns information about the named timer.

Input parameters

TIMER is the name of the timer being inquired upon.

Output parameters

EVENT is the name of the associated event.

TIMER_STATUS is the status of the timer. It can have one of these values:

`EXPIRED|FORCED|UNEXPIRED`

ABSTIME returns the timer's expiry time in ABSTIME format.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_ACTIVITY_ID, NO_CURRENT_ACTIVITY, FILE_NOT_AUTH, TIMER_NOT_FOUND, READ_FAILURE, FILE_UNAVAILABLE

EMBR gate, START_BROWSE_TIMER function

The START_BROWSE_TIMER function starts a timer browse and returns a token to be used for the browse.

Input parameters

ACTIVITY_ID is an optional activity id for the activity whose event pool is to be browsed.

Output parameters

BROWSE_TOKEN returns a token which is used to identify the browse.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_ACTIVITY_ID, FILE_NOT_AUTH, NO_CURRENT_ACTIVITY, READ_FAILURE, FILE_UNAVAILABLE

EMBR gate, GET_NEXT_TIMER function

The GET_NEXT_TIMER function returns the next name in the browse specified by the browse token, and returns the attributes associated with the timer.

Input parameters

BROWSE_TOKEN is the token which identifies the browse.

Output parameters

TIMER is the name of the timer.

EVENT is the name of the associated event.

TIMER_STATUS is the status of the timer. It can have one of these values:

EXPIRED|FORCED|UNEXPIRED

ABSTIME returns the timer's expiry time in ABSTIME format.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_BROWSE_TOKEN, BROWSE_END

EMBR gate, END_BROWSE_TIMER function

The END_BROWSE_TIMER function ends the timer browse identified by the browse token.

Input parameters

BROWSE_TOKEN is a token which identifies the browse.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_BROWSE_TOKEN

Event manager domain's generic gates

Table 50 summarizes the event manager domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 50. Event manager domain's generic gates

Gate	Trace	Function	Format
DMDM	EM 0101 EM 0102	INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
EMBA	EM 0401 EM 0402	INQUIRE_DATA_LENGTH GET_DATA DESTROY_TOKEN	BAGD

For descriptions of these functions and their input and output parameters, refer to the §s dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—"Domain manager domain's generic formats" on page 195

In initialization, quiesce, and termination processing, the event manager domain performs only internal routines.

Modules

Module	Function
DFHEMDM	Handles the following requests: INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHEMEM	Handles the following requests: ADD_SUBEVENT CHECK_TIMER DEFINE_ATOMIC_EVENT DEFINE_COMPOSITE_EVENT DEFINE_TIMER DELETE_EVENT DELETE_TIMER FIRE_EVENT FORCE_TIMER INQUIRE_STATUS REMOVE_SUBEVENT RESET_EVENT RETRIEVE_REATTACH_EVENT RETRIEVE_SUBEVENT TEST_EVENT

Module	Function
DFHEMBR	Handles the following requests: INQUIRE_EVENT START_BROWSE_EVENT GET_NEXT_EVENT END_BROWSE_EVENT INQUIRE_TIMER START_BROWSE_TIMER GET_NEXT_TIMER END_BROWSE_TIMER
DFHEMBA	Handles the following requests: INQUIRE_DATA_LENGTH GET_DATA DESTROY_TOKEN
DFHEMDUF	Formats the EM domain control blocks
DFHEMTRI	Interprets EM domain trace entries

Trace

The point IDs for the event manager domain are of the form EM xxxx; the corresponding trace levels are EM 1, EM 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Exits

No global user exit points are provided in this domain.

Chapter 33. EXEC interface

The EXEC interface provides the support for application programs containing EXEC CICS commands.

Design overview

The relevant parts of the EXEC interface are:

- The main EXEC interface module, DFHEIP, which is called when an EXEC CICS command is executed in a user application program.

  A parameter list is passed, in which the first argument (referred to as arg-zero) contains a group code and a function code as the first 2 bytes.

  – The group code in general indicates the CICS component associated with the command being executed. In subsequent processing it is this code alone which determines which EXEC processor module (see below) is called from DFHEIP.

  – The function code identifies the actual command being executed.

  Note: DFHEIP is link-edited with other modules to form the application interface program (DFHAIP) load module. DFHEIPA (next to be described) is one of these modules.

- The DFHEIPA module, which handles the allocation and freeing of dynamic storage (mapped by DFHEISTG) for assembler-language application programs in response to DFHEIENT and DFHEIRET calls respectively.
- A set of EXEC processor modules, each of which is called from DFHEIP, and which performs the first level of analysis of the command being executed. The processor then calls the appropriate CICS domain to complete the execution of the command.
- A set of EXEC stubs, one for each of the application languages: COBOL, PL/I, C/370, and assembler language. The appropriate stub must be link-edited at the front of each CICS application program, and provides the mechanism for getting to the correct entry points in DFHEIP.
- The DFHAPLI module, which is called at the initialization and termination of each application program.

Control blocks

The control blocks associated with the EXEC interface are as follows:

EXEC interface block (EIB) (DSECT name: DFHEIBLK).
Each task in a command-level environment has a control block called the EXEC interface block (EIB) associated with it. The EIB is used for direct communication between command-level programs and CICS.

The EIB contains information that is useful during the execution of an application program, such as the transaction identifier, the time and date (initially when the task is started, and subsequently, if updated by the application program), and the cursor position on a display device. The EIB also contains information that is helpful when a dump is being used to debug a program. DFHEIBLK defines the layout of an EIB, and is included automatically in the application program, giving access to all of the fields in the EIB by name.

A further EIB, known as the "system" EIB, exists for each task. The system EIB has the same format as the "user" (or "application") EIB. It is intended for use mainly by CICS system code. In general, application programs have addressability to the user EIB only, which is a copy taken of the system EIB at appropriate times. However, any service programs translated with the SYSEIB option have addressability to the system EIB also, so that they can issue EXEC CICS commands without causing the user EIB to be updated. (See the *CICS Application Programming Guide* for further information about the SYSEIB translator option.)

Figure 54 shows the format of an EIB.

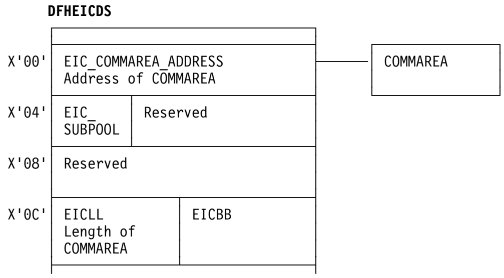
DSECT: DFHEIBLK
Register: DFHEIBR

X'00'	EIBTIME 0HHMMSS	EIBDATE 00YYDDD					
X'08'	EIBTRNID Transaction identifier	EIBTASKN Task number					
X'10'	EIBTRMID Terminal identifier	EIBRSVD1 Reserved	EIBPOSN Cursor position				
X'18'	EIBCALEN COMMAREA length	EIBAID 3270 AID	EIBFN Last function requested	EIBRCODE Last response code returned			
X'20'	EIBRCODE Continued	EIBDS Last data set referenced					
X'28'	EIBDS Continued	EIBREQID Last identifier assigned by CICS to an interval control request					
X'30'	EIBREQID Continued	EIBRSRCE Resource name					
X'38'	EIBRSRCE Continued	EIBSYNC Sync point req'sted	EIBFREE Term free req'sted	EIBRECV Data RECV req'sted	EIBSEND Reserved	EIBATT Attach data exists	
X'40'	EIBEOC Data complete	EIBFMH Data contains FMH	EIBCOMPL Data complete	EIBSIG Signal received	EIBCONF Confirm req'sted	EIBERR Error received	EIBERRCD Error code received
X'48'	EIBCONF Confirm req'sted	EIBERR Error received	EIBERRCD Error code received	EIBRESP Condition number			
X'50'	EIBRESP2 More details on condition	EIBRLDBK Rolled back	EIBLENG				

Figure 54. EXEC interface block (EIB)

EXEC interface communication area (DSECT name: DFHEICDS). The EXEC interface communication area describes the storage that is used to pass the COMMAREA from one command-level transaction to another using an EXEC CICS RETURN command with the TRANSID, COMMAREA, and LENGTH options.

Figure 55 shows the format of the EXEC interface communication area.



Note: EIC_SUBPOOL is a flag indicating the storage subpool used by the COMMAREA.

Figure 55. EXEC interface communication area (EIC)

EXEC interface storage (EIS) (DSECT name: DFHEISDS). The EXEC interface storage is used by DFHEIP as the interface between the application program and CICS control blocks. It contains a system area used by DFHEIP only. EIS is storage acquired by the DFHAPXM module (part of the transaction manager), along with other task-lifetime storage such as the TCA and both system and user EIBs. There is one EIS per transaction (not per program), and it is addressed by TCAEISA in the TCA. (See Figure 56.)

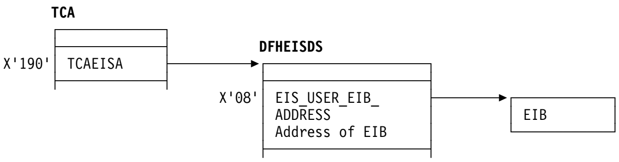


Figure 56. EXEC interface storage (EIS)

See the *CICS Data Areas* manual for a detailed description of these control blocks.

Modules

The EXEC interface comprises the following modules:

- The main interface module (DFHEIP)
- Prologue and epilogue code for assembler-language programs (DFHEIPA)
- 55 EXEC interface processors
- 4 EXEC stubs.

Of the EXEC interface processors, 16 are coded in Assembler language; the other modules are coded in other languages. All are CICS nucleus modules.

These processor modules (together with DFHEIP) support the EXEC CICS commands listed in Table 51.

DFHEIP also supports EXEC DLI commands, by passing them through the external resource manager interface program, DFHERM, on their way to DFHEDP for conversion to standard CALL parameter lists acceptable to DL/I.

The following tables list all the EXEC CICS commands, showing the class of each command (basic or special), its group and function codes, also the name and language of the associated EXEC interface processor. Table 51 is ordered by command name. Table 52 on page 244 is ordered by group/function code.

The group and function codes used by the Front End Programming Interface (FEPI) feature are not listed in these tables. However, the EXEC CICS FEPI commands use group codes of 82 (API-type commands) and 84 (SPI-type commands). For details about the EXEC CICS FEPI commands, see the *CICS Front End Programming Interface User's Guide*.

Note: An asterisk (*) after a command name in the tables shows that the command is intended for CICS internal use only.

Table 51 (Page 1 of 3). EXEC CICS commands ordered by command name

Command	Class	Gp/fn code	Module DFH...	Lang
ABEND	B	0E 0C	EPC	A
ACQUIRE TERMINAL	S	86 02	EIACQ	O
ADDRESS	B	02 02	EEI	A
ADDRESS SET	B	02 10	EEI	A
ALLOCATE	B	04 20	ETC	A
ASKTIME	B	10 02	EIIC	O
ASKTIME ABSTIME	B	4A 02	EIDTI	O
ASSIGN	B	02 08	EEI	A
BIF DEEDIT	B	20 02	EBF	A
BUILD ATTACH	B	04 26	ETC	A
CANCEL	B	10 0C	EIIC	O
CHANGE TASK	B	5E 06	EIQSK	O
COLLECT STATISTICS	S	70 08	EIQMS	O
CONNECT PROCESS	B	04 32	ETC	A
CONVERSE	B	04 06	ETC	A
CREATE CONNECTION	S	30 0E	EICRE	O
CREATE FILE	S	30 14	EICRE	O
CREATE JOURNALMODEL	S	30 1E	EICRE	O
CREATE LSRPOOL	S	30 16	EICRE	O
CREATE MAPSET	S	30 04	EICRE	O
CREATE PARTITIONSET	S	30 06	EICRE	O
CREATE PARTNER	S	30 18	EICRE	O
CREATE PROFILE	S	30 0A	EICRE	O
CREATE PROGRAM	S	30 02	EICRE	O
CREATE SESSIONS	S	30 12	EICRE	O
CREATE TDQUEUE	S	30 1C	EICRE	O
CREATE TERMINAL	S	30 10	EICRE	O
CREATE TRANCLASS	S	30 1A	EICRE	O
CREATE TRANSACTION	S	30 08	EICRE	O
CREATE TYPETERM	S	30 0C	EICRE	O
DELAY	B	10 04	EIIC	O
DELETE	B	06 08	EIFC	O
DELETEQ TD	B	08 06	ETD	A
DELETEQ TS	B	0A 06	ETS	A
DEQ	B	12 06	EKC	A
DISCARD AUTINSTMODEL	S	42 10	EIQTM	O

Table 51 (Page 2 of 3). EXEC CICS commands ordered by command name

Command	Class	Gp/fn code	Module DFH...	Lang
DISCARD FILE	S	4C 10	EIQDS	O
DISCARD JOURNALMODEL	S	92 10	EIQSL	O
DISCARD JOURNALNAME	S	60 10	EIQSJ	O
DISCARD PARTNER	S	44 10	EIQPN	O
DISCARD PROFILE	S	46 10	EIQPF	O
DISCARD PROGRAM	S	4E 10	EIQSP	O
DISCARD TRANSACTION	S	50 10	EIQSX	O
DISABLE	B	22 04	UEM	A
DUMP	B	1C 02	EDC	A
DUMP SYSTEM	B	7E 04	EDCP	O
DUMP TRANSACTION	B	7E 02	EDCP	O
ENABLE	B	22 02	UEM	A
ENDBR	B	06 12	EIFC	O
ENQ	B	12 04	EKC	A
ENTER TRACEID	B	1A 04	ETR	A
ENTER TRACENUM	B	48 02	ETRX	O
EXTRACT ATTACH	B	04 28	ETC	A
EXTRACT ATTRIBUTES	B	04 3E	ETC	A
EXTRACT EXIT	B	22 06	UEM	A
EXTRACT LOGONMSG	B	04 3C	ETC	A
EXTRACT PROCESS	B	04 2E	ETC	A
EXTRACT TCT	B	04 2A	ETC	A
FORMATTIME	B	4A 04	EIDTI	O
FREE	B	04 22	ETC	A
FREEMAIN	B	0C 04	ESC	A
GDS ALLOCATE	B	24 02	EGL	A
GDS ASSIGN	B	24 04	EGL	A
GDS CONNECT PROCESS	B	24 0C	EGL	A
GDS EXTRACT ATTRIBUTES	B	24 1C	EGL	A
GDS EXTRACT PROCESS	B	24 06	EGL	A
GDS FREE	B	24 08	EGL	A
GDS ISSUE ABEND	B	24 0A	EGL	A
GDS ISSUE CONFIRMATION	B	24 0E	EGL	A
GDS ISSUE ERROR	B	24 10	EGL	A
GDS ISSUE PREPARE	B	24 1A	EGL	A
GDS ISSUE SIGNAL	B	24 12	EGL	A
GDS RECEIVE	B	24 14	EGL	A
GDS SEND	B	24 16	EGL	A
GDS WAIT	B	24 18	EGL	A
GETMAIN	B	0C 02	ESC	A
HANDLE ABEND	B	0E 0E	EPC	A
HANDLE AID	B	02 06	EEI	A
HANDLE CONDITION	B	02 04	EEI	A
IGNORE CONDITION	B	02 0A	EEI	A
INQUIRE AUTINSTMODEL	S	42 02	EIQTM	O
INQUIRE AUTOINSTALL	S	68 12	EIQVT	O
INQUIRE CONNECTION	S	58 02	EIQSC	O
INQUIRE DCE	S	8E 02	EIQDE	O
INQUIRE DSNAME	S	7A 02	EIQDN	O
INQUIRE DUMPDS	S	66 02	EIQDU	O
INQUIRE EXITPROGRAM	S	88 02	EIQUE	O
INQUIRE FILE	S	4C 02	EIQDS	O
INQUIRE IRC	S	6E 02	EIQIR	O
INQUIRE JOURNALMODEL	S	92 02	EIQSL	O
INQUIRE JOURNALNAME	S	60 12	EIQSJ	O
INQUIRE JOURNALNUM	S	60 02	EIQSJ	O
INQUIRE MODENAME	S	5A 02	EIQSM	O
INQUIRE MONITOR	S	70 12	EIQMS	O
INQUIRE NETNAME	S	52 06	EIQST	O
INQUIRE PARTNER	S	44 02	EIQPN	O
INQUIRE PROFILE	S	46 02	EIQPF	O
INQUIRE PROGRAM	S	4E 02	EIQSP	O
INQUIRE REQID	S	8A 02	EIQRQ	O
INQUIRE STATISTICS	S	70 02	EIQMS	O
INQUIRE STREAMNAME	S	92 12	EIQSL	O
INQUIRE SYSDUMPCODE	S	66 22	EIQDU	O
INQUIRE SYSTEM	S	54 02	EIQSA	O
INQUIRE TASK	S	5E 02	EIQSK	O
INQUIRE TCLASS	S	5E 12	EIQSK	O
INQUIRE TDQUEUE	S	5C 02	EIQSQ	O
INQUIRE TERMINAL	S	52 02	EIQST	O
INQUIRE TRACEDEST	S	78 02	EIQTR	O
INQUIRE TRACEFLAG	S	78 12	EIQTR	O
INQUIRE TRACETYPE	S	78 22	EIQTR	O
INQUIRE TRANDUMPCODE	S	66 12	EIQDU	O
INQUIRE TRANSACTION	S	50 02	EIQSX	O
INQUIRE TSQUEUE	S	0A 08	EIQTS	O
INQUIRE VTAM	S	68 02	EIQVT	O
ISSUE ABEND	B	04 30	ETC	A
ISSUE ABORT	B	1E 08	EDI	A
ISSUE ADD	B	1E 02	EDI	A
ISSUE CONFIRMATION	B	04 34	ETC	A
ISSUE COPY	B	04 0A	ETC	A
ISSUE DISCONNECT	B	04 14	ETC	A
ISSUE END	B	1E 0C	EDI	A
ISSUE ENDFILE	B	04 1A	ETC	A
ISSUE ENDOUTPUT	B	04 16	ETC	A
ISSUE EODS	B	04 08	ETC	A
ISSUE ERASE	B	1E 04	EDI	A
ISSUE ERASEAUP	B	04 18	ETC	A
ISSUE ERROR	B	04 36	ETC	A
ISSUE LOAD	B	04 0E	ETC	A
ISSUE NOTE	B	1E 10	EDI	A
ISSUE PASS	B	04 3A	ETC	A
ISSUE PREPARE	B	04 38	ETC	A
ISSUE PRINT	B	04 1C	ETC	A
ISSUE QUERY	B	1E 0A	EDI	A
ISSUE RECEIVE	B	1E 0E	EDI	A
ISSUE REPLACE	B	1E 06	EDI	A
ISSUE RESET	B	04 12	ETC	A
ISSUE SEND	B	1E 14	EDI	A
ISSUE SIGNAL	B	04 1E	ETC	A
ISSUE WAIT	B	1E 12	EDI	A
LINK	B	0E 02	EPC	A
LOAD	B	0E 06	EPC	A
MONITOR	B	48 04	ETRX	O
PERFORM RESETTIME	S	72 02	EIPRT	O
PERFORM SECURITY	S	64 02	EIPSE	O
PERFORM SHUTDOWN	S	76 02	EIPSH	O
PERFORM STATISTICS	S	70 06	EIQMS	O
POINT	B	04 24	ETC	A
POP	B	02 0E	EEI	A
POST	B	10 06	EIIC	O
PURGE MESSAGE	B	18 0A	EMS	A
PUSH	B	02 0C	EEI	A
QUERY SECURITY	B	6A 02	ESE	O
READ	B	06 02	EIFC	O
READNEXT	B	06 0E	EIFC	O
READPREV	B	06 10	EIFC	O
READQ TD	B	08 04	ETD	A
READQ TS	B	0A 04	ETS	A
RECEIVE	B	04 02	ETC	A
RECEIVE MAP	B	18 02	EMS	A
RECEIVE PARTN	B	18 0E	EMS	A
RELEASE	B	0E 0A	EPC	A
RESETBR	B	06 14	EIFC	O
RESYNC	B	16 04	ESP	A
RETRIEVE	B	10 0A	EIIC	O
RETURN	B	0E 08	EPC	A
REWRITE	B	06 06	EIFC	O
ROUTE	B	18 0C	EMS	A
SEND	B	04 04	ETC	A
SEND CONTROL	B	18 12	EMS	A
SEND MAP	B	18 04	EMS	A
SEND PAGE	B	18 08	EMS	A
SEND PARTNSET	B	18 10	EMS	A
SEND TEXT	B	18 06	EMS	A
SET AUTOINSTALL	S	68 14	EIQVT	O

Table 51 (Page 3 of 3). EXEC CICS commands ordered by command name

Command	Class	Gp/fn code	Module DFH...	Lang
SET CONNECTION	S	58 04	EIQSC	O
SET DCE	S	8E 04	EIQDE	O
SET DSNAME	S	7A 04	EIQDN	O
SET DUMPDS	S	66 04	EIQDU	O
SET FILE	S	4C 04	EIQDS	O
SET IRC	S	6E 04	EIQIR	O
SET JOURNALNAME	S	60 14	EIQSJ	O
SET JOURNALNUM	S	60 04	EIQSJ	O
SET MODENAME	S	5A 04	EIQSM	O
SET MONITOR	S	70 14	EIQMS	O
SET NETNAME	S	52 08	EIQST	O
SET PROGRAM	S	4E 04	EIQSP	O
SET STATISTICS	S	70 04	EIQMS	O
SET SYSDUMPCODE	S	66 24	EIQDU	O
SET SYSTEM	S	54 04	EIQSA	O
SET TASK	S	5E 04	EIQSK	O
SET TCLASS	S	5E 14	EIQSK	O
SET TDQUEUE	S	5C 04	EIQSQ	O
SET TERMINAL	S	52 04	EIQST	O
SET TRACEDEST	S	78 04	EIQTR	O
SET TRACEFLAG	S	78 14	EIQTR	O
SET TRACETYPE	S	78 24	EIQTR	O
SET TRANDUMPCODE	S	66 14	EIQDU	O
SET TRANSACTION	S	50 04	EIQSX	O
SET VTAM	S	68 04	EIQVT	O
SIGNOFF	B	74 04	ESN	O
SIGNON	B	74 02	ESN	O
SPOOLCLOSE	B	56 10	EPS	O
SPOOLOPEN	B	56 02	EPS	O
SPOOLREAD	B	56 04	EPS	O
SPOOLWRITE	B	56 06	EPS	O
START	B	10 08	EIIC	O
STARTBR	B	06 0C	EIFC	O
SUSPEND	B	12 08	EKC	A
SYNCPOINT	B	16 02	ESP	A
TRACE	B	1A 02	ETR	A
UNLOCK	B	06 0A	EIFC	O
WAIT CONVID	B	04 2C	ETC	A
WAIT EVENT	B	12 02	EKC	A
WAIT EXTERNAL	B	5E 22	EIQSK	O
WAIT JOURNALNAME	B	14 08	EJC	A
WAIT JOURNALNUM	B	14 04	EJC	A
WAIT SIGNAL	B	04 10	ETC	A
WAIT TERMINAL	B	04 0C	ETC	A
WAITCICS	B	5E 32	EIQSK	O
WRITE FILE	B	06 04	EIFC	O
WRITE JOURNALNAME	B	14 06	EJC	A
WRITE JOURNALNUM	B	14 02	EJC	A
WRITE OPERATOR	B	6C 02	EOP	O
WRITEQ TD	B	08 02	ETD	A
WRITEQ TS	B	0A 02	ETS	A
XCTL	B	0E 04	EPC	A

Abbreviations:

```
Class of command:    B = basic       S = special
Language of module:  A = assembler   O = other
```

Table 52 (Page 1 of 3). EXEC CICS commands ordered by group/function code

Command	Class	Gp/fn code	Module DFH...	Lang
ADDRESS	B	02 02	EEI	A
HANDLE CONDITION	B	02 04	EEI	A
HANDLE AID	B	02 06	EEI	A
ASSIGN	B	02 08	EEI	A
IGNORE CONDITION	B	02 0A	EEI	A
PUSH	B	02 0C	EEI	A
POP	B	02 0E	EEI	A
ADDRESS SET	B	02 10	EEI	A
RECEIVE	B	04 02	ETC	A
SEND	B	04 04	ETC	A
CONVERSE	B	04 06	ETC	A
ISSUE EODS	B	04 08	ETC	A
ISSUE COPY	B	04 0A	ETC	A
WAIT TERMINAL	B	04 0C	ETC	A
ISSUE LOAD	B	04 0E	ETC	A
WAIT SIGNAL	B	04 10	ETC	A
ISSUE RESET	B	04 12	ETC	A
ISSUE DISCONNECT	B	04 14	ETC	A
ISSUE ENDOUTPUT	B	04 16	ETC	A
ISSUE ERASEAUP	B	04 18	ETC	A
ISSUE ENDFILE	B	04 1A	ETC	A
ISSUE PRINT	B	04 1C	ETC	A
ISSUE SIGNAL	B	04 1E	ETC	A
ALLOCATE	B	04 20	ETC	A
FREE	B	04 22	ETC	A
POINT	B	04 24	ETC	A
BUILD ATTACH	B	04 26	ETC	A
EXTRACT ATTACH	B	04 28	ETC	A
EXTRACT TCT	B	04 2A	ETC	A
WAIT CONVID	B	04 2C	ETC	A
EXTRACT PROCESS	B	04 2E	ETC	A
ISSUE ABEND	B	04 30	ETC	A
CONNECT PROCESS	B	04 32	ETC	A
ISSUE CONFIRMATION	B	04 34	ETC	A
ISSUE ERROR	B	04 36	ETC	A
ISSUE PREPARE	B	04 38	ETC	A
ISSUE PASS	B	04 3A	ETC	A
EXTRACT LOGONMSG	B	04 3C	ETC	A
EXTRACT ATTRIBUTES	B	04 3E	ETC	A
READ	B	06 02	EIFC	O
WRITE FILE	B	06 04	EIFC	O
REWRITE	B	06 06	EIFC	O
DELETE	B	06 08	EIFC	O
UNLOCK	B	06 0A	EIFC	O
STARTBR	B	06 0C	EIFC	O
READNEXT	B	06 0E	EIFC	O
READPREV	B	06 10	EIFC	O
ENDBR	B	06 12	EIFC	O
RESETBR	B	06 14	EIFC	O
WRITEQ TD	B	08 02	ETD	A
READQ TD	B	08 04	ETD	A
DELETEQ TD	B	08 06	ETD	A
WRITEQ TS	B	0A 02	ETS	A
READQ TS	B	0A 04	ETS	A
DELETEQ TS	B	0A 06	ETS	A
INQUIRE TSQUEUE	S	0A 08	EIQTS	O
GETMAIN	B	0C 02	ESC	A
FREEMAIN	B	0C 04	ESC	A
LINK	B	0E 02	EPC	A
XCTL	B	0E 04	EPC	A
LOAD	B	0E 06	EPC	A
RETURN	B	0E 08	EPC	A
RELEASE	B	0E 0A	EPC	A
ABEND	B	0E 0C	EPC	A
HANDLE ABEND	B	0E 0E	EPC	A
ASKTIME	B	10 02	EIIC	O
DELAY	B	10 04	EIIC	O
POST	B	10 06	EIIC	O
START	B	10 08	EIIC	O

Table 52 (Page 2 of 3). EXEC CICS commands ordered by group/function code

Command	Class	Gp/fn code	Module DFH...	Lang
RETRIEVE	B	10 0A	EIIC	O
CANCEL	B	10 0C	EIIC	O
WAIT EVENT	B	12 02	EKC	A
ENQ	B	12 04	EKC	A
DEQ	B	12 06	EKC	A
SUSPEND	B	12 08	EKC	A
WRITE JOURNALNUM	B	14 02	EJC	A
WAIT JOURNALNUM	B	14 04	EJC	A
SYNCPOINT	B	16 02	ESP	A
RESYNC	B	16 04	ESP	A
RECEIVE MAP	B	18 02	EMS	A
SEND MAP	B	18 04	EMS	A
SEND TEXT	B	18 06	EMS	A
SEND PAGE	B	18 08	EMS	A
PURGE MESSAGE	B	18 0A	EMS	A
ROUTE	B	18 0C	EMS	A
RECEIVE PARTN	B	18 0E	EMS	A
SEND PARTNSET	B	18 10	EMS	A
SEND CONTROL	B	18 12	EMS	A
TRACE	B	1A 02	ETR	A
ENTER TRACEID	B	1A 04	ETR	A
DUMP	B	1C 02	EDC	A
ISSUE ADD	B	1E 02	EDI	A
ISSUE ERASE	B	1E 04	EDI	A
ISSUE REPLACE	B	1E 06	EDI	A
ISSUE ABORT	B	1E 08	EDI	A
ISSUE QUERY	B	1E 0A	EDI	A
ISSUE END	B	1E 0C	EDI	A
ISSUE RECEIVE	B	1E 0E	EDI	A
ISSUE NOTE	B	1E 10	EDI	A
ISSUE WAIT	B	1E 12	EDI	A
ISSUE SEND	B	1E 14	EDI	A
BIF DEEDIT	B	20 02	EBF	A
ENABLE	B	22 02	UEM	A
DISABLE	B	22 04	UEM	A
EXTRACT EXIT	B	22 06	UEM	A
GDS ALLOCATE	B	24 02	EGL	A
GDS ASSIGN	B	24 04	EGL	A
GDS EXTRACT PROCESS	B	24 06	EGL	A
GDS FREE	B	24 08	EGL	A
GDS ISSUE ABEND	B	24 0A	EGL	A
GDS CONNECT PROCESS	B	24 0C	EGL	A
GDS ISSUE CONFIRMATION	B	24 0E	EGL	A
GDS ISSUE ERROR	B	24 10	EGL	A
GDS ISSUE SIGNAL	B	24 12	EGL	A
GDS RECEIVE	B	24 14	EGL	A
GDS SEND	B	24 16	EGL	A
GDS WAIT	B	24 18	EGL	A
GDS ISSUE PREPARE	B	24 1A	EGL	A
GDS EXTRACT ATTRIBUTES	B	24 1C	EGL	A
CREATE PROGRAM	S	30 02	EICRE	O
CREATE MAPSET	S	30 04	EICRE	O
CREATE PARTITIONSET	S	30 06	EICRE	O
CREATE TRANSACTION	S	30 08	EICRE	O
CREATE PROFILE	S	30 0A	EICRE	O
CREATE TYPETERM	S	30 0C	EICRE	O
CREATE CONNECTION	S	30 0E	EICRE	O
CREATE TERMINAL	S	30 10	EICRE	O
CREATE SESSIONS	S	30 12	EICRE	O
CREATE FILE	S	30 14	EICRE	O
CREATE LSRPOOL	S	30 16	EICRE	O
CREATE PARTNER	S	30 18	EICRE	O
CREATE TRANCLASS	S	30 1A	EICRE	O
CREATE TDQUEUE	S	30 1C	EICRE	O
CREATE JOURNALMODEL	S	30 1E	EICRE	O
INQUIRE AUTINSTMODEL	S	42 02	EIQTM	O
DISCARD AUTINSTMODEL	S	42 10	EIQTM	O
INQUIRE PARTNER	S	44 02	EIQPN	O
DISCARD PARTNER	S	44 10	EIQPN	O
INQUIRE PROFILE	S	46 02	EIQPF	O
DISCARD PROFILE	S	46 10	EIQPF	O
ENTER TRACENUM	B	48 02	ETRX	O
MONITOR	B	48 04	ETRX	O
ASKTIME ABSTIME	B	4A 02	EIDTI	O
FORMATTIME	B	4A 04	EIDTI	O
INQUIRE FILE	S	4C 02	EIQDS	O
SET FILE	S	4C 04	EIQDS	O
DISCARD FILE	S	4C 10	EIQDS	O
INQUIRE PROGRAM	S	4E 02	EIQSP	O
SET PROGRAM	S	4E 04	EIQSP	O
DISCARD PROGRAM	S	4E 10	EIQSP	O
INQUIRE TRANSACTION	S	50 02	EIQSX	O
SET TRANSACTION	S	50 04	EIQSX	O
DISCARD TRANSACTION	S	50 10	EIQSX	O
INQUIRE TERMINAL	S	52 02	EIQST	O
SET TERMINAL	S	52 04	EIQST	O
INQUIRE NETNAME	S	52 06	EIQST	O
SET NETNAME	S	52 08	EIQST	O
INQUIRE SYSTEM	S	54 02	EIQSA	O
SET SYSTEM	S	54 04	EIQSA	O
SPOOLOPEN	B	56 02	EPS	O
SPOOLREAD	B	56 04	EPS	O
SPOOLWRITE	B	56 06	EPS	O
SPOOLCLOSE	B	56 10	EPS	O
INQUIRE CONNECTION	S	58 02	EIQSC	O
SET CONNECTION	S	58 04	EIQSC	O
INQUIRE MODENAME	S	5A 02	EIQSM	O
SET MODENAME	S	5A 04	EIQSM	O
INQUIRE TDQUEUE	S	5C 02	EIQSQ	O
SET TDQUEUE	S	5C 04	EIQSQ	O
INQUIRE TASK	S	5E 02	EIQSK	O
SET TASK	S	5E 04	EIQSK	O
CHANGE TASK	B	5E 06	EIQSK	O
INQUIRE TCLASS	S	5E 12	EIQSK	O
SET TCLASS	S	5E 14	EIQSK	O
WAIT EXTERNAL	B	5E 22	EIQSK	O
WAITCICS	B	5E 32	EIQSK	O
INQUIRE JOURNALNUM	S	60 02	EIQSJ	O
SET JOURNALNUM	S	60 04	EIQSJ	O
INQUIRE JOURNALNAME	S	60 12	EIQSJ	O
SET JOURNALNAME	S	60 14	EIQSJ	O
PERFORM SECURITY	S	64 02	EIPSE	O
INQUIRE DUMPDS	S	66 02	EIQDU	O
SET DUMPDS	S	66 04	EIQDU	O
INQUIRE TRANDUMPCODE	S	66 12	EIQDU	O
SET TRANDUMPCODE	S	66 14	EIQDU	O
INQUIRE SYSDUMPCODE	S	66 22	EIQDU	O
SET SYSDUMPCODE	S	66 24	EIQDU	O
INQUIRE VTAM	S	68 02	EIQVT	O
SET VTAM	S	68 04	EIQVT	O
INQUIRE AUTOINSTALL	S	68 12	EIQVT	O
SET AUTOINSTALL	S	68 14	EIQVT	O
QUERY SECURITY	B	6A 02	ESE	O
WRITE OPERATOR	B	6C 02	EOP	O
CICSMESSAGE *	S	6C 12	EOP	O
INQUIRE IRC	S	6E 02	EIQIR	O
SET IRC	S	6E 04	EIQIR	O
INQUIRE STATISTICS	S	70 02	EIQMS	O
SET STATISTICS	S	70 04	EIQMS	O
PERFORM STATISTICS	S	70 06	EIQMS	O
COLLECT STATISTICS	S	70 08	EIQMS	O
INQUIRE MONITOR	S	70 12	EIQMS	O
SET MONITOR	S	70 14	EIQMS	O
PERFORM RESETTIME	S	72 02	EIPRT	O
SIGNON	B	74 02	ESN	O
SIGNOFF	B	74 04	ESN	O
PERFORM SHUTDOWN	S	76 02	EIPSH	O
INQUIRE TRACEDEST	S	78 02	EIQTR	O

Table 52 (Page 3 of 3). EXEC CICS commands ordered by group/function code

Command	Class	Gp/fn code	Module DFH...	Lang
SET TRACEDEST	S	78 04	EIQTR	O
INQUIRE TRACEFLAG	S	78 12	EIQTR	O
SET TRACEFLAG	S	78 14	EIQTR	O
INQUIRE TRACETYPE	S	78 22	EIQTR	O
SET TRACETYPE	S	78 24	EIQTR	O
INQUIRE DSNAME	S	7A 02	EIQDN	O
SET DSNAME	S	7A 04	EIQDN	O
DUMP TRANSACTION	B	7E 02	EDCP	O
DUMP SYSTEM	B	7E 04	EDCP	O
INQUIRE JOURNALMODEL	S	92 02	EIQSL	O
INQUIRE STREAMNAME	S	92 12	EIQSL	O

Abbreviations:

```
Class of command:    B = basic       S = special
Language of module:  A = assembler   O = other
```

DFHEIP

The EXEC interface program, DFHEIP, has several entry points associated with initialization and termination. Note, however, that DFHEIPAN is in the DFHEIPA module.

Entry point	Function
DFHEIPNA	Formal main entry point
DFHEIPAN	Get or free dynamic storage for assembler-language prologue or epilogue
DFHEIPGM	Get dynamic storage for COBOL initialization
DFHEIPFM	Free dynamic storage for COBOL
DFHEIPTT	Take run-unit token routine for COBOL initialization.

DFHEIP has these entry points associated with executing a command issued from an application program:

Entry point	Function
DFHEIPRN	EXEC RMI calls
DFHEIPCN	EXEC CICS calls
DFHEIPDN	xxxTDLI calls.

It also has many return and entry points for common functions that are called from those processor modules residing in the nucleus:

Entry point	Function
EIPNORML	Normal return on completion of command

Error point	Function
EIPERROR	Condition occurred (code in EIBRCODE)
EIPCONDN	Condition occurred (code in EIBRESP)
EICCER99	Unsupported function, abend AEY9
EICCDF00	Subroutine to invoke EDF

Several length-checking routines (EICCLCnn):

Error point	Function
EICCLC30	Input check, V format only
EICCLC94	LENGERR flag check

Several program control routines (EICCPCnn):

Error point	Function
EICCPC00	Process terminating PL/I program
EICCPC40	HANDLE ABEND processing

Several storage control routines (EICCSCnn):

Error point	Function
EICCSC10	FREEMAIN
EICCSC20	GETMAIN shared storage
EICCSC30	GETMAIN terminal storage
EICCSC70	GETMAIN user storage init. X'00'
EICCFM10	FREEMAIN for COMMAREAs

Method of calling processor modules

All processor modules reside in the CICS nucleus, and the same calling method is used regardless of the language in which the processor is coded.

CICS initialization puts the address of each module in the CSA optional features list (CSAOPFL), in a table of addresses starting at CSAEXECS, and at an offset corresponding to its group code.

The calling method for the processor modules at execution time uses a table (at label EICC71T in DFHEIP), known as the **EXEC command processor module call table**. DFHEIP uses this table, and the table of addresses in CSAOPFL.

The EXEC command processor module call table is indexed by the 1-byte group code, which identifies the way that the processor is called:

Call type Description

A Has a vector of offsets at its entry point. This vector is indexed by the command function code to locate the actual entry point, to which DFHEIP does an unconditional branch.

Return is to label EIPNORML, EIPCONDN, or EIPERROR.

B Has a single entry point, for which DFHEIP issues a DFHAM TYPE=LINK call.

The appropriate return address in DFHEIP is set in register 14, an unconditional branch is made to the DFHEIP, which tests the response in EIBRESP.

C Has a single entry point, for which DFHEIP issues a DFHEIEIM call (through the kernel).

Return is to the next instruction, where DFHEIP tests the response in EIBRESP.

D Has a single entry point, for which DFHEIP uses a BALR R14,R15 instruction; this type is used only for GDS.

The appropriate return address in DFHEIP is set in register 14, an unconditional branch is made to the DFHEIP, the response in the user's RETCODE field.

Exits

The following global user exit points are provided in DFHEIP:

XEIIN

XEIOUT

XEISPIN

XEISPOUT

For further information, see the *CICS Customization Guide*.

Trace

The following point ID is provided for DFHEIP:

- AP 00E1, for which the trace level is EI 1.

The following point IDs are provided for DFHEISR:

- AP E110 (entry), for which the trace level is EI 2.
- AP E111 (exit), for which the trace level is EI 2.

Trace entries are made before and after the execution of a command by its EXEC interface processor module.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 34. Execution diagnostic facility (EDF)

The execution diagnostic facility (EDF) allows users of the CICS command-level programming interface to step through the CICS commands of an application program. This program can be part of a local or remote transaction. At each step, the user can check the validity of each command and make temporary modifications to the program.

Design overview

EDF enables an application programmer to test a command-level application program online without making any modifications to the source program or the program preparation procedure. EDF intercepts execution of the application program at certain points and displays relevant information about the program at these points.

There are seven places in the EXEC interface program (DFHEIP) where the EDF can be called:

1. When program initialization has been done, just before control is passed to the application entry point
2. When program termination is being done, just after control has been received from the application
3. Before a normal EXEC command is passed to its processor module
4. When a normal EXEC command has returned to DFHEIP
5. Before an EXEC CICS GDS command is passed to its processor module
6. When an EXEC CICS GDS command has returned to DFHEIP
7. Before an EXEC CICS FEPI command is passed to its processor module
8. When an EXEC CICS FEPI command has returned to DFHEIP
9. At the end of a PL/I program.

Modules

CEBR transaction (DFHEDFBR)

The temporary-storage browse transaction (CEBR) allows the user to browse, copy, or delete items in a queue. CEBR invokes DFHEDFBR to execute the required action.

EDF display (DFHEDFD)

The EDF display program, DFHEDFD, provides the following functions:

- To display the user program status
- To allow the user to modify argument values and responses
- To allow the user to display and modify the EXEC interface block (EIB) and program working storage
- To allow the user to display any hexadecimal location in the partition user screen
- To allow the user to suppress EDF displays until specified conditions are met.

Method

1. Data describing user status is passed to DFHEDFD in the TWA.
2. Initialize exception and abend handling.
3. If TS queue for user terminal already exists, read control information; otherwise create control information about TS queue.
4. Check for security violation.
5. If necessary, remember user screen.
6. Build required display by calling DFHEDFS.
7. Send display to EDF screen.
8. Extract modified information by calling DFHEDFS.
9. Analyze request.
10. Set up build information for next display.
11. Go and build required display.
12. When no further displays are required:
    a. Save function display
    b. If necessary, restore user screen
    c. Update control information
    d. If transaction is defined as remote, purge TS queue and any shared storage associated with the EDF task
    e. Return to DFHEDFP.

EDF map set (DFHEDFM)

The EDF map set, DFHEDFM, consists of three maps:

DFHEDFM	To display status information at the various EDF interception points
DFHEDFN	To display the EDF stop conditions
DFHEDFP	To display a dump of storage.

All maps are (24,80). The first two lines of each map contain the transaction ID, program name, status, and so on. The format of these two lines must be identical for all maps. A menu is displayed with each map, and includes a message line and a reply field. The format of the menu must be identical for all maps. The cursor is positioned by symbolic cursor positioning.

EDF control program (DFHEDFP)

The EDF control program, DFHEDFP, provides the CEDF transaction for starting EDF, and is used in two different ways:

1. To control the debugging task
2. To set debug mode on or off.

Input: Input to the DFHEDFP program is provided as follows:

To control the debugging task
Information describing the user task status is written into the debug linkage area (DLA) of CEDF by DFHEDFX.

To set debug mode on or off
The user enters a CEDF request at the debug display terminal using the following syntax:

```
CEDF termid,ON|OFF
```

Alternatively, a PF key may be used to switch single-terminal debug mode on.

Note: To use EDF for a remote transaction, only single-terminal mode is available.

Output: Output from the DFHEDFP program is as follows:

To control the debugging task
DFHEDFD displays user program status.

To set debug mode on or off
Switches the debug mode bit either in the user terminal TCTTE or, if an EXEC task is running, in the user task EIS. For two-terminal debugging, creates temporary-storage queue element to connect user terminal with display terminal.

Method

To control the program for debugging a task
If the task is attached by DFHEDFX and if only one terminal is being used for debugging, link to DFHEDFD to display program status. If two terminals are being used for debugging, start CEDF at the display terminal, restore that terminal to the user, resume the user task, then return to CICS.

To set debug mode on or off
If invoked by using a PF key, set the debug mode on for single-terminal debugging in the user TCTTE. If invoked by a CEDF request, extract the user terminal ID (default is display terminal), and extract the debug mode (default is on). If the user terminal ID does not exist, output a diagnostic message. If the EXEC task is running and the task is in debug mode, output a diagnostic message; otherwise switch the debug bit in EIS, or switch the debug bit in TCTTE. Create a temporary-storage queue element naming the debug terminal.

EDF response table (DFHEDFR)

The EDF response table, DFHEDFR, is a table used by DFHEDFD to interpret the responses obtained by EXEC commands.

EDF task switch program (DFHEDFX)

The EDF task switch program, DFHEDFX, is used to attach the debugging task, provide it with all necessary information about the status of the user task, and suspend the user task until the debugging task allows it to resume.

Method

1. Extract information describing the user task status and copy it into the DLA for the attached task
2. Issue wait on user terminal
3. Attach CEDF
4. Suspend the user task
5. When the user task is resumed by EDF, check if EDF has not abended
6. If the user requests an abend, abend the user task; otherwise, return to caller.

Exits

No global user exit points are provided for this function.

Trace

No trace points are provided for this function.

Chapter 35. Extended recovery facility (XRF)

The extended recovery facility (XRF) enables you to achieve a high level of availability. You can run an alternate CICS system that monitors your active CICS system, and takes over automatically or by operator control if the active system fails. You can also plan and execute a takeover yourself when you want to do maintenance on an active system.

Problems in the active system can be detected and isolated as soon as they occur. The alternate system can recover and restart quickly, like an emergency restart, and the time for reconnection of terminals is reduced.

Design overview

A detailed overview of this function is given in the *CICS/ESA 3.3 XRF Guide*.

Control blocks

A command list table (CLT) is used by an alternate system when it takes over the running of CICS from an active system. It holds the ID data for the JES system in use, data used to verify its authority to take over, and routing information. If there is more than one active system in two CECs, the CLT also holds VTAM MODIFY commands, and messages to the operator (WTO) to complete the takeover. It is loaded during takeover, and deleted when processed.

See the *CICS Data Areas* manual for a detailed description of this control block.

Modules

Figure 57 shows the modules for XRF.

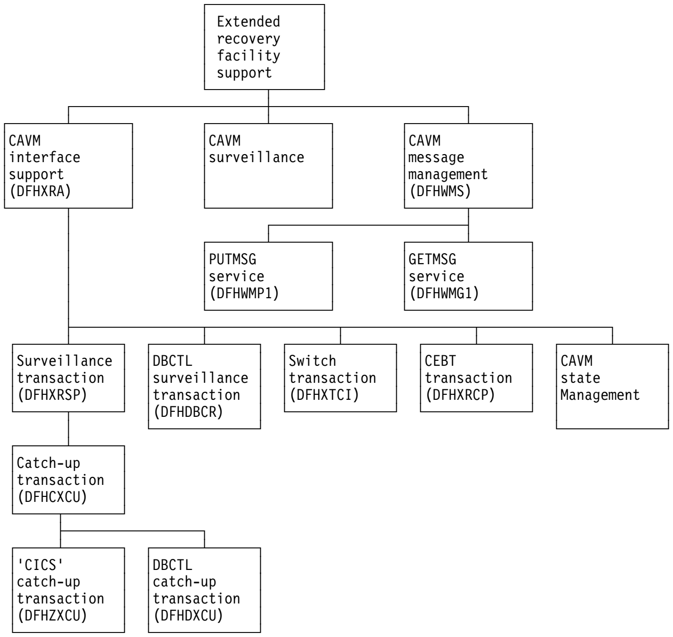

Extended recovery facility support
CAVM interface support (DFHXRA)
CAVM surveillance
CAVM message management (DFHWMS)
PUTMSG service (DFHWMP1)
GETMSG service (DFHWMG1)
Surveillance transaction (DFHXRSP)
DBCTL surveillance transaction (DFHDBCR)
Switch transaction (DFHXTCI)
CEBT transaction (DFHXRCP)
CAVM state Management
Catch-up transaction (DFHCXCU)
'CICS' catch-up transaction (DFHZXCU)
DBCTL catch-up transaction (DFHDXCU)

Figure 57. Extended recovery facility support

Exits

There is one global user exit point in DFHXRA: XXRSTAT. For further information about this, see the *CICS Customization Guide*.

Trace

The following point IDs are provided for the CAVM services:

- AP 00C4, AP 00C5, AP 00C6, and AP 00C7, for which the trace level is AP 1.

The following point IDs are provided for the XRF takeover signon/sign-off function:

- AP 0Axx, for which the trace levels are AP 1, AP 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 36. External CICS interface

The external CICS interface (EXCI) is an integral part of CICS Transaction Server for OS/390 Release 3. The function is called an external CICS interface because it enables non-CICS application programs (*client programs*) running in MVS to call programs (*server programs*) running in a CICS Transaction Server for OS/390 Release 3 region and to pass and receive data by means of a communications area.

Design overview

This section provides an overview of the design of the external CICS interface. For more information about the external CICS interface, see the *CICS External Interfaces Guide*.

The external CICS interface is an application programming interface that enables a non-CICS program (a *client program*) running in MVS to call a program (a *server program*) running in a CICS Transaction Server for OS/390 Release 3 region and to pass and receive data by means of a communications area. The CICS application program is invoked as if linked-to by another CICS application program.

This programming interface allows a user to allocate and open sessions (or *pipes*[1]) to a CICS region, and to pass distributed program link (DPL) requests over them. The multiregion operation (MRO) facility of CICS interregion communication (IRC) facility supports these requests, and each pipe maps onto one MRO session.

Unless the CICS region is running in a sysplex under MVS/ESA 5.1 and therefore able to use cross-system MRO (XCF/MRO), the client program and the CICS server region (the region where the server program runs or is defined) must be in the same MVS image. Although the external CICS interface does not support the cross-memory access method, it can use the XCF access method provided by XCF/MRO in CICS Transaction Server for OS/390 Release 3. See the CICS Intercommunication Guide for information about XCF/MRO.

A client program that uses the external CICS interface can operate multiple sessions for different users (either under the same or separate TCBs) all coexisting in the same MVS address space without knowledge of, or interference from, each other.

Where a client program attaches another client program, the attached program runs under its own TCB.

The programming interfaces

The external CICS interface provides two forms of programming interface: the EXCI CALL interface and the EXEC CICS interface.

The EXCI CALL interface

This interface consists of six commands that allow you to:

- Allocate and open sessions to a CICS system from non-CICS programs running under MVS
- Issue DPL requests on these sessions from the non-CICS programs
- Close and deallocate the sessions on completion of the DPL requests.

The six EXCI commands are:

1. Initialize_User
2. Allocate_Pipe
3. Open_Pipe
4. DPL call
5. Close_Pipe
6. Deallocate_Pipe

The processing of an EXCI CALL-level command is shown in Figure 58 on page 254.

The EXEC CICS interface

The external CICS interface provides a single, composite command–EXEC CICS LINK PROGRAM– that performs all six commands of the EXCI CALL interface in one invocation. The processing of an EXEC CICS LINK command is shown in Figure 59 on page 254.

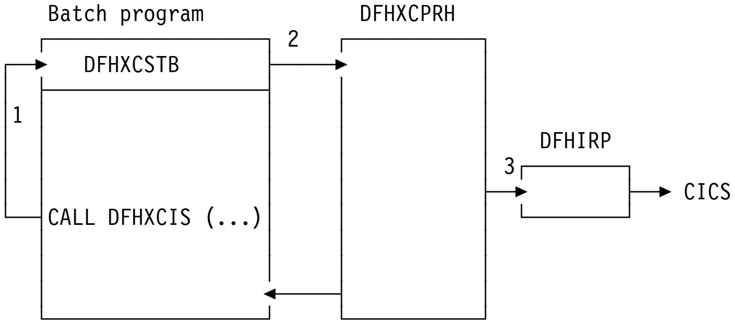
This command takes the same form as the distributed program link command of the CICS command-level application programming interface.

[1] **pipe**. A one-way communication path between a sending process and a receiving process. In an external CICS interface implementation, each pipe maps onto one MRO session, where the client program represents the sending process and the CICS server region represents the receiving process.

API restrictions for server programs

A CICS server program invoked by an external CICS interface request is restricted to the DPL subset of the CICS application programming interface. This subset (the DPL subset) of the API commands is the same as for a CICS-to-CICS server program.

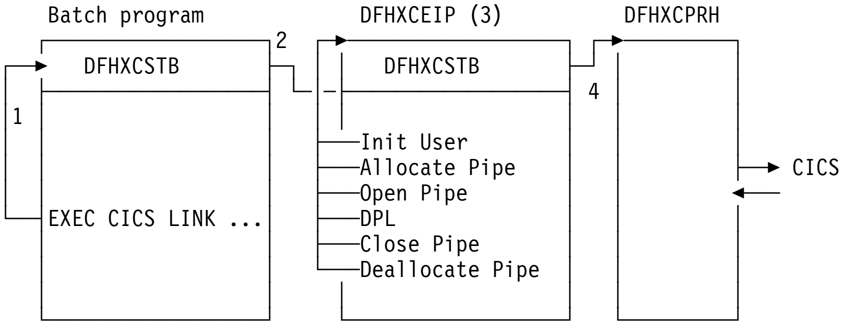
For details about the DPL subset for server programs, see the *CICS Application Programming Guide*.



Notes:

1. An EXCI CALL API request is issued, and invokes the DFHXCIS entry point in the EXCI stub, DFHXCSTB.
2. DFHXCSTB locates DFHXCPRH, and invokes it to process the EXCI request. If DFHXCPRH is not found, DFHXCSTB loads DFHXCPRH before invoking it.
3. DFHXCPRH sets up the control blocks needed for the EXCI request. For a DPL request, DFHXCPRH invokes DFHIRP to pass control to CICS.

Figure 58. External CICS interface, CALL-level API



Notes:

1. An EXCI EXEC API request is issued, and invokes the DFHXCEI entry point in the EXCI stub, DFHXCSTB.
2. DFHXCSTB locates DFHXCEIP, and invokes it to process the EXCI request. If DFHXCEIP is not found, DFHXCSTB loads DFHXCEIP before invoking it.
3. DFHXCEIP converts the EXCI EXEC-level request into a series of EXCI CALL-level requests.
4. The CALL-level requests result in calls to the EXCI stub, DFHXCSTB (as in Figure 58).

Figure 59. External CICS interface, EXEC-level API

Modules

Module	Function
DFHXCALL	EXEC-level API macro. Invoked by the CICS translator when processing EXCI EXEC-level requests.
DFHXCDMP	dump services. Calls the CICS SVC to issue SDUMP macro requests, to take an SDUMP of the EXCI address space.
DFHXCSTB	stub link-edited with applications that want to use EXCI.
DFHXCEIP	EXEC-level API handler. The main EXCI module that processes EXCI EXEC-level requests.
DFHXCO	options macro for generating the DFHXCOPT options table.
DFHXCOPT	options table to customize the EXCI environment.
DFHXCPLD	Assembler-language parameter list definitions. Copybook defining the parameters for use with the EXCI APIs.
DFHXCPLH	C parameter list definitions. Copybook defining the parameters for use with the EXCI APIs.
DFHXCPLL	PL/I parameter list definitions. Copybook defining the parameters for use with the EXCI APIs.
DFHXCPLO	COBOL parameter list definitions. Copybook defining the parameters for use with the EXCI APIs.
DFHXCPRH	program request handler The main EXCI module that processes EXCI CALL-level requests.
DFHXCRCD	Assembler-language return code definitions. Copybook defining the return codes for use with the EXCI APIs.
DFHXCRCH	C return code definitions. Copybook defining the return codes for use with the EXCI APIs.
DFHXCRCL	PL/I return code definitions. Copybook defining the return codes for use with the EXCI APIs.
DFHXCRCO	COBOL return code definitions. Copybook defining the return codes for use with the EXCI APIs.
DFHXCSVC	SVC services. Invoked by the CICS SVC to issue an SDUMP macro to take an SDUMP of the EXCI address space.
DFHXCTAB	language table. Copybook defining the syntax of the EXCI EXEC language for use by the CICS translator.
DFHXCTRA	global trap program. The EXCI equivalent of the DFHTRAP module, providing the service with ability to collect extra diagnostic information.
DFHXCTRD	local trap parameter list definition. Defines the parameter list passed to DFHXCTRA and all EXCI trace points used by DFHXCTRA.
DFHXCTRP	trace services. Writes EXCI trace entries to the EXCI internal trace table.
DFHXCTRI	trace initialization. Initializes EXCI trace services.
DFHXCURM	User-replaceable module that allows the user to modify the applid of the CICS region to which the EXCI request is to be issued.

Exits

There are no exit points for the EXCI.

Trace

The EXCI has its own internal trace table in the EXCI address space where the client program is running. EXCI trace entries can also be written to the MVS GTF trace data set.

EXCI trace point IDs are EXxxxx, with a trace level of 1, 2, or Exc.

For more information about EXCI tracing, see the *CICS External Interfaces Guide*.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 37. Field engineering program

The field engineering program (DFHFEP) is a CICS system service function primarily designed for an IBM field engineer to use when installing new terminals. When CICS is running, this program (invoked by the CSFE transaction) transmits a set of characters to the requesting terminal. In addition, the program can be used to echo a message; that is, it repeats exactly what is keyed at the terminal.

This program also supports some general debugging functions.

Design overview

When used for testing terminals, DFHFEP first prepares for device-dependent conditions. It then issues a storage control FREEMAIN, followed by a GETMAIN for storage for the ENTER message, which it writes using terminal control WRITE, READ, and WAIT macros. Finally, if **print** was requested, the character set is printed; if **end** was requested, the completion message is issued; otherwise the input is echoed.

DFHFEP performs all the requests made by the CSFE transaction. In addition to the terminal test function, CSFE can request the activation or deactivation of:

- System spooling interface trace
- Terminal builder trace
- Storage freeze
- Storage violation trap
- Global trap/trace exit.

See the *CICS Supplied Transactions* manual for details of the command syntax and functions provided.

Modules

DFHFEP

Exits

No global user exit points are provided for this function.

Trace

No trace points are provided for this function.

Chapter 38. File control

File control provides a facility for accessing data sets, files, and data tables, using keyed or relative-byte-address (RBA) access through the virtual storage access method (VSAM), the basic direct access method (BDAM), shared data table services and the coupling facility data tables server. VSAM data sets can be accessed in either RLS or non-RLS mode. RLS mode allows sharing of data sets across a parallel sysplex. File control allows updates, additions, deletions, random retrieval, and sequential retrieval (browsing) of logical data in the data sets. If VSAM is used, access to logical data can be via a VSAM alternate index path, as well as through the base data set.

File control reads from, and writes to, user-defined data sets and data tables, gathers statistics, and acquires dynamic storage for I/O operations. File control uses control information defined by the user in the file control table (FCT). This table describes the physical characteristics of all the data sets, and any logical relationships that may exist between them.

Design overview

File control provides the following services and features:

- Random record retrieval
- Random record update
- Random record addition
- Random record deletion (VSAM only)
- Sequential record retrieval
- BDAM deblocking
- Enabling and disabling of files, making them accessible to applications
- Opening and closing of files for the access method
- Exclusive control of records during update operations
- Mass record insertion (VSAM only)
- Automatic journaling and logging.

Deblocking services for BDAM data sets

CICS provides deblocking of logical records on a direct-access (BDAM) data set. This service is provided for both fixed-length and variable-length records. The data set must have been created according to standard System/370 record-formatting conventions.

Concurrency control

Protection is provided against the concurrent updating (adding, deleting or changing) of a data set record by two or more transactions (or strictly speaking, two or more units of work; a transaction may optionally consist of a sequence of units of work). This protection is in most cases achieved using locking. If a second unit of work attempts to update a record which has been locked by another unit of work, the second unit of work is normally queued until the first releases its lock. If the lock has been converted into a retained lock (this is done if a syncpoint failure occurs) then the second unit of work gets an error response rather than being queued. An optimized alternative to locking is used to achieve concurrency control for coupling facility data tables. This is described in the section 'Concurrency control for coupling facility data tables'.

For a VSAM data set being accessed in non-RLS mode, CICS acquires locks (or enqueues) using the NQ domain that prevent the same record from being updated by more than one unit of work at a time. If the file is recoverable, then the lock is not released until syncpoint (that is, the end of the unit of work), otherwise it is released when the request thread completes. A request thread consists, for example, of a read update followed by a rewrite. In non-RLS mode, VSAM also provides a form of concurrency control known as **exclusive control**. The sphere of exclusive control is the control interval (CI), and this means that two different records cannot be concurrently updated if they are both within the same CI. Exclusive control is only maintained while a record is being updated, and is released as soon as the operation is complete.

For a VSAM data set being accessed in RLS mode, VSAM acquires locks at the record level to prevent the same record from being updated by more than one unit of work within the sysplex at a time. If the data set is recoverable, then the lock is not released until syncpoint, otherwise it is released when the request sequence completes. There is no CI locking with RLS mode.

For a recoverable BDAM file, CICS acquires locks using the NQ domain that prevent the same record from being updated by more than one unit of work at a time.

Concurrency control for coupling facility data tables: Concurrency control for coupling facility data tables is provided by using one of two update models provided by coupling facility data tables support (CFDT support).

The default is the locking update model, in which the CFDT server acquires locks at the record level to prevent the same record from being updated by more than one unit of work within the sysplex at a time. If the data set is recoverable, then the lock is not released until syncpoint, otherwise it is released when the request sequence completes.

The contention update model is an optimized alternative to using locking to achieve update integrity (concurrency control). With this model, which can be specified on a per-data table basis, no locks are acquired when a record is read for update, but if another unit of work subsequently changes or deletes this record, then the first unit of work will be informed that the record has changed (or been deleted) when it comes to rewrite or delete the record itself. The occurrence of such a contention is detected by the CFDT server, and the contention update model is only available for coupling facility data tables.

Sequential retrieval

A facility supported by CICS file control is the sequential retrieval of records from the database. This facility is known as browsing. To initiate a browse operation, the user provides either a specific or generic (partial) record reference (key) for the point at which sequential retrieval is to begin. Each subsequent get request by the user initiates retrieval of the next sequential record. The application, while in browse mode, can issue random get for update requests to a different data set, without interrupting the browse operation. For VSAM files accessed in RLS mode, the application can update the records that it is browsing. For VSAM files accessed in non-RLS mode, and BDAM files, in order to update a record of the same data set, the application must first terminate the browse operation. The same application can concurrently browse several different data sets and browse the same data set with multiple tasks.

With VSAM data sets, the application can skip forward during a browse operation to bypass unwanted data.

All types of CICS data tables (CICS-maintained, user-maintained and coupling facility) can be browsed.

Read Integrity

When a file is accessed in RLS mode, three levels of read integrity are supported:

- UNCOMMITTED read integrity is the same level of read integrity as is supported for non-RLS requests. With this level of read integrity, read requests can return data which has not yet been committed, and which might subsequently be backed out.
- CONSISTENT read integrity. With this level of read integrity, read requests are serialized with concurrent update activity for the record, so that a read request will wait until data which is being updated has been committed (or until the update has completed, for a non-recoverable data set). This means that read requests will always see commit-consistent data.
- REPEATABLE read integrity. With this level of read integrity, additional locking is used so that in addition to waiting for updates to be committed, records that have been read within a unit of work cannot be updated until the unit of work completes. This means that if a read is repeated within a unit of work, the same data will be returned.

Backout logging

File control will perform automatic logging of file operations which update recoverable files. This logging is written to the CICS system log stream. In the event of either a system or a transaction failure, the information can subsequently be used to restore the recoverable data set as though the current transaction had never run.

For coupling facility data tables, the CFDT server performs its own logging, and is responsible for backing out updates in the event of a failure.

Forward Recovery Logging

If a file (non-RLS VSAM) or data set (RLS or non-RLS VSAM) is defined to be forward recoverable, then CICS will perform automatic logging of file operations which update it. This logging is written to the forward recovery log stream specified on the file definition or data set. In the event of a failure, the information can be used to forward recover from a backup copy of the data set.

Forward recovery support is not provided for user-maintained data tables or coupling facility data tables.

Automatic journaling and logging

Except in the case of user-maintained data tables and coupling facility data tables, CICS provides optional automatic journaling and logging facilities for records that are updated, deleted from, or added to a file control data set. Automatic journaling is specified in the file control table, by the user, for each data set affected. For a specified data set, a record read for update, a new record added, or an existing record deleted is automatically written to the specified journal. To allow journaled records to be associated with the appropriate data set (instead of with the CICS file name), a special record is journaled showing the current data set allocation whenever it changes.

Use of concurrent tasks

The file control non-RLS VSAM interface program (DFHFCVR) uses a change-mode request to the dispatcher to allow VSAM I/O requests and VSAM UPAD exit code to run under a concurrent task. This provides overlapping of processing in a multiprocessor environment.

RLS requests use a different mechanism: SMSVSAM assigns each request its own SRB, allowing MVS to concurrently schedule requests in an analogous way to that provided by subtasking for non-RLS.

Shared Data table services

Shared data tables (that is, CICS-maintained and user-maintained data tables) are managed by a set of OCO modules, referred to in this book as “data table services”. The services are invoked by a branch-and-link interface passing a parameter block.

Services provided include the following:

- Initialization
- Open, close, and load of tables
- Retrieval and update of table records
- Backout and commit of table changes
- Statistics.

For files that are defined by the user as CICS-maintained or user-maintained data tables, file control invokes these services at appropriate points in the processing of application requests.

Coupling facility data tables server

Coupling facility data tables are managed by a OCO modules within the CICS address space, along with a separate address space, referred to as the "Coupling Facility Data Tables Server". The CFDT server provides access to coupling facility data tables residing in a coupling facility data tables pool, so that they can be shared by CICS regions across a parallel sysplex. Refer to the *CICS Supplied Transactions* for more details about CFDT servers.

For files that are defined by the user as accessing coupling facility data tables, file control makes calls to the CFDT server at appropriate points in the processing of application requests.

How CICS processes file control requests

CICS receives file control requests from applications through the EXEC interface. This section describes only the mainstream processing for such requests. It does not describe exceptional conditions. For guidance about exceptional conditions, see the *CICS Application Programming Guide.* For general-use programming interface information about exceptional conditions, see the *CICS Application Programming Reference* manual. This section also does not provide details about the specific processing for requests to any kind of data table.

Processing using VSAM

For VSAM data sets, this section describes the processing followed when the file is being accessed in non-RLS mode. For RLS mode, the processing is broadly similar, although it differs in some of the interfaces used to VSAM, and the locking mechanisms are very different.

Note: File control processing is constrained by the availability of buffers, CICS strings and (for local shared resource (LSR) files) LSR strings. Tasks can get suspended during the execution of any file control request if there are not enough strings or buffers available for the immediate processing that is to be done.

With VSAM RLS, a task waiting for buffers will be suspended in VSAM rather than in CICS.

Processing using Data Tables

For shared data tables (CICS-maintained and user-maintained data tables), processing is broadly similar to that for non-RLS VSAM. The main differences are that, for remote files, non-update requests may be processed locally instead of being function shipped, and that, in cases where a request cannot be satisfied from a data table, it may be converted into a non-RLS or RLS VSAM request to be processed by DFHFCVS or DFHFCRS, or function shipped via DFHFCDTX.

For coupling facility data tables, processing is also broadly similar to that for non-RLS VSAM. The main difference is that instead of issuing the request to VSAM, a call or calls are made to entry points within the CFDT server, which then processes the request and returns the results. A task accessing a coupling facility data table may occasionally be suspended in the CFDT server.

Note that the following processing sections do not describe data table processing explicitly.

General request processing

All file requests, whatever the request and whatever the file access method, follow the same general sequence of steps:

1. User exit XFCREQ is called.
2. If an explicit SYSID was specified, the request is function-shipped to that CICS region.
3. The file control table entry is located.
4. If resource security is active, the security check is made, unless a check has already been made within this UOW for this file.
5. CICS checks whether the file is defined as local or remote. If it is remote, the request is function-shipped to the file-owning region, where CICS processes the request as if it had originated locally. There is an

exception for CICS-maintained and user-maintained data tables, for which non-update requests are treated as local rather than being function shipped.

Note that RLS support and coupling facility data tables support both provide shared access within a parallel sysplex without the use of function shipping Files which use either of these types of sharing will be defined as local on all systems which wish to share the data set (in the case of RLS support) or data table (CFDT support).

6. Convert the request from EXEC parameter list form to FCFRR interface form.

   If this is the first request to this file by the transaction, obtain a FLAB. If this is not the first request to the file then locate the FLAB that represents accesses made to the file by this transaction.
7. If this is the first, or only, request of a request sequence obtain a FRTE and implicitly open the file if necessary. If this is not the first request in a request sequence locate the FRTE that represents the sequence.
8. Release and/or obtain SET storage for READ and browse requests.
9. The SERVREQ attribute of the file is checked.
10. The access method specific request processor is called as follows:
    - DFHFCVS for non-RLS VSAM files
    - DFHFCRS for RLS VSAM files
    - DFHFCBD for BDAM files
    - DFHFCDR for coupling facility data tables
    - DFHFCDTS for user-maintained data tables
    - DFHFCDTS for non-update requests to CICS maintained data tables
    - DFHFCVS for update requests to CICS maintained data tables
11. Make provision for SET storage for BDAM files or below the line READ.
12. The FRTE is released if the request sequence has ended and the file closed if a close is pending and this FRTE is the last user, and the FLAB indicates that the file can be closed.
13. Convert the FCFRR response to EIBRCODE values.
14. User exit XFCREQC is called.

    The following sections discuss details specific to access method and request type.

READ request processing: The course of READ request processing depends on the access method, and whether or not the UPDATE option is specified on the request:

VSAM processing:

1. The supplied keylength is validated.
2. A VSAM work area (VSWA) is created. This includes the request parameter list (RPL) that will be passed to VSAM.

   The processing that follows depends on whether the UPDATE option was specified on the READ request.

   UPDATE option not specified:

   a. The RPL is completed, and a call made to VSAM to get the record.
   b. If the request specifies INTO and the record is too large for the user-specified area, the request is reissued specifying a work area large enough to hold the record. The record is then copied to the user-specified area in truncated form, and the LENGERR condition is raised.
   c. The VSWA is freed.
   d. The read is journaled if specified in the FCT entry.

   UPDATE option specified:

   a. The UPDATE flag is set in the RPL.
   b. An attempt is made to read the record by issuing the VSAM request. READ UPDATE requires exclusive control of the control interval (CI) containing the record. VSAM manages the locking mechanism for control intervals. If the CI is already locked, VSAM returns an error and the requesting task is forced to wait on resource type FCXCWAIT.
   c. CICS file control acquires a record lock on the record just read, using a CICS ENQUEUE request. The record lock prevents any other transaction from updating the record before the owning transaction has reached a syncpoint (for recoverable files), or before the REWRITE, DELETE, UNLOCK or syncpoint that completes the request sequence (non-recoverable files).
   d. Exclusive control of the CI is retained until the REWRITE, DELETE, or UNLOCK request that follows the READ UPDATE has been completed, or until the next syncpoint.

      The CICS record lock (if any) is retained until the next syncpoint, in case the transaction updating the record abends and dynamic transaction backout processing is necessary.
   e. If the file is recoverable the request is logged. If required, the request is also recorded in a user-specified journal.

BDAM processing:

a. A file I/O area (FIOA) is obtained.

b. If the UPDATE option has been specified:

   1) The address of the RIDFLD is saved in the FIOA.

   2) If the data set is recoverable, the RIDFLD is ENQUEUEd on to lock the record against other updates. The ENQUEUE is retained until the next syncpoint.

c. The KEYLENGTH is checked for validity.

d. The key field is converted from character string format (TTTTTTRR) to binary format (TTR), if necessary.

e. A BDAM READ request is issued. If the READ is successful, the required block is returned in the FIOA.

f. The key field returned by BDAM is converted from binary format to character string format, if necessary.

g. If the file is recoverable and UPDATE has been specified, the request is logged. If required, the request is also recorded in a user-specified journal.

h. If deblocking is required, the required record is located in the block that has been returned by BDAM:

   1) If DEBREC has been specified, the record number is used to locate the record.

   2) If DEBKEY has been specified, the embedded key is used to locate the record.

WRITE request processing: The course of WRITE request processing depends on the access method, and for VSAM access on whether the file is a data table: **VSAM processing:**

1. The KEYLENGTH is checked for validity. If it is incorrect, the INVREQ condition is raised.

2. A VSAM work area (VSWA) is created. This includes the request parameter list (RPL) that will be passed to VSAM.

   Different paths are now followed depending on the type of file.

   ESDS file:

   a. If the file is recoverable or writes are to be journaled then

      1) If this is not the first write of a sequence and the ESDS write lock is being waited for by another transaction, then release the lock and end this sequence, logging the completion if recoverable.

      2) If this is (or has become) the first write of a sequence, acquire the ESDS write lock for the data set.

   b. If the file is recoverable, the WRITE ADD request is recorded in the CICS system log.

   c. If required, the WRITE ADD request is recorded in a user-specified journal.

   d. Any fields in the RPL not supplied when the VSWA was created are completed.

   e. The RPL is set to point to the user-specified data area. If the user specified a record that is too large for the file, the length in the RPL is set to the maximum length, so that the record is truncated.

   f. A VSAM PUT request is issued to write the record.

   g. If the file is recoverable, a CICS record lock is obtained for the record that has just been written. The record lock will be retained until the next syncpoint, in case the transaction writing the record abends and dynamic transaction backout processing has to be performed.

   h. If the file is recoverable, the after-image of the record is logged for forward recovery and a write complete record is written on the system log.

   i. If not a MASSINSERT the ESDS write lock is released, if held.

   KSDS or RRDS file:

   a. For KSDS requests, the RIDFLD key specified in the request is checked against the key field in the record to be written. (The record is currently in the application FROM data area.) If it does not match, the INVREQ condition is raised.

   b. If the file is recoverable and not in load mode:

      1) A CICS lock is obtained on the record that is to be written, and an attempt is made to read the record (by means of a VSAM GET request) to discover whether it already exists in the file. If it does, the DUPREQ condition will be raised on the write to VSAM.

      2) If the file is a KSDS, and if this request is part of a MASSINSERT, or if a MASSINSERT is in progress, the read is issued with GTEQ to find the next record in the base data set. A lock is created, using the key of this next record, to prevent other transactions from inserting records into the empty range.

      3) If there is no existing record with the given key, the WRITE ADD request to VSAM is recorded in the CICS system log and, if required, in a user-specified journal.

   c. If the file is not recoverable or in load mode, the WRITE request is recorded, if required, in the user-specified journal, and if recoverable a record lock is obtained and the write logged.

   d. Any fields in the RPL not supplied when the VSWA was created are completed.

  e. If a data table is associated with the base cluster (the data table will be a CICS-maintained table, as user-maintained and coupling facility data tables follow a separate processing path which is not described here). a data table pre-add is issued to place the record in the table as a not-yet-valid entry. If the file is recoverable, a record lock is already held; if not, a lock is acquired before the data table service is called.
  f. A VSAM request is issued to write the record.
  g. If the file is recoverable, the after-image of the record is logged for forward recovery.
  h. If required, the after-image is recorded in a user-specified journal.
  i. If the file is a data table, a data table request is issued to complete the add to the data table by validating the record. If a record lock was obtained for a non-recoverable file, it is released.

3. If the MASSINSERT option has *not* been specified on the WRITE request, the VSWA for the operation is released.

   If MASSINSERT has been specified, the VSWA is not released, because it is likely to be needed for subsequent WRITE operations. In this case, the end of MASSINSERT processing is notified to VSAM by the CICS UNLOCK function. (See "UNLOCK request processing" on page 265.)

   Specifying MASSINSERT causes exclusive control of the CI to be acquired. Exclusive control is released by issuing an UNLOCK request. To avoid deadlocks, this should be done immediately after the last WRITE MASSINSERT request.

BDAM processing:

1. The KEYLENGTH is checked for validity. If it is incorrect, the INVREQ condition is raised.
2. The WRITE command input is checked to ensure that MASSINSERT has not been specified—BDAM does not support MASSINSERT processing. If it has, condition INVREQ is raised.
3. A file I/O area (FIOA) is obtained.
4. If the file is recoverable, the record to be written is ENQUEUEd on. The lock is retained until the next syncpoint.
5. The record to be written is copied from the user-supplied data area to the FIOA. If the record is too large, it is truncated.
6. If the file is recoverable, the request is logged. If required, the request is also recorded in a user-specified journal.
7. The key field is converted from character string format to binary format, if necessary, and the BDAM I/O request issued.
8. The key returned by BDAM is converted from binary format to character string format, if necessary, and passed to the application.
9. A supervisor call (SVC 53) is issued to release BDAM exclusive control, if necessary.
10. The FIOA is FREEMAINed.

REWRITE request processing: The REWRITE request is used to write a record back to a file following a READ UPDATE request. **VSAM processing:**

1. The RPL is set to point to the user-specified data area. If the user specified a record that is too large for the file, the length in the RPL is set to the maximum length, so that the record is truncated.
2. The RPL is completed.
3. If there is a data table associated with the base cluster (this will be a CICS-maintained table, as user-maintained tables follow data table processing):
   a. If the file is nonrecoverable, a record lock is obtained. (If the file is recoverable, a lock is already held).
   b. A data table request is issued to invalidate the record in the table before the VSAM update.
4. VSAM is called to PUT(UPDATE) the record. Exclusive control of the CI, which was obtained for the preceding READ UPDATE request, is released, but the CICS record lock (for recoverable files) is retained until the next syncpoint, in case the transaction abends and dynamic transaction backout processing is necessary.
5. If there is a data table associated with the data set, the table record is updated and its validity is reinstated, by issuing a call to data table services. If the file is nonrecoverable, the record lock is released.
6. If the file is recoverable, and if the record is successfully rewritten, the after-image is written to the log for forward recovery.
7. The VSWA for the operation is released.

   Note: When a record is updated by way of a path, the corresponding alternate index is updated by VSAM to reflect the change. However, if the record is updated directly by way of the base, or by a different path, the AIX will only be updated by VSAM if it has been defined to VSAM (when created) to belong to the **upgrade set** of the base data set.

BDAM processing:

1. The FIOA that was used in the corresponding READ UPDATE request is located, and the modified record read into it from the user-specified area. If the record is too long, it is truncated.
2. A FREEMAIN call is issued to release the FWA.

3. If the file is recoverable, the request is logged. If required, the request is also recorded in a user-specified journal.
4. The key field is converted from character string format to binary format, if necessary, and the BDAM I/O request issued.
5. The key returned by BDAM is converted from binary format to character string format, if necessary, and passed to the application.
6. A supervisor call (SVC 53) is issued to release BDAM exclusive control, if necessary.
7. A FREEMAIN call is issued to release the FIOA.

UNLOCK request processing: The UNLOCK request is used to release exclusive control obtained during a READ UPDATE (VSAM or BDAM) or WRITE MASSINSERT (VSAM only) request.

VSAM processing (including CICS-maintained data tables):

1. The VSWA for the operation is released, together with associated storage.
2. An ENDREQ request is sent to VSAM. This releases exclusive control of the CI, if it is held, and frees any VSAM strings.

BDAM processing:

1. A supervisor call (SVC 53) is issued to release BDAM exclusive control, if necessary.
2. A FREEMAIN call is issued to release the FIOA.

DELETE request processing: The course of DELETE request processing depends on whether a RIDFLD has been specified. The processing for user-maintained data tables differs from that for CICS-maintained data tables. DELETE requests are not valid for VSAM ESDS or for BDAM files.

VSAM processing (including CICS-maintained data tables):

1. If a RIDFLD has been specified:
   a. If a KEYLENGTH has been specified, it is checked for validity.
   b. If the GENERIC option has been specified, and the file is *not* a KSDS, condition INVREQ is raised.
   c. A VSWA is created.
2. If no RIDFLD was specified, the SERVREQ attribute of the file is checked to ensure that DELETE requests are valid for this file. If not, the INVREQ condition is raised.

   If a RIDFLD has been specified, the cycle of actions described below is performed once if GENERIC has not been specified, or is repeated until there are no more records containing the generic key, if GENERIC has been specified.

   Start of cycle:

3. VSAM is requested to GET for UPDATE a record with the specific or generic key. GET UPDATE processing requires exclusive control of the CI. The record is read into an internal buffer.

   The generic key value, if supplied, is checked against the key contained in the record. If it does not match, there are no more records containing the generic key in the file.
4. If the file is recoverable:
   a. A CICS record lock is obtained for the record. This will be held until the next syncpoint.
   b. The VSAM GET UPDATE request is recorded synchronously on the system log.
   c. A CICS range lock is obtained for the record to be deleted if a MASSINSERT is in progress. This is to prevent an end-of-range record from being deleted while the range is in use for a MASSINSERT sequence.
5. If there is a data table (which will be CICS-maintained) associated with the base cluster, a record lock is acquired if the file is nonrecoverable, and a data table pre-update call is issued to invalidate the record before the VSAM update.
6. A VSAM ERASE request is issued, to delete the record from the file.
7. If there is a data table associated with the base cluster, the record is deleted from the table by issuing a call to data table services. If the file is nonrecoverable, the record lock is released.
8. If a range lock was acquired, it is released.
9. If the file is recoverable, a WRITE DELETE record is written in the system log for forward recovery.
10. If required, a WRITE DELETE record is written to a user-specified journal.

    End of cycle.

11. The VSWA is released.

STARTBR and RESETBR request processing: STARTBR and RESETBR request processing are very similar, and are described together.

VSAM processing:

1. A VSWA is created if STARTBR.
2. The user key is recorded in the VSWA for use in subsequent BROWSE processing.
3. A call is made to VSAM to point to the record, and to acquire shared control of the CI.

BDAM processing:

1. An FIOA is obtained and initialized if STARTBR.

2. The initial key is saved in the FIOA, converting the key from character string format to binary format if necessary.
3. If deblocking is required, the deblocking indicator (DEBREC or DEBKEY) is saved in the FIOA.

READNEXT and READPREV request processing:

READNEXT and READPREV request processing are very similar, and are described together.

VSAM processing:

1. A check is made that READPREV with a generic key was not requested. If it was, condition INVREQ is raised.
2. If KEYLENGTH was specified, it is checked for validity. If it is incorrect, the INVREQ condition is raised.
3. The RPL options are set.
4. If SET is specified, an internal work area is obtained and the RPL is set to point to the work area. The area is either above or below the 16MB line, depending on the requirements of the application.
5. If INTO is specified, the RPL is set to point to the user-specified area.
6. A VSAM request is issued to read the record. Shared control of the CI is needed, and the request will not succeed if some other task already has exclusive control. In such a case, a call is made to VSAM to reestablish the correct position in the file. The task then waits until VSAM informs CICS that the CI is available to the task. CICS resumes the task, which can now acquire shared control and obtain the required record.
7. If SET is specified, the SET pointer points to the work area.
8. If INTO is specified, a check is made to see if the record is too large to fit into the user-specified area. If it is too large, the request is reissued using an internal work area, the data is copied from the work area into the user-specified area and truncated, and the LENGERR condition is raised.
9. If required, the request is recorded in a user-specified journal.

BDAM processing—READNEXT requests:

1. A check is made that READPREV was not issued. If it was, condition INVREQ is raised.
2. The FIOA that was created on STARTBR is located.
3. If a new block is required, a BDAM I/O request is issued to get it.
4. If deblocking is required, the required record is located in the block that has been returned by BDAM:
   a. If DEBREC has been specified, the record number is used to locate the record.
   b. If DEBKEY has been specified, the embedded key is used to locate the record.
5. If INTO is specified, the record or block is moved from the FIOA to the user-specified area. If the record is longer than the user-specified area, it is truncated, and the LENGERR condition is raised.
6. If SET is specified, the SET pointer points to the record in the FIOA.
7. The RIDFLD of the record is returned to the application.
8. The current browse position is recorded in the FIOA.

ENDBR request processing:

The ENDBR request is used to end a browse session on a file. To avoid deadlocks, ENDBR must be issued when the browse session is complete.

VSAM processing:

1. An ENDREQ request is sent to VSAM. This frees any VSAM strings that are held, and relinquishes shared control of the CI.
2. The VSWA for the operation is released.

BDAM processing:

- The FIOA that was used for the browse session is FREEMAINed.

Control blocks

Figure 60 on page 267 shows the major control blocks associated with file control. Control blocks which are not shown in this diagram include those relating to coupling facility data tables support.

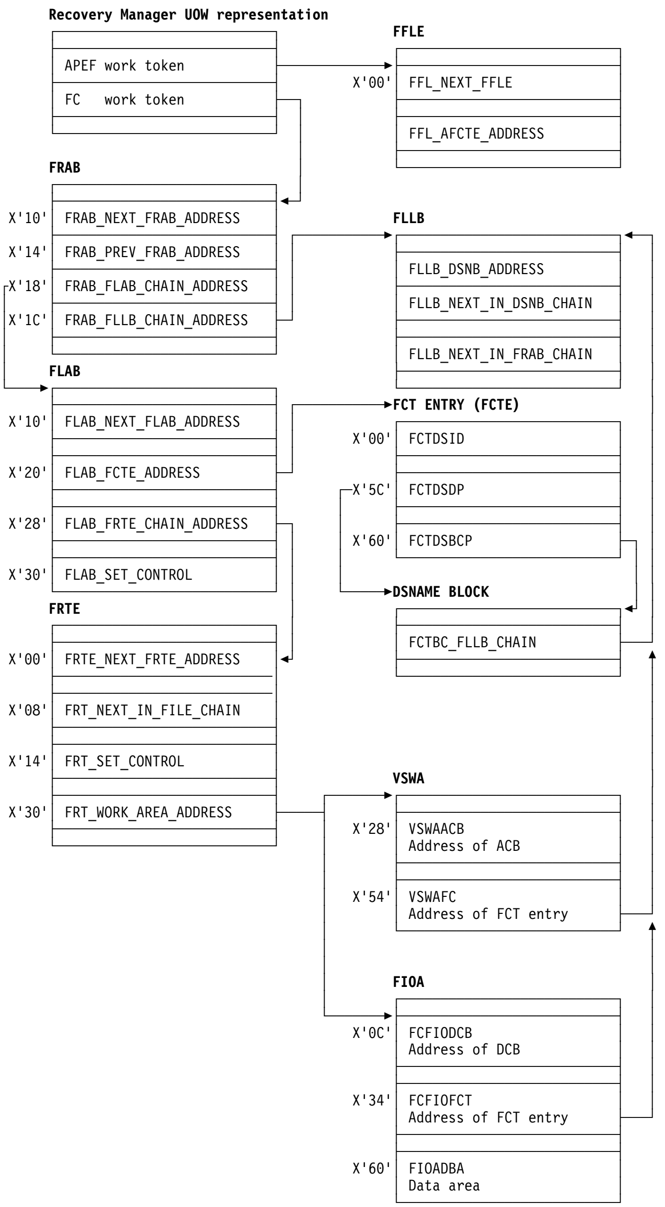
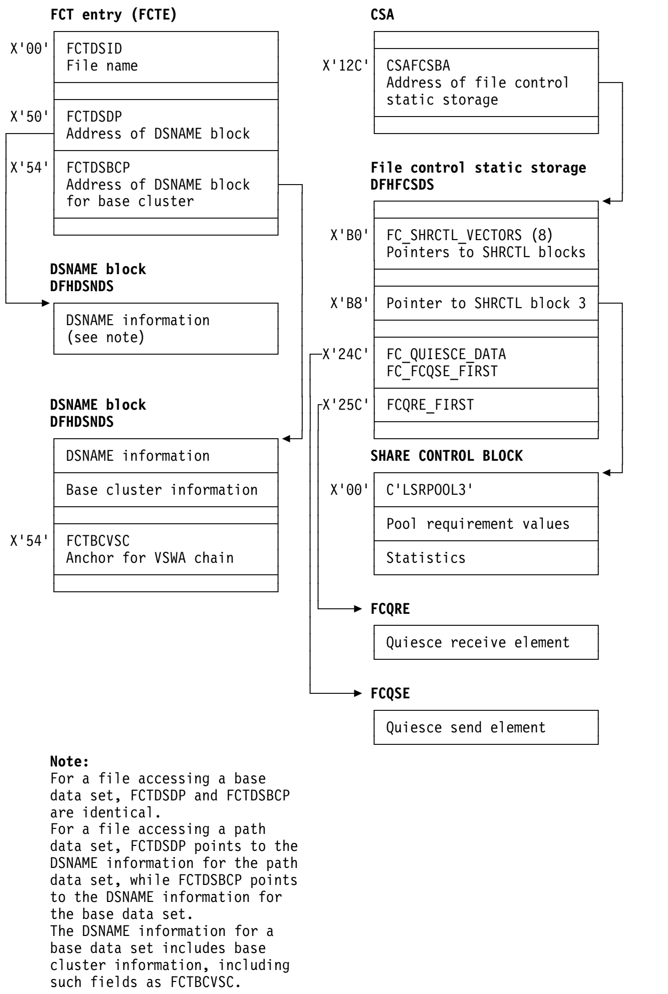

Recovery Manager UOW representation
APEF work token
FC work token
FFLE
X'00' FFL_NEXT_FFLE
FFL_AFCTE_ADDRESS
FRAB
X'10' FRAB_NEXT_FRAB_ADDRESS
X'14' FRAB_PREV_FRAB_ADDRESS
X'18' FRAB_FLAB_CHAIN_ADDRESS
X'1C' FRAB_FLLB_CHAIN_ADDRESS
FLLB
FLLB_DSNB_ADDRESS
FLLB_NEXT_IN_DSNB_CHAIN
FLLB_NEXT_IN_FRAB_CHAIN
FLAB
X'10' FLAB_NEXT_FLAB_ADDRESS
X'20' FLAB_FCTE_ADDRESS
X'28' FLAB_FRTE_CHAIN_ADDRESS
X'30' FLAB_SET_CONTROL
FCT ENTRY (FCTE)
X'00' FCTDSID
X'5C' FCTDSDP
X'60' FCTDSBCP
DSNAME BLOCK
FCTBC_FLLB_CHAIN
FRTE
X'00' FRTE_NEXT_FRTE_ADDRESS
X'08' FRT_NEXT_IN_FILE_CHAIN
X'14' FRT_SET_CONTROL
X'30' FRT_WORK_AREA_ADDRESS
VSWA
X'28' VSWAACB Address of ACB
X'54' VSWAFC Address of FCT entry
FIOA
X'0C' FCFIODCB Address of DCB
X'34' FCFIOFCT Address of FCT entry
X'60' FIOADBA Data area

Figure 60 (Part 1 of 2). Control blocks associated with file control


FCT entry (FCTE)
X'00' FCTDSID File name
X'50' FCTDSDP Address of DSNAME block
X'54' FCTDSBCP Address of DSNAME block for base cluster
DSNAME block DFHDSNDS
DSNAME information (see note)
DSNAME block DFHDSNDS
DSNAME information
Base cluster information
X'54' FCTBCVSC Anchor for VSWA chain
CSA
X'12C' CSAFCSBA Address of file control static storage
File control static storage DFHFCSDS
X'B0' FC_SHRCTL_VECTORS (8) Pointers to SHRCTL blocks
X'B8' Pointer to SHRCTL block 3
X'24C' FC_QUIESCE_DATA FC_FCQSE_FIRST
X'25C' FCQRE_FIRST
SHARE CONTROL BLOCK
X'00' C'LSRPOOL3'
Pool requirement values
Statistics
FCQRE
Quiesce receive element
FCQSE
Quiesce send element

Note:
For a file accessing a base data set, FCTDSDP and FCTDSBCP are identical.
For a file accessing a path data set, FCTDSDP points to the DSNAME information for the path data set, while FCTDSBCP points to the DSNAME information for the base data set.
The DSNAME information for a base data set includes base cluster information, including such fields as FCTBCVSC.

Figure 60 (Part 2 of 2). Control blocks associated with file control

Note: The pointer to the DSNAME block, FCTDSDP, is different from the pointer to the base cluster DSNAME block, FCTDSBCP, only when the FCT entry does not represent a base. DSNAME blocks that do not correspond to bases do not have the base cluster information, although the space is allocated.

These control blocks are described in the §s "Access method control block (ACB)" through "VSAM work area (VSWA)" on page 273.

Access method control block (ACB)

The ACB identifies to VSAM the file associated with this VSAM request. It is passed to VSAM by DFHFCRV, for RLS, or DFHFCVR, for non-RLS (it is actually the RPL, which points to the ACB, that is passed) to initiate a VSAM request. The ACB lasts as long as the associated CICS file is open; that is, it is created at file open time and deleted at file close time by DFHFCN for non-RLS or DFHFCRO for RLS.

The ACB is addressable through a pointer in the associated FCT entry. In addition, a 4-byte field appended (by CICS) to the ACB structure points back to this FCTE.

Note that the ACB is a VSAM control block.

At open time, storage is obtained from a subpool above the 16MB line. A VSAM GENCB macro is issued to generate the ACB with attributes obtained from the FCT entry. At open time, VSAM fills in more information in the ACB. Some of this is subsequently copied back into the FCTE.

The storage for the ACB is freed when the file is closed.

There is one ACB per VSAM FCT entry.

The layout of the ACB is defined by the VSAM IFGACB structure, and also by a DSECT of the same name.

ACBs are not cataloged and are not restored across WARM or emergency starts. The ACB is rebuilt every time a CICS file is opened.

A special type of ACB, known as a base cluster ACB, is created by DFHFCM to allow for the implicit opening of a base cluster, when required by a non-RLS file access through an alternate index path. In this case, the 4-byte field appended to the ACB structure points to the associated DSNAME block for the base cluster.

A second special type of ACB, known as a **control ACB** is required for VSAM RLS processing. Storage for the control ACB is obtained by DFHFCCA and filled in using the GENCB macro before registering the control ACB. The storage is freed when the control ACB is unregistered by DFHFCCA. The control ACB is passed to VSAM on calls issued by DFHFCCA. It is used for all requests that are not associated with a specific file.

Application file control table entry (AFCTE)

Each entry in the AFCT defines a CICS file to the application (AP) domain. Each entry can be either local or remote. If the AFCTE defines a local file, there is a corresponding FCTE owned by file control.

The AFCTE is used by all modules outside the file control component (only modules in the file control component can access an FCTE directly), and it lasts for the lifetime of a CICS run, or from when it is created by RDO to the end of the CICS run.

The AFCTE is addressable through a TMP index; its layout is defined by the DFHAFCTP structure and by the DFHAFCTA DSECT; and it resides above the 16MB line.

An AFCTE is created in the same way as an FCTE (see "File control table entry (FCTE)" on page 270). Additionally, a remote AFCTE is created using the DFHFCT TYPE=REMOTE macro. An AFCT entry is associated with its FCT entry by means of a token.

Data control block (DCB)

The DCB identifies to BDAM the file associated with this BDAM request. It is passed to BDAM by DFHFCBD to initiate a BDAM request, and lasts for the lifetime of the CICS run.

The DCB is addressable through a pointer in the associated FCT entry. In addition, a 4-byte field appended (by CICS) to the DCB structure points back to this FCTE.

Note that the DCB is a BDAM control block.

There is one DCB per BDAM FCT entry.

The layout of the DCB is defined by the generalized structure IHADCB. The structure is qualified with a parameter stating that a BDAM DCB is required. There is also a DSECT of the same name.

The DCB is assembled as part of the FCT. (Note that there is no RDO for BDAM files.) DFHFCRP acquires storage for the DCB below the 16MB line and copies the DCB into it (only on cold start). The DCB is cataloged and restored across a warm and emergency start. Thus, unlike an ACB, a DCB is only built once.

Data set name block (DSNB)

The DSNB represents a physical VSAM or BDAM data set that is being accessed through one or more CICS files. It is used by file control to hold information relevant to the data set and not only to the CICS file. Also, it provides a single "anchor block" to control many requests accessing this data set through many different CICS files.

After it has been created, a DSNB survives the lifetime of a CICS run unless the user deletes it by means of an EXEC CICS SET DSNAME REMOVE command or its CEMT equivalent.

The DSNB is addressable through pointers in an FCTE entry, or through DFHTMP using the 44-character name as a key, or using the DSNB number as a key.

A DSNB is created, if it does not exist already, when an FCTE attempts to connect itself to a DSNB. This happens at file open time, or when an EXEC CICS SET FILE DSNAME command (or its CEMT equivalent) is executed.

A DSNB that represents a VSAM base data set has a **base cluster block** embedded in it, which has information specific to the base data set. Note that a BDAM data set has a small amount of information held in the base cluster block.

A DSNB representing a VSAM path has a blank base cluster block embedded in it.

Information about the base data set is obtained from the VSAM catalog when a CICS file (path or base) referencing that data set is opened. The information is stored in the base cluster block.

DSNBs are cataloged in the CICS global catalog and are restored across warm and emergency starts.

DSNBs reside above the 16MB line.

The layout of the DSNB is defined by the DFHDSNPS structure, and by the DFHDSNDS DSECT (using the DFHDSND macro).

The DFHFCDN module handles DSNAME blocks (creation, deletion, FCTE-DSNB connections). DFHFCDN also provides an interface for the EXEC layer to process DSNAME blocks through the use of EXEC CICS INQUIRE or SET DSNAME, and CEMT INQUIRE or SET DSNAME. Modules within the file control component can access the DSNBs directly through pointers in the FCTE.

File browse work area (FBWA)

The FBWA maintains the state of a browse to a data table. It is used for browsing coupling facility data tables, CICS-maintained data tables, and user-maintained data tables.

An FBWA is created when the browse is started (via a STARTBR request), and is addressed by the FRT_FBWA_ADDRESS field in the FRTE. It is stored in a file control IO buffer of the appropriate size to hold the key information.

Some of the fields are specific to CICS-maintained data tables, because the source data set will sometimes be accessed during a browse of a CICS-maintained data table.

There is a variable-length portion at the end of the FBWA which contains keys, which are pointed to by fields in the fixed part:

- CURRENT_KEY points to the first of the key fields, which is used to hold the key returned by the most recent request.
- REQUEST_KEY points to the second of the key fields, which is used to contain the key specified at the start of a browse segment (STARTBR or RESETBR).
- NEXT_KEY points to the third of the key fields, which is used for CICS-maintained data tables to handle "gaps".

File control static storage (FC static)

File control static storage is used by file control to store information for use throughout the lifetime of a CICS run; for example, SHRCTL vectors and entry points of file control modules. It is used by file control modules and by modules outside the file control component, and lasts for the lifetime of a CICS run. It is addressed by a field in the CSA named CSAFCSBA; it is created by DFHFCIN during CICS initialization before DFHFCRP gets control, and resides above the 16MB line.

FC static storage is defined by the DFHFCSPS structure and by the DFHFCSDS DSECT.

File control quiesce receive element (FCQRE)

File control uses quiesce receive elements to communicate details of quiesce requests received from SMSVSAM. There is also a permanent error FCQRE used for communicating errors. The FCQRE contains information about the data set to which the quiesce applies (or the cache for quiesce type QUICA), the type of quiesce, and (for the error FCQRE) the type of error and error data.

Each quiesce request received from SMSVSAM via the quiesce exit results in DFHFCQX, the quiesce exit module, creating an FCQRE which is passed to DFHFCQR, the quiesce receive system task module.

Storage for FCQREs is obtained from storage MVS getmained above the 16MB line.

FCQREs are chained in a one-way linked list anchored from file control static storage. The permanent error FCQRE is also anchored from file control static storage, and is added to the FCQRE chain when an error occurs.

The layout of the FCQRE is defined by the DFHFCQRE structure and the DFHFCQRE DSECT.

File control quiesce send element (FCQSE)

File control uses quiesce send elements to communicate the details of quiesce requests that are to be sent to SMSVSAM. They contain information about the task initiating the request, the data set to be quiesced, the type of quiesce requested, and the address of an ECB which is posted by SMSVSAM when the request is completed.

Each quiesce request initiated by CICS results in DFHFCQI, the quiesce initiate module, creating an FCQSE which is passed to DFHFCQS, the quiesce send module.

Storage for FCQSEs is obtained from the FC_ABOVE subpool, which resides above the 16MB line.

FCQSEs are chained in a two-way linked list anchored from fields in file control static storage.

The layout of the FCQSE is defined by the DFHFCQSE structure and the DFHFCQSE DSECT.

File control coupling facility data table pool element (FCPE)

A file control CFDT pool element represents one connection to a Coupling Facility Data Table Pool. For each CFDT pool which can be accessed by a given MVS image, there is a CFDT server running in that image which manages access to the pool.

An FCPE is created and chained to FC static when a file definition that refers to the pool is installed and there is not already a pool element for that CFDT pool. The creation of an FCPE can occur:

- when files are installed at CICS startup,
- when files are installed using CEDA,
- when a SET FILE is issued which names a CFDT pool for which there is not already a pool element.

FCPEs are getmained from the FCPE subpool which is created by DFHFCRP during File Control Initialization, and chained to the FCPE chain in FC static. The head of the FCPE chain is the field FC_FCPE_CHAIN.

FCPEs are catalogued when they are created, so that they can be restored at emergency restart.

File control coupling facility data table pool wait element (FCPW)

The file control CFDT pool wait element (FCPW) represents a task which has tried to issue a request to a coupling facility data table that resides in a particular pool, but which has to wait because there are no available request slots. Depending on the kind of request, the FCPW will represent either a 'Locking request slot' (LRS) waiter or a 'MaxReqs' waiter. A flag in the FCPW indicates what kind of wait it is.

The FCPW is created when a task goes into a MaxReqs or LRS wait. It is getmained from the pool wait element subpool, and appended to a chain of wait elements for the pool. The wait chains are anchored in the pool element (FCPE), with one FCPW for each task that is waiting. The FCPE contains head and tail fields for the chains of LRS and MaxReqs FCPWs (FCPE_FIRST_LRS_WAITER, FCPE_LAST_LRS_WAITER, FCPE_FIRST_WAITER and FCPE_LAST_WAITER). The chains are manipulated using logic which does not require any special case code for the ends of the chains, but which does mean that when the chains are empty, the head and tail fields contain a special initial value, rather than zero.

The FCPW includes:

- A pointer to the next FCPW in the chain (if no next FCPW, this contains the special initial value).
- A pointer to previous FCPW in the chain (if no previous FCPW, this contains the special initial value).
- The suspend token for the wait.
- The task token of the waiting task.
- The suspend start time.

File control table entry (FCTE)

Each entry in the file control table defines a CICS file that is defined to be the CICS view of a VSAM or BDAM data set or a data table. The FCTE is used by all modules in the file control component (but never outside), and lasts for the lifetime of a CICS run, or from when it is created by RDO to the end of the CICS run.

The FCTE is addressable through a TMP index; its layout is defined by the DFHFCTPS structure and by the DFHFCTDS DSECT; and it resides above the 16MB line.

The FCTE contains information that can be split into three broad groups:

- CICS information about the file, including statistics
- Information that is used as input to build the VSAM ACB or BDAM DCB
- Information that is returned by VSAM, both from the ACB and direct from the VSAM catalog, when the file is opened.

An FCTE can be created in two ways:

- By defining the file using the DFHFCT TYPE=FILE macro (BDAM only).
- By defining the file online using RDO while CICS is running (VSAM only).

File control table entry (FCPW)

File control coupling facility data tables UOW pool block (FCUP)

The File Control CFDT UOW Pool Block (FCUP) represents recoverable updates made within a unit of work to one or more CF data tables residing in a coupling facility data table pool. An FCUP block is created when a unit of work makes its first recoverable request to a CFDT in a given pool, at the same time as an RMC link is added to represent the recoverable update.

There is one FCUP block per UOW per recoverably-updated CFDT pool. The FCUP is getmained and freemained from the FCUP subpool using the storage manager quickcell mechanism. The FCUP blocks for a unit of work are chained from the FRAB for that unit of work, addressed by FRAB_FCUP_CHAIN_ADDRESS.

An FCUP block contains:

- Forward and back pointers for the chain of FCUP blocks relating to this unit of work.
- The name of the CFDT pool.
- The CFDT RMC link token.

- A pointer to the pool element for the CFDT pool.
- A pointer back to the owning FRAB.

File input/output area (FIOA)

The FIOA is analogous to the VSWA for VSAM, in that it represents the request to BDAM. Embedded in the FIOA is what is known as the data event control block (DECB), which is passed to BDAM to initiate the request.

The FIOA is used by DFHFCBD when processing browse requests against BDAM files. It holds position in a browse when browsing a BDAM file.

An FIOA survives as long as the DECB needs to survive to complete the BDAM request; for example, it survives from READ UPDATE to the REWRITE request.

The address of the FIOA is held in the file request thread element (FRTE) in the FRT_WORK_AREA_ADDRESS field.

Storage for the FIOA is acquired from below the 16MB line.

The layout of the FIOA is defined by the DFHFIOA DSECT.

File lasting access block (FLAB)

The FLAB serves as an anchor for the set of file request thread elements (FRTEs) belonging to a particular file within a given transaction and a given environment. If a transaction accesses several files from within the same environment, there will be one FLAB for each file. If a transaction accesses the same file from more than one environment, there will be one FLAB for each environment.

The FLAB contains pointers to the FCTE for the file, to the owning FRAB, to the chain of FRTEs owned by the FLAB, and to the next FLAB in the chain of FLABs for the unit of work.

The FLAB is used by file control to

- anchor the FRTEs for the file within the unit of work and environment,
- ensure that a file cannot be closed if there are any FRTEs associated with it, or if there have been recoverable updates made by units of work which have not yet reached syncpoint phase 2,
- ensure that the corresponding file entry cannot be reallocated to a different data set, even if the file is closed and disabled, when there is uncommitted recoverable work associated with the file,
- hold READ SET storage control information across intermediate syncpoints,
- ensure that units of work which have updated the file reach syncpoint before a copy or BWO copy for a file opened in RLS mode is allowed to proceed,
- record the reason for a failure during syncpoint, and keep track of the fact that the file has uncommitted updates within a unit of work as a result of the failure.

The file lasting access block is built by DFHFCFR as part of processing of the first file control request for a particular file within a given transaction and environment. FLABs for recoverable files are also rebuilt by DFHFCIR at warm and emergency restart.

The storage for the FLAB is obtained from a FLAB storage subpool above the 16MB line.

The FLAB is deleted after all the FRTEs have been processed during syncpoint terminate processing, providing that there have been no syncpoint failures for the file within the unit of work. The FLAB storage is not returned to the FLAB storage subpool, but is instead added to a chain of free FLABs, anchored from file control static storage. Subsequent requests to build a FLAB are, if possible, satisfied by a quick cell mechanism from this chain.

If a unit of work is shunted as a result of a syncpoint failure, the FLABs for any files which suffered the syncpoint failure are also shunted.

The chain of FLABs for a unit of work is anchored from field FRAB_FLAB_CHAIN_ADDRESS in the FLAB.

The layout of the FLAB is defined by the DFHFLAB structure and the DFHFLAB DSECT.

File control locks locator blocks (FLLBs)

The file control locks locator block records the fact that a unit of work held locks against a file which were protecting uncommitted changes to the file, and that it is now uncertain whether the locks are valid. This can occur, for example, if the data set against which the locks were held is now in the lost locks state, or if a non-RLS open for update has taken place despite the presence of retained locks and has overridden the locks (in this case the locks are intact, but the data may not be). It is used by file control to keep track of outstanding recovery work, because whilst the data set still has FLLBs associated with it, special processing rules apply (the actual rules vary with the type of lock condition that has occurred).

FLLBs are created by DFHFCRR (for the lost locks condition, or for an OFFSITE=YES CICS restart), or by DFHFCRO (after a file open which has returned the 'non-RLS override' reason code).

FLLBs are chained from both the associated DSNB and the associated FRAB. There is one FLLB per file that held locks per unit of work. Since the FLLB records information about a data set and a unit of work, it contains the DSNB address and the local unit of work ID. It also contains an indicator of the type of lock failure condition that it represents.

FLLBs are getmained from an FLLB subpool above the 16MB line.

File control locks locator blocks are freemained by DFHFCRC at commit time when there are no longer any retained FLABs for the file.

The layout of the FLLB is defined by the DFHFLLB structure and the DFHFLLB DSECT.

Fast file locate elements (FFLEs)

FFLEs record the addresses of AFCTEs and the results of any security checks. They are used to avoid performing repeated locates of AFCTEs, and repeated security checks.

An FFLE is created by the file control EXEC interface module, DFHEIFC, when the first request is made against a specific file. It is chained according to task. The head of the FFLE chain is addressed by the APEF resource recovery work token associated with the task (see Chapter 63, "Recovery Manager Domain (RM)" on page 457 for more details).

The FFLE is freed either by the file control recovery control program, DFHFCRC (as an optimization), or by the EXEC file control syncpoint processor, DFHEFRM, at syncpoint commit or rollback time, so its lifetime is until syncpoint.

Storage for FFLEs is acquired from above the 16MB line.

The layout of FFLEs is defined by the DFHFFLPS structure.

File request anchor block (FRAB)

The file request anchor block serves as an anchor for the set of file lasting access blocks (FLABs) belonging to a particular transaction. The file request thread elements (FRTEs) are chained from the FLABs. The FRAB identifies the transaction to which a given file control request belongs.

The FRAB contains pointers to: the next FRAB in the chain from the FC static, the chain of FLABs for this transaction, the chain of FLLBs for the transaction, and any VSWA that has suffered exclusive control conflict for the transaction. The FRAB also contains some indicators related to recovery, such as whether or not the transaction holds RLS locks, whether the unit of work has been through phase 2 of syncpoint, and whether the unit of work has ever been shunted. There is also some information related to RLS access, including the local unit of work id, a timeout value to be specified on RLS requests, and some problem determination information returned by VSAM RLS when deadlocks occur.

The FRAB is built by DFHFCFR as part of processing of the first File Control request in a transaction. The storage for the FRAB is obtained from a FRAB storage subpool above the 16MB line. The address of the FRAB is then used as the Recovery Manager token associated with the client name 'FC'. FRABs are rebuilt by DFHFCIR at warm or emergency restart, for units of work which had not completed when CICS terminated. A FRAB is also built if a failure occurs during phase 2 of an intermediate syncpoint. The original FRAB for the transaction is shunted along with the failed parts of the unit of work, and the newly built FRAB is passed on to the next unit of work in the transaction.

If a unit of work is shunted, the FRAB is shunted with it, unless there was no recoverable file control work in the unit of work.

The FRAB is deleted after all the FLABs have been processed during syncpoint at transaction termination. At the same time, the Recovery Manager token is set to zero. At this point, the FRAB storage is not returned to the FRAB storage subpool, but is instead added to a chain of free FRABs, anchored from file control static storage. Subsequent requests to build a FRAB are, if possible, satisfied by a quick cell mechanism from this chain.

Issuing an INQUIRE_WORK_TOKEN call to the recovery manager with client name 'FC' returns the address of the file request anchor block for a transaction. There is a chain of all the FRABs in a CICS system, anchored from field FC_FRAB_CHAIN in file control static storage.

The layout of the FRAB is defined by the DFHFRAB structure and the DFHFRAB DSECT.

File request thread elements (FRTEs)

FRTEs are used by file control to:

- Represent active file control requests
- Link related requests together as a file thread, for example, the request sequence STARTBR, READNEXT, ..., ENDBR, or READ UPDATE, REWRITE
- Anchor SET storage used for READ SET UPDATE requests and browse requests with the set option, the lifetime of which is that of the request thread.

FRTEs are created by the main file control module, DFHFCFR, and are freed ***either*** by DFHFCFR at the end of a request or thread of requests ***or*** by the file control recovery control program, DFHFCRC, at syncpoint if this occurs before a thread of requests has completed.

FRTEs for a particular file within a particular task and environment are chained together, and anchored from the FLAB for that file, task and environment.

Storage for FRTEs is acquired from above the 16MB line.

The layout of FRTEs is defined by the DFHFRTE structure and by the DFHFRTE DSECT.

Keypoint list element (KPLE)

The keypoint list forms part of file control's implementation of backup while open (BWO) copy for data sets accessed in non-RLS mode. One KPLE exists for each keypoint and records the start and end times at which tie up records are written.

The KPLE chain is anchored from FC_KPLE_CHAIN in file control static storage.

The keypoint list elements are created, processed and deleted (when they become redundant) by DFHFCRC following RMKP take keypoint calls from the recovery manager. These calls are made whenever a CICS keypoint is taken. KPLEs are getmained from above the 16MB line.

The layout of the KPLE is defined by the KPLE structure.

Shared resources control (SHRCTL) block

The SHRCTL block represents the CICS region's requirements of, and the use made of, a local shared resources pool (LSRPOOL). It is used by DFHFCL when calling VSAM to build an LSRPOOL. It is also used by DFHFCL and statistics programs to hold and update file control statistics. It lasts for the lifetime of a CICS run, and is addressable through a pointer in file control static storage. There are eight pointers collectively named the SHRCTL vector.

A SHRCTL block holds information such as how many virtual and hyperspace buffers of a particular size are needed, how many strings are needed, the maximum key length allowed. CICS passes this information to VSAM when the pool is built. It also holds statistics about the pool which are sent to the statistics domain when requested or when the pool is deleted.

Each SHRCTL block represents one LSRPOOL, and there are eight SHRCTL blocks. The layout of each SHRCTL block is defined by the DFHFCTLS structure and by the DFHFCTSR DSECT, and they reside above the 16MB line.

On a CICS cold start, DFHFCRP performs the following:

- Unconditionally builds eight SHRCTL blocks above the 16MB line (from a SHRCTL block subpool)
- Fills in default settings in the block, or inserts user-specified information
- Catalogs each SHRCTL block in the CICS global catalog (GCD).

On a CICS warm or emergency start:

- DFHFCRP restores all eight SHRCTL blocks from the global catalog.

The contents of a SHRCTL block are decided in one of three ways:

- User defines the contents in the FCT by means of the DFHFCT TYPE=SHRCTL,LSRPOOL=n macro call. This assembled information is used by DFHFCRP on a COLD start only (as per FCT entries).
- User defines the contents online through a CEDA DEFINE LSRPOOL command.
- If neither of the above two methods is used, DFHFCL calculates the contents before calling VSAM to build the LSRPOOL.

VSAM work area (VSWA)

The VSWA represents a VSAM request to CICS. Embedded in the VSWA is the request parameter list (RPL) which is passed to VSAM to perform the request. In addition to the RPL, the VSWA contains other CICS information related to the request.

The VSWA is used by DFHFCVS and DFHFCRS when processing VSAM files.

A VSWA survives as long as the RPL needs to survive to complete the VSAM request; for example, it survives from READ UPDATE to the REWRITE request.

The address of the VSWA is held in the file request thread element (FRTE) in the FRT_WORK_AREA_ADDRESS field.

Storage for the VSWA is acquired from above the 16MB line.

The layout of the VSWA is defined by the DFHVSWAS structure and by the DFHVSWA DSECT.

Modules

This § describes the following modules. Unless otherwise stated, addressing mode and residency mode are AMODE 31 and RMODE ANY respectively.

Module	Function	See page
DFHAFMT	EXEC file control AFCT manager	275
DFHEFRM	EXEC file control syncpoint processor	276
DFHEIFC	File control EXEC interface module	276
DFHEIQCF	Exec INQUIRE CFDTPOOL module	-
DFHFCAT	File control catalog manager	276
DFHFCBD	File control BDAM request processor	277
DFHFCCA	File control RLS control ACB manager	277
DFHFCDL	File control coupling facility data table load program	278
DFHFCDN	File control DSNAME block manager	278
DFHFCDO	File control coupling facility data table open/close program	279
DFHFCDR	File control coupling facility data table request processor	279
DFHFCDTS	File control shared data table request processor	279
DFHFCDTX	File control shared data table function ship program	279
DFHFCDU	File control coupling facility data table UOW calls program	279
DFHFCDW	File control coupling facility data table RMC program	279

Module	Function	See page
DFHFCDY	File control coupling facility data table resynchronization program	280
DFHFCES	File control ENF servicer	280
DFHFCFL	File control FRAB and FLAB processor	280
DFHFCFR	File control file request handler	280
DFHFCFS	File control file state program	281
DFHFCIN1	File control initialization program 1	282
DFHFCIN2	File control initialization program 2	282
DFHFCIR	File control initialize recovery	283
DFHFCL	File control shared resources pool processor	283
DFHFCLF	File control log failure handler	284
DFHFCLJ	File control logging and journaling program	284
DFHFCMT	File control table manager	284
DFHFCN	File control open/close program	286
DFHFCNQ	File control non-RLS lock handler	288
DFHFCOR	File control offsite recovery completion	288
DFHFCQI	File control RLS quiesce initiation	288
DFHFCQR	File control RLS quiesce receive transaction	288
DFHFCQS	File control RLS quiesce send transaction	288
DFHFCQT	File control RLS quiesce common system transaction	288
DFHFCQU	File control RLS quiesce processor	289
DFHFCQX	File control RLS quiesce exit	289
DFHFCRC	File control recovery control program	289
DFHFCRD	File control RLS cleanup transaction	290
DFHFCRL	File control share control block manager	290
DFHFCRO	File control RLS open/close program	291
DFHFCRP	File control restart program	291
DFHFCRR	File control RLS restart	292
DFHFCRS	File control RLS record management processor	292
DFHFCRV	File control RLS VSAM interface processor	292
DFHFCSD	File control shutdown program	292
DFHFCST	File control statistics program	293
DFHFCVR	File control VSAM interface program	293
DFHFCVS	File control VSAM request processor	294

There are also a number of modules which make up the coupling facility data tables server. These all have names of the form DFHCFxx.

Figure 61 on page 275 shows the main file control modules and their interfaces.

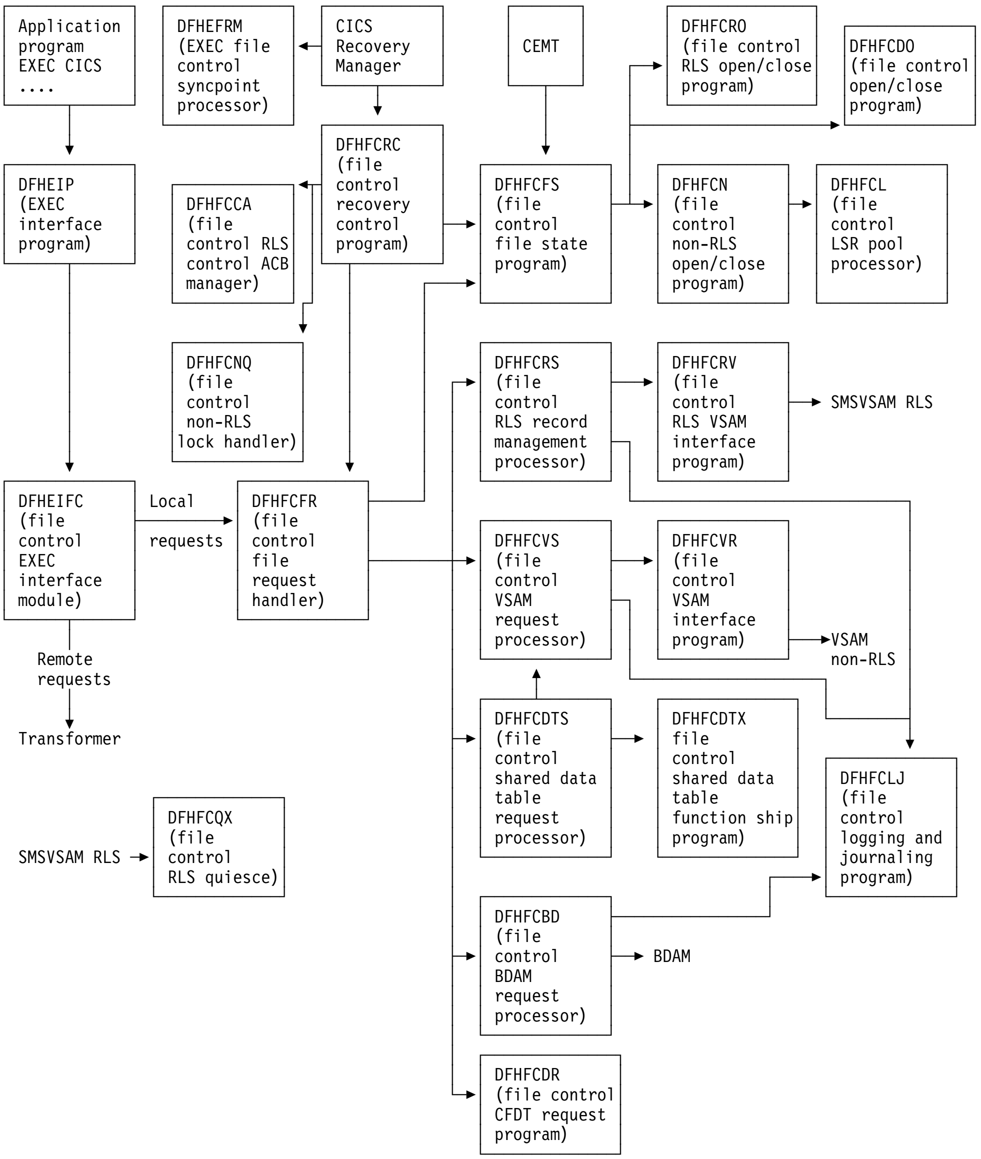

Application program EXEC CICS ....
DFHEFRM (EXEC file control syncpoint processor)
CICS Recovery Manager
CEMT
DFHFCRO (file control RLS open/close program)
DFHFCDO (file control open/close program)
DFHEIP (EXEC interface program)
DFHFCCA (file control RLS control ACB manager)
DFHFCRC (file control recovery control program)
DFHFCFS (file control file state program)
DFHFCN (file control non-RLS open/close program)
DFHFCL (file control LSR pool processor)
DFHFCNQ (file control non-RLS lock handler)
DFHFCRS (file control RLS record management processor)
DFHFCRV (file control RLS VSAM interface program)
SMSVSAM RLS
DFHEIFC (file control EXEC interface module)
Local requests
DFHFCFR (file control file request handler)
DFHFCVS (file control VSAM request processor)
DFHFCVR (file control VSAM interface program)
VSAM non-RLS
Remote requests
Transformer
DFHFCDTS (file control shared data table request processor)
DFHFCDTX file control shared data table function ship program)
DFHFCLJ (file control logging and journaling program)
SMSVSAM RLS
DFHFCQX (file control RLS quiesce)
DFHFCBD (file control BDAM request processor)
BDAM
DFHFCDR (file control CFDT request program)

Figure 61. Main file control modules and their interfaces

DFHAFMT (file control AFCT manager)

DFHAFMT is part of the AP domain. It manages AFCT entries which represent files to AP. The most important use of AFCT entries is to describe remote files.

DFHAFMT is called by EXEC interface modules such as DFHEIQDS, DFHEIQMS and DFHESE to locate AFCT entries, inquire on their attributes, and delete AFCTE entries; by RDO modules such as DFHAMFC during INSTALL of a FILE object to build the AFCT entry, and by the CSD manager, DFHDMPCA, to locate the AFCT entry for the CSD.

The interface to the module is defined in DSECT DFHAFMTA.

DFHAFMT provides the following functions:

- ADD_FILE - create a new AFCT entry
- DELETE_FILE - delete an AFCT entry that is not in use
- SET_FILE - update attributes of an existing AFCT entry
- INQUIRE_FILE - return attributes of an existing AFCT entry
- START_FILE_BROWSE - start browse of AFCTEs
- GET_NEXT_FILE - get next AFCTE in browse sequence
- END_FILE_BROWSE - terminate browse of AFCTEs
- UNLOCK_FILE - remove TMP read lock after inquire
- COMMIT_FILES - called during cold start initialization to catalog all AFCTEs together, to reduce I/Os.

DFHEFRM (EXEC file control syncpoint processor)

DFHERM performs phase-1 and phase-2 syncpoint processing for the EXEC to File Control Interface. The function of DFHEFRM is to clean up the FFLE chain. It is loaded by DFHAPSI as part of AP domain initialization.

DFHEFRM is called by the Recovery Manager domain:

- At syncpoint (using RMRO requests) for commit, backout, or shunt requests. The FFLE chain created by EIFC is released on any of these calls. All information concerning prior AFCTE locates and security checks is consequently lost at syncpoint.

  The recovery manager work token for the 'APEF' client is a pointer to the first item in the chain of FFLEs created for the unit of work. DFHEFRM clears the work token, and releases the FFLE chain by finding the end of the chain and placing the whole chain at the head of the free FFLE chain.

  As an optimization, the Recovery Manager domain does not call DFHEFRM at syncpoint prepare; the work token is cleared and the FFLE chain released by DFHFCRC on DFHEFRM's behalf. This means that DFHEFRM will only be called at syncpoint commit if all the unit of work's file requests had been function shipped or if the unit of work performed file requests after prepare (for example, from a user exit), or if the unit of work was backed out.
- At activity keypoint (using RMKP requests) for keypoints. No action is taken.
- At CICS restart (using RMDE requests) for delivery of restart data. No action is taken.

DFHEIFC (file control EXEC interface module)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHEIFC. Stored in the CSA in a field named CSAEIFC.

Purpose: DFHEIFC is DFHEIP's file control interface. It routes a local request to the file control file request handler, DFHFCFR. It routes a request for a remote file to the intersystem module, DFHISP.

Called by: DFHEIP exclusively.

Inputs: The EIEI parameter list, as defined by the DFHEIEIA DSECT.

Outputs: Updated EIEI parameter list, with completed EIB.

Operation: If SYSID is remote, ships the request through the DFHISP module.

If SYSID is local, or is not specified:

- Locates the AFCTE.
- Checks authorization.
- Creates and chains an FFLE, in which are recorded the AFCTE address and security information so that subsequent locates and authorization checks for the same task and file can be performed by scanning the FFLE chain.
- If the request is local, calls the file control file request handler, DFHFCFR.
- If the request is remote, does the following
  1. If the Shared Data Tables feature is installed, first tries to satisfy non-update requests directly from the table, if any, by calling DFHFCFR
  2. Ships the request through the DFHISP module.

How loaded: At CICS startup, as part of the building of the CICS nucleus. The nucleus is built by DFHSIB1, which uses its nucleus build list to determine the content and characteristics of the CICS nucleus.

DFHFCAT (file control catalog manager)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHFCAT. The entry point address is held in FC static storage in a field named FC_FCAT_ADDRESS, which is set by DFHFCRP when it loads DFHFCAT.

Purpose: The file control catalog manager is part of the file control component. This program processes inquire and update requests on the state of the backup while open (BWO) attributes in the ICF catalog for VSAM data sets and inquire on the quiesce state in the ICF catalog. The DFSMS Callable Services interface is used for these operations.

Called by

DFHFCDN	Get the base data set name for a DSNB that has not yet been validated, update the recovery point, or to set the BWO attributes to a 'forward recovered' state
DFHFCN	Inquire on the current state of, and to update, BWO attributes during file open processing; and to reset these attributes during file close processing.
DFHFCQI	Inquire on the quiesce state of a data set.

Inputs: The FCAT parameter list, as defined by the DFHFCATA DSECT, is created as part of the subroutine call.

The input parameters are:

Data set name
Recovery point

Outputs: Returned in the FCAT parameter list:

Quiesce state
Base data set name
State (fuzzy, sharp)
Response
Reason

Operation: DFHFCAT provides the following functions:

INQ_BASEDSNAME
Gets the base data set name for a specified data set name from the ICF catalog. This function is used when there is not a validated DSN block for the data set.

INQ_CATALOG_QUIESCESTATE
If the level of DFSMS is 1.3 or higher, issues an IGWARLS call to determine the quiesce state of the data set (quiesced or unquiesced).

INQ_DATASET_STATE
Determines the current state of a VSAM data set's BWO attributes in the ICF catalog. If the BWO attributes indicate that the data set is "back level", that is, a backup copy has been restored but not forward recovered, an exception response is returned; otherwise, a state of 'fuzzy' or 'sharp' is returned, indicating whether or not the data set is defined in the ICF catalog as eligible for BWO.

SET_CATALOG_RECOVERED
Updates a VSAM data set's BWO attributes in the ICF catalog to a 'forward recovered' state to indicate that the data set has been forward recovered.

SET_CATALOG_RECOV_POINT
Updates a VSAM data set's BWO attributes in the ICF catalog with the new recovery point.

SET_BWO_BITS_DISABLED
Updates a VSAM data set's BWO attributes in the ICF catalog to show that the data set is no longer eligible for BWO support, and updates the recovery point.

SET_BWO_BITS_ENABLED
Updates a VSAM data set's BWO attributes in the ICF catalog to show that the data set is eligible for BWO support, and updates the recovery point.

How loaded: By DFHFCRP as part of file control initialization.

DFHFCBD (file control BDAM request processor)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHFCBD. The entry point address is held in FC static storage in a field named FC_BDAM_ENTRY_ADDRESS.

Addressing mode: AMODE 31.

Residency mode: RMODE 24.

Purpose: The BDAM request processor is part of the file control component. It processes access requests to BDAM files.

Called by: DFHFCFR, after having determined that the request is for a BDAM file.

Inputs: The FCFR parameter list, as defined by the DFHFCFRA DSECT. Also, the file control environment, including FC static storage and the FCT.

Outputs: Updated FCFR parameter list.

Operation: Acquires and releases FIOA storage as necessary. Implements BDAM exclusive control requests. Performs record-length and key-length checking. Calls BDAM to perform the I/O request.

Acquires storage, in the correct key subpool, for requests that specify SET.

How loaded: By DFHFCFS, by means of a loader domain call. DFHFCBD is not loaded unless DFHFCFS is called to open a BDAM file and, in doing so, it discovers that DFHFCBD is not yet in storage.

DFHFCCA (file control RLS control ACB manager)

DFHFCCA is the file control RLS control ACB manager. The RLS control ACB is a special ACB required when a commit protocol application such as CICS uses VSAM RLS. FCCA processes requests to register and unregister the control ACB, and all other file control requests to SMSVSAM that have to be made via the control ACB. These requests are:

- IDAREGP (register)
- IDAUNRP (unregister)
- IDARECOV (clear recovery status)
- IDAINQRC (inquire on recovery)
- IDAQUIES (quiesce)
- IDALKREL (release locks, and retain locks marked for retention)
- IDARETLK (mark locks for retention)

DFHFCCA also includes the code for the RLSWAIT exit used by control ACB requests. Whenever CICS issues such a request, VSAM drives the RLSWAIT exit as soon as it is about to transfer control to the SMSVSAM address space. CICS is then able to drive the dispatcher and schedule other CICS tasks whilst the SMSVSAM address space is busy processing the request.

DFHFCDL (file control CFDT load program)

DFHFCDL is attached by DFHFCDO to load a load-capable coupling facility data tavle with records from a source data set.

DFHFCDN (file control DSN block manager)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHFCDN. The entry point address is held in FC static storage in a field named FC_FCDN_ADDRESS, which is set by DFHFCRP when it loads DFHFCDN.

Purpose: The DSNAME block manager is part of the file control component. This program is called to perform various operations on data set name blocks. These operations include connecting and disconnecting DSN blocks and FCT entries, setting their attributes, and deleting them when no longer required. The program also allows the caller to inspect a particular DSN block or browse a set of blocks. It can also be called to update the backup while open (BWO) attributes in the ICF catalog for VSAM data sets, and to set the quiesce state to normal in all DSN blocks. Finally it can be called to catalog the information in a DSN block to the CICS global catalog.

Called by

DFHAMFC Connect a DSN block to a newly created FCT entry

DFHAMPFI Connect the DSN block for the CSD to the associated FCT entry

DFHEIQDN Connect, disconnect, delete, set attributes, browse, and inquire against DSN blocks in response to external requests; and to update the BWO attributes in the ICF catalog for a VSAM data set to a 'forward recovered' state

DFHEIQDS Connect or disconnect DSN blocks and FCT entries in response to external requests

DFHFCLF Set the availability attribute to unavailable after a forward recovery log stream failure

DFHFCMT Disconnect the DSN block when deleting an FCT entry

DFHFCN Connect or disconnect and to catalog a DSN block

DFHFCRC Update the recovery point in the ICF catalog for all VSAM data sets that are open for update in non-RLS mode and defined as eligible for BWO support at keypoint time

DFHFCRD To reset all quiesce states to normal after an SMSVSAM server failure

DFHFCRO Connect or disconnect and to catalog a DSN block

DFHFCRP Connect or reconnect DSN blocks during file control initialization or restart.

Inputs: The FCDN parameter list, as defined by the DFHFCDNA DSECT, is created as part of the subroutine call.

The input parameters include:

Request identifier
Address of FCTE or FCTE token
Data set name
Browse token
Availability status
Type of pointer
Recovery point

Outputs: Output parameters, as part of the FCDN parameter list. Apart from the response, all these are returned on the inquire or browse requests. The parameters include:

Access method
Base data set name
Availability status
DSNB type
File count
DSNB valid status
Lost locks status
Forward-recovery log stream name
Forward-recovery log ID
Recovery status
Response
Reason

Operation

- Connect:

  The inputs are a data set name and an FCTE pointer or an FCTE token, with an indication of whether the entity to be connected is a base or an object.

  If the FCT entry is already connected, the connection is broken before connecting it to a DSN block representing the new object. The DSN block that is connected can exist already, or DFHFCDN creates a new block before connecting it.

  The request is rejected if it requires an existing connection to be broken, and there are uncommitted updates to the file; that is, there are retained locks.

- Disconnect:

The connection between the FCT entry and the DSN block is broken. The DSN block remains even if there are no other FCT entries connected to it. The request is rejected if there are uncommitted updates to the file: that is, there are retained locks.

- Delete:

  Checks are made to ensure that the DSN block is allowed to be deleted. If the deletion can proceed, the table manager is called to delete the DSN from the DSN index, and the storage domain is called to free the storage.

- Inquire:

  The attributes stored in the DSN block are returned to the caller in the FCDN parameter list.

- Set:

  The availability status is set in the DSN block. The catalog domain is called to catalog the change.

- Start browse, get next, end browse:

  The DSN blocks are browsed in order. For each, the attributes are returned to the caller.

- Catalog:

  The information in a DSN block is cataloged to the CICS global catalog.

- SET_CATALOG_RECOVERED:

  This function is used by DFHEIQDN. DFHFCDN in turn issues a SET_CATALOG_RECOVERED call to DFHFCAT to update the BWO attributes in the ICF catalog for a given VSAM data set to a 'forward recovered' state.

- UPDATE_RECOVERY_POINTS:

  This function is used by DFHFCRC. DFHFCDN in turn issues a SET_CATALOG_RECOV_POINT call to DFHFCAT to update the recovery point in the BWO attributes in the ICF catalog for every data set that is open for update in non-RLS mode and defined as eligible for BWO support.

  The recovery point is the time from which a forward-recovery utility should start applying log records. It is always before the time the last backup was taken. For further information about recovery points and backup while open in general, see the *CICS Recovery and Restart Guide*.

- RESET_ALL_QUIESCE_STATUS:

  This function is used by DFHFCRD. The DSNB table is scanned, and the quiesce status is reset to normal in each DSNB.

How loaded: By DFHFCRP as part of file control initialization.

DFHFCDO (file control CFDT open/close program)

When called using the FCFS parameter list, DFHFCDO performs an equivalent function for coupling facility data table opens and closes as is performed by DFHFCN for non-RLS VSAM files.

When called using the FCDS parameter list, DFHFCDO performs statistics collection for coupling facility data tables, and disconnects from CFDT pools at shutdown.

DFHFCDR (file control CFDT request processor)

DFHFCDR performs an equivalent function for coupling facility data tables as is performed by DFHFCVS for non-RLS VSAM files, and uses the same interface.

DFHFCDTS (file control shared data table request program)

DFHFCDTS performs an equivalent function for CICS-maintained and user-maintained data tables as is performed by DFHFCVS for non-RLS VSAM files and uses the same interface.

DFHFCDTX (file control shared data table function ship program)

DFHFCDTX receives file requests from DFHFCDTS in FCFRR format, converts them into command level interface form and then calls ISP to function ship the request.

The response returned by ISP in the EIB is translated back into an FCFRR response and reason code.

DFHFCDU (file control CFDT UOW calls program)

DFHFCDU encapsulates the processing required to call the coupling facility data tables server for unit of work related operations, such as commit, backout, inquire. It is called via the FCDU parameter list by DFHFCDW and DFHFCDY.

DFHFCDW (file control CFDT RMC program)

DFHFCDW provides a recovery manager connector (RMC) between file control and the coupling facility data tables server, to support 2-phase commit and recovery for recoverable coupling facility data tables. It is called by the CICS Recovery Manager using the RMLK parameter list.

DFHFCDY (file control CFDT resynchronization program)

DFHFCDY performs resynchronization of coupling facility data table pools and links. It is called using the FCDY parameter list by DFHFCDO, DFHFCDR and DFHFCDU.

DFHFCES (file control ENF servicer)

DFHFCES is the file control ENF servicer. It is used to prompt dynamic restart of RLS file control when the SMSVSAM Server becomes available again after an earlier failure. DFHFCES is invoked whenever the MVS Event Notification Facility notifies CICS (via the CICS domain manager ENF support) that SMSVSAM is available.

DFHFCES establishes a transaction environment, and calls DFHFCRR to dynamically restart RLS.

DFHFCFL (file control FRAB and FLAB processor)

DFHFCFL is the File Control FRAB/FLAB processor. It contains a number of functions to process FLAB control blocks belonging to a particular base data set. It processes the functions of the FCFL interface.

The DSNB of the data set is not locked during the processing of the commands. As a FLAB exists, and hence an FCTE, the DSNB cannot be deleted, therefore there is no need to lock the DSNB.

DFHFCFR (file control file request handler)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHFCFR. Stored in the CSA in a field named CSAFCEP.

Purpose: The central module in the file control component.

Processes file control requests issued by DFHEIFC (requests from application programs), or from other CICS modules (internal CICS file control requests).

Receives and routes file control access-method dependent requests to one of the following:

- DFHFCRS for VSAM RLS
- DFHFCVS for VSAM non-RLS
- DFHFCBD for BDAM
- DFHFCVS for update and browse requests against CICS-maintained data tables
- DFHFCDTS for other data table requests

Implements TEST_FILE_USER requests.

Routes RESTART_FILE_CONTROL requests to DFHFCVS and DFHFCRS during the file control initialization.

Frees buffers at the request of DFHAPSM when 'short on storage' has been detected.

Performs a CLEAR_ENVIRONMENT when requested by DFHERM, DFHAPLI or DFHUEH. This cleans up file control storage at the completion of a task-related user exit, a URM, or a global user exit:

- The FLAB and FRTE chain are scanned to find all FRTEs for the specified environment.
- An ENDBR request is issued to terminate any active browse operation.
- An UNLOCK request is issued for any active READ UPDATE or WRITE MASSINSERT.

Called by

DFHAPLI	AP language interface program
DFHAPSM	AP domain storage notify gate
DFHDMPCA	CSD manager adapter
DFHDTLX	Shared data tables load program
DFHEIFC	File control EXEC interface module
DFHERM	Resource manager interface (RMI) module
DFHFCDL	Coupling facility data tables load program
DFHFCDTS	File control shared data table request processor
DFHFCFR	File control file request handler (a recursive call)
DFHFCRC	File control recovery control program
DFHFCRP	File control restart program
DFHUEH	AP user exit handler.

Inputs: The FCFR parameter list, as defined by the DFHFCFRA DSECT. Also the file control environment, including FC static storage and the FCT.

Outputs: Updated FCFR parameter list.

Operation: Selects on the request type, and passes control to the routine specific to that request.

Performs monitoring.

Obtains a FLAB and FRTE to represent this request, or scans the FLAB and FRTE chains to associate this request with a previous FRTE if required. Some checking for error situations is performed during the scan.

Performs file state checking to determine whether or not a (VSAM or BDAM) request to a file is able to proceed. If file is enabled but closed, opens it before carrying out the request.

Checks for "privileged" requests.

Checks the "service request" attributes for the file to determine whether the request can proceed.

Checks the file's access method (VSAM or BDAM as defined in the FCT). If BDAM, calls DFHFCBD to process the request. If VSAM and non-RLS, calls DFHFCVS to process the request. If VSAM and RLS, calls DFHFCRS to process the request. If a data table, calls DFHFCDTS for read requests against a CICS-maintained data table or any request against a user-maintained table, and calls DFHFCVS otherwise (that is, for update and browse requests against a CICS-maintained data table).

On return, performs cleanup if required.

How loaded: By DFHSIB1 as part of the CICS nucleus.

DFHFCFS (file control file state program)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHFCFS. The entry point address is held in FC static storage in a field named FC_FCFS_ADDRESS, which is set by DFHFCRP when it loads DFHFCFS.

Purpose: The file control file state program is part of the file control component.

The program processes requests to enable, disable, open, and close files. Such requests can originate from explicit requests (either CEMT or EXEC CICS SET), from implicit requests (such as implicit open), or from requests made from CICS internal processing.

Close and disable requests are processed in different ways, depending on whether the request has been issued with the WAIT or the NOWAIT option. A request with the WAIT option is treated as a synchronous request, that is, control returns to the requesting program only after all users of the file have completed their use.

A request with the NOWAIT option is treated as an asynchronous request. In this case, the file is marked with the intended state and control is returned immediately.

Called by

DFHAMFC	Enable a newly installed file
DFHDMPCA	Change the state of the CSD
DFHDMRM	Close CSD after an error
DFHDTLX	Close the data set associated with a shared data table
DFHEIQDS	Implement CEMT and EXEC CICS requests
DFHFCDL	Close the data set associated with a coupling facility data table
DFHFCDTS	Close shared data table if remote connection disabled or invalidated
DFHFCFR	Implicit open
DFHFCQU	Close files for quiesce, cancel close for unquiesce, enable files
DFHFCRC	Open files which need backout, and close files at syncpoint
DFHFCRD	Immediate close of RLS files
DFHFCRV	Close files for pending immediate close requests
DFHFCSD	Close files on a normal CICS shutdown
DFHFCU	Open all files with FILSTAT=OPEN coded
DFHFCVS	Open the base, and during empty file or I/O error processing.

Inputs: The FCFS parameter list, as defined by the DFHFCFSA DSECT, is created as part of the subroutine call.

The input parameters are:

Request identifier (open, close, enable, disable, cancel close)
FCTE address
FCTE token
Open options (open base, open for backout)
Close qualifier (close pending, shutdown, immediate close, quiesce, and so on)
Action (wait, do not wait, force)

Outputs: Returned in the FCFS parameter list:

DFHFCN return code
Register 15 return code
VSAM return code

Operation: Before any processing to change the state of a file is carried out, its FCT entry is locked by means of a DFHKC ENQ call. At the conclusion of file state change processing, the FCT entry is unlocked before returning to the caller.

- Enable file.

  DFHFCFS marks the FCT entry and the AFCT entry as 'enabled', and catalogs the change.

- Disable file.

  If the WAIT option is specified, DFHFCFS tests whether the transaction issuing the request is a current user of the file. If it is, DFHFCFS returns an exception response.

  DFHFCFS next marks the FCT entry and the AFCT entry as 'disabled' and catalogs the change. If the disable request stems from a close request (see later), DFHFCFS also sets the implicit indicator, thereby marking the state as 'unenabled'. However, if this close request originated from DFHFCSD as part of CICS shutdown processing, DFHFCFS does ***not*** mark the state as 'unenabled'.

  Finally, if the WAIT option is specified, the FCT entry is unlocked before waiting for the 'disabled' ECB in the FCT entry to be posted by the transaction that reduces the use count to zero.

- Open file.

If the file is unenabled (due to a previous close), DFHFCFS enables it and catalogs the new state, unless the open option is open for backout.

If the file refers to a BDAM data set, DFHFCFS tests whether DFHFCBD is already loaded; if not, it calls loader domain to do so.

If the file is a data table, DFHFCFS loads and initializes data table services, if this has not been done already on a previous open request.

DFHFCFS next calls DFHFCN (for non-RLS) or DFHFCRO (for RLS) to perform the physical open. After the file has been successfully opened, its FCT and AFCT entries are marked accordingly.

For a data table, DFHFCFS issues OPEN and LOAD requests to data table services.

- Close file.

  If there is no close qualifier, the file is first implicitly disabled (as described above), taking into account the WAIT or NOWAIT option. The new state is cataloged.

  If the file use count is zero, DFHFCFS calls DFHFCN or DFHFCRO to perform the physical close. After the file has been successfully closed, its FCT and AFCT entries are marked accordingly.

  An immediate close is issued if the SMSVSAM RLS server fails. The close must wait until there are no requests active in the RLS record management processor. The enablement state of the file is not changed. A close with close qualifier of quiesce is issued to process an RLS quiesce request. The file is unenabled, and the state catalogued.

  For a data table, DFHFCFS issues a CLOSE request to data table services, except in the case of a special type of CLOSE request issued by DFHFCVS for a user-maintained data table, when loading is complete and the source data set is to be closed, but not the table itself.

  For a remote data table, DFHFCFS issues a DISCONNECT request to data table services.

  If the file use count is nonzero, DFHFCFS sets the ‘close requested’ indicator in the FCT and returns to the caller. Any subsequent transaction that reduces the use count to zero tests the ‘close requested’ indicator and, if set, performs the actual close.

  When called by DFHFCSD during CICS shutdown, DFHFCFS ensures that files are closed, marks the file as ‘closed unenabled’ in the FCT, but does ***not*** record this change in the global catalog. This allows implicit file opens on a subsequent restart.

- Cancel close.

  An in-progress close is cancelled if a data set is unquiesced. The close_in_progress flag is reset, any tasks waiting for the file to close are resumed, and the file is re-enabled.

How loaded: By DFHFCRP as part of file control initialization.

DFHFCIN1 (file control initialization program 1)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHFCIN1. Stored in the CSA in a field named CSAFCXAD.

Purpose: The file control initialization program is part of the file control component. This program initializes file control and starts the file control restart task. It also waits for the restart task to complete, and returns the status of the completion to the caller.

Called by: DFHSII1, as part of CICS initialization.

Inputs: The FCIN parameter list, as defined by the DFHFCINA DSECT.

Outputs: Updated FCIN parameter list.

Operation: Initialize:

- Calls storage manager domain to add a subpool for file control static storage.
- Calls storage manager domain to create the storage for file control static storage.
- Initializes file control static storage.
- Attaches the file control restart task by means of a DFHKC request, with entry point address DFHFCIN2.

WAITINIT:

- Issues a dispatcher domain call to wait on the CICS ECB which indicates that the file control restart task has finished (FC_RECOV_ALLOWED_ACB) in file control static storage.
- On completion of the wait, tests the response and returns to DFHSII1.

How loaded: Link-edited with DFHFCIN2 to form the DFHFCIN module, which is loaded by DFHSIB1 as part of the CICS nucleus.

DFHFCIN2 (file control initialization program 2)

Call mechanism: Attached by DFHFCIN1 as a separate CICS task. Given control by means of the DFHKC TYPE=ATTACH mechanism.

Entry address: DFHFCIN2. Because DFHFCIN2 is link-edited with DFHFCIN1, the entry address is known to DFHFCIN1 at the time the DFHKC TYPE=ATTACH is issued.

Purpose: The file control initialization program is part of the file control component. This program loads and calls the file control restart program (DFHFCRP), to perform file control restart as a separate task.

Called by: CICS task control, after being attached by DFHFCIN1.

Inputs: None.

Outputs: The initialized file control component. Addresses and indicators completed in file control static storage.

Operation: Calls loader domain to acquire (that is, to load) the DFHFCRP program. Stores the entry point address of the loaded module (which is also the load point) in DFHFCIN2's automatic storage in a field named FCRP_ENTRY_ADDRESS.

If the ACQUIRE request failed, calls loader domain to define program and then retries the ACQUIRE request.

Calls DFHFCRP by means of a subroutine call via the kernel.

On successful completion, calls loader domain to release DFHFCRP. On both successful and unsuccessful completion, posts the ECBs FC_NON_RECOV_ALLOWED_ECB and FC_RECOV_ALLOWED_ECB. The success or otherwise of File Control restart is indicated by the flag FCSCMPLT in file control static storage.

On unsuccessful completion, posts the Restart Task ECB complete and returns.

How loaded: By DFHSIB1 as part of the CICS nucleus.

DFHFCIR (file control initialize recovery)

DFHFCIR is the File Control Initialize Recovery Module. It initializes the File Control environment in which recovery after a CICS failure is carried out.

DFHFCIR handles the delivery of recovery data by the CICS Recovery Manager during its scan of the system log at warm or emergency restart, and rebuilds the file control structures that represent units of work that were in-flight or shunted when CICS terminated.

During its log scan, Recovery Manager calls File Control's recovery gate, which invokes the module DFHFCRC. DFHFCRC passes the calls through to DFHFCIR via a kernel subroutine call. The calls are the RMDE functions START_DELIVERY, DELIVER_RECOVERY, DELIVER_FORGET and END_DELIVERY.

DFHFCL (file control shared resources pool processor)

Call mechanism: BALR, obtaining LIFO storage on entry.

Entry address: DFHFCLNA. DFHFCL is, together with DFHFCN and DFHFCM, link-edited with DFHFCFS. All calls to DFHFCL are made from DFHFCN; the entry point address is known to DFHFCN from the link edit.

Purpose: The shared resources pool processor is part of the file control component.

This program is called at file open time to create a specific local shared resources pool if it does not exist. It is also called to delete a specific pool when the last file to use the pool is being closed.

The size and characteristics of the pool being built are obtained either from information in the SHRCTL definition in the FCT or, if that information has not been provided, from the best information available to DFHFCL at the time of the open.

Called by: DFHFCL is called exclusively by DFHFCN.

Inputs: The FCLPARAM parameter list, created in DFHFCN's automatic storage and addressed by register 1 on the call.

The input parameters are:

Request identifier (build, delete)
LSR pool number

Outputs: Returned in the FCLPARAM parameter list:

DFHFCL return code
BLDVRP/DLVRP return code
VSAM return code

Operation: If the request is for LSR pool creation, DFHFCL first checks whether the SHRCTL block includes specifications for the number of strings, maximum key length, and the number of virtual and hyperspace buffers of each of the eleven sizes in the pool. If these values are known, DFHFCL sets up the BLDVRP parameter list and creates the pool by issuing the BLDVRP macro.

If some or all of the pool characteristics are not specified in the SHRCTL definition, DFHFCL calculates the pool requirements from the information in the FCT and the VSAM catalog.

Each FCT entry is inspected to find whether it is to be included in the pool being built. If so, its DSNAME is determined and this is used to obtain data set characteristics from the VSAM catalog. The information required for the BLDVRP macro is accumulated in the SHRCTL block and the pool is built from these values.

If the request is for LSR pool deletion, DFHFCL first obtains the VSAM statistics for the pool and saves them in the SHRCTL block. These statistics are unobtainable after the pool has been deleted.

DFHFCL next deletes the specified pool by issuing a DLVRP macro.

Finally, DFHFCL sends pool statistics to the statistics domain as unsolicited data.

How loaded: As a constituent part of DFHFCFS, which is loaded by DFHFCRP as part of file control initialization.

DFHFCLF (file control log failures handler)

DFHFCLF provides control of long term logger failures for File Control. It is called in the event of a failure of a general log stream, which will be either the forward recovery log for a data set or the autojournal for a file.

The CICS Log Manager invokes DFHFCLF when an MVS log stream being used for forward recovery or file autojournalling suffers a long term failure. The call is made using the LGGL ERROR function.

When file control opens a forward recovery log stream or an autojournal, it will register this call back gate to the Log Manager by specifying FCLF as the file control error gate.

When called, DFHFCLF takes action to ensure that the log stream failure causes minimum damage. For a forward recovery log failure it closes all files open against the data set using that forward recovery log (across the sysplex for a data set accessed in RLS mode) and issues a message advising that a new backup copy should be taken. For an autojournal it closes the file using that autojournal and issues a warning message.

DFHFCLJ (file control logging and journaling program

DFHFCLJ is the file control logging and journaling program. It is called to perform logging for transaction backout and forward recovery, to write to journals for autojournal requests and to write to the log of logs.

Records are written to the system log using the RMRE APPEND function, and optionally forced using the RMRE FORCE function. Records are written to forward recovery logs and autojournals using the LGGL WRITE function, and to the log of logs using the LGGL WRITE_JNL function.

DFHFCMT (file control table manager)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHFCMT. The entry point address is held in FC static storage in a field named FC_FCMT_ADDRESS, which is set by DFHFCRP when it loads DFHFCMT.

Purpose: The file control table manager is part of the file control component. This program is called to add, delete, and set FCT entries, and to return attributes of an FCT entry (inquire). It is also called to make or release an association with an AFCT entry (connect and disconnect).

Called by

DFHAFMT	Connect (or disconnect) an FCT entry to an already existing AFCT entry
DFHAMFC	Inquire on, add, or delete a newly created FCT entry to the system
DFHAMPFI	Add the entry in the FCT for the CSD to the system
DFHDMPCA	Inquire on and set the attributes of the FCT entry for the CSD
DFHEDFX	Inquire on the attributes of an FCT entry
DFHEIQDS	Inquire on or set the attributes of FCT entries, or delete an FCT entry.

Inputs: The FCMT parameter list, as defined by the DFHFCMTA assembler DSECT, is created as part of the subroutine call.

The input parameters are:

Common parameters:
Request identifier
File name
AFCT token
FCTE token
String number
Journal ID
Recovery characteristics
Journaling characteristics
Enablement status
Open time
Data set disposition
Service request attributes
Record format
Number of data buffers
Number of index buffers
Whether to catalog the FCT entry

VSAM-specific parameters:
VSAM password
Empty status
Data set name sharing
LSR pool ID
Base name
Forward recovery log ID
BWO eligibility
RLS access mode
Read integrity

BDAM-specific parameters:
Exclusive control

Outputs: Output parameters, as part of the FCMT parameter list. Apart from the response, all these are returned on the inquire or browse requests. The output parameters are:

Common parameters:
FCTE token
String number
Record size
Key length
Key position
Recovery characteristics
Journaling characteristics
Enablement status
Open status
Open time
Data set type
Data set disposition
Data set name
Base data set name
Service request attributes
Record format
Block format
Access method

VSAM-specific parameters:
VSAM password
Empty status
Object type
Data set name sharing
Number of data buffers
Number of index buffers
Number of active strings
LSR pool ID
Whether using shared resources
Forward-recovery log ID
RLS access mode
Read integrity

BDAM-specific parameters:
Block size
Block key length
Relative address form
Exclusive control
Response
Reason

Data Table specific parameters:
Table type
Table size

Operation

- Add:

  Storage for the new FCT entry is obtained out of the VSAM FCT storage subpool (BDAM FCT entries cannot be created).

  The new FCT entry is completed by filling in the information from the caller's parameter list.

  The name of the new FCT entry is added to the TMP index.

  Finally the information in the new entry is written to the CICS global catalog if required.

- Delete:

  The request is rejected if there are uncommitted updates for the file; that is, there are retained locks. DFHTMP is called to locate and quiesce the FCT entry.

  Any DSN block that is connected to the FCT entry is disconnected.

  The FCT entry name is deleted from the TMP index.

  The storage for the FCT entry is freed. In the case of a BDAM FCT entry, its DCB storage is also freed.

  Any catalog entries for the FCT entry are deleted.

- Set:

  DFHTMP is called to locate the FCT entry.

  The request is rejected if there are uncommitted updates for the file; that is, there are retained locks.

  If the FCT entry is not marked 'closed' and 'disabled' (or 'unenabled'), the request is rejected.

  Changes are made to the information in the FCT according to the caller's parameter list.

  Finally the changes are recorded by writing them to the CICS global catalog.

- Inquire:

  DFHTMP is called to locate the FCT entry.

  The attributes are returned in the FCMT parameter list.

- Connect:

  DFHTMP is called to locate the FCT entry.

  The supplied AFCT token is stored in the FCT entry and the connect count incremented. The FCT token is returned to the caller.

- Disconnect:

  DFHTMP is called to quiesce the FCT entry.

  A check is made to ensure that the file is closed and disabled (or unenabled). If the check fails, an error is returned to the caller.

The AFCT token and the connect count in the FCT are cleared and a call is again made to DFHTMP to release the quiesce.

How loaded: By DFHFCRP as part of file control initialization.

DFHFCN (file control open/close program)

Call mechanism: BALR, obtaining LIFO storage on entry.

Entry address: DFHFCNNA. DFHFCN is link-edited with DFHFCFS. All calls to DFHFCN are made from DFHFCFS; the entry point address is known to DFHFCFS from the link-edit.

Purpose: The file control open/close program is part of the file control component.

This program performs the physical opening and closing of files by making the corresponding requests to VSAM or BDAM. Associated with these operations are a number of further activities that must be completed before control is returned to DFHFCFS.

These activities include:

- Dynamic allocation of the file
- Empty file checking
- Dynamically setting up ACB fields in advance of the VSAM open
- Copying into file-control control blocks VSAM information about the file which is available after the open
- Inquiring on, and updating, the VSAM data set's backup while open (BWO) attributes in the ICF catalog for a file that is defined in the FCT as eligible for BWO support if the appropriate prerequisite software levels have been installed
- On close, deallocating the file if necessary and clearing the file control information related to the file
- Resetting a VSAM data set's BWO attributes in the ICF catalog during close processing.

Called by: DFHFCFS, exclusively.

Inputs: The FCSPARMS parameter list, created in DFHFCFS's automatic storage and addressed by register 1 on the call.

The input parameters are:

FCTE address
Request identifier

Outputs: Returned in the FCSPARMS parameter list:

DFHFCN return code
Register 15 return code
VSAM return code
Base data set name
Recovery attributes of base

Operation: Execution of the DFHFCN code is serialized. This is done by DFHFCFS issuing a DFHKC ENQ before calling DFHFCN, and a DFHKC DEQ after calling DFHFCN. As a consequence, only a single open or close request to any file can be in progress at any time, and multiple concurrent requests are single-threaded.

The main actions when processing an open request

1. If the file is being opened for update and any type of autojournalling is specified on the file definition, then the autojournal log stream is opened, via a call to DFHLGGL.
2. The file is tested to determine if it is allocated to the job by means of a JCL statement or is to be allocated dynamically.

   If the file is already allocated, any existing DSN block to which it may be connected is disconnected and a new block with the actual DSNAME is connected. Connecting and disconnecting of DSNAME blocks is always performed by calling DFHFCDN.

   If the file is not already allocated, it is at this point dynamically allocated to the DSNAME in the DSNAME block to which it is connected.

   In the case of a VSAM file, the file's data set name is used to issue appropriate SHOWCAT and LOCATE instructions to determine relevant information from the VSAM catalog about the data set that the file represents. In particular, the following are obtained:

   Base/path indicator
   Base data set name
   Attributes of the data set
   Key length of the base
   Relative key position of base key
   Maximum record length
   Control interval size
   Share options
   High RBA
3. The data set is checked to determine if it is empty (high RBA is zero) or is to be emptied.

   The 'load' mode indicator is set on.
4. DFHFCDN is now called to connect the FCT entry to a DSNAME block for the base cluster (which may be the existing allocation DSNAME block, or may need to be newly created, or may already exist and need only be pointed to from the FCT). The base cluster's attributes, as obtained from the VSAM catalog, are stored in the base cluster block.

The file's recovery characteristics are checked against any that may already have been stored in the base cluster block and, if they have not yet been set up, are saved there. Any conflict with the stored values is handled. In some cases the new value overrides the old one, in others an error is returned.

During this processing, if this is the first open for update for a file associated with this particular data set:

a. a call is made to the VSAM callable interface IGWARLS, in order to get any recovery attributes that may be defined in the VSAM catalog. If they are present, then they override any values in the FCT entry.

b. if forward recovery logging is specified, the forward recovery log stream is opened, using either the log stream name from the VSAM catalog, or a log stream name derived from the id specified in the file definition.

In the case of an entry sequenced data set or a path to an ESDS, the next available RBA in the data set is determined and stored in the base cluster block.

5. If the file uses a shared resources (LSR) pool, and if the pool is not currently in existence, DFHFCL is called to determine the pool's characteristics and to build it.

6. Before opening a VSAM file, any STRNO, BUFND, or BUFNI parameters that may have been specified in the JCL DD statement are copied to the FCT entry (for LSR opens, these are ignored). The ACB is now created and its various options and parameters filled in from information in the FCT entry. The OPEN is finally completed by a call to VSAM.

7. If the file refers to a BDAM data set, the assembled DCB is used for the open request and no dynamic setting of DCB options is carried out.

8. After the VSAM file has been successfully opened, certain file attributes are obtained from VSAM and are stored in the FCT entry. These include:

   Key length
   Relative key position
   Base/path/AIX indicator
   KSDS/ESDS/RRDS/VRRDS indicator
   Number of strings required for an update operation.

9. For a file opened for update against a VSAM base data set when the update use count in the DSNB for this data set is zero, the BWO attributes in the ICF catalog are validated to find their current state. This is done by making an INQ_DATASET_STATE call to DFHFCAT, regardless of whether the file is defined in the FCT as eligible for BWO support.

   The file open request is rejected if one of the following is true:

   a. The BWO attributes in the ICF catalog show ***either*** that the data set is "back level", that is, a backup copy has been restored but not forward recovered, ***or*** that either the catalog or the data set has been corrupted.

   b. The BWO attributes in the FCT entry conflict with those defined in the DSNB, that is, the file has already been opened with different attributes since the DSNB was created.

   If the file is defined in the FCT as eligible for BWO support, the BWO attributes in the ICF catalog are updated by making a SET_BWO_BITS_ENABLED call to DFHFCAT.

   However, if the file is not defined in the FCT as eligible for BWO support, but the BWO attributes in the ICF catalog currently show that the VSAM base data set is eligible for BWO support, the BWO attributes in the ICF catalog are disabled by making a SET_BWO_BITS_DISABLED call to DFHFCAT, and CICS issues a warning message.

   Note: The ICF BWO attributes are a property of a VSAM sphere; therefore, the VSAM base data set and alternate index path definitions should be consistent. For a general description of the CICS backup while open (BWO) facility, see the *CICS Recovery and Restart Guide*.

10. The base DSNB, and path DSNB if this is a path, are marked as validated and catalogued.

The main actions when processing a close request

1. If the close request is for the last file that was opened for update against a VSAM base data set and the file is defined in the FCT as eligible for BWO support, the BWO attributes in the ICF catalog are reset so that BWO support is no longer enabled. This is done by making a SET_BWO_BITS_DISABLED call to DFHFCAT.

2. Before performing the access method close for a VSAM file, the number of accumulated EXCPs is obtained by making a call to VSAM and is saved in the FCT entry ready to be sent to the statistics domain as part of the file statistics.

3. A CLOSE request is then made by issuing the appropriate (VSAM or BDAM) macro.

4. The ACB storage is freed, and certain fields in the FCT entry which are no longer valid are cleared.

5. File statistics and data table statistics, if any, are sent to the statistics domain as unsolicited data.

6. If the file being closed uses shared resources, and if it is the last to have been closed in its LSR pool, DFHFCL is called to delete the pool.

7. If the file was dynamically allocated at open time, it is deallocated, leaving a pointer to the DSNAME block in the FCT entry.

8. If the file had an autojournal, then the autojournal log stream is closed.

9. If the base data set was forward recoverable, and its use count is non-zero, then the forward recovery log stream is closed.

How loaded: As a constituent part of DFHFCFS, which is loaded by DFHFCRP as part of file control initialization.

DFHFCNQ (file control non-RLS lock handler)

DFHFCNQ is the file control non-RLS lock handler. It is called using the FCCA RETAIN_DATASET_LOCKS interface to retain locks in cases of backout failure. It is called using the NQNQ INTERPRET_ENQUEUE interface to interpret File Control locks for presentation purposes.

Lock retention: When DFHFCRC encounters a failure during an attempt to backout a unit of work it must retain all record locks held by that UOW for the failing data set. It issues an FCCA RETAIN_DATASET_LOCKS request to DFHFCCA for RLS access data sets and to this DFHFCNQ for non-RLS access data sets.

Lock name interpretation: Non-RLS locks include record locks for all file types, and for VSAM files, mass-insert range locks, load mode locks and ESDS WRITE locks. Each lock belongs to one of some half dozen or so pools created by DFHFCRP during CICS initialization. DFHFCNQ is called using the NQNQ INTERPRET_ENQUEUE interface and is passed the enqueue pool name and the lock identifier. The name of pool to which a lock belongs is sufficient information to allow the identifier to be parsed and its constituents returned to the caller.

The pool names and lock constituents are:

- FCDSRECD - Data set name and record identifier - for VSAM and CICS-maintained data tables
- FCFLRECD - File name and record identifier - for BDAM and user-maintained data tables
- FCDSRNGE - Data set name and record identifier - VSAM range locks
- FCDSLDMD - Data set name - VSAM load mode locks
- FCDSESWR - Data set name - VSAM ESDS WRITE locks
- FCFLUMTL - File name - UMT load locks

DFHFCOR (file control offsite recovery completion)

DFHFCOR is the file control RLS offsite recovery completion transaction.

Transaction CFOR is attached when CICS detects that is has completed its RLS offsite recovery processing. RLS offsite recovery is only performed when OFFSITE=YES is specified as a system initialization override. CFOR may be attached either during RLS warm or emergency restart (if there is no RLS offsite recovery work to be performed) or during file control commit processing (if the commit was for the last remaining item of RLS offsite recovery work).

DFHFCOR issues message DFHFC0575 and awaits an operator reply. When the reply is received, it enables RLS access for new transactions.

DFHFCQI (file control RLS quiesce initiation)

DFHFCQI is the RLS Quiesce Initiation module. It provides code to initiate a quiesce request against a base data set. It also provides code to inquire on the quiesce state of a base data set, and to complete a quiesce request against a base data set. Quiesce initiations are issued by the CICS API, or by CICS internally, or by CICS internally cancelling certain in-progress quiesce operations. Quiesce inquiries are issued via the CICS API. Quiesce completions are issued by CICS internally.

DFHFCQR (file control quiesce receive transaction)

DFHFCQR is the VSAM RLS Quiesce Receive module, running under a dedicated CFQR system transaction. It provides code to take quiesce requests from the CICS VSAM RLS quiesce exit and pass them to DFHFCQU for processing. As DFHFCQR runs under a system transaction, it has full transaction environment which enables it to invoke API-capable global user exits, or to call parts of file control that reference the TCA.

DFHFCQS (file control RLS quiesce send transaction)

DFHFCQS is the VSAM RLS Quiesce Send module, running under a dedicated CFQS system transaction. It provides code to take quiesce requests from another task and pass them to SMSVSAM. As DFHFCQS runs under a system transaction, it has full transaction environment which enables it to invoke API-capable global user exits, or to call parts of file control that reference the TCA. DFHFCQS is called from DFHFCQT, the quiesce system transaction module, if the transaction id under which DFHFCQT was started is 'CFQS'.

DFHFCQT (file control RLS quiesce common system transaction)

DFHFCQT is the file control RLS quiesce common system transaction.

There are two file control system transactions dedicated to RLS quiesce processing: CFQS and CFQR. CFQS sends quiesce requests to SMSVSAM in order to initiate the quiesce or unquiesce of a data set throughout the sysplex.

CFQR receives quiesce requests from VSAM RLS and performs the quiesce processing required for the CICS region concerned. These transactions share a common top-level program, DFHFCQT.

There is no DFHFCQT parameter list. The action DFHFCQT takes depends on the transid of the transaction it is running under. If it is CFQS then DFHFCQS SEND_QUIESCES is called. If it is CFQR then DFHFCQR RECEIVE_QUIESCES is called. If DFHFCQS or DFHFCQR subsequently fail with a disastrous error, control is returned to DFHFCQT and a transaction abend is issued, having first re-attached the transaction concerned to ensure that RLS Quiesce support is not lost for ever.

DFHFCQU (file control RLS quiesce processor)

DFHFCQU is the RLS Quiesce Process module. It processes quiesce requests received from SMSVSAM via the quiesce exit mechanism.

DFHFCQX (file control RLS quiesce exit)

DFHFCQX is the RLS Quiesce Exit module. It is called by SMSVSAM whenever the CICS region concerned is required to perform processing for a quiesce request.

The quiesce exit is specified on the RLS control ACB EXLST. The exit simply initiates processing and returns to VSAM. It must not issue any VSAM requests. It is scheduled as an IRB on the TCB that registered the RLS control ACB. Because of the environment DFHFCQX cannot issue CICS requests. GTF tracing is used to trace entry, exit and any errors.

On entry to DFHFCQX, register 1 contains the address of a VSAM structure mapped by IFGQUIES which defines the quiesce request. The processing of the quiesce request is performed by the CFQR long-running system transaction (DFHFCQR). To communicate the quiesce to CFQR, DFHFCQX creates an FC Quiesce Receive Element (FCQRE) to describe the request, and adds it to a chain in file control static storage, posting an ECB associated with the chain also in FC static.

DFHFCRC (file control recovery control program)

DFHFCRC provides recovery control for file control. All calls from the Recovery Manager domain to file control come through DFHFCRC.

DFHFCRC is called by the Recovery Manager domain to participate in syncpoint and in warm and emergency restart.

Early on during startup File Control registers as a client of the CICS Recovery Manager. During File Control initialization, File Control will add its recovery gate to the kernel, specifying DFHFCRC as the entry point, and then declares the recovery gate to the CICS Recovery Manager via an RMCD SET_GATE call.

At syncpoint, a resource owner such as File Control may be called either

1. to prepare, optionally followed by shunt-unshunt pairs, followed either by calls to backout (as in 2 below) or a call to commit.
2. to backout, which involves start_backout, optional delivery of backout data, and end_backout, followed by prepare and commit, optionally followed by backout retries (which consist of shunt-unshunt pairs followed by the start_backout - delivery of backout data - end_backout - prepare - commit sequence).

At warm or emergency restart, a resource owner such as File Control will be called with start_delivery, optional deliver_recovery and deliver_forget calls, followed by end_deliver.

The Recovery Manager functions processed by DFHFCRC are:

- RMRO PERFORM_PREPARE
- RMRO PERFORM_COMMIT
- RMRO START_BACKOUT
- RMRO DELIVER_BACKOUT_DATA
- RMRO END_BACKOUT
- RMRO PERFORM_SHUNT
- RMRO PERFORM_UNSHUNT
- RMKP TAKE_KEYPOINT
- RMDE START_DELIVERY
- RMDE DELIVER_RECOVERY
- RMDE DELIVER_FORGET
- RMDE END_DELIVERY

DFHFCRC performs different processing depending on the function with which it has been called:

PERFORM_PREPARE: Any active VSAM requests are terminated, and a vote of READ_ONLY is returned if the unit of work did not make any recoverable file control updates, a vote of YES if the prepare was successful, or a vote of NO otherwise.

PERFORM_COMMIT: For a forwards syncpoint, any changes made by the unit of work to recoverable user-maintained data tables are committed. For a backwards syncpoint, locks for any backout-failed data sets are retained. All other locks are released.

On transaction termination, the FLABs and FRAB are freed unless there are FLABs marked for retention. On an intermediate syncpoint, various flags in the FLABs and FRAB are reset to indicate that a commit has been performed.

START_BACKOUT: Any active VSAM requests are terminated, and any changes made by the unit of work to recoverable user-maintained data tables are backed out.

DELIVER_BACKOUT_DATA: The recoverable file control change represented by the log record delivered to DFHFCRC is backed out via calls to DFHFCFR which reverse the update. The change is not backed out if the unit of work has already suffered a backout failure for the data set, or if the data set is in a 'non-RLS update permitted' state, or if this call is being made as part of a CEMT or EXEC CICS SET DSNAME RESETLOCKS request.

If a failure occurs during the backout, then backout failure processing is carried out.

END_BACKOUT: Under normal conditions there should be no processing required at END_BACKOUT, but it is conceivable that there might be outstanding active VSAM requests to be terminated.

PERFORM_SHUNT: The failed parts of the unit of work's file control structures are put into a condition to survive without an executable transaction environment. This involves retaining any FLABs that are marked for retention, which will allow files to be closed, but not to be reallocated to a different data set.

If this is an intermediate syncpoint, and the shunt is due to a failure in phase 2 of syncpoint, the transactional parts of the unit of work are copied into a new control structure to be passed to the follow-on unit of work. A new FRAB is acquired to anchor this control structure. If this is transaction termination, or the shunt is due to a failure in phase 1 of syncpoint, the transactional parts are cleaned up.

PERFORM_UNSHUNT: The file control structures are converted back into a condition suitable for a unit of work that is in an executable state. Retained FLABs for the unit of work are restored.

TAKE_KEYPOINT: DFHFCRC is called when CICS takes a keypoint, to perform processing required by BWO backup on non-RLS data sets. This involves the writing of a set of 'tie up records' and the calculation of a new BWO recovery time.

START_DELIVERY: DFHFCIR is called to process the call.

DELIVER_RECOVERY: DFHFCIR is called to process the call.

DELIVER_FORGET: DFHFCIR is called to process the call.

END_DELIVERY: DFHFCIR is called to process the call.

DFHFCRD (file control RLS cleanup transaction)

As soon as CICS detects an SMSVSAM server failure, it runs program DFHFCRD under transaction CSFR to perform cleanup.

Following the server failure all current RLS ACBs become unusable. DFHFCRD scans a chain of files open in RLS mode, which is anchored from file control static storage and call DFHFCFS to perform an IMMEDIATE_CLOSE for each open file.

DFHFCRD then waits:

1. for the last file to close,
2. once the last file has closed, for SMSVSAM to complete any residual requests against the RLS control ACB.

When both these events have occurred, DFHFCRD calls DFHFCCA to perform UNREGISTER_CONTROL_ACB processing in order to clean up the CICS and VSAM state with respect to the control ACB.

DFHFCRD finally posts an ECB which allows dynamic RLS restart to go ahead. Dynamic RLS restart cannot start until DFHFCRD has completed clean up and posted this ECB.

DFHFCRL (file control share control block manager)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHFCRL. The entry point address is held in FC static storage in a field named FC_FCRL_ADDRESS, which is set by DFHFCRP when it loads DFHFCRL.

Purpose: The file control share control block manager is part of the file control component.

This program modifies the CICS specification of a shared resources pool. The changes are allowed to be made only when the actual pool is deleted.

Called by: DFHAMFC, when installing an LSR pool defined by RDO.

Inputs: The FCRL parameter list, as defined by the DFHFCRLA DSECT, is created as part of the subroutine call.

The input parameters are:

Request identifier
Pool identifier
Number of strings
Maximum key length
Share limit
Buffer characteristics

Outputs: The response and reason codes only. These are returned in the FCRL parameter list.

Operation: The SHRCTL block for the specified pool is addressed. A test is made to determine whether or not the pool is currently built; if it is built, the request is rejected with an error response.

The pool characteristics specified in the input parameter list are included in the SHRCTL block.

Finally the information in the SHRCTL block is written to the CICS global catalog.

How loaded: By DFHFCRP as part of file control initialization.

DFHFCRO (file control RLS open/close program)

DFHFCRO performs an equivalent function for RLS opens and closes as is performed by DFHFCN for non-RLS access mode.

DFHFCRP (file control restart program)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHFCRP. This address is needed only by DFHFCIN2 during initialization; it is therefore not saved in FC static storage.

Purpose: The file control restart program is part of the file control component. This program creates a file control component on a cold or initial start of CICS, or re-creates it after a warm or emergency start. For a warm or emergency start, the intention is to reconstruct the identical file control environment which was in effect at the time of the previous CICS termination.

Called by: DFHFCIN2, during file control initialization.

Inputs: None.

Outputs: The restarted file control component. File control static addresses and indicators are set up. DFHFCRP’s response and reason codes are set in the parameter list defined by DFHFCRPA DSECT.

Operation: Calls loader domain to define (if necessary) and acquire (load) the following file control programs: DFHAFMT, DFHDTINS, DFHFCAT, DFHFCCA, DFHFCDN, DFHFCD2, DFHFCES, DFHFCFL, DFHFCFS, DFHFCIR, DFHFCLF, DFHFCLJ, DFHFCMT, DFHFCNQ, DFHFCQI, DFHFCQU, DFHFCQX, DFHFCRC, DFHFCRL, DFHFCRO, DFHFCRR, DFHFCRS, DFHFCRV, DFHFCSD, DFHFCST, and DFHFCVS.

Adds gates to the kernel for recovery control, ENF services, and log stream failure notification.

Calls storage manager domain to add (create) the following storage subpools: file control general below 16MB, VSAM FCTE, BDAM FCTE, ACB, DCB, SHRCTL, AFCTE, DSN, FFLE, FRAB, FRTE, FLLB, FLAB, RPL, IFGLUWID, file control fixed-length buffer storage. Calls the NQ domain to add (create) enqueue subpools for: dataset record NQs, file record NQs, range NQs, load mode NQs, ESDS write NQs, and UMT loading NQs.

Calls DFHTMP to create TMP primary indexes for the FCT, AFCT, and DSN tables, and a TMP secondary index for the DSN table.

If RLS is supported (correct level of DFSMS, and RLS=YES SIT parameter) initializes the CSFR, CFQS, CFQR and CFOR tasks, registers file control's interest in the SMSVSAM ENF signal by a LISTEN call to DFHDMEN, and calls DFHFCRR to restart RLS.

On a warm or emergency start:

- Determines installation levels of the MVS/Data Facility Product (MVS/DFP) (or DFSMS), the Data Facility Hierarchical Storage Manager (DFHSM), and the Data Facility Data Set Services (DFDSS) for VSAM backup while open (BWO) support.
- Restores DSNAME blocks from the CICS global catalog, recreating a DSN control block in the DSN subpool storage. For each block, adds its DS name to the TMP primary index, and adds its DS number to the TMP secondary index.
- Restores VSAM file entries from the CICS global catalog. For each entry, adds its file name to the TMP FCT index.
- Restores BDAM file entries from the CICS global catalog. For each entry, adds its file name to the TMP FCT index. Further, for each entry, restores the BDAM DCB from the catalog and copies it to an entry in the DCB storage subpool.
- Restores AFCT entries from the CICS global catalog. For each entry, adds its application file name to the TMP AFCT index.
- Restores DSNAME references from the CICS global catalog. For each entry, locates its FCTE and invokes DFHFCDN to connect the FCTE to its DSN block.
- Restores SHRCTL blocks from the CICS global catalog.

On a cold start:

- As for a warm or emergency start, determines installation levels of MVS/DFP, DFHSM, and DFDSS for VSAM backup while open (BWO) support.
- Purges the CICS global catalog of all FCTEs, SHRCTL blocks, DSNAME references, AFCTEs, and BDAM DCBs.

- Calls the loader domain to load the FCT specified by the FCT system initialization parameter.
- Builds all eight SHRCTL blocks, using any information that may have been specified in the loaded FCT. Writes the blocks to the CICS global catalog.
- For each file control table entry in the loaded FCT, creates an FCT entry in the FCT storage subpool, copies the information to it, adds the file name to the TMP index, and writes the table entry to the CICS global catalog.
- For each AFCT table entry in the loaded FCT, creates an AFCT entry in the AFCT storage subpool, copies the information to it, adds the application file name to the TMP index, and writes the table entry to the CICS global catalog.

  If the AFCTE is for a remote file, creates a "remote" FCT entry and connect it to the AFCTE, but does not add it to the TMP index. (These entries are used by shared data tables support.)
- Calls the loader domain to delete the previously loaded FCT.

Indicates file control restart complete for non-recoverable business by setting FC_NON_REV_ALLOWED_ECB on.

Sends message to inform that file control restart is complete.

If all was successful, turns on the FCSCMPLT flag in FC static.

Finally, posts the FC_RECOV_ALLOWED_ECB in FC static.

How loaded: By the file control initialization module 2, DFHFCIN2, and deleted after it has completed.

DFHFCRR (file control RLS restart)

DFHFCRR is used to restart the RLS component of File Control. It is called whenever CICS is restarted and after any total RLS failure. DFHFCRR is also called whenever a resource can be made available again after earlier failures have been rectified, and after recovery from Lost Locks.

DFHFCRR is invoked whenever CICS is restarted (COLD, WARM or EMERGENCY) by DFHFCRP, and following any total RLS failure (DYNAMIC restart) by DFHFCES.

DFHFCRR is also called to retry work which has been shunted because a resource (a data set, and RLS cache, or the VSAM RLS server) was not available. For this purpose, it is called by DFHFCQU when CICS is notified that a data set has been unquiesced, has completed a non-BWO copy or has completed forward recovery, and when CICS is notified that a previously failed cache is now available; by DFHFCFL when the API interface is used to retry all shunted work for a given data set; and by DFHFCRO when an override condition is detected, in order to drive any shunted work.

DFHFCRR is also called by DFHFCQU when CICS is notified that all systems have completed lost locks recovery for a data set.

DFHFCRS (file control RLS record management processor)

DFHFCRS performs an equivalent function for RLS access mode record management requests as is performed by DFHFCVS for non-RLS access mode requests.

DFHFCRV (file control RLS VSAM interface processor)

DFHFCRV performs an equivalent function for RLS access mode record management requests as is performed by DFHFCVR for non-RLS access mode requests.

DFHFCSD (file control shutdown program)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHFCSD. The entry point address is held in FC static storage in a field named FC_FCSD_ADDRESS, which is set by DFHFCRP when it loads DFHFCSD.

Purpose: The file control shutdown program is part of the file control component. Its purpose is to close all CICS files that are still open during phase 2 of a normal controlled CICS termination. This processing is bypassed for immediate termination.

Called by: DFHSTP, to close all open files managed by CICS file control.

Inputs: The FCSD parameter list, as defined by the DFHFCSDA DSECT, is created as part of the subroutine call.

The input parameters are:

Type of shutdown (immediate, warm)

Outputs: The response and reason codes only, which are returned in the FCSD parameter list.

Operation: DFHFCSD has only one function: TERMINATE.

On a 'warm' shutdown (that is, a not-immediate shutdown), DFHFCSD calls DFHTMP to scan all FCT entries. For each file, it calls DFHFCFS to close the file. A special CLOSE qualifier (shutdown) is specified on the call to DFHFCFS so as not to catalog the FCT entry as in an 'unenabled' state. DFHFCSD also calls DFHFCDO to disconnect coupling facility data table pools.

If RLS is supported, the quiesce system tasks CFQS and CFQR are terminated.

How loaded: By DFHFCRP as part of file control initialization.

DFHFCST (file control statistics program)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHFCST. The entry point address is held in FC static storage in a field named FC_FCST_ADDRESS, which is set by DFHFCRP when it loads DFHFCST.

Purpose: The file control statistics program is part of the file control component.

This program is called to collect statistics for a single file, together with any data table statistics, or to collect statistics for the activity in a shared resources pool.

It is also called to return file statistics associated with a file's use of a shared resources pool.

Called by

DFHSTFC	Collect file statistics
DFHSTLS	Collect pool statistics and also file-in-pool statistics.

Inputs: The FCST parameter list, as defined by the DFHFCSTA DSECT, is created as part of the subroutine call.

The input parameters are:

Request identifier
File name
FCTE token
Statistics record
Pool identifier
Browse token
Reset indicator

Outputs: Returned in the FCST parameter list:

Browse token
Response
Reason

Operation

- Collect file statistics:

  The FCT entry token is validated if supplied; otherwise, the file name is used to locate the FCT entry.

  The file statistics, and any data table statistics, are collected from the FCTE and copied into the statistics record. The statistics in the FCTE are optionally reset according to the reset indicator.

  For data tables, a STATISTICS data table service request is issued to retrieve and reset those statistics that are maintained by data table services. These statistics are appended to the file statistics record.

  The FCT entry is unlocked and the statistics record returned to the caller.
- Collect pool statistics:

  The SHRCTL block for the specified pool is addressed. The pool statistics are copied into the statistics record and are returned to the caller.
- Start browse of files in pool:

  Storage is obtained from the general file control pool for the browse cursor. The browse token is returned to the caller.
- Get statistics for next file in pool:

  DFHTMP is invoked to locate the FCT entry identified by the browse cursor. If the file uses the specified pool, the shared pool statistics for this file are retrieved and returned in the statistics record.

  The statistics contain the data and index buffer sizes, and the number of times buffer waits occurred.

  The browse cursor is updated before returning to the caller.
- End browse of files in pool:

  The browse cursor storage is freed before returning to the caller.

How loaded: By DFHFCRP as part of file control initialization.

DFHFCVR (file control VSAM interface program)

Call mechanism: BALR, obtaining LIFO storage on entry.

Entry address: DFHFCVR. DFHFCVR is link-edited with DFHFCVS. For calls to DFHFCVR from DFHFCVS, the entry point address is known to DFHFCVS from the link-edit. This address is also stored in FC static storage in a field named FC_FCVR_ENTRY. In addition, there is a further "entry address", UPADEXIT, which is the entry code for the UPAD exit code.

Purpose: The VSAM request interface program is part of the file control component.

This module contains code that issues the VSAM requests, and performs UPAD exit processing in the case of synchronous requests to LSR files, or performs the IOEVENT wait ('FCIOWAIT') in the case of asynchronous requests to NSR files.

The module also contains a number of further routines that implement functions required by DFHFCVS.

Called by

DFHFCBD	To issue a message
DFHFCFR	To wait on a CICS ECB
DFHFCVR	Recursively, in order to issue an ENDREQ request to free a deadlock
DFHFCVS	When issuing VSAM requests
DFHFCVS	To execute one of the constituent functions
VSAM	To invoke the UPAD exit.

Inputs: The FCWSV parameter list, as defined by the DFHFCWS macro, is created in the caller's automatic storage and addressed by register 1 on the call. The input parameters are:

Request identifier
FCTE address
VSWA address
ECB address
Wait resource type
Message number
Dump code

In addition, DFHFCVR requires access to the TCA for certain of its operations.

Outputs: FCVR_RESPONSE parameter (only), defined as part of the FCWSV parameter list.

Operation: Initialize: Copies the VSAM exit list to FC static storage. This action is performed as part of file control initialization.

VSAM_Request: Issues the request to VSAM. Performs the IOEVENT wait. Handles LSR 'no buffers' logical error. Issues change mode request to perform the request under the concurrent TCB if possible.

Get_Strings and Free_Strings: Acquires and frees the required number of shared strings from the LSR pool.

Get_TRANID and Free_TRANID: Allocates and releases a VSAM tranid required during sequential update operations to an LSR file.

Wait_CICSECB: Issues a function request to wait for a CICS ECB to be posted.

Wait_String: Issues a function request to wait for a private string to become available.

Send_Message: Issues a function request to send a message.

How loaded: Link-edited with DFHFCVS to form the DFHFCVS load module, which is loaded by DFHFCRP as part of file control initialization.

DFHFCVS (file control VSAM request processor)

Call mechanism: Kernel subroutine call. Automatic stack storage acquired as part of the call.

Entry address: DFHFCVS. The entry point address is held in FC static storage in a field named FC_FCVS_ADDRESS, which is set by DFHFCRP when it loads DFHFCVS.

Purpose: Processes file control requests to VSAM files.

Also initializes certain FC static storage fields during file control initialization.

Called by

DFHFCDTS	To access the VSAM source data set to satisfy requests that cannot be satisfied by the table itself
DFHFCFR	After having determined that the request is for a VSAM file.

Inputs: The FCFR parameter list, as defined by the DFHFCFRA DSECT. Also the file control environment, including FC static storage and the FCT.

Outputs: Updated FCFR parameter list.

Operation: Selects on the request type, and passes control to the routine specific to that request.

Acquires and releases the VSWA as necessary.

Logs and journals the request if required.

Performs record-length and key-length checking.

Acquires storage, in the correct key subpool, for requests that specify SET.

Calls DFHFCVR to perform the VSAM request.

Resolves conflicts of exclusive control.

Performs record locking and resolves locking conflicts, including the detection of deadlocks caused either by single tasks that deadlock themselves or by multiple tasks that deadlock each other.

Performs initialization of FC static storage during file control initialization.

For CICS-maintained data tables, calls data table services to update the table to keep it in step with the VSAM source data set.

How loaded: By DFHFCRP as part of file control initialization.

Parameter lists

File control provides the following functions in OCO modules:

FCCA CHECK function

CHECK is issued to get the results of a previous, asynchronous, operation.

Input parameters:

CHECK_TOKEN is a token that was returned on the previous request for which the results are being checked.

Output parameters

ACCMETH_RETURN_CODE is a two-byte code returned by SMSVSAM.

CONFLICTING_QUIESCE indicates the type of quiesce which conflicts with this request, and can have any of these values:

QUIESCE|UNQUIESCE|NONBWO_END|BWO_END|NONBWO_START|
BWO_START

RESPONSE is DFHFCCA’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	VSAM_REQUEST_ERROR, RLS_FAILURE
DISASTER	ABEND

FCCA COLD_START_RLS function

This request is issued as part of CICS cold start processing. CICS issues an IDARECOV TYPE=COLDSTART call to SMSVSAM to release all RLS locks owned by this CICS, and to clear the lost locks status and 'non RLS update permitted' state of all data sets with respect to this CICS.

Input parameters:

SUBSYSNM is a pointer to an IFGSYSNM structure.

Output parameters

ACCMETH_RETURN_CODE is a two-byte code returned by SMSVSAM.

RESPONSE is DFHFCCA’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	VSAM_REQUEST_ERROR, RLS_FAILURE
DISASTER	ABEND

FCCA DRAIN_CONTROL_ACB function

The Control ACB must be drained when file control detects that an instance of the SMSVSAM server has become failed. DFHFCCA will set an indicator in FC static storage so that no other RLS activity may proceed, and then drain all existing RLS access. This involves incrementing the server sequence number in FC static storage, closing all RLS ACBs and unregistering the Control ACB.

Input parameters: None

Output parameters

RESPONSE is DFHFCCA’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DISASTER_PERCOLATION, ABEND

FCCA INQUIRE_RECOVERY function

This request is issued as part of CICS start up processing. CICS makes an IDAINQRC request to VSAM to obtain the information necessary to determine what RLS recovery actions are required by CICS.

Input parameters:

AREA_PTR is the address of an area in which the IFGINQRC information is to be returned.

AREA_LENGTH is the length of the supplied area.

Output parameters

ACCMETH_RETURN_CODE is a two-byte code returned by SMSVSAM.

REQUIRED_LENGTH is the length of the IFGINQRC area to be returned, if it exceeds the length of the supplied area.

RESPONSE is DFHFCCA’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	AREA_TOO_SMALL, VSAM_REQUEST_ERROR, RLS_FAILURE
DISASTER	ABEND

FCCA LOST_LOCKS_COMPLETE function

CICS issues an IDARECOV TYPE=LL request to SMSVSAM when it has completed recovery processing for a data set that is in lost locks status. SMSVSAM resets the state of the data set in the sharing control data set to indicate that the data set is no longer lost locks with respect to this CICS.

Input parameters:

DATASET is the 44-character name of the base data set for which CICS has completed lost locks recovery.

[RESTART] is an optional parameter which indicates whether the call was issued by file control restart. It can have either of these values:

```
YES|NO
```

Output parameters

ACCMETH_RETURN_CODE is a two-byte code returned by SMSVSAM.

RESPONSE is DFHFCCA’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	VSAM_REQUEST_ERROR, RLS_FAILURE
DISASTER	ABEND

FCCA QUIESCE_COMPLETE function

When CICS has completed the processing required by it for a quiesce request from SMSVSAM, it issues an IDAQUIES call to SMSVSAM with a quiesce type of QUICMP.

Input parameters:

DATASET is the 44-character name of the base data set for which quiesce processing is complete.

VSAM_QUIESCE_TOKEN is a token used to relate quiesce completion to the quiesce request which has been completed, and which is supplied by SMSVSAM when the quiesce request is received by CICS.

Output parameters

ACCMETH_RETURN_CODE is a two-byte code returned by SMSVSAM.

RESPONSE is DFHFCCA’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	VSAM_REQUEST_ERROR, RLS_FAILURE
DISASTER	ABEND

FCCA QUIESCE_REQUEST function

DFHFCCA issues quiesce requests to SMSVSAM on behalf of the quiesce component of CICS. It issues IDAQUIES calls of the following types:

- QUICLOSE to request SMSVSAM to notify all CICS systems that have ACBs open against this data set that these ACBs are to be closed. In addition the data set is marked in the VSAM catalog as being quiesced once these ACBs have been closed.
- QUIOPEN to request SMSVSAM to mark the data set as no longer quiesced, i.e. unquiesced. In addition QUIOPEN will cancel an in-progress QUICLOSE.
- QUIBEND to request SMSVSAM to cancel an in-progress BWO backup of a data set.
- QUICEND to request SMSVSAM to cancel an in-progress non-BWO backup of a data set.

Input parameters:

DATASET is the 44-character name of the base data set to be quiesced.

QUIESCE_TYPE is the type of quiesce, and can have any of these values:

```
QUIESCE|UNQUIESCE|NONBWO_END|BWO_END
```

QUIESCE_TYPE is the type of quiesce, and can have any of these values:

```
QUIESCE|UNQUIESCE|NONBWO_END|BWO_END
```

[IMMEDIATE] applies only when the quiesce type is quiesce, and indicates whether or not the quiesce will force files to close immediately, or will allow in-flight units of work to reach syncpoint. It can have either of these values:

```
YES|NO
```

Output parameters

ACCMETH_RETURN_CODE is a two-byte code returned by SMSVSAM.

CHECK_TOKEN is a token which will be used on the CHECK request.

CONFLICTING_QUIESCE indicates the type of quiesce which conflicts with this request, and can have any of these values:

```
QUIESCE|UNQUIESCE|NONBWO_END|BWO_END|NONBWO_START|
BWO_START
```

RESPONSE is DFHFCCA’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	VSAM_REQUEST_ERROR, RLS_FAILURE
DISASTER	ABEND

FCCA REGISTER_CONTROL_ACB function

The Control ACB is 'opened' using an IDAREGP request to SMSVSAM. The Control ACB must be registered before CICS can open any 'ordinary' ACB for RLS access.

Input parameters: None

Output parameters

VSAM_RETURN_CODE is a fullword return code from VSAM.

VSAM_REASON_CODE is a fullword return code from VSAM.

VSAM_ERROR_DATA is an 8-byte field containing error data returned by VSAM.

RESPONSE is DFHFCCA's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	RLS_FAILURE, VSAM_REQUEST_ERROR
DISASTER	DISASTER_PERCOLATION, ABEND

FCCA RELEASE_LOCKS function

CICS issues an IDALKREL request to SMSVSAM as part of commit processing at the end of every unit of work. It requests VSAM to release all locks owned by the unit of work.

Input parameters

LUWID is a pointer to an IFGLUWID structure containing the id for the unit of work.

[RESTART] is an optional parameter which indicates whether the call was issued by file control restart. It can have either of these values:

```
YES|NO
```

Output parameters

ACCMETH_RETURN_CODE is a two-byte code returned by SMSVSAM.

RESPONSE is DFHFCCA's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	VSAM_REQUEST_ERROR, RLS_FAILURE
DISASTER	ABEND

FCCA RESET_NONRLS_BATCH function

CICS issues an IDARECOV TYPE=NONRLS request to VSAM when it has completed processing the NSR batch override response from an RLS file open. SMSVSAM resets the state of the data set in the sharing control data set to indicate that the batch override (or 'non RLS update permitted') state no longer needs to be reported to this CICS when it opens the data set.

Input parameters

DATASET is the 44-character name of the base data set for which the state is to be cleared.

Output parameters

ACCMETH_RETURN_CODE is a two-byte code returned by SMSVSAM.

RESPONSE is DFHFCCA's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	VSAM_REQUEST_ERROR, RLS_FAILURE
DISASTER	ABEND

FCCA RETAIN_DATASET_LOCKS function

CICS issues an IDARETLK TYPE=SS call to SMSVSAM when a unit of work has suffered a backout failure on a data set. This requests SMSVSAM to mark all locks against the data set owned by the unit of work for conversion into retained locks on a subsequent IDALKREL call.

Input parameters

LUWID is a pointer to an IFGLUWID structure containing the id for the unit of work.

DATASET is the 44-character name of the base data set which has suffered a backout failure.

Output parameters

ACCMETH_RETURN_CODE is a two-byte code returned by SMSVSAM.

RESPONSE is DFHFCCA's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	VSAM_REQUEST_ERROR, RLS_FAILURE
DISASTER	ABEND

FCCA RETAIN_UOW_LOCKS function

CICS issues an IDARETLK TYPE=IND call to SMSVSAM when a unit of work has encountered an in-doubt failure. This requests VSAM to mark all locks owned by the unit of work for conversion into retained locks on a subsequent IDALKREL call.

Input parameters

LUWID is a pointer to an IFGLUWID structure containing the id for the unit of work.

Output parameters

ACCMETH_RETURN_CODE is a two-byte code returned by SMSVSAM.

RESPONSE is DFHFCCA’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	VSAM_REQUEST_ERROR, RLS_FAILURE
DISASTER	ABEND

FCCA UNREGISTER_CONTROL_ACB function

The RLS Control ACB is ’closed’ using an IDAUNRP request to SMSVSAM. The Control ACB cannot be unregistered while there are any ’ordinary’ ACBs open for RLS access.

Input parameters: None

Output parameters

VSAM_RETURN_CODE is a fullword return code from VSAM.

VSAM_REASON_CODE is a fullword reason code from VSAM.

RESPONSE is DFHFCCA’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	RLS_FAILURE, VSAM_REQUEST_ERROR
DISASTER	DISASTER_PERCOLATION, ABEND

FCCI INQUIRE function

FCCI is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for the table inquire function. It is not used by CICS.

FCCR POINT function

FCCR is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for data access requests.

The POINT function locates a record in a coupling facility data table.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

TABLE_TOKEN is the token returned on OPEN which must be passed on all subsequent requests against that open table.

KEY is the 16-byte key of the record to be accessed. For approximate key operations, this specifies the start key and is updated on successful completion to contain the key of the record actually accessed.

KEY_COMPARISON is the comparison condition, and can take the values

LT|LTEQ|EQ|GTEQ|GT

KEY_MATCH_LENGTH is the key match length for generic key operations.

UOW_ID is the unit of work identification, which is required when updating using the locking model (non-recoverable or recoverable).

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

KEY returns the 16-byte key of the located record.

RESPONSE is DFHFCCR’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECORD_NOT_FOUND, TABLE_LOADING, TABLE_TOKEN_INVALID, TABLE_DESTROYED, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCR HIGHEST function

FCCR is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for data access requests.

The HIGHEST function returns the highest key in a coupling facility data table, if any.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

TABLE_TOKEN is the token returned on OPEN which must be passed on all subsequent requests against that open table.

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

KEY returns the 16-byte key of the highest record.

RESPONSE is DFHFCCR's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECORD_NOT_FOUND, TABLE_LOADING, TABLE_TOKEN_INVALID, TABLE_DESTROYED, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCR READ function

FCCR is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for data access requests.

The READ function reads a record from a coupling facility data table, optionally for update.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

TABLE_TOKEN is the token returned on OPEN which must be passed on all subsequent requests against that open table.

KEY_COMPARISON is the comparison condition, and can take the values

LT|LTEQ|EQ|GTEQ|GT

KEY_MATCH_LENGTH is the key match length for generic key operations.

KEY is the 16-byte key of the record to be accessed. For approximate key operations, this specifies the start key and is updated on successful completion to contain the key of the record actually accessed.

BUFFER is the input buffer for read requests.

UOW_ID is the unit of work identification, which is required when updating using the locking model (non-recoverable or recoverable).

SUSPEND specifies whether to wait if the requested record is locked by an active lock, and can take the values

YES|NO

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

UPDATE_TOKEN returns a token on a read for update.

KEY returns the 16-byte key of the highest record.

LOCK_OWNER_SYSTEM identifies the MVS system from which the record lock was acquired for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

LOCK_OWNER_APPLID identifies the applid of the region which owns the record lock for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

LOCK_OWNER_UOW_ID identifies the unit of work which owns the record lock for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

RESPONSE is DFHFCCR's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECORD_NOT_FOUND, RECORD_BUSY, RECORD_LOCKED, TABLE_LOADING, INVALID_REQUEST, INCOMPLETE_UPDATE, TABLE_TOKEN_INVALID, TABLE_DESTROYED, UOW_FAILED, UOW_NOT_IN_FLIGHT, UOW_TOO_LARGE, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCR READ_DELETE function

FCCR is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for data access requests.

The READ_DELETE function reads and deletes a record from a coupling facility data table. It is not used by CICS.

FCCR UNLOCK function

FCCR is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for data access requests.

The UNLOCK function unlocks a record previously read for update in a coupling facility data table.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

TABLE_TOKEN is the token returned on OPEN which must be passed on all subsequent requests against that open table.

KEY is the 16-byte key of the record to be unlocked.

BUFFER is the input buffer for read requests.

UPDATE_TOKEN is the token returned on the preceding read for update.

UOW_ID is the unit of work identification, which is required for the locking model (non-recoverable or recoverable).

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

RESPONSE is DFHFCCR’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECORD_NOT_FOUND, RECORD_CHANGED, TABLE_LOADING, INVALID_REQUEST, UPDATE_TOKEN_INVALID, TABLE_TOKEN_INVALID, TABLE_DESTROYED, UOW_FAILED, UOW_NOT_IN_FLIGHT, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCR LOAD function

FCCR is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for data access requests.

The LOAD function adds a record to a coupling facility data table during loading.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

TABLE_TOKEN is the token returned on OPEN which must be passed on all subsequent requests against that open table.

KEY is the 16-byte key of the record to be loaded.

DATA is the address and length of the record data to be loaded.

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

RESPONSE is DFHFCCR’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, DUPLICATE_RECORD, MAXIMUM_RECORDS_REACHED, NO_SPACE_IN_POOL, INVALID_REQUEST, INVALID_LENGTH, TABLE_TOKEN_INVALID, TABLE_DESTROYED, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCR WRITE function

FCCR is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for data access requests.

The WRITE function writes a new record to a coupling facility data table.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

TABLE_TOKEN is the token returned on OPEN which must be passed on all subsequent requests against that open table.

KEY is the 16-byte key of the record to be added.

DATA is the address and length of the record data to be added.

UOW_ID is the unit of work identification, which is required when updating using the locking model (non-recoverable or recoverable).

SUSPEND specifies whether to wait if the requested record is locked by an active lock, and can take the values

YES|NO

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

LOCK_OWNER_SYSTEM identifies the MVS system from which the record lock was acquired for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

LOCK_OWNER_APPLID identifies the applid of the region which owns the record lock for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

LOCK_OWNER_UOW_ID identifies the unit of work which owns the record lock for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

RESPONSE is DFHFCCR's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, DUPLICATE_RECORD, RECORD_BUSY, RECORD_LOCKED, MAXIMUM_RECORDS_REACHED, NO_SPACE_IN_POOL, TABLE_LOADING, INVALID_REQUEST, INVALID_LENGTH, UPDATE_TOKEN_INVALID, INCOMPLETE_UPDATE, TABLE_TOKEN_INVALID, TABLE_DESTROYED, UOW_FAILED, UOW_NOT_IN_FLIGHT, UOW_TOO_LARGE, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCR REWRITE function

FCCR is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for data access requests.

The REWRITE function rewrites an an existing record in a coupling facility data table, following a read for update.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

TABLE_TOKEN is the token returned on OPEN which must be passed on all subsequent requests against that open table.

KEY is the 16-byte key of the record to be rewritten.

DATA is the address and length of the record data to be rewritten.

UPDATE_TOKEN is the token returned on the preceding read for update.

UOW_ID is the unit of work identification, which is required when updating using the locking model (non-recoverable or recoverable).

SUSPEND specifies whether to wait if the requested record is locked by an active lock, and can take the values

YES|NO

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

LOCK_OWNER_SYSTEM identifies the MVS system from which the record lock was acquired for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

LOCK_OWNER_APPLID identifies the applid of the region which owns the record lock for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

LOCK_OWNER_UOW_ID identifies the unit of work which owns the record lock for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

RESPONSE is DFHFCCR's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECORD_NOT_FOUND, RECORD_CHANGED, RECORD_BUSY, RECORD_LOCKED, MAXIMUM_RECORDS_REACHED, NO_SPACE_IN_POOL, TABLE_LOADING, INVALID_REQUEST, INVALID_LENGTH, UPDATE_TOKEN_INVALID, INCOMPLETE_UPDATE, TABLE_TOKEN_INVALID, TABLE_DESTROYED, UOW_FAILED, UOW_NOT_IN_FLIGHT, UOW_TOO_LARGE, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCR DELETE function

FCCR is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for data access requests.

The DELETE function deletes a record from a coupling facility data table, following a read for update.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

TABLE_TOKEN is the token returned on OPEN which must be passed on all subsequent requests against that open table.

KEY_COMPARISON is the comparison condition, and can take the values

`LT|LTEQ|EQ|GTEQ|GT`

KEY_MATCH_LENGTH is the key match length for generic key operations.

KEY is the 16-byte key of the record to be deleted.

UPDATE_TOKEN is the token returned on the preceding read for update.

UOW_ID is the unit of work identification, which is required when updating using the locking model (non-recoverable or recoverable).

SUSPEND specifies whether to wait if the requested record is locked by an active lock, and can take the values

`YES|NO`

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

KEY is the 16-byte key of the record actually deleted.

LOCK_OWNER_SYSTEM identifies the MVS system from which the record lock was acquired for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

LOCK_OWNER_APPLID identifies the applid of the region which owns the record lock for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

LOCK_OWNER_UOW_ID identifies the unit of work which owns the record lock for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

RESPONSE is DFHFCCR's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECORD_NOT_FOUND, RECORD_CHANGED, RECORD_BUSY, RECORD_LOCKED, TABLE_LOADING, INVALID_REQUEST, UPDATE_TOKEN_INVALID, INCOMPLETE_UPDATE, TABLE_TOKEN_INVALID, TABLE_DESTROYED, UOW_FAILED, UOW_NOT_IN_FLIGHT, UOW_TOO_LARGE, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCR DELETE_MULTIPLE function

FCCR is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for data access requests.

The DELETE_MULTIPLE function deletes records from a coupling facility data table, subject to key match conditions, until no more records match or an exception occurs.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

TABLE_TOKEN is the token returned on OPEN which must be passed on all subsequent requests against that open table.

KEY_COMPARISON is the comparison condition, and can take the values

`LT|LTEQ|EQ|GTEQ|GT`

KEY_MATCH_LENGTH is the key match length for generic key operations.

KEY is the 16-byte key of the record(s) to be deleted.

UOW_ID is the unit of work identification, which is required when updating using the locking model (non-recoverable or recoverable).

SUSPEND specifies whether to wait if the requested record is locked by an active lock, and can take the values

`YES|NO`

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

DELETED_RECORD_COUNT is the number of records successfully deleted by the delete_multiple request.

KEY is the 16-byte key of the last record deleted.

LOCK_OWNER_SYSTEM identifies the MVS system from which the record lock was acquired for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

LOCK_OWNER_APPLID identifies the applid of the region which owns the record lock for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

LOCK_OWNER_UOW_ID identifies the unit of work which owns the record lock for a record_busy or record_locked condition. Also set when the wait exit is taken for a lock wait.

RESPONSE is DFHFCCR's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECORD_NOT_FOUND, RECORD_CHANGED, RECORD_BUSY, RECORD_LOCKED, TABLE_LOADING, INVALID_REQUEST, UPDATE_TOKEN_INVALID, INCOMPLETE_UPDATE, TABLE_TOKEN_INVALID, TABLE_DESTROYED, UOW_FAILED, UOW_NOT_IN_FLIGHT, UOW_TOO_LARGE, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCT OPEN function

FCCT is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for table status functions (Open, Close etc.).

The OPEN function defines a coupling facility data table table and establishes a connection between it and a CICS file. A security check is performed for access to the table name. If the table does not exist, it is implicitly created. If the table requires loading, it can only be opened if the access mode specifies exclusive access (or prefer_shared, allowing exclusive access if necessary).

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

RECORD_LENGTH specifies the maximum record length, in the range 1 to 32767.

KEY_LENGTH specifies the key length, in the range 1 to 16.

MAXIMUM_RECORDS specifies the maximum number of records which can be stored in the table.

UPDATE_MODEL specifies the method to be used for updating. It can take any of the values:

`CONTENTION|LOCKING|RECOVERABLE`

Contention means version compare and swap. Locking means normal update locking. Recoverable includes backout support in addition to the basic locking model.

INITIAL_LOAD specifies whether initial load is required. It can take the values:

`YES|NO`

OPEN_MODE specifies a read_only or read_write open. It can take the values

`READ_ONLY|READ_WRITE`

ACCESS_MODE specifies whether the table is being opened for exclusive or shared use. It can take the values:

`EXCLUSIVE|SHARED|PREFER_SHARED`

Only one user at a time can have an exclusive open active. If the table requires loading and is not yet being loaded, it can only be opened in exclusive mode. If PREFER_SHARED is specified, the table will be opened in exclusive mode if loading is required, otherwise it will be open in shared mode.

SHARED_ACCESS specifies for an exclusive mode open whether other users will be allowed shared access to the file at the same time. It can take the values:

`NONE|READ_ONLY|READ_WRITE`

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

TABLE_TOKEN is a unique token representing the connection to this table. It must be passed on all subsequent requests against that open table, including close and set.

RECORD_LENGTH returns the maximum record length of the table.

KEY_LENGTH returns the key length of the table.

MAXIMUM_RECORDS returns the maximum number of records limit for the table.

UPDATE_MODEL returns the update model for the data table. It can take any of the values:

`CONTENTION|LOCKING|RECOVERABLE`

Contention means version compare and swap. Locking means normal update locking. Recoverable includes backout support in addition to the basic locking model.

INITIAL_LOAD returns whether or not the data table requires initial loading. It can take the values:

`YES|NO`

ACCESS_MODE returns whether the table was opened for exclusive or shared use. It can take the values:

`EXCLUSIVE|SHARED`

LOADED returns an indication of whether the table has been loaded. If the table was created as empty this is set to yes as if loading were already done. It can take the values:

`YES|NO`

CURRENT_USERS returns the number of explicit opens which are currently active against the table (not including internal recoverable opens issued by the server).

CURRENT_RECORDS returns the number of records in the data table.

CURRENT_HIGH_KEY returns the key of the last record in the table at the time of the request, or low values if the table does not contain any records.

RESPONSE is DFHFCCT's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, ACCESS_NOT_ALLOWED, TABLE_NOT AVAILABLE, NOT_YET_LOADED, SHARED_ACCESS_CONFLICT, EXCLUSIVE_ACCESS_CONFLICT, INCOMPATIBLE_ATTRIBUTES, INCOMPLETE_ATTRIBUTES, INCORRECT_STATE, RECOVERY_NOT_ENABLED, OPTION_NOT_SUPPORTED, NO_SPACE_IN_POOL, MAXIMUM TABLES_REACHED, TOO_MANY_USERS, TABLE_DESTROYED, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCT CLOSE function

FCCT is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for table status functions (Open, Close etc.).

The CLOSE function terminates the connection to the specified table.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

TABLE_TOKEN is the token which was returned by the open.

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

RESPONSE is DFHFCCT's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, TABLE_TOKEN_INVALID, TABLE_DESTROYED, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCT DELETE function

FCCT is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for table status functions (Open, Close etc.).

The DELETE function deletes a coupling facility data table, provided that it is not currently open. A security check for table access is performed.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

RESPONSE is DFHFCCT's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, ACCESS_NOT_ALLOWED, TABLE_NOT_FOUND, EXCLUSIVE_ACCESS_CONFLICT, TABLE_DESTROYED, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCT SET function

FCCT is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for table status functions (Open, Close etc.).

The SET function is used to change the attributes of a table. The maximum number of records can be changed, the open mode can be changed to indicate no longer loading, and the access mode can be changed from exclusive to shared.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

MAXIMUM_RECORDS specifies the maximum number of records which can be stored in the table.

AVAILABLE indicates whether new open requests are to be allowed for this table. It can take the values:

`YES|NO`

LOADED indicates whether the table is to be marked as loaded. It can take the values:

`YES|NO`

ACCESS_MODE specifies the access mode which is to be set for the table. It can take the values:

`EXCLUSIVE|SHARED`

The access mode is normally set to shared when a data table load has completed.

SHARED_ACCESS specifies the shared access which is to be allowed by other users when the access mode is shared.

`NONE|READ_ONLY|READ_WRITE`

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

RESPONSE is DFHFCCT's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, ACCESS_NOT_ALLOWED, TABLE_NOT_FOUND, SHARED_ACCESS_CONFLICT, EXCLUSIVE_ACCESS_CONFLICT, ALREADY_SET, INCORRECT_STATE, OPTION_NOT_SUPPORTED, TABLE_TOKEN_INVALID, TABLE_DESTROYED, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCT EXTRACT_STATISTICS function

FCCT is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for table status functions (Open, Close etc.).

The EXTRACT_STATISTICS function returns information about a table which is currently open, with optional reset.

Input parameters

TABLE_NAME is the 16-character name of the CFDT (8 characters padded with trailing spaces).

TABLE_TOKEN is the token which was returned by the open.

RESET_STATISTICS is an optional parameter which specifies whether or not statistics are to be reset. It can take the values

YES|NO

TRANSACTION_NUMBER identifies the requesting task within the debug trace, if used.

Output parameters

CURRENT_USERS is the number of explicit opens which are currently active against the table (not including internal recoverable opens issued by the server).

CURRENT_RECORDS is the number of records currently in the data table.

HIGHEST_RECORDS is the highest number of records in the table as seen by the current server at any time since the last statistics reset.

CONTENTION_COUNT is the number of times a rewrite or delete failed because of a mismatched version (for the contention model) or the number of times that a lock was found to be unavailable (for the locking or recoverable models) since the last statistics reset.

RESPONSE is DFHFCCT's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, TABLE_TOKEN_INVALID

FCCU PREPARE function

FCCU is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for unit of work related functions.

The PREPARE function prepares to commit a unit of work.

Input parameters

UOW_ID is the CICS unit of work identification, which is prefixed by the CFDT server with the subsystem name to form the fully qualified unit of work identifier.

TRANSACTION_NUMBER is used for debug trace purposes.

Output parameters

RESPONSE is DFHFCCU's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECOVERY_NOT_ENABLED, UOW_NOT_FOUND, UOW_MADE_NO_CHANGES, UOW_FAILED, NO_SPACE_IN_POOL, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCU RETAIN function

FCCU is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for unit of work related functions.

The RETAIN function marks a unit of work as retained.

Input parameters

UOW_ID is the CICS unit of work identification, which is prefixed by the CFDT server with the subsystem name to form the fully qualified unit of work identifier.

TRANSACTION_NUMBER is used for debug trace purposes.

Output parameters

RESPONSE is DFHFCCU's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECOVERY_NOT_ENABLED, UOW_NOT_FOUND, UOW_MADE_NO_CHANGES, UOW_FAILED, NO_SPACE_IN_POOL, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCU COMMIT function

FCCU is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for unit of work related functions.

The COMMIT function commits a unit of work.

Input parameters

UOW_ID is the CICS unit of work identification, which is prefixed by the CFDT server with the subsystem name to form the fully qualified unit of work identifier.

TRANSACTION_NUMBER is used for debug trace purposes.

Output parameters

RESPONSE is DFHFCCU's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECOVERY_NOT_ENABLED, UOW_NOT_FOUND, UOW_MADE_NO_CHANGES, UOW_FAILED, NO_SPACE_IN_POOL, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCU BACKOUT function

FCCU is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for unit of work related functions.

The BACKOUT function backs out a unit of work.

Input parameters

UOW_ID is the CICS unit of work identification, which is prefixed by the CFDT server with the subsystem name to form the fully qualified unit of work identifier.

TRANSACTION_NUMBER is used for debug trace purposes.

Output parameters

RESPONSE is DFHFCCU's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECOVERY_NOT_ENABLED, UOW_NOT_FOUND, UOW_MADE_NO_CHANGES, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCCU INQUIRE function

FCCU is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for unit of work related functions.

The INQUIRE function inquires about the status of a unit of work.

Input parameters

UOW_ID is the CICS unit of work identification, which is prefixed by the CFDT server with the subsystem name to form the fully qualified unit of work identifier.

UOW_RESTARTED is an optional parameter which indicates whether the inquire should select only units of work which have been through restart processing, and can take the values:

NO|YES

TRANSACTION_NUMBER is used for debug trace purposes.

BROWSE specifies whether the inquire is for a single unit of work or for the first or next UOW in a browse. If omitted, a single UOW inquire is performed. If specified, it can take the values

FIRST|NEXT

FIRST indicates a search for a UOWID greater than or equal to the specified UOWID, and NEXT indicates a search for a UOWID greater than the specified UOWID.

Output parameters

UOW_STATE IN_FLIGHT,IN_DOUBT,IN_COMMIT,IN_BACKOUT indicates the state of an active unit of work, and can have any of the values:

IN_FLIGHT|IN_DOUBT|IN_COMMIT|IN_BACKOUT

In_flight means that the unit of work has made some changes but has not yet reached the stage of prepare to commit. In_doubt means that it has been prepared but not committed or backed out. In_commit means that commit processing has been started. In_backout means that backout processing has been started. (When commit or backout processing completes, the unit of work is deleted).

UOW_ID is the CICS unit of work id of the UOW for which inquire data is being returned.

UOW_RESTARTED indicates whether the unit of work has been through restart processing, and can take the values:

NO|YES

UOW_RETAINED indicates whether the locks for the unit of work have been marked as retained, either explicitly within the current connection or implicitly by a restart. It can take the values:

NO|YES

RESPONSE is DFHFCCU's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECOVERY_NOT_ENABLED, UOW_NOT_FOUND

FCCU RESTART function

FCCU is the parameter list used by File Control to communicate with the Coupling Facility Data Table cross-memory server, DFHCFMN, for unit of work related functions.

The RESTART function establishes recovery status on connecting to a CFDT server.

Input parameters

UOW_SUBSYSTEM_NAME is not specified by CICS (the CICS applid is used by default).

TRANSACTION_NUMBER is used for debug trace purposes.

Output parameters

RESPONSE is DFHFCCU's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, SUBSYSTEM_ALREADY_ACTIVE, RESTART_ALREADY_ACTIVE, TABLE_OPEN_FAILED, NO_SPACE_IN_POOL, POOL_STATE_ERROR, CF_ACCESS_ERROR

FCDS EXTRACT_CFDT_STATS function

This function causes statistics relating to coupling facility data table usage to be extracted from the coupling facility data tables server.

Input parameters

FCTE_POINTER is the address of the FCTE entry of the file for which CFDT statistics are to be extracted.

RESET_STATISTICS indicates whether the statistics fields are to be reset to zero or not. It takes the values

YES|NO

TRANSACTION_NUMBER is an optional parameter which allows the transaction number to be passed to the CFDT server for inclusion in trace messages.

Output parameters

CURRENT_USERS is an optional fullword parameter which returns the current number of users of the coupling facility data table (that is, the number of opens issued against it).

MAXIMUM_RECORDS is an optional fullword parameter which returns the current value of the MAXNUMRECS limit for the data table.

CURRENT_RECORDS is an optional fullword parameter which returns the current number of records in the coupling facility data table.

HIGHEST_RECORDS is an optional fullword parameter which returns the highest number of records which have ever been in this coupling facility data table since it was last created.

CONTENTION_COUNT is an optional fullword parameter which returns the number of contentions which have been detected, for a coupling facility data table which uses the contention update model.

RESPONSE is DFHFCDS's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION, INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	CFDT_CONNECT_ERROR, CFDT_DISCONNECT_ERROR, CFDT_REOPEN_ERROR, CFDT_SERVER_NOT_AVAILABLE, CFDT_SERVER_NOT_FOUND, CFDT_STATS_ERROR, CFDT_SYSIDERR, CFDT_TABLE_GONE
INVALID	INVALID_FORMAT, INVALID_FUNCTION
DISASTER	POOL_ELEMENT_NOT_FOUND, ABEND, DISASTER_PERCOLATION

FCDS DISCONNECT_CFDT_POOLS function

This function causes CICS to disconnect from any coupling facility data table pools to which it is connected.

Input parameters: None

Output parameters

RESPONSE is DFHFCDS's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION, INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	CFDT_DISCONNECT_ERROR
INVALID	INVALID_FORMAT, INVALID_FUNCTION
DISASTER	ABEND, DISASTER_PERCOLATION

FCDU PREPARE function

This function causes the coupling facility data table server to be called to prepare a unit of work which has made recoverable updates to one or more coupling facility data tables.

Input parameters

POOL_ELEM_ADDR is the address of the pool element which identifies the coupling facility data table pool for which the prepare is to be issued. One or more of the coupling facility data tables updated by the unit of work reside in this pool. The prepare call will be issued to the CFDT server for this pool.

POOL_NAME is the name of the coupling facility data table pool. The pool name is included for diagnostic purposes.

UOW_ID is the identifier for the unit of work which is to be prepared.

Output parameters

RESPONSE is DFHFCDU's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION, INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECOVERY_NOT_ENABLED, UOW_NOT_FOUND, UOW_MADE_NO_CHANGES, UOW_FAILED, NO_SPACE_IN_POOL, POOL_STATE_ERROR, CF_ACCESS_ERROR, CFDT_SYSIDERR, CFDT_SERVER_NOT_AVAILABLE, CFDT_SERVER_NOT_FOUND, CFDT_CONNECT_ERROR, CFDT_DISCONNECT_ERROR, RESYNC_RETRY_FAILED
INVALID	INVALID_FORMAT, INVALID_FUNCTION
DISASTER	ABEND, DISASTER_PERCOLATION

FCDU RETAIN function

This function causes the coupling facility data table server to be called to convert locks held by the unit of work against recoverable coupling facility data tables into retained locks.

Input parameters

POOL_ELEM_ADDR is the address of the pool element which identifies the coupling facility data table pool for which the retain is to be issued. One or more of the coupling facility data tables updated by the unit of work reside in this pool. The retain call will be issued to the CFDT server for this pool.

POOL_NAME is the name of the coupling facility data table pool. The pool name is included for diagnostic purposes.

UOW_ID is the identifier for the unit of work for which locks are to be retained.

Output parameters

RESPONSE is DFHFCDU's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION, INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECOVERY_NOT_ENABLED, UOW_NOT_FOUND, UOW_MADE_NO_CHANGES, UOW_FAILED, NO_SPACE_IN_POOL, POOL_STATE_ERROR, CF_ACCESS_ERROR, CFDT_SYSIDERR, CFDT_SERVER_NOT_AVAILABLE, CFDT_SERVER_NOT_FOUND, CFDT_CONNECT_ERROR, CFDT_DISCONNECT_ERROR, RESYNC_RETRY_FAILED
INVALID	INVALID_FORMAT, INVALID_FUNCTION
DISASTER	ABEND, DISASTER_PERCOLATION

FCDU COMMIT function

This function causes the coupling facility data table server to be called to commit a unit of work which has made recoverable updates to one or more coupling facility data tables.

Input parameters

POOL_ELEM_ADDR is the address of the pool element which identifies the coupling facility data table pool for which the commit is to be issued. One or more of the coupling facility data tables updated by the unit of work reside in this pool. The commit call will be issued to the CFDT server for this pool.

POOL_NAME is the name of the coupling facility data table pool. The pool name is included for diagnostic purposes.

UOW_ID is the identifier for the unit of work which is to be committed.

Output parameters

RESPONSE is DFHFCDU’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION, INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECOVERY_NOT_ENABLED, UOW_NOT_FOUND, UOW_MADE_NO_CHANGES, UOW_FAILED, NO_SPACE_IN_POOL, POOL_STATE_ERROR, CF_ACCESS_ERROR, CFDT_SYSIDERR, CFDT_SERVER_NOT_AVAILABLE, CFDT_SERVER_NOT_FOUND, CFDT_CONNECT_ERROR, CFDT_DISCONNECT_ERROR, RESYNC_RETRY_FAILED
INVALID	INVALID_FORMAT, INVALID_FUNCTION
DISASTER	ABEND, DISASTER_PERCOLATION

FCDU BACKOUT function

This function causes the coupling facility data table server to be called to backout a unit of work which has made recoverable updates to one or more coupling facility data tables.

Input parameters

POOL_ELEM_ADDR is the address of the pool element which identifies the coupling facility data table pool for which the backout is to be issued. One or more of the coupling facility data tables updated by the unit of work reside in this pool. The backout call will be issued to the CFDT server for this pool.

POOL_NAME is the name of the coupling facility data table pool. The pool name is included for diagnostic purposes.

UOW_ID is the identifier for the unit of work which is to be backed out.

Output parameters

RESPONSE is DFHFCDU’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION, INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECOVERY_NOT_ENABLED, UOW_NOT_FOUND, UOW_MADE_NO_CHANGES, POOL_STATE_ERROR, CF_ACCESS_ERROR, CFDT_SYSIDERR, CFDT_SERVER_NOT_AVAILABLE, CFDT_SERVER_NOT_FOUND, CFDT_CONNECT_ERROR, CFDT_DISCONNECT_ERROR, RESYNC_RETRY_FAILED
INVALID	INVALID_FORMAT, INVALID_FUNCTION
DISASTER	ABEND, DISASTER_PERCOLATION

FCDU INQUIRE function

This function causes an INQUIRE to be issued to the coupling facility data table in order to obtain information about the status of an active unit of work. If the BROWSE parameter is specified, then the function will return the status of the next unit of work in the browse.

Input parameters

POOL_ELEM_ADDR is the address of the pool element which identifies the coupling facility data table pool for which the INQUIRE is to be issued. The inquire call will be issued to the CFDT server for this pool.

POOL_NAME is the name of the coupling facility data table pool. The pool name is included for diagnostic purposes.

UOW_ID identifies the unit of work for which status information is to be returned, or gives the previous unit of work in the browse.

UOW_RESTARTED is an optional input parameter which indicates whether or not the inquire should select only units of work which have been through restart processing. It can take the values

YES|NO

BROWSE is an optional parameter which specified whether the inquire is for a single unit of work or for the first or next UOW in a browse, and which can take the values

FIRST|NEXT

If the BROWSE parameter is omitted, the request is a single UOW inquire. The FIRST option indicates a search for a UOW id greater than or equal to the specified UOW_ID, and next indicates a search for a UOW id greater than the specified UOW_ID.

Output parameters

RETURNED_UOW_ID Is the unit of work for which the browse is returning status information.

UOW_STATE indicates the state of the unit of work, and can have the values:

```
IN_FLIGHT|IN_DOUBT|IN_COMMIT|IN_BACKOUT
```

UOW_RESTART_STATE indicates whether the unit of work has been through restart processing.

UOW_RETAINED indicates whether the locks for the unit of work have been retained.

RESPONSE is DFHFCDU’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION, INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, RECOVERY_NOT_ENABLED, UOW_NOT_FOUND, CF_ACCESS_ERROR, CFDT_SYSIDERR, CFDT_SERVER_NOT_AVAILABLE, CFDT_SERVER_NOT_FOUND, CFDT_CONNECT_ERROR, CFDT_DISCONNECT_ERROR, RESYNC_RETRY_FAILED
INVALID	INVALID_FORMAT, INVALID_FUNCTION
DISASTER	ABEND, DISASTER_PERCOLATION

FCDU RESTART function

This function establishes recovery status for a coupling facility data table pool when a CICS region has successfully connected to it.

Input parameters

POOL_ELEM_ADDR is the address of the pool element which identifies the coupling facility data table pool for recovery status is to be established. The RESTART call will be issued to the CFDT server for this pool.

POOL_NAME is the name of the coupling facility data table pool. The pool name is included for diagnostic purposes.

Output parameters

RETURNED_UOW_ID Is the unit of work for which the browse is returning status information.

UOW_STATE indicates the state of the unit of work, and can have the values:

```
IN_FLIGHT|IN_DOUBT|IN_COMMIT|IN_BACKOUT
```

UOW_RESTART_STATE indicates whether the unit of work has been through restart processing.

UOW_RETAINED indicates whether the locks for the unit of work have been retained.

RESPONSE is DFHFCDU’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION, INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_CONNECTION_FAILED, SUBSYSTEM_ALREADY_ACTIVE, RESTART_ALREADY_ACTIVE, TABLE_OPEN_FAILED, NO_SPACE_IN_POOL, CF_ACCESS_ERROR, CFDT_SYSIDERR, CFDT_SERVER_NOT_AVAILABLE, CFDT_SERVER_NOT_FOUND, CFDT_CONNECT_ERROR, CFDT_DISCONNECT_ERROR
INVALID	INVALID_FORMAT, INVALID_FUNCTION
DISASTER	ABEND, DISASTER_PERCOLATION

FCDY RESYNC_CFDT_POOL function

This function causes a coupling facility data table pool to be resynchronized.

Input parameters

POOL_NAME is the name of the coupling facility data table pool which is to be resynchronized.

Output parameters

RESPONSE is DFHFCDY’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION, INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INITIATE_RECOVERY_FAILED, TERMINATE_RECOVERY_FAILED, CFDT_SERVER_CALL_FAILED
INVALID	INVALID_FORMAT, INVALID_FUNCTION
DISASTER	ABEND, DISASTER_PERCOLATION

FCDY RESYNC_CFDT_LINK function

This function causes a link between a unit of work and a coupling facility data table pool to be resynchronized.

Input parameters

POOL_NAME is the name of the coupling facility data table pool for which the link is to be resynchronized.

UOW_ID is the unit of work ID which identifies the link to be resynchronized.

Output parameters

RESPONSE is DFHFCDY's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION, INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INITIATE_RECOVERY_FAILED, TERMINATE_RECOVERY_FAILED, CFDT_SERVER_CALL_FAILED
INVALID	INVALID_FORMAT, INVALID_FUNCTION
DISASTER	ABEND, DISASTER_PERCOLATION

FCDY RETURN_CFDT_ENTRY_POINTS function

This function causes module DFHFCDY to return the entry point addresses of the other modules with which it is link-edited.

Input parameters: None

Output parameters

CFDT_EP_DFHFCDW is the entry point address of module DFHFCDW.

CFDT_EP_DFHFCDU is the entry point address of module DFHFCDU.

RESPONSE is DFHFCDY's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION
DISASTER	ABEND, DISASTER_PERCOLATION

FCFL END_UOWDSN_BROWSE function

After a browse of all the data set failures within a unit of work, the END_UOWDSN_BROWSE function releases the storage that was used for a snapshot of the failures.

Input parameters

BROWSE_TOKEN is the token which was used for the browse.

Output parameters

RESPONSE is DFHFCFL's response to the call. It can have any of these values:

`OK|INVALID|DISASTER|PURGED`

[REASON] is returned when RESPONSE is INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_BROWSE_TOKEN
DISASTER	DISASTER_PERCOLATION, ABEND

FCFL FIND_RETAINED function

This function looks for any FLAB associated with the specified data set which is flagged as retained, indicating that there are retained locks associated with the data set.

Input parameters

DSNAME is the 44-character name of the data set for which associated retained locks are to be found.

Output parameters

RETLOCKS indicates whether or not there are retained locks associated with the data set, and can have either of these values:

`RETAINED|NORETAINED`

RESPONSE is DFHFCFL's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DISASTER_PERCOLATION, ABEND

FCFL FORCE_INDOUBTS function

This function is used by the CEMT or EXEC CICS SET DSNAME() UOWACTION(COMMIT|BACKOUT|FORCE) command. Shunted in-doubt units of work are forced to complete in the specified direction. FORCE means that the direction is obtained from the ACTION specified on the transaction definition.

Input parameters

DSNAME is the 44-character name of the data set for which shunted in-doubt units of work are to be forced to complete.

DIRECTION is the direction in which the units of work are to complete: forwards (commit), backwards (backout), or heuristic (from the action specified on the transaction definition). It can have any of these values:

`FORWARD|BACKWARD|HEURISTIC`

Output parameters

RESPONSE is DFHFCFL's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DISASTER_PERCOLATION, ABEND

FCFL GET_NEXT_UOWDSN function

This function returns the failure information for the next data set that has a failure within the unit of work being browsed.

Input parameters

BROWSE_TOKEN is the token for the browse, which was returned by a START_UOWDSN_BROWSE call.

Output parameters

DSNAME is the 44-character name of the data set for which failure information is returned.

[RLSACCESS] indicates whether the data set was last open in RLS or non-RLS access mode, and can have either of these values:

RLS|NOTRLS

[CAUSE] indicates the cause of the failure, and can have any of these values:

CACHE|RLSSERVER|CONNECTION|DATASET|UNDEFINED

[RETAIN_REASON] indicates the reason for the failure, and can have any of these values:

RLSGONE|COMMITFAIL|IOERROR|DATASETFULL|INDEXRECFULL|
OPENERROR|DELEXITERROR|DEADLOCK|BACKUPNONBWO|LOCKSTRUCFULL|
FAILEDBKOUT|NOTAPPLIC|RR_COMMITFAIL|RR_INDOUBT|

RESPONSE is DFHFCFL's response to the call. It can have any of these values:

OK|INVALID|EXCEPTION|DISASTER

[REASON] is returned when RESPONSE is EXCEPTION, INVALID, or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	END_OF_LIST
INVALID	INVALID_BROWSE_TOKEN
DISASTER	DISASTER_PERCOLATION, ABEND

FCFL RESET_BFAILS function

This function is used by the CEMT and EXEC CICS SET DSNAME() ACTION(RESETLOCKS) command. It purges shunted unit of work log records which hold backout-failure or commit-failure locks on the specified data set, and releases the locks.

Input parameters

DSNAME is the 44-character name of the data set for which backout and commit failures are to be reset.

Output parameters

RESPONSE is DFHFCFL's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DISASTER_PERCOLATION, ABEND, REMOVE_FAILURE

FCFL RETRY function

This function is used by the CEMT and EXEC CICS SET DSNAME() UOWACTION(RETRY) command. It drives retry of any failed backouts and commits for the specified data set, by informing DFHFCRR that the failed resource (that is, the data set) is now available.

Input parameters

DSNAME is the 44-character name of the data set for which backout and/or commits are to be retried.

Output parameters

RESPONSE is DFHFCFL's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DISASTER_PERCOLATION, ABEND, RESOURCE_NOT_FOUND

FCFL START_UOWDSN_BROWSE function

This function starts a browse of the data set failures within a unit of work. A snapshot of the failed data sets for the unit of work and the reasons for the failures are collected in an in-storage table to be browsed by the GET_NEXT_UOWDSN function.

Input parameters

UOW is the 8-byte local unit of work identifier.

Output parameters

BROWSE_TOKEN is a token which is used during the browse.

RESPONSE is DFHFCFL's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UOW_NOT_FOUND, NO_FLABS_FOUND
DISASTER	DISASTER_PERCOLATION, ABEND

FCFL TEST_USER function

This function is used to test if the task has updated a record, and therefore established itself as a file user, either for any data set or for a specified data set. It can be used either as a domain subroutine call or as an inline macro.

Input parameters

[ENVIRONMENT] is an optional parameter which is a fullword environment identifier. If specified, then the function will test whether the task is a user of any files within that environment.

[DSNAME] is an optional parameter which specifies that a particular data set is to be tested.

Output parameters

FLAB_PTR is the address of a FLAB which was found by the test. If a non-zero value is returned, then this means that the user is a task.

RESPONSE is DFHFCFL's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DISASTER_PERCOLATION, ABEND

FCLJ FILE_OPEN function

This function is called when a file is opened, and causes a 'tie up record' record to be written to the log of logs if either the file (or associated data set) is forward recoverable or if autojournalling is specified for the file, to the forward recovery log if the file (or associated data set) is forward recoverable, and to the autojournal if autojournalling is specified for the file.

Input parameters

FCTE_ADDRESS is the address of the file control table entry for the file being opened.

Output parameters

RESPONSE is DFHFCLJ's response to the call. It can have any of these values:

OK|INVALID|PURGED|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LG_RETURNED_ERROR

FCLJ FILE_CLOSE Function

This function is called when a file is closed, and causes a file close log record to be written to the log of logs if either the file (or associated data set) is forward recoverable or if autojournalling is specified for the file, to the forward recovery log if the file (or associated data set) is forward recoverable, and to the autojournal if autojournalling is specified for the file.

Input parameters

FCTE_ADDRESS is the address of the file control table entry for the file being closed.

Output parameters

RESPONSE is DFHFCLJ's response to the call. It can have any of these values:

OK|INVALID|PURGED|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LG_RETURNED_ERROR

FCLJ READ_ONLY Function

This function causes a read_only log record to be written to an autojournal, if read-only autojournalling is specified on the file definition. The log record is built using the input parameters.

Input parameters

BASE_ESDS_RBA is the RBA of the record being read, if the file is an ESDS.

FCTE_ADDRESS is the address of the file control table entry for the file being read.

KEY_ADDRESS is the address of the key of the record being read.

KEY_LENGTH is the key length of the record being read.

RECORD_ADDRESS is the address of the record being read.

RECORD_LENGTH is the length of the record being read.

SHUNTED indicates whether or not the unit of work has ever been shunted (due to some failure during syncpoint). It can have either of these values:

YES|NO

Output parameters

RESPONSE is DFHFCLJ's response to the call. It can have any of these values:

OK|INVALID|PURGED|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LG_RETURNED_ERROR, RM_RETURNED_ERROR

FCLJ READ_UPDATE Function

This function causes a read_update log record to be written to the system log, if the file is recoverable, and if the destination parameter specifies either LOG or BOTH. It causes a read_update log record to be written to the autojournal if journaling of read updates is specified on the file definition, and if the destination parameter specifies either JOURNAL or BOTH. The log record is built using the input parameters.

Input parameters

BASE_ESDS_RBA is the RBA of the record being read for update, if the file is an ESDS.

FCTE_ADDRESS is the address of the file control table entry for the file being read for update.

KEY_ADDRESS is the address of the key of the record being read for update.

KEY_LENGTH is the key length of the record being read for update.

RECORD_ADDRESS is the address of the record being read for update.

RECORD_LENGTH is the length of the record being read for update.

DESTINATION specifies whether the log record is to be written to the autojournal, the system log, or both. It is used to suppress writing records that would otherwise be requested by the file definition. It can have any of these values:

JOURNAL|LOG|BOTH

SYNCHRONIZE_LOG indicates whether or not the system log is to be synchronized (forced) when the log record is written. It can have either of these values:

YES|NO

SHUNTED indicates whether or not the unit of work has ever been shunted (due to some failure during syncpoint). It can have either of these values:

YES|NO

Output parameters

[LOG_TOKEN] is an optional parameter which is returned if SYNCHRONIZE(NO) was specified, and which contains a token to be used when subsequently synchronizing (forcing) the system log.

RESPONSE is DFHFCLJ's response to the call. It can have any of these values:

OK|INVALID|PURGED|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LG_RETURNED_ERROR, RM_RETURNED_ERROR

FCLJ WRITE_UPDATE Function

This function causes a write_update log record to be written to the forward recovery log, if the file (or associated data set) is forward recoverable, and to the autojournal, if journaling of write updates is specified on the file definition. A write_update log record represents the completion of a file REWRITE request. The log record is built using the input parameters.

Input parameters

BASE_ESDS_RBA is the RBA of the record being rewritten, if the file is an ESDS.

FCTE_ADDRESS is the address of the file control table entry for the file being rewritten to.

KEY_ADDRESS is the address of the key of the record being rewritten.

KEY_LENGTH is the key length of the record being rewritten to.

RECORD_ADDRESS is the address of the record being rewritten.

RECORD_LENGTH is the length of the record being rewritten.

SHUNTED indicates whether or not the unit of work has ever been shunted (due to some failure during syncpoint). It can have either of these values:

YES|NO

Output parameters

RESPONSE is DFHFCLJ's response to the call. It can have any of these values:

OK|INVALID|PURGED|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LG_RETURNED_ERROR, RM_RETURNED_ERROR

FCLJ WRITE_ADD Function

This function causes a write_add log record to be written to the system log if the file is recoverable, and if the destination parameter specifies BOTH. It causes a write_add log record to be written to the autojournal if journaling of write adds was specified on the file definition. The log record is built using the input parameters.

Input parameters

BASE_ESDS_RBA is the RBA of the record being added, if the file is an ESDS.

FCTE_ADDRESS is the address of the file control table entry for the file being written to.

KEY_ADDRESS is the address of the key of the record being added.

KEY_LENGTH is the key length of the record being written to.

MASSINSERT indicates whether or not the record is being added as part of a mass insert. It can have either of these values:

YES|NO

DESTINATION specifies whether the log record is to be written to the autojournal only, or to both the autojournal and the system log. It is used to suppress writing records that would otherwise be requested by the file definition. It can have either of these values:

JOURNAL|BOTH

RECORD_ADDRESS is the address of the record being added.

RECORD_LENGTH is the length of the record being added.

SHUNTED indicates whether or not the unit of work has ever been shunted (due to some failure during syncpoint). It can have either of these values:

YES|NO

Output parameters

RESPONSE is DFHFCLJ's response to the call. It can have any of these values:

OK|INVALID|PURGED|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LG_RETURNED_ERROR, RM_RETURNED_ERROR

FCLJ WRITE_ADD_COMPLETE Function

This function causes a write_add_complete log record to be written to the forward recovery log if the file (or associated data set) is forward recoverable, and to the autojournal if write_add_complete journaling is specified on the file definition. It causes a truncated write_add_complete log record to be written to the system log if the file is a recoverable ESDS accessed in non-RLS mode. If MASSINSERT(YES) and MASSINSERT_STAGE(LAST) are specified, then only the system log record is written, and not the forward recovery log or autojournal record. The log record is built using the input parameters.

Input parameters

BASE_ESDS_RBA is the RBA of the record that has been added, if the file is an ESDS.

FCTE_ADDRESS is the address of the file control table entry for the file that has been written to.

KEY_ADDRESS is the address of the key of the record which has been added.

KEY_LENGTH is the key length for the file which has been written to.

MASSINSERT indicates whether or not the record was added as part of a mass insert. It can have either of these values:

YES|NO

[MASSINSERT_STAGE] is an optional parameter which indicates whether the record is either the first or last record added during a massinsert sequence. It can have either of these values:

FIRST|LAST

RECORD_ADDRESS is the address of the record which has been added.

RECORD_LENGTH is the length of the record which has been added.

SHUNTED indicates whether or not the unit of work has ever been shunted (due to some failure during syncpoint). It can have either of these values:

YES|NO

Output parameters

RESPONSE is DFHFCLJ's response to the call. It can have any of these values:

OK|INVALID|PURGED|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LG_RETURNED_ERROR, RM_RETURNED_ERROR

FCLJ WRITE_DELETE Function

This function causes a write_delete log record to be written to the forward recovery log if the file (or associated data set) is forward recoverable, and to the autojournal if journaling of write_deletes is specified on the file definition. The log record is built using the input parameters.

Input parameters

BASE_ESDS_RBA is the RBA of the record being deleted, if the file is an ESDS.

FCTE_ADDRESS is the address of the file control table entry for the file.

KEY_ADDRESS is the address of the key of the record being deleted.

KEY_LENGTH is the key length for the file.

BASE_KEY_ADDRESS is the address of the base key of the record being deleted, which is used if the data set is being accessed via a path.

SHUNTED indicates whether or not the unit of work has ever been shunted (due to some failure during syncpoint). It can have either of these values:

YES|NO

Output parameters

RESPONSE is DFHFCLJ's response to the call. It can have any of these values:

OK|INVALID|PURGED|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LG_RETURNED_ERROR, RM_RETURNED_ERROR

FCLJ SYNCHRONIZE_READ_UPDATE Function

This function causes any log records previously written to the system log for this file to be synchronized (forced). The log token returned on a previous call to write a log record for this file is supplied as input.

Input parameters

FCTE_ADDRESS is the address of the file control table entry for the file being read for update.

LOG_TOKEN is the token returned on a previous call. The system log record written by the previous call, plus any log records written prior to that, are hardened.

Output parameters

RESPONSE is DFHFCLJ's response to the call. It can have any of these values:

OK|INVALID|PURGED|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, RM_RETURNED_ERROR

FCLJ TAKE_KEYPOINT Function

Provided that BWO copy is supported by this CICS (indicated by a flag in file control static storage), then this function performs a scan of the file control table and, unless it has been called within the last half hour, writes a tie up record for each file open for update in non-RLS mode that is BWO-eligible and forward recoverable to the forward recovery log.

A tie up record specifies which CICS system within the sysplex opened the file, and the data set which the file was opened against. Tie up records are used by forward recovery utilities, for example CICSVR.

Input parameters: None

Output parameters

KEYPOINT_TAKEN indicates whether or not the set of tie up records was successfully written. It can have either of these values:

YES|NO

RESPONSE is DFHFCLJ's response to the call. It can have any of these values:

OK|INVALID|PURGED|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LG_RETURNED_ERROR, TM_GETNEXT_FCTE_FAILED

FCLJ DATASET_COPY Function

This function is called when DFSMSdss initiates a copy of an RLS data set via the VSAM RLS quiesce mechanism. The function causes a 'tie up record' to be written to the log of logs if either the data set is forward recoverable, or some flavor of autojournalling has been specified in the file definition. In addition, if applicable, a record is written to the forward recovery log.

A tie up record specifies which CICS system within the sysplex opened the file, and the data set which the file was opened against. Tie up records are used by forward recovery utilities, for example CICSVR.

Input parameters

FCTE_ADDRESS is the address of the file control table entry for the file associated with a data set being copied.

Output parameters

RESPONSE is DFHFCLJ’s response to the call. It can have any of these values:

```
OK|INVALID|PURGED|DISASTER
```

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LG_RETURNED_ERROR

FCQI INITIATE_QUIESCE Function

This function takes a quiesce request of type QUIESCE, IMMQUIESCE, UNQUIESCE, QUIESCE_CANCEL, NONBWO_CANCEL or BWO_CANCEL and creates a FC Quiesce Send Element (FCQSE) to describe the request. The FCQSE is added to a chain anchored in FC static, and an ECB associated with the chain (also in FC static) is posted. DFHFCQI then either suspends until the quiesce request completes or returns immediately to its caller, depending on whether busy WAIT or NOWAIT was specified on the call.

When DFHFCQI posts the ECB, the CFQS transaction (DFHFCQS) wakes up and processes the FCQSE on the chain, calling DFHFCCA QUIESCE to issue the appropriate flavor of IDAQUIES macro to SMSVSAM. When the IDAQUIES has completed, DFHFCQS will resume DFHFCQI if it was suspended, communicating the results of the IDAQUIES via the FCQSE. The FCQSE can then be unchained and freed.

Input parameters

QUIESCE_TYPE indicates the type of quiesce being initiated and can have any of these values:

```
QUIESCE|IMMQUIESCE|UNQUIESCE|NONBWO_CANCEL|
BWO_CANCEL|QUIESCE_CANCEL
```

DSNAME is the 44-character name of the base data set to be quiesced.

BUSY indicates whether DFHFCQI is to wait for the quiesce to complete, or is to return immediately to the caller, and can take either of these values:

```
WAIT|NOWAIT
```

SOURCE indicates whether the source of the quiesce request was CICS or a user, and can take either of these values:

```
CICS|USER
```

Output parameters

RESPONSE is DFHFCQI’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is INVALID, EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_QUIESCE_TYPE
EXCEPTION	NOT_SUPPORTED, UNKNOWN_VSAM_DATASET, QUIESCE_NOT_POSSIBLE, UNQUIESCE_NOT_POSSIBLE, CANCELLED, TIMED_OUT, IOERR, SERVER_FAILURE, DATASET_MIGRATED
DISASTER	ABEND, CATALOG_ERROR, DISASTER_PERCOLATION

FCQI INQUIRE_QUIESCE Function

This function returns the quiesce state of a data set as QUIESCED, UNQUIESCED, or QUIESCING. DFHFCAT is called to inquire on the state of the ’quiesced’ bit in the VSAM ICF catalog, which will return QUIESCED or UNQUIESCED. If UNQUIESCED is returned, the FCQSE chain is then scanned to find an FCQSE specifying the data set in question. If such an FCQSE is found for a quiesce or immquiesce request then a state of QUIESCING is returned. There is no UNQUIESCING state as the unquiesce operation is far quicker than quiesce.

Input parameters

DSNAME is the 44-character name of the base data set for which quiesce state information is to be returned.

Output parameters

QUIESCESTATE indicates the quiesce state of the data set, and can have any of these values:

```
QUIESCED|UNQUIESCED|QUIESCING
```

RESPONSE is DFHFCQI’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_SUPPORTED, UNKNOWN_VSAM_DATASET, IOERR
DISASTER	ABEND, CATALOG_ERROR, DISASTER_PERCOLATION

FCQI COMPLETE_QUIESCE Function

This function is invoked whenever CICS has finished the processing for those quiesce requests for which SMSVSAM must be notified with an IDAQUIES QUICMP. Such quiesce requests are VSAM QUICLOSE (quiesce), QIOCOPY (non-BWO backup) and QUIBWO (BWO backup). This is achieved by calling DFHFCCA QUIESCE_COMPLETE to issue the IDAQUIES QUICMP macro to SMSVSAM.

Input parameters

DSNAME is the 44-character name of the base data set for which quiesce processing has been completed by this CICS.

QUIESCE_TOKEN is the token which was supplied by SMSVSAM when it drove the quiesce exit for the original quiesce request, and which must be returned on the IDAQUIES QUICMP.

Output parameters

RESPONSE is DFHFCQI’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	IOERR, SERVER_FAILURE
DISASTER	ABEND, DISASTER_PERCOLATION

FCQR RECEIVE_QUIESCES Function

This function consists of a forever loop around a dispatcher wait on an ECB. It receives work from the CICS RLS quiesce exit DFHFCQX whenever SMSVSAM requires CICS to perform processing for a quiesce request. DFHFCQX queues the request to DFHFCQR by adding an FC Quiesce Receive Element (FCQRE) to a chain anchored in file control static storage, and posting the ECB associated with the chain, also in FC static.

The posting of the ECB wakes the CFQR transaction, which executes the code in DFHFCQR. The FCQREs on the chain are processed, and DFHFCQU is called with function PROCESS_QUIESCE to perform the actual work. The ECB might also be posted to inform DFHFCQR that CICS is terminating. When DFHFCQU has finished processing, DFHFCQR unchains and frees the FCQRE.

Input parameters: None.

Output parameters

RESPONSE is DFHFCQR’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, PROCESS_QUIESCE_ERROR, DISASTER_PERCOLATION

FCQS SEND_QUIESCES Function

This function consists of a forever loop around a dispatcher wait on a list of ECBs. Work is received from tasks that wish to send a quiesce request to SMSVSAM. Such tasks call DFHFCQI with function INITIATE_QUIESCE, which queues the request to DFHFCQS by adding an FC Quiesce Send Element (FCQSE) to the chain anchored in file control static storage, and posting an ECB associated with the chain, also in FC static.

When the ECB is posted, it wakes the CFQS transaction, which executes the code in DFHFCQS. The FCQSEs on the chain are processed, and DFHFCCA is called with function QUIESCE_REQUEST to issue the appropriate flavor of IDAQUIES macro to SMSVSAM. This is an asynchronous operation, and SMSVSAM returns the address of an ECB that will be posted when the IDAQUIES completes. This is saved in the FCQSE.

DFHFCQS then goes back into its dispatcher wait. It is actually waiting on a list of ECBs, the ECB for the chain plus an ECB for **each** IDAQUIES request. It wakes and processes the chain whenever one of these ECBs is posted. The wait also specifies a timeout interval, so that IDAQUIES requests that hang can be detected. When DFHFCQS wakes up, this can mean that: there is new work on the chain, or a quiesce request has completed, or a quiesce request timed out, or CICS is terminating. When a quiesce request has completed or timed out, DFHFCQS will resume the initiating task if it is waiting, after issuing appropriate messages and invoking global user exit XFCQUIS if active.

Input parameters: None.

Output parameters

RESPONSE is DFHFCQS’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, TIMEOUT_CANCEL_ERROR, DISASTER_PERCOLATION

FCQU PROCESS_QUIESCE Function

DFHFCQU PROCESS_QUIESCE is called whenever a quiesce request is received from VSAM RLS. The quiesce exit DFHFCQX queues requests to the CFQR system transaction (DFHFCQR), which calls DFHFCQU to process each one in turn. The PROCESS_QUIESCE function is also called to implement a non-RLS variant of QUIESCE called NON_RLS_CLOSE. This is for non-RLS files, is only used internally by CICS, and does not run under the CFQR system transaction. Each quiesce request type is processed in a different way by DFHFCQU.

QUIESCE corresponds to an SMSVSAM QUICLOSE. All files open against the data set are closed, the file state of each file is set to unenabled but with a flag that says re-enable on QUIOPEN, and a QUICMP is issued for the QUICLOSE back to VSAM RLS to indicate our QUICLOSE processing is complete. The immediate option on the DFHFCQU call governs how file closes are to be performed. If NO or omitted then closes will occur when all UOWs using the data set have completed normally. If YES then all such UOWs will be force purged to speed things up.

UNQUIESCE corresponds to an SMSVSAM QUIOPEN. All files associated with the data set are checked to see if the file state requires resetting back to enabled, because it had been set unenabled by a QUICLOSE.

NONBWO_START corresponds to an SMSVSAM QUICOPY. CICS prepares for a non-BWO backup of the data set by preventing new units of work from updating the data set, allowing existing UOWs to finish updating the data set, and then issuing a QUICMP for the QUICOPY back to SMSVSAM to indicate that QUICOPY processing is complete. The files involved are not closed.

NONBWO_END corresponds to an SMSVSAM QUICEND. All files associated with the data set are checked to see if the file state requires resetting to enabled because it had been set unenabled by an OPEN failure, and a set of 'tie up records' are written for the data set.

BWO corresponds to an SMSVSAM QUIBWO. CICS prepares for a BWO backup of the data set by writing a set of 'tie up records' allowing existing units of work to finish updating the data set, and then issuing a QUICMP for the QUIBWO back to SMSVSAM to indicate that QUIBWO processing is complete. The files involved are not closed, nor are updates prevented.

BWO_END corresponds to an SMSVSAM QUIBEND. The only processing involved is to stop an existing BWO quiesce if one is in progress.

LOST_LOCKS_RECOVERED corresponds to an SMSVSAM QUILLRC. It notifies CICS that lost locks recovery has been completed for the data set throughout the sysplex. DFHFCRR is called with function LOST_LOCKS_RECOVERED to process the availability of the data set.

FORWARD_RECOVERY_COMPLETE corresponds to an SMSVSAM QUIFRC. It notifies CICS that forward recovery has been completed for the data set. DFHFCRR is called with function RESOURCE_AVAILABLE to process the availability of the data set.

CACHE_AVAILABLE corresponds to an SMSVSAM QUICA. It notifies CICS that a previously failed cache structure is now available. DFHFCRR is called with function RESOURCE_AVAILABLE to process the availability of the cache.

NON_RLS_CLOSE processes a non-RLS variant of type CLOSE called NON_RLS_CLOSE. All ACBs open against the specified non-RLS data set are closed.

Some of the requests cause global user exit XFCVSDS to be invoked if active and a DSNB exists for the data set, and XFCVSDS can suppress certain of the requests if desired. Suppression causes the quiesce request to be cancelled throughout the sysplex (by issuing the inverse quiesce request).

The types of quiesce that DFHFCQU can receive fall into two 'completion' categories.

1. Those for which VSAM does not require completion notification. For these no IDAQUIES QUICMP is issued. The successful return of the quiesce exit DFHFCQX to VSAM is sufficient. The requests in this category are:

   ```
   UNQUIESCE, NONBWO_END, BWO_END, CACHE_AVAILABLE,
   LOCKS_RECOVERY_COMPLETE, FORWARD_RECOVERY_COMPLETE.
   ```

2. Those for which VSAM requires completion notification because CICS must complete some critical processing. For these an IDAQUIES QUICMP must be issued when CICS processing is complete. The requests in this category are:

   ```
   QUIESCE, NONBWO_START, BWO_START.
   ```

Input parameters

QUIESCE_TYPE indicates the type of quiesce being requested. It can have any of these values:

```
QUIESCE|UNQUIESCE|NONBWO_START|NONBWO_END|BWO_START|
BWO_END|LOCKS_RECOVERY_COMPLETE|FORWARD_RECOVERY_COMPLETE|
CACHE_AVAILABLE|NON_RLS_CLOSE
```

DSNAME|CACHE_NAME either specifies the 44-character name of the data set to which the quiesce request applies, or (when the quiesce_type is CACHE_AVAILABLE) the 16-character name of the cache structure which has become available.

[IMMEDIATE] applies when the quiesce_type is QUIESCE or NON_RLS_CLOSE, and indicates whether units of work which have updated the data set will be forced to complete immediately, or whether the request will wait for such units of work to complete naturally. It can have either of these values:

```
YES|NO
```

[CONCURRENT] applies when the quiesce_type is NONBWO_START or BWO_START, and indicates whether the concurrent copy technique is being used. It is purely informational, and has no effect on the processing. It can have either of these values:

```
YES|NO
```

[QUIESCE_TOKEN] is a token which is supplied by SMSVSAM when certain quiesce requests are initiated, and must be passed back when the quiesce complete is issued.

Output parameters

RESPONSE is DFHFCQU's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID, EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_QUIESCE_TYPE
EXCEPTION	DSNB_NOT_FOUND
DISASTER	ABEND, DISASTER_PERCOLATION, DFHFCRR_ERROR, DFHFCQI_ERROR, DFHFCFS_ERROR, DFHTM_FAILURE

FCRR RESTART_RLS Function

This function performs a restart of the RLS component of file control. The exact processing depends on the type of restart being performed.

COLD and INITIAL: The RLS control ACB is registered, and RLS is cold started, both via calls to DFHFCCA.

WARM and EMERGENCY: The RLS control ACB is registered, and recovery information is inquired upon from SMSVSAM, both via calls to DFHFCCA. If the recovery information indicates that there are data sets in lost locks status, then the corresponding DSNBs are marked as being lost locks, and preparation for lost locks recovery is carried out. Any orphan locks are eliminated.

DYNAMIC: This type of restart occurs when a new instance of the SMSVSAM server becomes available following a previous server failure.

Having waited for file control restart to complete if it was still in progress, and for any in-progress dynamic RLS restart to complete, RLS access is drained if this has not already been done, the control ACB is registered, and recovery information is inquired upon from SMSVSAM, all three via calls to DFHFCCA. If the recovery information indicates that there are data sets in lost locks status, then the corresponding DSNBs are marked as being lost locks, and preparation for lost locks recovery is carried out. Any orphan locks are eliminated. The CICS recovery manager is called to unshunt any units of work that are backout-failed due to the SMSVSAM server failure or a general file backout failure, and any units of work that are commit-failed due to the SMSVSAM server failure.

Input parameters

TYPE_OF_RESTART indicates the type of RLS restart being performed, and can have any of these values:

COLD|WARM|EMERGENCY|DYNAMIC

Output parameters

RESPONSE is DFHFCRR's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID, EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FUNCTION, INVALID_RESTART_TYPE
EXCEPTION	REGISTER_CTL_ACB_FAILED, COLD_START_RLS_FAILED, DRAIN_RLS_FAILED, LOST_LOCKS_INFO_LOST, INQUIRE_RECOVERY_FAILED, LOST_LOCKS_COMPLETE_FAILED, ORPHAN_RELEASE_FAILED
DISASTER	DSSR_FAILED, TM_LOCATE_FAILED, TM_UNLOCK_FAILED, ABEND, DISASTER_PERCOLATION

FCRR RESOURCE_AVAILABLE function

This function causes the CICS recovery manager to be notified of the availability of the specified resource. When the resource_type is DSET, an RMRE AVAIL call is issued for the specified data set. When the resource_type is CACHE, an RMRE avail call is issued for every data set that has outstanding work shunted due either to a cache failure or to a general file backout failure. When the resource_type is OTHER, an RMRE AVAIL call is issued for the specified resource.

Input parameters

RESOURCE_TYPE is the type of resource which has become available, and can have any of these values:

DSET|CACHE|OTHER

RESOURCE_NAME is the 44-character field containing the name of the resource which has become available.

RESOURCE_NAME_LENGTH is a halfword containing the actual length of the resource name.

Output parameters

RESPONSE is DFHFCRR's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FUNCTION, INVALID_RESOURCE_TYPE
DISASTER	ABEND, DISASTER_PERCOLATION

FCRR LOST_LOCKS_RECOVERED function

This function is called when lost locks recovery for a data set has been completed by all CICS regions that were sharing it, and causes the flag in the DSNB which indicates that the data set is in lost locks state to be cleared.

Input parameters

RESOURCE_NAME is the 44-character field containing the name of the resource (data set) for which lost locks recovery has been completed.

Output parameters

RESPONSE is DFHFCRR's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID, EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FUNCTION
EXCEPTION	SPHERE_UNKNOWN
DISASTER	TM_LOCATE_FAILED, TM_UNLOCK_FAILED, ABEND, DISASTER_PERCOLATION

File Control's call back gates

Table 53 summarizes file control's call back gates. It shows the FC level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and the format for calls to the gate.

Table 53. File control's call back gates

Gate	Trace	Function	Format
RMRO	FC 0BE0 FC 0BE1	PERFORM_PREPARE PERFORM_COMMIT START_BACKOUT DELIVER_BACKOUT_DATA END_BACKOUT PERFORM_SHUNT PERFORM_UNSHUNT	RMRO
RMKP	FC 0BE0 FC 0BE1	TAKE_KEYPOINT	RMKP
RMLK	FC 24A0 FC 24A1	PREPARE COMMIT SEND_DO_COMMIT SHUNT UNSHUNT	RMLK
RMDE	FC 0BE0 FC 0BE1	START_DELIVERY DELIVER_RECOVERY DELIVER_FORGET END_DELIVERY	RMDE
LGGL	FC 2350 FC 2351	ERROR	LGGL
DMEN	FC 0BD0 FC 0BD1	NOTIFY_SMSVSAM_AVAILABLE	DMEN

You can find descriptions of these functions and their input and output parameters, in the chapters on the recovery manager, log manager, and domain manager.

The functions of the RMRO gate are processed by DFHFCRC. For PERFORM_PREPARE and PERFORM_COMMIT, DFHFCRC performs prepare and commit processing respectively for any file resources involved in the unit of work. For START_BACKOUT, DELIVER_BACKOUT_DATA and END_BACKOUT, DFHFCRC backs out changes made to file resources by the unit of work. For PERFORM_SHUNT and PERFORM_UNSHUNT, DFHFCRC respectively shunts and unshunts the file control structures representing recoverable parts of the unit of work.

The functions of the RMKP gate are processed by DFHFCRC. For TAKE_KEYPOINT, DFHFCRC performs processing required for forward recovery of BWO-eligible non-RLS files.

The functions of the RMLK gate are processed by DFHFCDW, which performs syncpoint and recovery functions for recoverable coupling facility data tables.

The functions of the RMDE gate are passed through by DFHFCRC to DFHFCIR. For START_DELIVERY, DFHFCIR takes no action. For DELIVER_RECOVERY and DELIVER_FORGET, DFHFCIR uses the log records that are delivered to it to rebuild file control structures representing the recoverable parts of each unit of work, and also rebuilds locks for non-RLS files. For END_DELIVERY, DFHFCIR notifies file control that the rebuilding of recovery information at CICS restart is now complete.

The functions of the LGGL gate are processed by DFHFCLF. For ERROR, DFHFCLF takes actions to handle a log stream failure for a general log used by file control.

The functions of the DMEN gate are processed by DFHFCES. For NOTIFY_SMSVSAM_AVAILABLE, DFHFCES calls DFHFCRR with a function of RESTART_RLS and TYPE_OF_RESTART as DYNAMIC.

Exits

The following global user exit points are provided for file control:

In DFHEIFC	XFCREQ and XFCREQC
In DFHFCFS	XFCSREQ and XFCSREQC
In DFHFCN	XFCNREC
In DFHFCRC	XFCBFAIL, XFCBOUT, XFCBOVER and XFCLDEL

The following global user exit points are provided specifically for data table services: XDTAD, XDTLC, and XDTRD.

See the *CICS Customization Guide* for further information.

Trace

The following point IDs are provided for file control:

- AP 04xx, for which the trace levels are FC 1, FC 2, and Exc
- AP 0Bxx, for which the trace levels are FC 1, FC 2, and Exc.
- AP 23xx, for which the trace levels are FC 1, FC 2, and Exc.
- AP 24xx, for which the trace levels are FC 1, FC 2, and Exc.

Note: Trace entries for shared data table services have point IDs at the lower end of the AP 0Bxx range, and a corresponding trace level of FC 2. Trace entries for coupling facility data tables are from AP 2440 upwards.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 39. Front end programming interface (FEPI)

The front end programming interface (FEPI) is an integral part of CICS Transaction Server for OS/390 Release 3. The function is called a front end programming interface because it enables you to write CICS application programs that access other CICS or IMS programs. In other words, it provides a front end to those programs.

Design overview

This section describes how FEPI works at a high level. It discusses how the FEPI functions are provided within CICS.

FEPI as a CICS transaction

The main functions of FEPI are provided through the **CSZI** transaction, which is defined in group DFHFEPI. CSZI runs the FEPI Resource Manager, which is responsible for most of the functions of FEPI.

The FEPI Resource Manager transaction is attached during a late stage of CICS initialization. CSZI runs as a high-priority CICS system task, and cannot be canceled by an operator; it is terminated during CICS shutdown processing.

The FEPI commands communicate with the Resource Manager through the FEPI adapter program, which is loaded when CICS initializes, and is part of the CICS nucleus.

The FEPI adapter receives information from FEPI commands through two EXEC stubs, **DFHESZ** and **DFHEIQSZ**. DFHESZ handles the FEPI application programming commands, while DFHEIQSZ handles the system programming commands.

These two EXEC stubs call the adapter to do FEPI work. The adapter communicates with the Resource Manager through work queues. See “Application flows” for details of these flows.

Application flows

“FEPI as a CICS transaction” outlined the main components of FEPI. This section shows the pathways followed by a FEPI command.

Application programming command flows: The FEPI application programming commands flow through the normal EXEC CICS route into DFHEIP, from where they are routed to DFHESZ. DFHESZ passes the command parameter list to the FEPI adapter. After checking and other processing, the adapter generates another parameter list in internal format, and places it on a queue for the FEPI Resource Manager to process.

While the adapter is waiting for the Resource Manager to process the command, it issues a wait. The event control block (ECB) for this wait is contained in the parameter list queued to the Resource Manager. Consequently, the application that issued the FEPI command is in a wait state while the Resource Manager is processing the FEPI command. For information about wait processing, see the *CICS Problem Determination Guide*.

When the Resource Manager has retrieved the command from its queue, and processed it, the ECB is posted, thus ending the wait.

Control returns from the adapter to DFHEIP, and the application program in the normal fashion.

Figure 62 shows this processing. Note that the details are for illustration only.

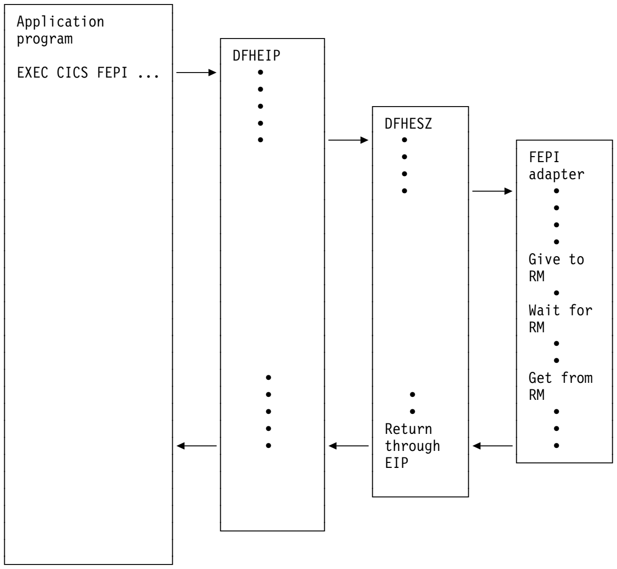


Figure 62. FEPI application programming command flows

System programming command flows: The FEPI system programming commands flow through DFHEIQSZ rather than DFHESZ, but the overall picture is the same as for FEPI application programming requests.

However, some system commands can flow directly to the FEPI Resource Manager, bypassing the EXEC stub. These commands are mainly concerned with FEPI processing to be done at “special” events, such as task termination and CICS shutdown.

Figure 63 on page 324 shows this processing. The details are for illustration only.

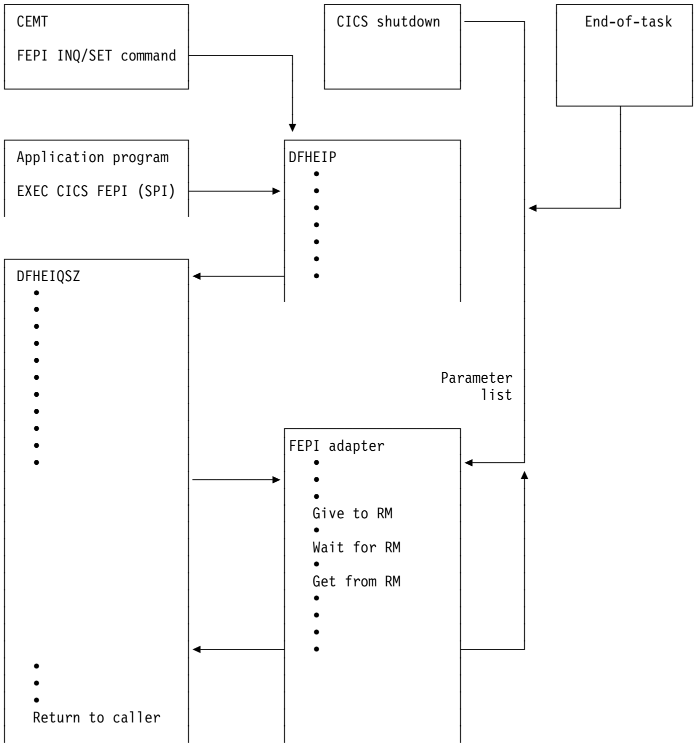


Figure 63. FEPI system programming command flows

Logic flow within the FEPI adapter: Figure 64 shows the logic flow within the FEPI adapter in more detail. In particular, it shows the points at which the FEPI global user exits, XSZBRQ and XSZARQ, and the FEPI journaling function, are invoked.

Journaling of data occurs after the Resource Manager has processed the request, but before XSZARQ is called (if active). Data is not journaled if your XSZBRQ exit program rejects the request.

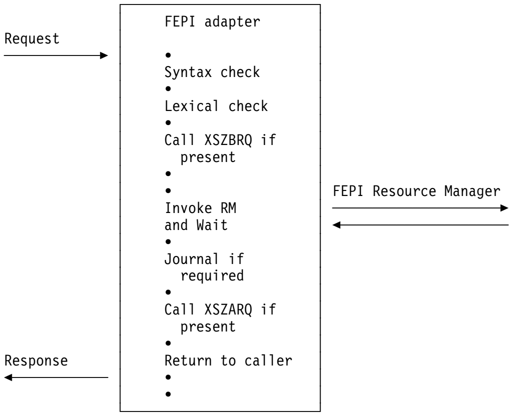


Figure 64. Logic flow within the FEPI adapter

The FEPI adapter and Resource Manager: The FEPI adapter runs as part of the invoking CICS task, and so runs under the **QR** task control block (TCB). The FEPI Resource Manager, running as CSZI, runs under the **SZ** TCB (reserved for use by the Resource Manager).

Consequently, the interface between the adapter and the Resource Manager uses waits and queues to synchronize access. The control block used to pass information between the adapter and the Resource Manager is called the **DQE**.

Figure 65 shows this interaction. The details are for illustration only.

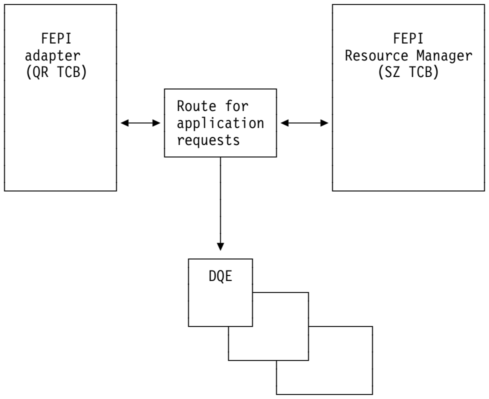

FEPI adapter (QR TCB)
Route for application requests
FEPI Resource Manager (SZ TCB)
DQE

Figure 65. Interaction of the FEPI adapter and Resource Manager

The FEPI Resource Manager work queues

When organizing its work, the FEPI Resource Manager uses a mechanism that is optimized for the FEPI environment. Each DQE is chained to a queue representing the work to be done next.

The most common mechanism used for this movement between queues is the connection on which the original FEPI command is operating.

Summary of Resource Manager work queues: In addition to the application queue, there are other queues used only by the Resource Manager. They are:

API/Norm
Used for FEPI application requests

API/Expd
Used for FEPI high-priority application requests

PRB
Used for Resource Manager internal work

PRB/Time
Used for Resource Manager internal time-dependent work

IRB
Used to control work done in VTAM exits

IRB/Time
Used to control time-dependent work done in VTAM exits

TPEND8
Used to process VTAM TPEND8 conditions

Timer
Used to control timer-related work

Free
Used to hold VTAM RBs that have to be freed

Discard
Used to control requests initiated by FEPI DISCARD commands.

CICS work
Used to schedule work that has to run under the CICS QR TCB.

Control blocks

This section lists *some* of the FEPI control blocks and their resident storage subpools, where applicable. For details of the subpools, see Chapter 74, “Storage manager domain (SM)” on page 527.

DFHSZSDS (Static area)
Used to anchor all FEPI storage

DFHSZDCM (Common area)
Used to anchor all FEPI Resource Manager storage (*SZSPFCCM*)

DFHSZDND (Node)
Represents a node (*SZSPFCND*)

DFHSZDPD (Pool)
Represents a pool (*SZSPFCPD*)

DFHSZDTD (Target)
Represents a target (*SZSPFCTD*)

DFHSZDPS (Propertyset)
Represents a property set (*SZSPFCPS*)

DFHSZDCD (Connection)
Represents a connection (a node-target pair) (*SZSPFCCD*)

DFHSZDCV (Conversation)
Represents a FEPI conversation (*SZSPFCCV*)

DFHSZDSR (Surrogate)
Used to associate nodes, pools, and targets with other control blocks—*not* to be confused with a CICS surrogate terminal (*SZSPFCSR*)

DFHSZDQE (Queue element)
Used to schedule Resource Manager work (*SZSPFCWE*).

Some of the relations between FEPI control blocks are shown in Figure 66.

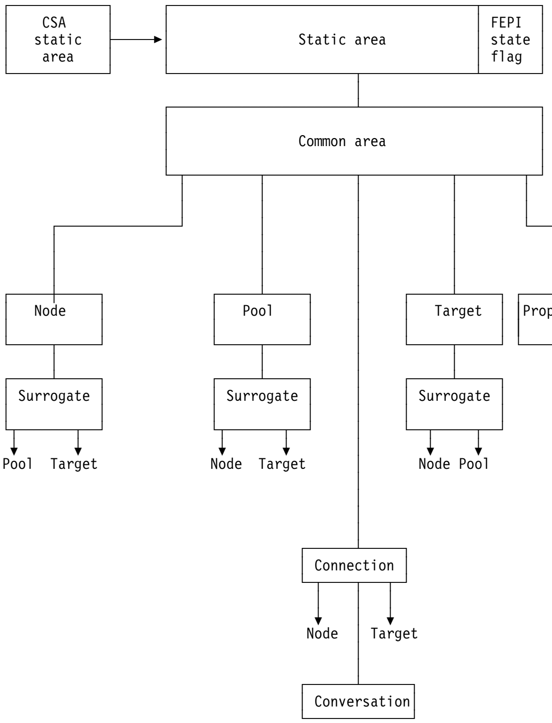


Figure 66. FEPI control block relationships

Dump

This section documents the areas that can be listed by the FEPI dump routines. For information about how to use these facilities for problem determination, see the *CICS Problem Determination Guide*.

Note: The length of areas described in this section may change in future versions or releases of CICS. Any status values interpreted may also be open to change. So you should use diagrams and descriptions in this section only as *illustrations* of how to interpret FEPI dumps.

Here is a list all the FEPI areas that can be interpreted. If an area does not exist in your system, it does not appear in the dump—no error message is produced.

- The static area
- The common area:
  - The temporary ACB.
- Property sets
- Pools:
  - Connections within the pool
  - Node surrogates chained to the pool
  - Target surrogates chained to the pool
  - Queued allocate DQEs waiting within the pool
- Nodes:
  - Connections used by the node
  - Pool surrogates chained to the node
  - Node’s ACB
  - Node’s RPL
  - Unsolicited BINDs queued to the node

- Targets:
  - Connections used by the target
  - Connections queueing on the target
  - Pool surrogates chained to the target
- Connections:
  - Current API request
  - Connection's RPL
  - Connection's RESP data
  - Formatted data extension:
    - Graphics plane
    - Attributes
    - Highlights
    - Color
    - Selection
    - Validation
- Active conversations
- Browse conversations
- Inactive conversations
- CICS work queues
- PRB DQEs
- PRB time DQEs
- IRB DQEs
- IRB time DQEs
- TPend8 DQEs
- Discard DQEs
- API normal DQEs
- API expd DQEs
- Timer DQEs
- Free RBs
- The stacks (level 2 only).

A DQE is interpreted further, as follows:

- The DRP representing the DQE
- The DQE associated storage
- Any horizontal DQE extension (chained) DQEs.

The following sections describe *some* of the areas interpreted.

The static area

```
==SZ.Static FEPI Static Area
 SZSDS 03AF6710 FEPI Static Area (Status is Open) 1
    0000  01406EC4 C6C8E2E9 E2C4E240 40404040  00000003 00030001 00000000 00000000  *. >DFHSZSDS     ................*    03AF6710
    0020  00000000 03B78000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03AF6730
    0040  04B96440 000000DC 04B964F0 000000DD  04B965A0 000000DE 04B96650 000000DF  *... .......0...............&....*    03AF6750
    0060  04B96700 000000E0 04B967B0 000000E1  04B96860 000000E2 04B96910 000000E3  *..................-...S.......T*    03AF6770
    0080  04B969C0 000000E4 04B96A70 000000E5  04B96B20 000000E6 04B96BD0 000000E7  *.......U.......V..,....W..,....X*    03AF6790
    00A0  04B96C80 000000E8 04B96DE0 000000EA  04B96E90 000000EB 04B96D30 000000E9  *..%....Y.._.......>......_....Z*    03AF67B0
    00C0  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03AF67D0
    00E0 -    013F LINES SAME AS ABOVE                                                                                    03AF67F0
```

1 This shows the status of the FEPI system; that is, whether or not it was running.

The common area

```
==SZ.Common FEPI Common Area
 SZDCM 1AE1A000 FEPI Common Area
    0000  01A86EC4 C6C8E2E9 C4C3D400 00000000  1C0E55A0 000000DB 1AE1A000 00000000  *.y>DFHSZDCM.....................*    1AE1A000
    0020  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    1AE1A020
    0040  00000000 00000000 00000000 1AE1D000  1BEE7210 1BEE72F0 1BEE7280 1BEE7360  *.......................0.......-*    1AE1A040
    0060  1AE1B000 00000000 00000000 1AE345A0  00000000 00000000 00000000 1AE2F000  *.............T...............S0.*    1AE1A060
    0080  00000000 1AD7F710 1BEE71C8 0007A630  00010000 0000000E 00001000 00000000  *.....P7....H..w.................*    1AE1A080
    00A0  00000000 00000F70 0000000E 00000000  1AC9F990 1AE18000 0000006C 1BEEB1B0  *.................I9........%....*    1AE1A0A0
    00C0  1AE1A000 1AE182B0 00000028 1BEEB20F  1AE2CB5C 1BEE71C8 0000000B 00000000  *......b..........S.*...H........*    1AE1A0C0
    00E0  9BEEA56E 1AE2CA28 1AE18000 1AE2CA28  9BEEAF0E 00000000 1AE1A114 1AE1A118  *..v>.S.......S..................*    1AE1A0E0
    0100  1AE1A11C 1AE1A120 1AE1A124 1AE1A128  9AE1A12C 00000000 00000000 00000000  *................................*    1AE1A100
    0120  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    1AE1A120
    0140  00000000 00000000 00000000 00000000  13000001 1AE1A16C 1AE1A168 1BF023C8  *.......................%.....0.H*    1AE1A140
    0160  1AE1A000 00000000 00000064 0002F6C1  00000000 00000000 00000000 00000000  *..............6A................*    1AE1A160
    0180  00002000 00010000 00000000 00000001  00000000 0000003C 00000078 00000005  *................................*    1AE1A180
    01A0  00000000 00000000                                                         *........                        *    1AE1A1A0
Dispatcher Status is Running,CICS Trigger(No ),Recovery Trigger(No ). Receive-Any Size = 00004096 1
Current Request is at address 1AE2F000 Current Timer Element is at address 00000000 2
Exit footprints :  TPEND, NSEXIT, SCIP, LOSTTERM, RECVANY, Common, DFASY, SETLOGON 3
LU2  footprints :  Send, Drain, REC(Spec), REQSESS, OPNSEC
LUP  footprints :  Send, Drain, REC(Spec), REQSESS, OPNSEC
RPL  footprints :  REQSESS, RA(A) issue, UnSolBind, RA(A) fdbk, IRB fdbk
```

1 This shows whether the FEPI Resource Manager was active.

2 This shows details of the currently executing item.

3 This shows whether one of the VTAM exits was active (none in this case). If an exit was active, it is shown preceded by an equals (=) character.

Property sets

```
==SZ.Prop FEPI Propertysets
 SZDPS.YRAH1 03B98370 FEPI Propertyset
    0000  00706EC4 C6C8E2E9 C4D7E200 00000000  04B96A70 000000E5 03B98370 00000000  *..>DFHSZDPS............V..c.....*    03B98370
    0020  03B98420 03B982C0 E8D9C1C8 F1404040  00000000 00000000 00000000 00000000  *..d...b.YRAH1   ................*    03B98390
    0040  00000000 00001000 00000004 0215021E  02200222 02120214 00000000 00000000  *................................*    03B983B0
    0060  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03B983D0
    0080  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03B983F0
    00A0  00000000 00000000 00000000 00000000                                       *................                *    03B98410
```

This shows details of the property set, which defines the characteristics of FEPI pools.

Pools

```
==SZ.Pool FEPI Pools
 SZDPD.P1 03B97000 FEPI Pool (created from Propertyset Y1      ) 1
    0000  008C6EC4 C6C8E2E9 C4D7C400 00000000  04B969C0 000000E4 03B97000 00000000  *..>DFHSZDPD............U........*    03B97000
    0020  03B97110 00000000 D7F14040 40404040  E8F14040 40404040 03BA9440 03BA9000  *........P1      Y1      ..m ....*    03B97020
    0040  03BAA2E0 00000000 00490226 00000000  00000000 00000000 00000000 00000000  *..s.............................*    03B97040
    0060  00001000 00000003 0215021E 02200222  02120214 00000000 00000000 00000000  *................................*    03B97060
    0080  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03B97080
    00A0  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03B970A0
    00C0  00000000 00000000 00000000 F1F2F3F4  F5F6F7F8 F9F0F1F2 F3F4F5F6 F7F8F9F0  *............12345678901234567890*    03B970C0
    00E0  F1F2F3F4 F5F6F7F8 F9F0F1F2 F3F4F5F6  F7F8F9F0 F1F2F3F4 F5F6F7F8 F9F0F1F2  *12345678901234567890123456789012*    03B970E0
    0100  F3F4F5F6 F7F8F9F0 F1F2F3E7                                                *34567890123X                    *    03B97100
          User Data is :1234567890123456789012345678901234567890123456789012345678901234567890123X
          Pool is using the Connection at address 03BAA2E0 2
 SZDSR 03BA9440 FEPI Pool's Surrogate refers to Node IYAEZM42 at address 03B9C1C0 3
    0000  003C6EC4 C6C8E2E9 C4E2D900 00000000  04B96C80 000000E8 03BA9440 00000000  *..>DFHSZDSR.......%....Y..m ....*    03BA9440
    0020  00000000 03BA9400 03BA95C0 00000000  03B97000 03B9C1C0 00000000           *......m...n...........A.....    *    03BA9460
 SZDSR 03BA9000 FEPI Pool's Surrogate refers to Target CSYSE6   at address 03BA8000 4
    0000  003C6EC4 C6C8E2E9 C4E2D900 00000000  04B96C80 000000E8 03BA9000 00000000  *..>DFHSZDSR.......%....Y........*    03BA9000
    0020  00000000 00000000 03BA9040 00000000  03B97000 03BA8000 00000000           *........... ................    *    03BA9020
5
```

1 Refers to the property set that defines the characteristics of the pool.

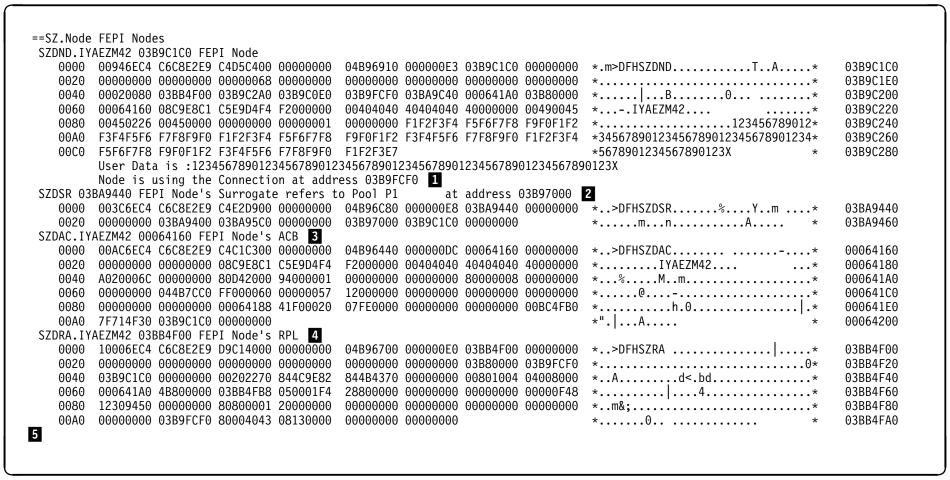
2 Shows the connections within the pool.

3 Shows the node surrogates chained to the pool.

4 Shows the pool surrogates chained to the pool.

5 There are no ACB, RPL, and unsolicited bind areas for this pool (no queued allocated DQEs within the pool). If there were, the areas would be shown here.

Nodes



```
==SZ.Node FEPI Nodes
 SZDND.IYAEZM42 03B9C1C0 FEPI Node
    0000  00946EC4 C6C8E2E9 C4D5C400 00000000  04B96910 000000E3 03B9C1C0 00000000  *.m>DFHSZDND............T..A.....*    03B9C1C0
    0020  00000000 00000000 00000068 00000000  00000000 00000000 00000000 00000000  *................................*    03B9C1E0
    0040  00020080 03BB4F00 03B9C2A0 03B9C0E0  03B9FCF0 03BA9C40 000641A0 03B80000  *......|...B........0... ........*    03B9C200
    0060  00064160 08C9E8C1 C5E9D4F4 F2000000  00404040 40404040 40000000 00490045  *...-.IYAEZM42....        .......*    03B9C220
    0080  00450226 00450000 00000000 00000001  00000000 F1F2F3F4 F5F6F7F8 F9F0F1F2  *....................123456789012*    03B9C240
    00A0  F3F4F5F6 F7F8F9F0 F1F2F3F4 F5F6F7F8  F9F0F1F2 F3F4F5F6 F7F8F9F0 F1F2F3F4  *34567890123456789012345678901234*    03B9C260
    00C0  F5F6F7F8 F9F0F1F2 F3F4F5F6 F7F8F9F0  F1F2F3E7                             *5678901234567890123X            *    03B9C280
          User Data is :1234567890123456789012345678901234567890123456789012345678901234567890123X
          Node is using the Connection at address 03B9FCF0 1
 SZDSR 03BA9440 FEPI Node's Surrogate refers to Pool P1       at address 03B97000 2
    0000  003C6EC4 C6C8E2E9 C4E2D900 00000000  04B96C80 000000E8 03BA9440 00000000  *..>DFHSZDSR.......%....Y..m ....*    03BA9440
    0020  00000000 03BA9400 03BA95C0 00000000  03B97000 03B9C1C0 00000000           *......m...n...........A.....    *    03BA9460
 SZDAC.IYAEZM42 00064160 FEPI Node's ACB 3
    0000  00AC6EC4 C6C8E2E9 C4C1C300 00000000  04B96440 000000DC 00064160 00000000  *..>DFHSZDAC........ .......-....*    00064160
    0020  00000000 00000000 08C9E8C1 C5E9D4F4  F2000000 00404040 40404040 40000000  *.........IYAEZM42....        ...*    00064180
    0040  A020006C 00000000 80D42000 94000001  00000000 00000000 80000008 00000000  *...%.....M..m...................*    000641A0
    0060  00000000 044B7CC0 FF000060 00000057  12000000 00000000 00000000 00000000  *......@....-....................*    000641C0
    0080  00000000 00000000 00064188 41F00020  07FE0000 00000000 00000000 00BC4FB0  *...........h.0................|.*    000641E0
    00A0  7F714F30 03B9C1C0 00000000                                                *".|...A.....                    *    00064200
 SZDRA.IYAEZM42 03BB4F00 FEPI Node's RPL 4
    0000  10006EC4 C6C8E2E9 D9C14000 00000000  04B96700 000000E0 03BB4F00 00000000  *..>DFHSZRA ...............|.....*    03BB4F00
    0020  00000000 00000000 00000000 00000000  00000000 00000000 03B80000 03B9FCF0  *...............................0*    03BB4F20
    0040  03B9C1C0 00000000 00202270 844C9E82  844B4370 00000000 00801004 04008000  *..A.........d<.bd...............*    03BB4F40
    0060  000641A0 4B800000 03BB4FB8 050001F4  28800000 00000000 00000000 00000F48  *..........|....4................*    03BB4F60
    0080  12309450 00000000 80800001 20000000  00000000 00000000 00000000 00000000  *..m&;...........................*    03BB4F80
    00A0  00000000 03B9FCF0 80004043 08130000  00000000 00000000                    *.......0.. .............        *    03BB4FA0
5
```

1 Shows the connections used by the node.

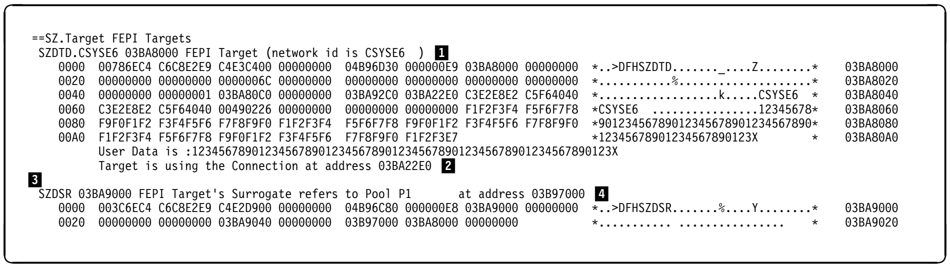
2 Shows the pool surrogates chained to the node.

3 Shows the node’s ACB.

4 Shows the node’s RPL.

5 There are no unsolicited binds outstanding for this nodes. If there were, the areas would be shown here.

Targets



```
==SZ.Target FEPI Targets
 SZDTD.CSYSE6 03BA8000 FEPI Target (network id is CSYSE6  ) 1
    0000  00786EC4 C6C8E2E9 C4E3C400 00000000  04B96D30 000000E9 03BA8000 00000000  *..>DFHSZDTD......._....Z........*    03BA8000
    0020  00000000 00000000 0000006C 00000000  00000000 00000000 00000000 00000000  *...........%....................*    03BA8020
    0040  00000000 00000001 03BA80C0 00000000  03BA92C0 03BA22E0 C3E2E8E2 C5F64040  *..................k.....CSYSE6  *    03BA8040
    0060  C3E2E8E2 C5F64040 00490226 00000000  00000000 00000000 F1F2F3F4 F5F6F7F8  *CSYSE6  ................12345678*    03BA8060
    0080  F9F0F1F2 F3F4F5F6 F7F8F9F0 F1F2F3F4  F5F6F7F8 F9F0F1F2 F3F4F5F6 F7F8F9F0  *90123456789012345678901234567890*    03BA8080
    00A0  F1F2F3F4 F5F6F7F8 F9F0F1F2 F3F4F5F6  F7F8F9F0 F1F2F3E7                    *123456789012345678901 23X       *    03BA80A0
          User Data is :1234567890123456789012345678901234567890123456789012345678901234567890123X
          Target is using the Connection at address 03BA22E0 2
3
 SZDSR 03BA9000 FEPI Target's Surrogate refers to Pool P1       at address 03B97000 4
    0000  003C6EC4 C6C8E2E9 C4E2D900 00000000  04B96C80 000000E8 03BA9000 00000000  *..>DFHSZDSR.......%....Y........*    03BA9000
    0020  00000000 00000000 03BA9040 00000000  03B97000 03BA8000 00000000           *........... ................    *    03BA9020
```

1 Shows the applid (network id) of the target.

2 Shows the connections used by the target.

3 There are no connections queuing on the target. If there were, the areas would be shown here.

4 Shows the pool surrogates chained to the target.

Connections

```
==SZ.Conn FEPI Connections
 SZDCD 03BAA2E0 FEPI Connection
   0000  01286EC4 C6C8E2E9 C4C3C400 00000000  04B964F0 000000DD 03BAA2E0 00000000  *..>DFHSZDCD........0......s.....*    03BAA2E0
   0020  00000000 00000000 00000064 00000000  00000000 00000000 00000000 00000001  *................................*    03BAA300
   0040  00000000 00000000 000000C0 C0000810  00000000 03B9F000 00000000 00000000  *......................0.........*    03BAA320
   0060  00000000 00000000 050001EB 00000000  00000000 00010000 00000000 12950000  *.............................n..*    03BAA340
   0080  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03BAA360
   00A0  00000000 00000000 00000000 C4F4C1F3  F2F7F8F2 00000000 00000000 00000000  *...........D4A32782.............*    03BAA380
   00C0  00000000 00000000 03BAA170 03BAAB80  00000000 03BAA450 03BAA170 03B97000  *.....................u&;........*    03BAA3A0
   00E0  03BA8000 03B9C1C0 00000000 00490045  00450226 01E50000 00000000 00000001  *......A..............V..........*    03BAA3C0
   0100  03BAB200 03BAA450 03BAA170 00000000  00000000 00000000 00000000 00000000  *......u&;.......................*    03BAA3E0
   0120  00000000 F1F2F3F4 F5F6F7F8 F9F0F1F2  F3F4F5F6 F7F8F9F0 F1F2F3F4 F5F6F7F8  *....1234567890123456789012345678*    03BAA400
   0140  F9F0F1F2 F3F4F5F6 F7F8F9F0 F1F2F3F4  F5F6F7F8 F9F0F1F2 F3F4F5F6 F7F8F9F0  *90123456789012345678901234567890*    03BAA420
   0160  F1F2F3E7 00000000                                                        *123X....                        *    03BAA440
         Status is DTR   Reset,Free,OutB,¬CD,Lose,RA Data abs,RA Resp abs  1
         Connection is using the Conversation at address 00000000  2
         User Data is :1234567890123456789012345678901234567890123456789012345678901234567890123X
 SZDRA 03B9F000 FEPI Connection's RPL  3
   0000  01286EC4 C6C8E2E9 C4C3C400 00000000  04B964F0 000000DD 03B9F000 00000000  *..>DFHSZDCD........0......0.....*    03B9F000
   0020  03BADE60 03B9F450 0000006E 08000000  003C0000 00000000 00000000 00000001  *...-..4&;..>....................*    03B9F020
   0040  00000000 80800000 00000100 00000010  00000000 00000000 00000000 00000000  *................................*    03B9F040
   0060  00000000 00000000 00000000 00000000  000000C5 00010000 00000000 00000000  *...................E............*    03B9F060
   0080  00000000 00000000 08570002 00000000  00000000 00000000 00000000 00000000  *................................*    03B9F080
   00A0  00000000 00000000 00000000 C4F4C1F3  F2F7F8F2 00000000                    *...........D4A32782....         *    03B9F0A0
4
 SZDDS 03BAB200 FEPI Connection's Format Extension  5
   0000  00F86EC4 C6C8E2E9 C4C4E200 00000000  04B967B0 000000E1 03BAB200 00000000  *.8>DFHSZDDS.....................*    03BAB200
   0020  00000000 00000000 00000000 00000000  03BB3000 03BB3780 00000000 00000000  *................................*    03BAB220
   0040  00000000 00000000 00000000 00000000  00000000 00000000 00000000 03BAA2E0  *..............................s.*    03BAB240
   0060  00000F00 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03BAB260
   0080  00000780 50185018 50180000 00000000  00000000 07000000 07000000 02004000  *....&;&;&;..................... .*    03BAB280
   00A0  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03BAB2A0
   00C0  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03BAB2C0
   00E0  00000000 00000000 00000000 00000000  00000000 00000000                    *........................        *    03BAB2E0
         Current Cursor position X'00000000' Current Buffer address X'00000000'
         Screen sizes Current/Default/Alt 024*080/024*080/024*080
 SZDDS.Pgraphic 03BB3000 FEPI Formatted Connection's Graphics Plane
5a
   0000  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03BB3000
   0020 -    077F LINES SAME AS ABOVE                                                                                       03BB3020
 SZDDS.Pattr 03BB3780 FEPI Formatted Connection's Attribute Plane
5a
   0000  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03BB3780
   0020 -    077F LINES SAME AS ABOVE                                                                                       03BB37A0
```

1 Shows the more significant VTAM statuses of the connection.

2 Shows the address of the conversation (if any) currently running over the connection.

3 Shows the connection's RPL.

4 There is no RESP data for this connection. If there were, it would be shown here.

5 Shows the connection's formatted data extension.

5a Shows some of the planes of the formatted data extension.

Only some of the format planes are present.

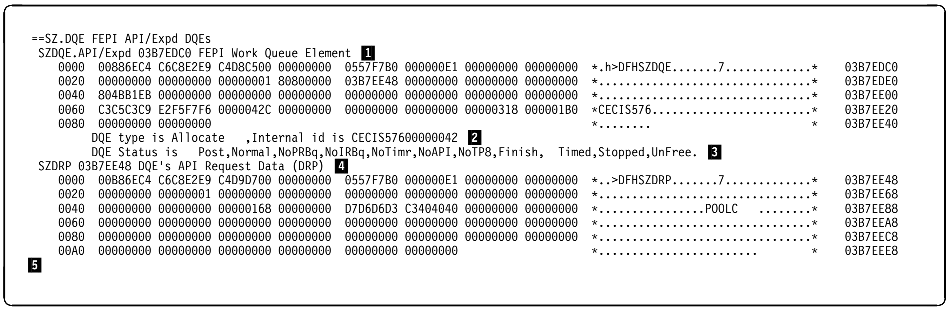
Conversations

```
==SZ.Conv FEPI Active   Conversations  1
 SZDCV 03B9A000 FEPI Active   Conversation
   0000  00686EC4 C6C8E2E9 C4C3E500 00000000  04B96650 000000DF 00000000 00000000  *..>DFHSZDCV........&;...........*    03B9A000
   0020  00000000 00000000 03BA3480 00001000  00000001 00000000 C3C5C3C9 C5F1F7F7  *........................CECIE177*    03B9A020
   0040  0000050C 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*    03B9A040
   0060  00000000 00000000                                                        *........                        *    03B9A060
Conversation 0000000100000000's internal id is CECIE17700000050 and is in session with the connection at address 03BA3480  2
```

1 Shows the conversation type (active, browse, or inactive).

2 Shows the address (if any) of the connection that is running the conversation, and the internal id of the conversation. The internal id of the conversation is a combination of the CICS transid, termid, and task number for the task running the FEPI request (these can be nulls if there is not a current task).

DQEs



```
==SZ.DQE FEPI API/Expd DQEs
 SZDQE.API/Expd 03B7EDC0 FEPI Work Queue Element 1
   0000  00886EC4 C6C8E2E9 C4D8C500 00000000  0557F7B0 000000E1 00000000 00000000  *.h>DFHSZDQE.......7.............*   03B7EDC0
   0020  00000000 00000000 00000001 80800000  03B7EE48 00000000 00000000 00000000  *................................*   03B7EDE0
   0040  804BB1EB 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*   03B7EE00
   0060  C3C5C3C9 E2F5F7F6 0000042C 00000000  00000000 00000000 00000318 000001B0  *CECIS576........................*   03B7EE20
   0080  00000000 00000000                                                         *........                        *   03B7EE40
        DQE type is Allocate   ,Internal id is CECIS57600000042 2
        DQE Status is   Post,Normal,NoPRBq,NoIRBq,NoTimr,NoAPI,NoTP8,Finish,  Timed,Stopped,UnFree. 3
 SZDRP 03B7EE48 DQE's API Request Data (DRP) 4
   0000  00B86EC4 C6C8E2E9 C4D9D700 00000000  0557F7B0 000000E1 00000000 00000000  *..>DFHSZDRP.......7.............*   03B7EE48
   0020  00000000 00000001 00000000 00000000  00000000 00000000 00000000 00000000  *................................*   03B7EE68
   0040  00000000 00000000 00000168 00000000  D7D6D6D3 C3404040 00000000 00000000  *................POOLC   ........*   03B7EE88
   0060  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*   03B7EEA8
   0080  00000000 00000000 00000000 00000000  00000000 00000000 00000000 00000000  *................................*   03B7EEC8
   00A0  00000000 00000000 00000000 00000000  00000000 00000000                    *........................        *   03B7EEE8
5
```

1 Shows the type of the DQE.

2 Shows the work the DQE is controlling, and the internal id of the connection on which it is processing.

3 Shows various significant statuses associated with the DQE.

4 Shows the DRP representing the DQE.

5 This DQE does not have any horizontal extensions, nor any associated storage area. If there were any, they would be shown here.

FEPI and VTAM

This section outlines how FEPI interacts with VTAM, and discusses VTAM control blocks and exits.

You should refer to the *OS/390 eNetwork Communications Server: SNA Programming* manual for all information relating to VTAM programming.

VTAM control blocks

FEPI uses standard VTAM programming facilities for its communication. The way in which VTAM control blocks interact with FEPI control blocks is as follows:

ACBs
Each FEPI node represents a terminal connected to the partner system. Consequently, each node has an **access control block** (ACB). This ACB is opened when the node is acquired, and closed when the node is released.

NIBs
Each FEPI target contains the applid of the back-end system. This is used to build a **node initialization block** (NIB), when a connection is acquired by issuing a VTAM REQSESS request. In common with CICS data communication, the "confidential" flag is set off.

RPLs
There are two types of **request parameter list** (RPL) used by FEPI:

- Each FEPI outbound request causes the generation of an RPL. This RPL lasts only for the duration of the FEPI request.
- Each FEPI node has a "Receive-Any" RPL. When an inbound flow occurs, this RPL is attached to the FEPI connection, and turned into a "Receive-Specific" RPL. When the flow has been received, a new "Receive-Any" RPL is generated and attached to the node.

VTAM exits

FEPI communicates with VTAM as asynchronously as possible. Therefore, VTAM exits are extensively used for FEPI communication. The following VTAM exits receive control at specific stages of the communication process:

DFASY
Processes the receipt of expedited-data-flow control indicators.

LOGON
Processes the receipt of a CINIT in which FEPI is acting as the primary logical unit (PLU).

LOSTERM
Processes the loss of a session.

NSEXIT
Processes:

- The failure of a process that was responded to positively
- A session outage
- The receipt of network service RUs.

SCIP
Processes the receipt of session-control requests.

TPEND
Processes the termination of VTAM.

Modules

Module	Function
DFHSZATC	adaptor command tables
DFHSZATR	adaptor program
DFHSZBCL	cleanup API requests at error routine
DFHSZBCS	RM collect statistics
DFHSZBFT	FREE transaction requests scheduler
DFHSZBLO	lost session reporter
DFHSZBRS	RM collect resource ID statistics
DFHSZBSI	signon exit scheduler
DFHSZBST	STSN transaction scheduler
DFHSZBUN	unsolicited data transaction scheduler
DFHSZBUS	RM unsolicited statistics recording
DFHSZDUF	dump formatting routine
DFHSZFRD	formatted 3270 RECEIVE support
DFHSZFSD	formatted 3270 SEND support
DFHSZIDX	SLU P queue install/discard exit
DFHSZPCP	SLU P flow controller
DFHSZPDX	SLU P drain completion exit
DFHSZPID	SLU P send data processor
DFHSZPIX	SLU P send completion exit
DFHSZPOA	SLU P send response processor
DFHSZPOD	SLU P receive data processor
DFHSZPOR	SLU P response processor
DFHSZPOX	SLU P receive specific response exit
DFHSZPOY	SLU P receive specific response processor
DFHSZPQS	SLU P REQSESS (request session) issuer
DFHSZPQX	SLU P REQSESS exit
DFHSZPSB	SLU P bind processor
DFHSZPSC	SLU P session controller
DFHSZPSD	SLU P SDT processor
DFHSZPSH	SLU P SHUTC processor
DFHSZPSQ	SLU P quiesce complete (QC) processor
DFHSZPSR	RESETSR processor CSECT
DFHSZPSS	SLU P STSN processor
DFHSZPSX	SLU P OPNSEC completion exit
DFHSZPTE	SLU P TERMSESS processor
DFHSZRCA	node control processor
DFHSZRCT	issue processor
DFHSZRDC	delete connection processor
DFHSZRDG	discard node processor
DFHSZRDN	delete node processor
DFHSZRDP	dispatcher
DFHSZRDS	discard property set processor
DFHSZRDT	discard target procsssor
DFHSZREQ	request passticket module
DFHSZRFC	FREE completion processor
DFHSZRGR	Dispatcher work queue processor
DFHSZRIA	allocate processor
DFHSZRIC	define connection processor
DFHSZRID	discard processor
DFHSZRIF	install free processor
DFHSZRII	install processor
DFHSZRIN	install node processor
DFHSZRIO	ACB open processor
DFHSZRIP	install pool processor
DFHSZRIQ	inquire processor
DFHSZRIS	install processor
DFHSZRIT	install target processor
DFHSZRIW	SET processor
DFHSZRNC	NODE processor
DFHSZRNO	NOOP processor
DFHSZRPM	timer services
DFHSZRPW	request preparation
DFHSZRQR	queue for REQSESS processing
DFHSZRQW	request queue processor
DFHSZRRD	RECEIVE request processor
DFHSZRRT	request release processor
DFHSZRSC	connection processor
DFHSZRSE	SEND request processor
DFHSZRST	START request processor
DFHSZRTM	recovery services
DFHSZRXD	EXTRACT processor
DFHSZRZZ	TERMINATE processor
DFHSZSIP	initialization processor
DFHSZVBN	copy NIB mask to real NIB
DFHSZVGF	get queue element FIFO
DFHSZVQS	REQSESS dispatcher
DFHSZVRA	VTAM receive_any processor
DFHSZVRI	VTAM receive_any issuer
DFHSZVSC	delayed bind processor
DFHSZVSL	SETLOGON request issuer
DFHSZVSQ	VTAM feedback interpreter
DFHSZVSR	VTAM feedback interpreter
DFHSZVSY	VTAM feedback interpreter
DFHSZWSL	RPL exit after SETLOGON
DFHSZXDA	VTAM DFASY exit
DFHSZXFR	RPL exit to free request block
DFHSZXLG	VTAM logon exit
DFHSZXLT	VTAM LOSTERM (lost terminal) exit
DFHSZXNS	VTAM NSEXIT (network services) exit
DFHSZXPM	STIMER IRB exit routine
DFHSZXRA	VTAM RECEIVE_ANY exit
DFHSZXSC	VTAM SCIP (session control) exit
DFHSZXTP	VTAM TPEND exit
DFHSZYLG	RPL exit following logon reject
DFHSZYQR	post for REQSESS processing
DFHSZYRI	VTAM RECEIVE_ANY issuer
DFHSZYSC	VTAM SCIP exit extension
DFHSZYSR	VTAM feedback interpreter

Module	Function
DFHSZYSY	VTAM feedback interpreter
DFHSZZAG	get RECEIVE_ANY request block
DFHSZZFR	free RECEIVE_ANY request block
DFHSZZNG	get session control request block
DFHSZZRG	get RPL request block
DFHSZ2CP	SLU2 flow controller
DFHSZ2DX	SLU2 drain completion exit
DFHSZ2ID	SLU2 send data processor
DFHSZ2IX	SLU2 send completion exit
DFHSZ2OA	SLU2 send response processor
DFHSZ2OD	SLU2 receive data processor
DFHSZ2OR	SLU2 response processor
DFHSZ2OX	SLU2 receive specific completion exit
DFHSZ2OY	SLU2 receive specific action module
DFHSZ2QS	SLU2 REQSESS issuer
DFHSZ2QX	SLU2 REQSESS exit
DFHSZ2SB	SLU2 bind processor
DFHSZ2SC	SLU2 session controller
DFHSZ2SD	SLU2 SDT processor
DFHSZ2SH	SLU2 SHUTC processor
DFHSZ2SQ	SLU2 QC processor
DFHSZ2SR	SLU2 RESETSR processor
DFHSZ2SX	SLU2 OPNSEC processor
DFHSZ2TE	SLU2 TERMSESS processor

Chapter 40. Function shipping

Function shipping allows a transaction from one CICS system to access a resource owned by another CICS system.

The CICS function shipping facility enables separate CICS systems to be connected so that a transaction in one system is able to retrieve data from, send data to, or initiate a transaction in, another CICS system. The facility is available to application programs that use the command-level interface of CICS.

Design overview

Figure 67 gives an overview of the function shipping component of CICS.

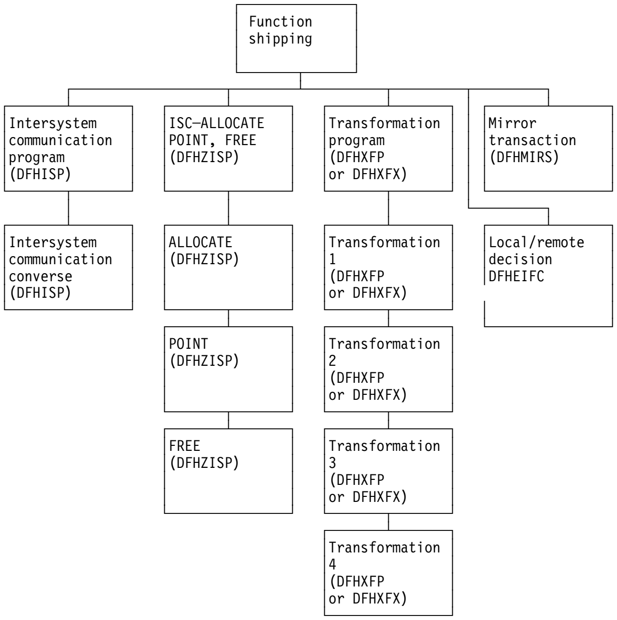

Function shipping
Intersystem communication program (DFHISP)
ISC–ALLOCATE POINT, FREE (DFHZISP)
Transformation program (DFHXFP or DFHXFX)
Mirror transaction (DFHMIRS)
Intersystem communication converse (DFHISP)
ALLOCATE (DFHZISP)
Transformation 1 (DFHXFP or DFHXFX)
Local/remote decision DFHEIFC
POINT (DFHZISP)
Transformation 2 (DFHXFP or DFHXFX)
FREE (DFHZISP)
Transformation 3 (DFHXFP or DFHXFX)
Transformation 4 (DFHXFP or DFHXFX)

Figure 67. CICS function shipping

This section provides an overview of the operation of CICS when it is being used to communicate with other connected CICS systems for CICS function shipping.

Note: The *CICS Intercommunication Guide* gives a full description of the reasons for CICS function shipping and how the user can take advantage of the facility.

Application programming functions with CICS function shipping

The functions provided by CICS are extended for CICS function shipping so that an application program can issue the following types of command and have them executed on another system:

- Temporary-storage commands
- Transient data commands
- Interval control commands
- File control commands
- DL/I calls
- Program link commands (DPL).

Application programs can use these extended functions without having to know where the resources are actually located; information about where resources are located is contained in the appropriate tables prepared by the system programmer. Alternatively, provision is made for an application program to name a remote system explicitly for a particular request.

Support for syncpoints, whether explicit (through EXEC CICS SYNCPOINT commands) or implicit (through DL/I TERM calls), allows updates to be made in several systems as part of a single logical unit of work.

Error handling routines may need to be extended to handle additional error codes that may be returned from a remote system. See the *CICS Intercommunication Guide* for the relevant conditions.

Local and remote names

For a transaction to access a resource (such as a file or transient data destination) in a remote system, it is usually necessary for the local resource table to contain an entry for the remote resource. The name of this entry (that is, the name by which the resource is known in the local system) must be unique within the local system. The entry also contains the identity (SYSIDNT) of the remote system and, optionally, a name by which the resource is known in the remote system. (If this latter value is omitted, it is assumed that the name of the resource in the remote system is the same as the name by which it is known in the local system.)

Mirror transactions

When a transaction issues a command for a function to be executed on a remote system, the local CICS system encodes the request and sends it to the system identified in the appropriate CICS table, or on the command itself. The receipt of this request at the remote system results in the attachment of one of the CICS-supplied mirror transactions, namely, CSMI, CSM1, CSM2, CSM3, and CSM5, or transactions CVMI and CPMI. All these transactions use the mirror program, DFHMIRS. (CVMI services LU6.2 sync level 1 requests, including those from CICS/VM, and CPMI services function shipping from CICS OS/2.)

For distributed program link (DPL) requests shipped from a CICS application region to a CICS resource region, the name of the mirror transaction to be attached may be specified by the user. If you specify your own mirror transaction, you must define the transaction in the resource region and associate it with the CICS-supplied mirror program, DFHMIRS.

The CVMI and CPMI transactions service requests sent as part of an LU6.2 synclevel 1 conversation, unlike the other transactions that service requests sent as part of an LU6.2 synclevel 2 conversation or an MRO or LU6.1 conversation.

A mirror transaction executes the initiating transaction's request and reflects back to the local system the response code and any control fields and data that are associated with the request. If the execution of the request causes the mirror transaction to abend, this information is also reflected back to the initiating transaction.

If a resource has browse place holders or is recoverable, or the lock has been acquired, the mirror transaction becomes a **long-running mirror** and does not end until the issuing transaction ends the logical unit of work (that is, a SYCNPOINT or RETURN). Any resources the mirror has acquired are freed when the initiating transaction issues the appropriate command to free those resources.

Initialization of CICS for CICS function shipping

If CICS has been generated with the appropriate options for intercommunication, the initialization of CICS with the ISC=YES system initialization parameter specified causes the following modules to be loaded:

- DFHISP (intersystem communication program)
- DFHXFP (data transformation program)
- DFHXFX (optimized data transformation program).

The entry point addresses of these modules are contained in the optional features list, which is addressed by CSAOPFLA in the CSA.

The mirror program, DFHMIRS, is not loaded until a request is received from a remote system. (This program can only be loaded if there is an associated PPT entry ***and*** PCT entries for mirror transactions CSMI, CSM1, CSM2, CSM3, and CSM5 or for transactions CVMI and CPMI; sample entries are created by the CSD group DFHISC.)

Note: The ISC=YES system initialization parameter causes other modules besides those specified earlier to be loaded; the ones mentioned here are those specifically required for CICS function shipping.

Communication with a remote system

For multiregion operation, communication between CICS systems can be implemented:

- Through support in CICS terminal control management modules and by use of a CICS-supplied interregion program (DFHIRP) loaded in the link pack area (LPA) of MVS. DFHIRP is invoked by a type 3 supervisory call (SVC). The SVC moves the data to an intermediate area in key 0 MVS CSA storage, and schedules an SRB to move the data from the intermediate area to the target.
- By MVS cross-memory services (DFHXMP), which you can select as an alternative to the CICS type 3 SVC mechanism. Here, DFHIRP is used only to open and close the interregion links. Cross-memory services do not require intermediate MVS CSA storage areas.
- By the cross-system coupling facility (XCF) of MVS. XCF is required for MRO links between CICS regions in different MVS images of an MVS sysplex. It is selected dynamically by CICS for such links, if available.

For ISC, communication between CICS systems takes place via ACF/VTAM links. CICS and the CICS application programmer are independent of, and unaware of, the type of physical connection used by ACF/VTAM to connect the two systems.

Protocols

Requests and replies exchanged between systems for CICS interval control, CICS transient data, CICS temporary storage, and DL/I functions are shipped using the standard protocol as defined for SNA logical unit type 6.1.

Requests and replies for CICS file control functions are shipped using a private protocol (with function management headers of type 43).

Symmetrical bracket protocol: Logical unit type 6.1 (LU6.1) sessions between two CICS systems require most protocols to be symmetrical; therefore, CICS receives (as well as sends) end bracket.

Shutdown protocol: The LU6.1 shutdown protocol does not use the SHUTDOWN command; it uses the data flow control commands SBI (stop bracket initiation) and BIS (bracket initial stopped). Shutdown is executed as part of session termination (by DFHZCLS) and ensures that, when a session is terminated normally (as a result of a master terminal release command or a normal CICS shutdown), there are no unfinished syncpoint requests on the session. This means that when the session is initiated, no resynchronization sequence is required.

Sender error recovery protocol (ERP): CICS support for LU6.1 uses a symmetrical SNA protocol called **Sender ERP**. In addition, when CICS wishes to send a negative response to a remote system, it sends a special negative response (0846), which indicates that an ERP message is to follow. This ERP message contains the real system and user sense values, together with a text message. The negative response and ERP message are built by DFHZEMW, and are received and processed by DFHZRAC, DFHZRVX, and DFHZNAC.

Resynchronization protocol: CICS support for LU6.1 sessions that use the syncpoint protocol has associated resynchronization logic, which is used during the initiation of a session after a previous session has terminated abnormally. This logic is used to generate messages concerning the outcome of any logical units of work that were **in doubt** when the previous session failed. The modules involved are DFHZRSY, DFHZSCX, and DFHZNAC.

CICS function shipping environment

This section describes the system entries for function shipping in the terminal control table, and how function shipping requests or replies are transformed between the format suitable for transmission and the internal parameter list format.

System entries in the terminal control table: All remote systems with which a given system is able to communicate are identified and described in terminal control table system entries (TCTSEs). The name of the system entry is the name specified in the SYSIDNT field of the CICS table entry describing a remote resource.

CICS uses the TCTSE as an anchor point to queue requests made by CICS transactions for connection to the remote system.

Figure 68 shows three TCTTEs. If a transaction fails and you get a transaction dump, this figure shows you how to find the relevant TCTTEs from the TCA.

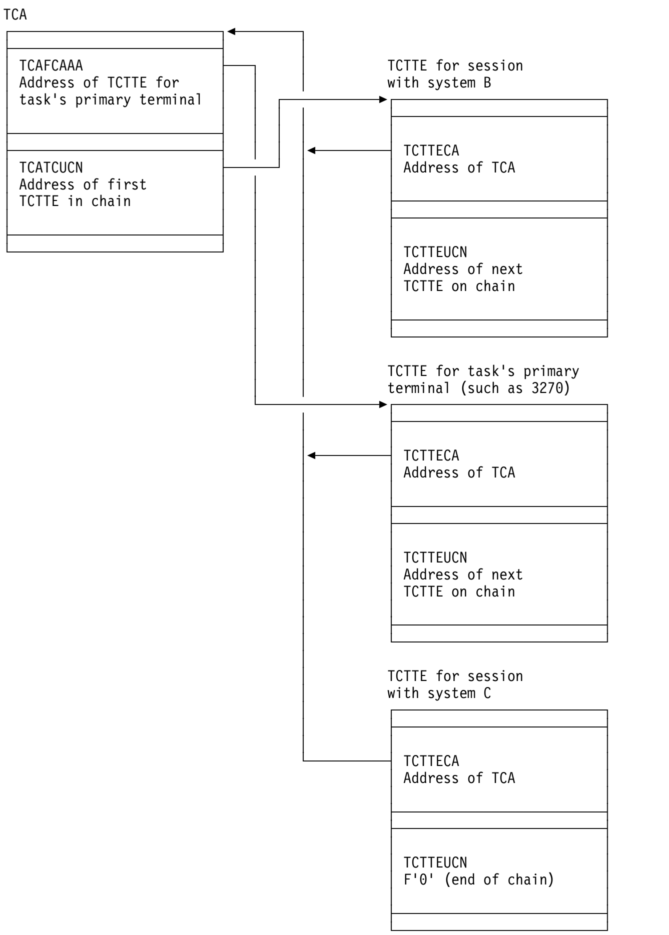


Figure 68. Task's view of CICS function shipping TCTTEs

Transformation of requests and replies for transmission between systems: Before a request or reply can be transmitted, it must be transformed from its internal, parameter list (EXEC interface) format to a format suitable for transmission; when received after transmission, the request must be transformed back into a parameter list format.

There are four such transformations (numbered 1 through 4), which are performed by DFHXFP, or by DFHXFX if optimized data transformations are possible. The latter only applies to data transformations for function shipping in an MRO environment, excluding those relating to DL/I requests.

Transformation 1
For a request to be sent by the originating system; transforms from parameter list format to transmission format.

Transformation 2
For a request received by the mirror transaction; transforms from transmission format to parameter list format.

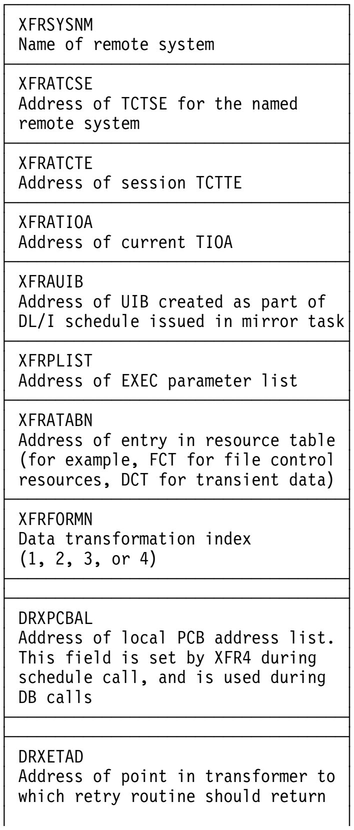
Transformation 3
For a reply to be sent by the mirror transaction; transforms from parameter list format to transmission format.

Transformation 4
For a reply received by the originating system; transforms from transmission format to parameter list format.

The parameter list format above refers to the parameter list that is normally passed to DFHEIP (for CICS requests) or to DFHDLI (for DL/I requests).

The transmission formats of these requests and replies (excluding those for syncpoint protocol) are described in the DFHFMHDS DSECT.

Information that DFHXFP and DFHXFX need to retain between transformations 1 and 4 (in the originating system) or between transformations 2 and 3 (in the mirror system) is stored in a transformer storage area called XFRDS; Figure 69 shows some of the more important fields in XFRDS.



XFRSYSNM
Name of remote system

XFRATCSE
Address of TCTSE for the named remote system

XFRATCTE
Address of session TCTTE

XFRATIOA
Address of current TIOA

XFRAUIB
Address of UIB created as part of DL/I schedule issued in mirror task

XFRPLIST
Address of EXEC parameter list

XFRATABN
Address of entry in resource table (for example, FCT for file control resources, DCT for transient data)

XFRFORMN
Data transformation index
(1, 2, 3, or 4)

DRXPCBAL
Address of local PCB address list. This field is set by XFR4 during schedule call, and is used during DB calls

DRXETAD
Address of point in transformer to which retry routine should return

Figure 69. Transformer storage area (XFRDS) fields

CICS function shipping—handling of EXEC CICS commands

This section describes the sending and receiving of requests and replies (other than DL/I or syncpoint requests) between two connected systems at the **application-layer** level; see Figure 70 on page 337. (The **function management** and **data flow control** layers, implemented by CICS terminal control, work in the same way, regardless of the type of request being transmitted.)

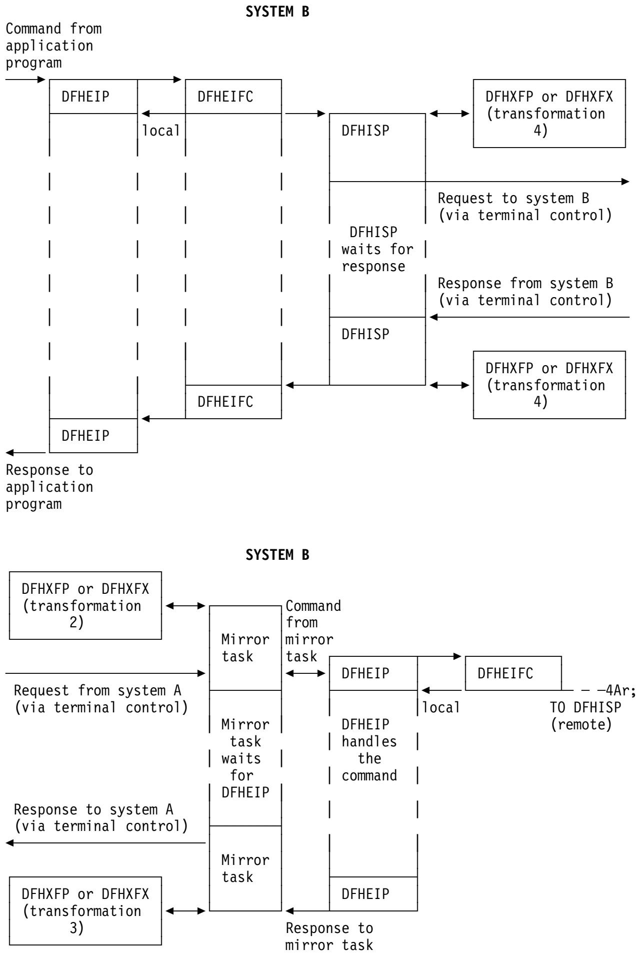

SYSTEM B
Command from application program
DFHEIP
DFHEIFC
local
DFHISP
DFHXFP or DFHXFX (transformation 4)
Request to system B (via terminal control)
DFHISP waits for response
Response from system B (via terminal control)
DFHISP
DFHXFP or DFHXFX (transformation 4)
DFHEIFC
DFHEIP
Response to application program
SYSTEM B
DFHXFP or DFHXFX (transformation 2)
Mirror task
Command from mirror task
DFHEIP
DFHEIFC
– –4Ar;
Request from system A (via terminal control)
local
TO DFHISP (remote)
Mirror task waits for DFHEIP
DFHEIP handles the command
Response to system A (via terminal control)
Mirror task
DFHXFP or DFHXFX (transformation 3)
DFHEIP
Response to mirror task

Figure 70. Overview of CICS function shipping

Sending a request to a remote system: A CICS command is handled for an application program by the EXEC interface program, DFHEIP. DFHEIP analyzes the arguments of each statement to determine the requested function and to assign values into the appropriate CICS control blocks; DFHEIP also performs storage control and error checking on behalf of the application programmer.

If the system has been initialized with the ISC=YES system initialization parameter, and if the request is for one of the functions that could be executed on a remote system (see "Application programming functions with CICS function shipping" on page 333), DFHEIP invokes a local/remote decision routine, which inspects the appropriate CICS table to determine whether the request is for a local or a remote resource (unless a remote system has specifically been requested). For all requests except file control, this local/remote decision is taken in DFHEIP. For file control requests, the decision is taken in the file control EXEC interface processor module, DFHEIFC (see Chapter 38, "File control" on page 259).

If the resource is local:

- DFHEIP invokes the appropriate EXEC interface processor module to process the request locally.
- DFHEIFC calls the file control file request handler, DFHFCFR, to process the request locally, and finally returns control to DFHEIP.

Note: A SYSID value that names the local system also causes the request to be processed locally.

If the resource is remote, DFHEIP or DFHEIFC:

1. Allocates a transformer storage area (XFRDS) chained off the EXEC interface storage EIS. XFRDS (see Figure 69 on page 336) provides a central area in which all information about processing of the request can be accessed.
2. Places the following data in XFRDS:
   - Name of remote system, for subsequent use by DFHISP (in XFRDS field XFRSYSNM)
   - Address of the application's list of parameters (EXEC parameter list) associated with the command being executed (in XFRDS field XFRPLIST)

- Address of the table (FCT, if DFHEIFC; DCT, and so on, otherwise) for the requested resource (in XFRDS field XFRATABN).

3. Issues a DFHIS TYPE=CONVERSE macro, which passes control to the CICS function shipping program DFHISP.

DFHISP obtains the address of the TCTSE for the remote system and places it in XFRDS field XFRATCSE. DFHISP obtains the address of the TCTTE that controls the session with the remote system and places it in XFRDS field XFRATCTE. (DFHISP obtains the address by issuing a DFHTC TYPE=POINT macro. If no session is established, there is no TCTTE; in this case DFHISP issues a DFHTC TYPE=ALLOCATE macro to establish the session TCTTE.)

If no session can be allocated because, for example, all sessions are out of service, DFHISP determines whether or not the function request can be queued for shipping at a later time. If it the request can be queued, then XFRATCTE is set to zero.

Optionally (if a TIOA already exists from an earlier CICS function shipping request from the same application), DFHISP also places the address of the TIOA in XFRDS field XFRATIOA.

DFHISP then invokes DFHXFP, or DFHXFX for optimized transformations, to transform the requested command and parameter list into a form suitable for transmission.
This is known as **transformation 1**, which:

1. Transforms the original **command** into an appropriate type of request for transmission.
2. Converts the EXEC parameter list into a **data unit** having a standardized character-string format (together with a function control header) suitable for transmission. The data unit is built in the TIOA and contains a copy of each of the parameters that are addressed by the EXEC parameter list. (For economy of transmission, certain types of data are compressed before being placed in the TIOA.)
3. Returns control to DFHISP.

Note: If local queuing is in effect, the data unit is built in user storage.

DFHISP then invokes terminal control to transmit the contents of the TIOA to the remote system and waits for the reply from the remote system, if necessary.

If local queuing is in effect, DFHISP issues a DFHIC TYPE=PUT macro specifying transaction CMPX, which sends the data unit at a later time.

Receiving a request at a remote system: Terminal control receives the request transmission and attaches one of the mirror transactions.

The mirror program allocates space for XFRDS in its LIFO storage area. As in the requesting system, XFRDS is a central area in which all information about the processing of the received request can be accessed. The mirror program places the following data in XFRDS:

- Address of the session TCTTE (in XFRDS field XFRATCTE)
- Address of the TIOA (in XFRDS field XFRATIOA).

The mirror program also allocates scratch pad storage in the LIFO storage area for use by DFHXFP (or DFHXFX) in building argument lists. The address of this storage is placed in XFRPLIST.

The mirror program then invokes DFHXFP, or DFHXFX for optimized transformations, to transform the received request into a form suitable for execution by DFHEIP. This is known as **transformation 2**, which:

1. Transforms the received request (as coded in the function management header of the data unit) into an appropriate CICS command.
2. Decodes the TIOA and builds (in the ***first*** part of the STORAGE area) an EXEC parameter list that basically consists of addresses that point to fields in the TIOA. (Those fields that were compressed for transmission are expanded and placed in the ***second*** part of the STORAGE area; for these fields, the EXEC parameter list points to the expanded versions, not the compressed versions in the TIOA.)

   Note: The NOHANDLE option is specified on each EXEC CICS command that is created; this has the effect of suppressing DFHEIP's branching to an error routine.
3. Returns control to the mirror program.

The mirror program then invokes DFHEIP (in the same way as for an application program), passing to it (in register 1) the address of the EXEC parameter list just built.

DFHEIP or DFHEIFC determines whether the request is for a remote resource on yet another system or for a local resource. If the resource is remote, DFHEIP or DFHEIFC allocates a new and separate transfer storage area XFRDS and invokes DFHISP (as described under "Sending a request to a remote system" on page 337).

If the resource is local, the reply is processed for the mirror program in the usual way.

Sending a reply at a remote system: The process of sending a reply in response to a request from another system is similar to that for sending a request; see "Sending a request to a remote system" on page 337.

When DFHEIP has successfully completed execution of the command, control is returned to the mirror program with the results of the execution in the EXEC interface block (EIB). The mirror program then invokes DFHXFP, or DFHXFX for optimized transformations, to transform the command response into a suitable form for the transmission of the reply.
This is known as **transformation 3**, which:

1. Checks whether the existing TIOA is long enough to take the reply; if not, DFHXFP (or DFHXFX) frees the existing TIOA and creates a new one.
2. Converts the EXEC parameter list (kept in the scratch pad area STORAGE) into a **data unit** having the standardized character-string format suitable for transmission. The data unit is built in the TIOA. If the request is received by the mirror program without CD (that is, the requesting system did not expect a reply), the mirror program issues a DFHTC TYPE=READ or TYPE=FREE macro. If an error is detected, the mirror program is forced to abend, so that at least a record of the request failure is written.
3. Returns control to the mirror program.

The mirror program then invokes terminal control to transmit the TIOA. (The mirror program does this by issuing a DFHTC TYPE=(WRITE,WAIT,READ) macro if the mirror program holds any state information that must be held for a further request or until a syncpoint. Otherwise, a DFHTC TYPE=(WRITE,LAST) macro is issued.

Receiving a reply from a remote system: Terminal control receives the reply and returns control to the initiating task; in particular, control is passed to DFHISP, which has been waiting for the reply.

DFHISP invokes DFHXFP, or DFHXFX for optimized transformations, (passing to it the address of the XFRDS area) in order to transform the reply into the form expected by the application program. This is known as **transformation 4**, which:

1. Obtains the addresses of the TIOA and of the original EXEC parameter list from XFRATIOA and XFRPLIST in the XFRDS area.
2. Uses data in the reply to complete the execution of the original command. For example:
   - Sets return codes in the EIB from status bits in the reply
   - Stores other received data (if any) in locations specified in the original EXEC parameter list.
3. Frees the TIOA.
4. Returns control to DFHISP.

DFHISP returns control to DFHEIP (if appropriate through DFHEIFC), which raises any error conditions associated with return codes set in the EIB. DFHEIP then returns control to the application program.

CICS function shipping—handling of DL/I requests

DL/I requests are handled in a similar manner to that for CICS commands; see Figure 71 on page 340.

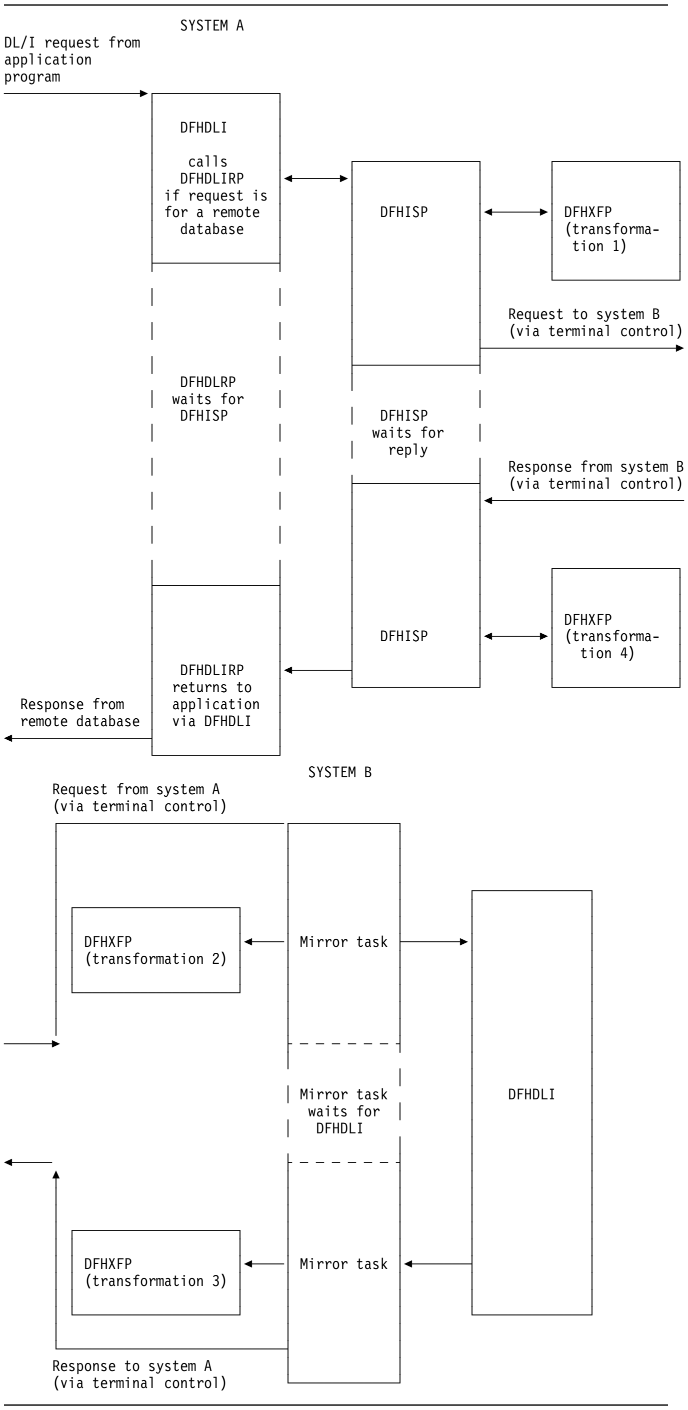

SYSTEM A
DL/I request from application program
DFHDLI calls DFHDLIRP if request is for a remote database
DFHISP
DFHXFP (transformation 1)
Request to system B (via terminal control)
DFHDLRP waits for DFHISP
DFHISP waits for reply
Response from system B (via terminal control)
DFHISP
DFHXFP (transformation 4)
DFHDLIRP returns to application via DFHDLI
Response from remote database
SYSTEM B
Request from system A (via terminal control)
DFHXFP (transformation 2)
Mirror task
Mirror task waits for DFHDLI
DFHDLI
DFHXFP (transformation 3)
Mirror task
Response to system A (via terminal control)

Figure 71. Overview of CICS function shipping of DL/I requests

Sending a DL/I request to a remote system: All DL/I requests are handled by DFHDLI.

DFHDLI determines whether the request is for a remote, or DBCTL database, and routes the request to the appropriate DL/I call processor. If the request is for a remote database, DFHDLI invokes DFHDLIRP, which passes control to DFHISP by issuing a DFHIS TYPE=CONVERSE macro.

DFHISP then:

1. Invokes DFHXFP to transform the request into a form suitable for transmission
2. Invokes terminal control to transmit the request.

Receiving a DL/I request at a remote system: As for a CICS request, the appropriate mirror transaction (in this case, CSM5) is attached.

The mirror program invokes DFHXFP to transform the received request into a form suitable for execution by DFHDLI.

The mirror program then passes the request to DFHDLI in the same way as any other application program would. DFHDLI determines what type of DL/I request is being made and then routes the request to the appropriate DL/I call processor: DFHDLIRP (remote, that is, daisy-chained to yet another system), or DFHDLIDP (DBCTL).

Sending a DL/I reply at a remote system: When DFHDLI has successfully completed the request, control is returned to the mirror program with the results in the user interface block (UIB). The mirror program then:

1. Invokes DFHXFP to transform the results into a form suitable for transmission
2. Invokes terminal control to transmit the reply.

Receiving a DL/I reply from a remote system: On receipt of the reply, terminal control returns control to DFHISP, which has been waiting for the reply; DFHISP then invokes DFHXFP to transform the reply into a form that can be used by DFHDLI. DFHXFP sets the return codes in an intermediate control block, DFHDRX, so that they can ultimately be copied to the UIB or the TCA for the application program. Control is then returned from DFHISP through DFHDLIRP to DFHDLI, and finally back to the application program.

Terminal control support for CICS function shipping

Terminal control support for CICS function shipping falls into the following three main areas:

1. TCTTE allocation functions, ALLOCATE, POINT, and FREE. These functions are used mainly by DFHISP to allow a CICS transaction to own additional TCTTEs. These are session TCTTEs to remote systems; these functions are supported by DFHZISP.
2. Syncpoint functions, SPR, COMMIT, ABORT, and PREPARE. These functions are used by the recovery manager connectors to implement the syncpoint protocol; these functions are supported by DFHZIS1.
3. LU6.1 functions. These functions are used by users of terminal control to support the data flow control protocols used in a LU6.1 session.

The functions described in areas 1 and 2 above are extensions to the DFHTC macro that are intended for internal use by CICS control programs only; they are not documented in the user manuals.

TCTTE allocation functions: Terminal control provides the following TCTTE-related functions:

ALLOCATE function
This allocates to the requesting transaction a session TCTTE for communication with a remote system. The name of the remote system is passed as a parameter. The address of the allocated TCTTE or a return code is returned to the requester. DFHZISP uses the DFHZCP automatic transaction initiation (ATI) mechanism to allocate the session.

If the allocation request cannot be satisfied immediately, an automatic initiate descriptor (AID) is created, and is chained off the system entry; the AID is used to remember, and subsequently to process, the outstanding allocation request.

Parallel sessions can be allocated explicitly, or implicitly by reference to a remote resource; sessions are automatically initiated at allocation time, if necessary. They can also be initiated by a master terminal ACQUIRE command, or automatically during CICS initialization if CONNECT=AUTO is specified in the TCTTE.

POINT function
This causes terminal control to supply the requesting task with the address of a session TCTTE for a named remote system. The TCTTE must have been previously allocated to the requesting task.

FREE function
This detaches a TCTTE from the owning task and makes it available for allocation to another transaction. (The FREE function is the opposite of the ALLOCATE function.)

TERM=YES operand
This operand enables the issuer of a terminal control macro to select explicitly the TCTTE to which the requested function is to be applied. The address of the TCTTE to be processed is passed as a parameter of the request; the TCTTE must have been previously allocated to the requesting task.

FREE TCTTE indicator
This indicator is set as a result of the remote system issuing a (WRITE,LAST) or FREE request to show that the current conversation has finished and that the session should be freed by the current owner of the TCTTE. The receiver of the FREE indicator (usually DFHISP) must issue a FREE request.

Syncpoint functions: For ISC, terminal control provides the following syncpoint functions (the equivalent functions for IRC are provided by DFHZIS1):

SPR (syncpoint request) function
This request is issued by the recovery manager connector during syncpoint processing, and causes terminal control (DFHZSDR) to send a request that has a definite DR2 response requested. This tells the other side of the session that a syncpoint is required.

COMMIT function
This request is issued by the recovery manager connector when syncpoint has been completed. It causes a positive DR2 response to be sent, signaling the successful completion of syncpoint protocol.

ABORT function
This request causes either a negative DR2 response or an LUSTATUS command to be sent, indicating that a requested syncpoint operation could not be completed successfully, or that there has been an abnormal end of the current logical unit of work.

PREPARE function
This request causes an LUSTATUS command to be sent to the mirror in the remote system and indicates that a syncpoint should be taken.

VTAM secondary half-session support: CICS acts as both the primary and the secondary halves of an LUTYPE6 session. To implement secondary half-session support, CICS VTAM terminal control has to do two things:

1. Implement the secondary half of the data flow control and session control protocols that CICS already uses as a primary.
2. Use the secondary API provided by VTAM.

The terminal control functions provided by CICS are independent of primary/secondary considerations. Differences between the primary and secondary VTAM interfaces are contained within the CICS modules that issue the appropriate VTAM request. The secondary support functions appear principally in the DFHZCP modules shown in Table 54.

Table 54. VTAM secondary support functions

Modules	Function	Secondary function
DFHZSIM	Request LOGON	Use REQSESS macro
DFHZOPN	OPNDST	Use OPNSEC macro
DFHZSCX	SCIP exit	Receive and process BIND, STSN, SDT, CLEAR, and UNBIND commands
DFHZCLS	CLSDST	Use TERMSESS macro
DFHZRSY	Resynchronization	Build STSN responses
DFHZSKR	Respond to	Send responses to BIND, SDT, and STSN commands
DFHZRAC, DFHZRVX	Receive	Receive and process BID commands
DFHZATI, DFHZRVX, DFHZRAC	Bracket protocol	Implement secondary contention resolution using bracket protocol
DFHZNSP	Network services error exit	Handle secondary LOSTERM type of errors

NOCHECK option function handling

The transmission of a START NOCHECK command and associated data is handled in a slightly different manner from that for other CICS function shipping commands. Compared with the process described earlier in "Security manager domain's generic gates" on page 510, the major differences are:

- After DFHISP has allocated the session TCTTE to the requesting task, the transformation program DFHXFP (or DFHXFX) performs **transformation 1**. In addition, the transformation program detects that a START NOCHECK command is being processed and passes this fact to DFHISP in its return code. Accordingly, DFHISP issues a DFHTC TYPE=WRITE macro, which is deferred until syncpoint, return, or another function-shipped request on that ISC session.
- DFHISP returns to its caller.
- On the receiving system, DFHEIP handles the START NOCHECK command in the usual way and then terminates when the command has been executed; no response is sent back to the first system.

Exits

There are two global user exit points in DFHISP: XISCONA and XISLCLQ. For further information about using these exit points, see the *CICS Customization Guide.*

Trace

The following point ID is provided for the intersystem program:

- AP 00DF, for which the trace level is IS 1.

The following point IDs are provided for function shipping data transformation:

- AP D9xx, for which the trace level is IS 1.

For more information about the trace points, see the *CICS Trace Entries.* For more information about using traces in problem determination, see the *CICS Problem Determination Guide.*

Chapter 41. "Good morning" message program

The CICS good morning program issues a "good morning" message for VTAM logical units.

Design overview

This module is invoked by running the CSGM system transaction.

If a satisfactory OPNDST has occurred (detected in the OPNDST exit, DFHZOPX) and if a "good morning" message has been requested on the TCT TYPE=TERMINAL entry, an NACP request is queued. NACP issues a DFHIC TYPE=INITIATE for this transaction.

This module determines the terminal type, sets up the appropriate control characters, gets a TIOA, and writes the message.

For a 3270 terminal, if the operator has entered data before the message has been received, NACP may be invoked to handle intervention required. In this case the transaction is abended and the write operation terminated.

A default message text is generated by DFHTCTPX and can be overridden by an option on the TCT TYPE=INITIAL statement. The text is stored in the TCT prefix.

Modules

DFHGMM

Exits

The XGMTEXT global user exit point is provided in DFHGMM. For further information about this, see the *CICS Customization Guide*.

Trace

No trace points are provided for this function.

Chapter 42. Interregion communication (IRC)

CICS multiregion operation (MRO) enables CICS regions that are running in the same MVS image, or in the same MVS sysplex, to communicate with each other. MRO does not support communication between a CICS system and a non-CICS system such as IMS.[2]

ACF/VTAM and SNA networking facilities are not required for MRO. The support within CICS that enables region-to-region communication is called **interregion communication** (**IRC**). IRC can be implemented in three ways:

- Through support in CICS terminal control management modules and by use of a CICS-supplied interregion program, DFHIRP, loaded in the MVS link pack area. DFHIRP is invoked by a type 3 supervisory call (SVC).
- By MVS cross-memory services, which you can select as an alternative to the CICS type 3 SVC mechanism. Here, DFHIRP is used only to open and close the interregion links.
- By the cross-system coupling facility (XCF) of MVS. XCF is required for MRO links between CICS regions in different MVS images of an MVS sysplex. It is selected dynamically by CICS for such links, if available.

This section describes the communication part of MRO. Chapter 54, "Multiregion operation (MRO)" on page 419 gives a brief description of multiregion operation.

Design overview

For information about the design and implementation of interregion communication facilities, and about the benefits of cross-system MRO, see the *CICS Intercommunication Guide*.

Control blocks

IRC uses two levels of control blocks:

1. A CICS/MRO terminal control layer
2. An interregion SVC layer interfaced by the DFHIR macro.

Terminal control layer

The CICS/MRO terminal control layer is shown in Figure 72 on page 346.

This layer uses the cross-region block (CRB). This is a global (that is, one per CICS system) block that is created in the CICS dynamic storage area above the 16MB line (the ECDSA) when IRC is initialized, and provides information to communicate with the IRC SVC. See Figure 73 on page 347.

[2] The external CICS interface (EXCI) uses a specialized form of MRO link to support: communication between MVS batch programs and CICS; DCE remote procedure calls to CICS programs.

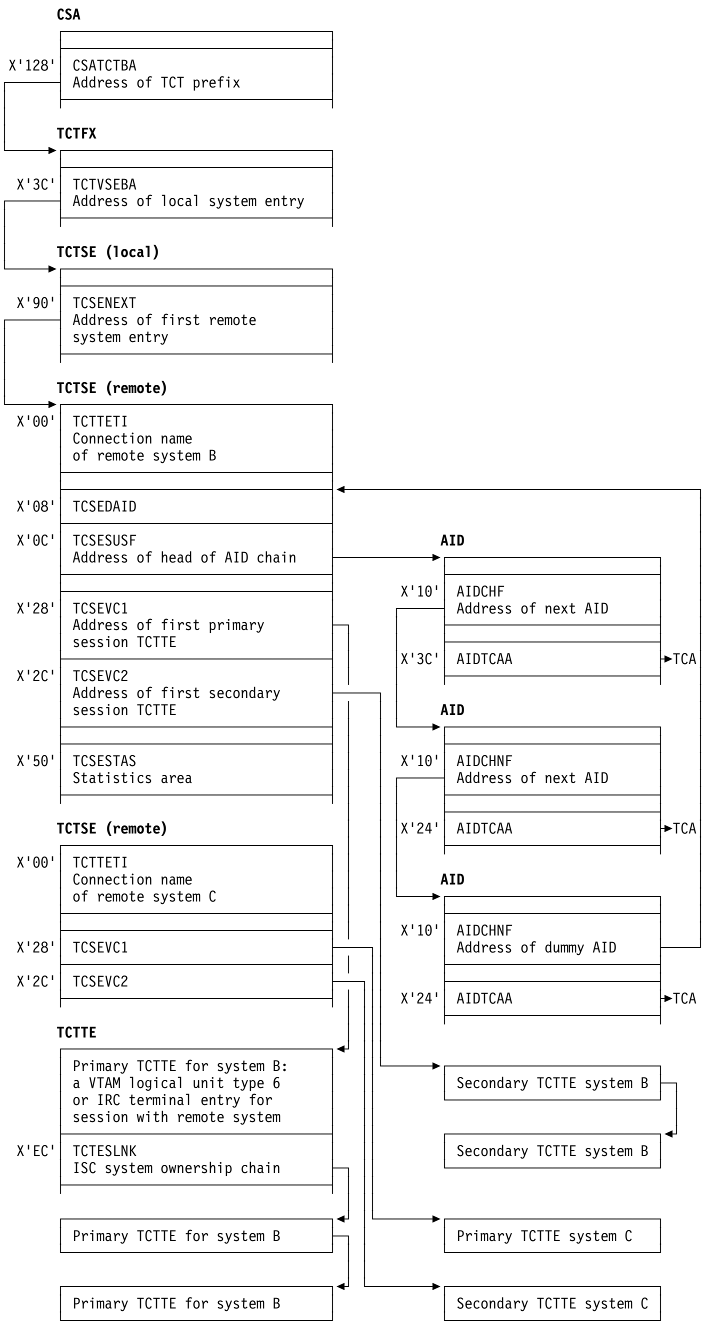


Figure 72 (Part 1 of 2). CICS/MRO terminal control layer of control blocks

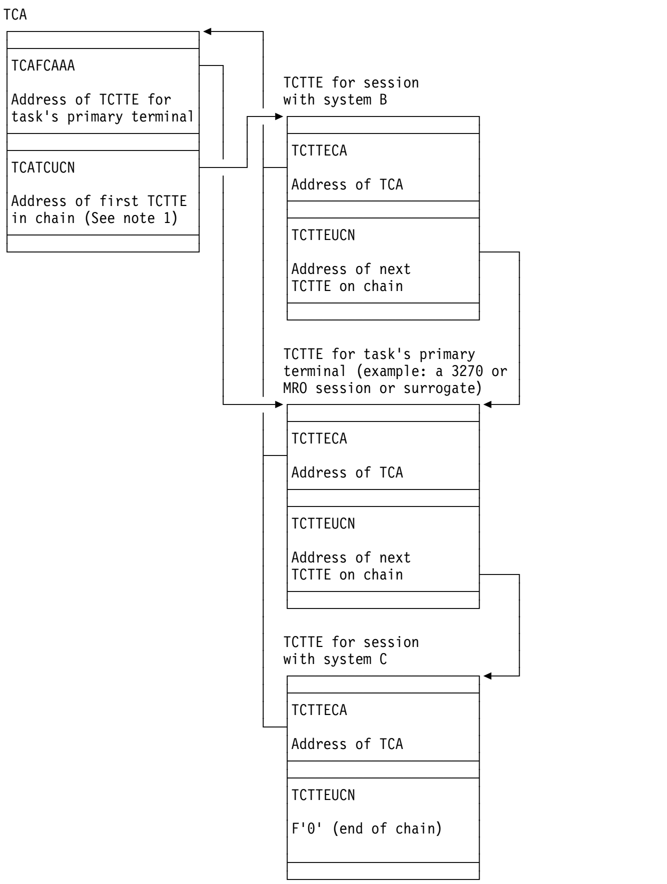

TCA
TCAFCAAA
Address of TCTTE for task's primary terminal
TCATCUCN
Address of first TCTTE in chain (See note 1)
TCTTE for session with system B
TCTTECA
Address of TCA
TCTTEUCN
Address of next TCTTE on chain
TCTTE for task's primary terminal (example: a 3270 or MRO session or surrogate)
TCTTECA
Address of TCA
TCTTEUCN
Address of next TCTTE on chain
TCTTE for session with system C
TCTTECA
Address of TCA
TCTTEUCN
F'0' (end of chain)

Figure 72 (Part 2 of 2). CICS/MRO terminal control layer of control blocks

Notes:

1. The first TCTTE on the chain is not necessarily the TCTTE for the task's primary terminal.
2. A task has allocated MRO sessions to other systems.
3. TCTTEs are described more fully in Chapter 86, "Terminal control" on page 585.
4. Primary TCTTEs relate to Receive sessions, and secondary TCTTEs relate to Send sessions.
5. TCSEVC1 is the label on the address of the TCTTE of the first primary session. TCSEVC2 is that of the first secondary session.
6. The primary and secondary sessions each have sets of TCTTEs. These are found by using the DFHTC CTYPE=LOCATE macro.
7. A TCTTE is allocated for a surrogate session in transaction routing.

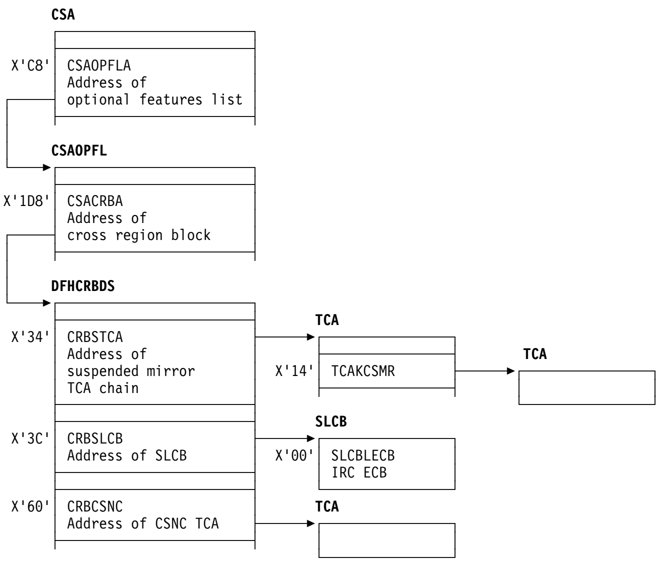


Figure 73. Cross-region block (CRB)

DFHIR layer

The interregion SVC layer interfaced by the DFHIR macro is shown in Figure 74.

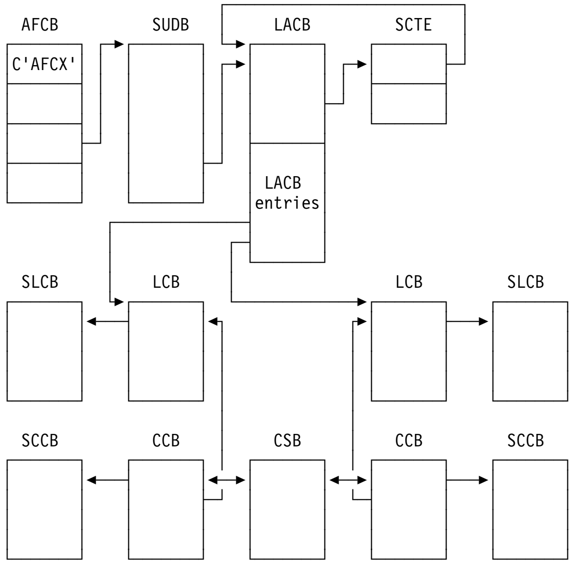


Figure 74. Interregion SVC layer of control blocks interfaced by the DFHIR macro

This layer uses the following control blocks, which, unless otherwise stated, reside in subpool 241 in MVS storage:

- Global (that is, one per MVS system) housekeeping (used by DFHIRP)

  Subsystem control table extension (SCTE)
  The SCTE is dynamically created, and contains information about the number of regions logged on to DFHIRP. It is used to locate the LACB. See also Figure 87 on page 540, which shows the subsystem interface control blocks, including a pointer to the SCTE in the CICS subsystem anchor block (SAB).

  Logon address control block (LACB)
  The LACB contains entries to identify the regions that have logged on, and contains the address of the region's logon control block (LCB).

- Local housekeeping (used by DFHIRP)

  Logon control block (LCB)
  The LCB is created for each successful log on.

  Logon control block entry (LCBE)
  The LCBE contains the basic control information for each IRC system with which this system communicates. It addresses the connection control blocks (CCBs).

  Subsystem user definition block (SUDB)
  A SUDB provides access to IRC control blocks. There is one SUDB for each TCB that is currently logged on (so each SUDB may have multiple LCBs associated with it). The SUDB contains TCB-related data and working storage.

  Connection control block (CCB)
  A CCB is created for each IRC send-receive session, and contains information controlling the connection to the other region. When the connection is in use, it addresses the CSB.

  Connection status block (CSB)
  The CSB provides status information about the connection between two regions.

  MVS transfer buffers (MVS SRB mode)
  The MVS transfer buffers are used to transfer IRC data between regions, and reside in subpool 231 in MVS storage.

Terminal control layer and DFHIR layer

Figure 75 on page 348 shows the control blocks that are accessed by both the terminal control layer and the DFHIR layer. Figure 76 on page 348 shows the location of these control blocks in MVS virtual storage.

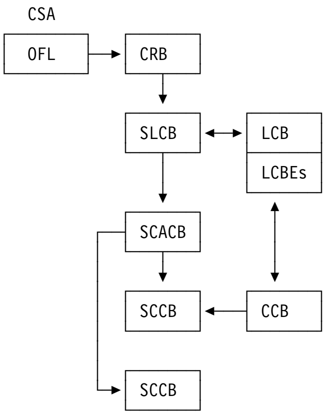


Figure 75. Control blocks accessed by CICS/MRO terminal-control layer of control blocks and by interregion SVC layer of control blocks

The following blocks are used by both the terminal control layer and the DFHIR layer. These blocks are allocated at logon time within a single MVS GETMAIN, and, unless otherwise stated, reside in subpool 251 of MVS storage.

Subsystem logon control block (SLCB)
The SLCB is used by the IRC SVC and region and contains the master ECB, posted when the region has IRC activity. It is pointed to by the CRB and LCB.

Subsystem connection address control block (SCACB)
The SCACB contains entries allowing the addressing of SCCBs from the SLCB.

Subsystem connection control block (SCCB)
The SCCB is created for each IRC send-receive session, and is allocated at logon. It contains the ECB, posted when input for the session is available.

Note: There is a one-to-one relationship between TCTTEs and SCCBs when they are in use.

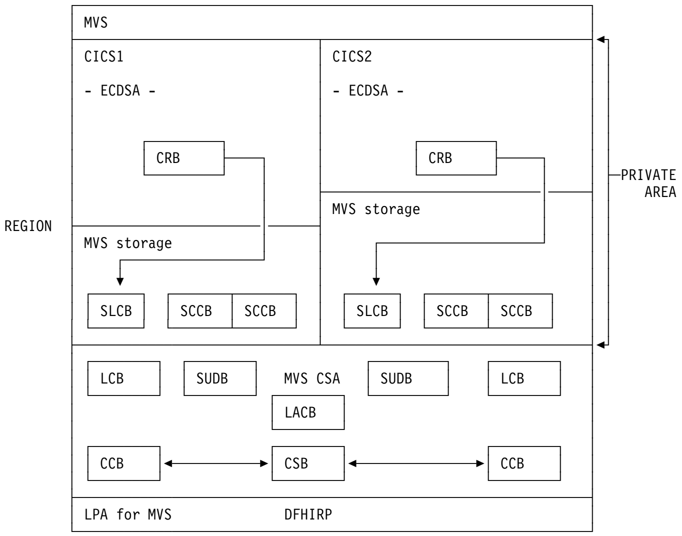


Figure 76. Location of control blocks in MVS virtual storage

MRO ECB summary

The following is a summary of the MRO event control blocks (ECBs):

Name	Location	Who waits	Who posts
Dependent ECB	SCCB	Application (TC WAIT)	DFHIRP
LOGON ECB	SLCB	CICS (KCP, Op sys WAIT list)	DFHIRP
Link ECB	LCB	DFHIRP (Op sys WAIT)	DFHIRP
Work queue ECB	QUEUE	CSNC transaction	DFHIRP DFHZIS2 DFHZLOC

See the *CICS Data Areas* manual for a detailed description of the CICS control blocks.

Modules

Figure 77 gives an overview of the modules involved with interregion communication.

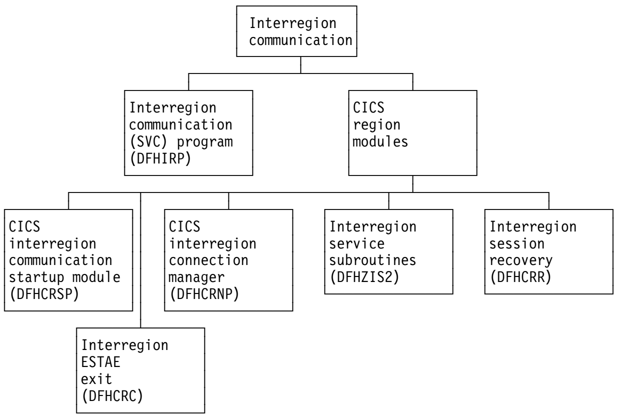

Interregion communication
Interregion communication (SVC) program (DFHIRP)
CICS region modules
CICS interregion communication startup module (DFHCRSP)
CICS interregion connection manager (DFHCRNP)
Interregion service subroutines (DFHZIS2)
Interregion session recovery (DFHCRR)
Interregion ESTAE exit (DFHCRC)

Figure 77. Interregion communication

The modules for IRC are of two types:

1. The interregion programs: DFHIRP and DFHXMP
2. CICS address space modules: DFHCRC, DFHCRNP, DFHCRR, DFHCRSP, DFHZCP, and DFHZCX.

Interregion programs

DFHIRP (interregion communication (SVC) program): The interregion communication program (DFHIRP) is used to pass data from one region to another in the same processing unit. The programs running in the regions usually are CICS programs, but DFHIRP does not assume that to be the case.

Each user of this program must first issue a LOGON request specifying an 8-character name. This user identifier is added to a table maintained in key 0 storage.

After the user has logged on, CONNECT requests may be issued to establish data paths to other users who have also logged on. The users must cooperate in this process by specifying, when they log on, to whom and from whom they are to be connected and by how many data paths.

After a connection has been established, either end of the connection may issue a SWITCH request to send data to the other end of the connection. The receiver of the data must provide a buffer into which the data is to be written. If the buffer is too small, the receiver is notified of the actual data length and, possibly having obtained a larger buffer, may issue a PULL request to retrieve as much data as is required. After the first data has been sent, the link must be used by each end alternately.

A connection may be broken by either end by issuing a DISCONNECT request. When all links have been disconnected, a user may log off.

When MVS cross-memory services are requested (ACCESSMETHOD(XM) in the RDO CONNECTION definition), DFHXMP is used (DFHIRP performs initialization and termination for DFHXMP); otherwise, communication is performed by DFHIRP running as an SVC. In this case, it is invoked by an SVC call to a startup program (DFHCSVC), which calls the required DFHIRP routine.

DFHXMP (MVS cross-memory program): When the MVS cross-memory services are used for interregion communication, the SWITCH and PULL functions are performed by DFHXMP, which is entered by issuing a **program call** (PC) instruction instead of an SVC. DFHXMP does not need a commonly addressable buffer or service request blocks (SRBs) to effect data transfer between address spaces.

Code in DFHIRP performs the cross-memory initialization and termination functions for DFHXMP as follows:

LOGON: Acquire and initialize the cross-memory resources (authorization index (AX), linkage index (LX), and entry table (ET)), unless this has already been done by a previous logon in this address space.

CONNECT: Update the authority tables (ATs) of both address spaces to allow each one to establish addressability to the other, unless this was done when a previous connection was established between them.

DISCONNECT: If the last cross-memory connection between a pair of address spaces is being removed, update the caller’s AT so that the other system is no longer permitted to access the caller’s address space.

LOGOFF: Free the cross-memory resources acquired by logon if they are no longer required by the caller’s address space.

CICS address space modules

The CICS address space modules control the handling of requests between this address space and other address spaces. They include several MRO management modules such as DFHCRSP (see DFHCRSP (CICS IRC startup module)) and DFHCRNP (see DFHCRNP (connection manager—CSNC transaction)), and several terminal-control modules (see “DFHZCX (CICS terminal control routines)” on page 350).

These modules provide the CICS address space with a DFHTC-level interface to interregion communication (in the same way as DFHZCP provides a DFHTC-level interface to VTAM). This enables other CICS modules (such as DFHISP) to allocate and execute input/output operations on IRC sessions. The IRC sessions are used for all forms of IRC communication, and the macro-level services available for IRC are broadly the same. Thus DFHISP works for both IRC and intersystem communication (ISC) function shipping.

The functions of each module are as follows:

DFHCRSP (CICS IRC startup module): Execution of this module makes interregion communication possible between this address space and other address spaces. DFHCRSP, which can be invoked either at system initialization or by the master terminal, allocates the cross-region block (CRB), issues a LOGON request to the SVC routine, and attaches the CSNC transaction (connection manager program, DFHCRNP).

DFHCRNP (connection manager—CSNC transaction): Interregion communication is controlled by the interregion control program, DFHCRNP, which runs as transaction CSNC. This is attached when CICS first logs on to the interregion program, and it remains attached until interregion communication is closed.

The main purpose of CSNC is to perform housekeeping and control on IRC sessions, and to simulate the access method. Its functions include the following:

1. Establish connections to other address spaces (by issuing CONNECT requests)
2. Detect unsolicited input data on connections and attach requested tasks to process such data
3. Disconnect unallocated (**between-bracket**) sessions during QUIESCE
4. Issue DFHKC AVAIL for any secondary sessions which have become available for reallocation, and are in demand
5. Issue PC RETURN when QUIESCE is complete.

CSNC is attached by DFHCRSP (IRC startup), and waits when it is not processing work. It is resumed by the dispatcher when the MRO work queue ECB has been posted, or the delay interval (if set) has expired and there is delayed work to be retried.

Whenever CSNC is posted, it checks first whether it has been invoked because quiescing of the interregion facility is complete.

- If CSNC has no been resumed to complete interregion quiesce processing, it checks each of the following:
  1. If the "delay-queue" is not empty, CSNC attempts to process any work it finds there. (An element is added to the queue whenever a transaction cannot be attached by CSNC. The system could, for example, have been at maximum tasks or short on storage when the previous attempt was made. It is also possible that a remote system tried to start a new conversation before the local system had freed the required session from an earlier conversation.)
  2. If a new conversation has been received:
     - If this is the first conversation on a new connection, and the connecting region is not a batch region, session recovery is performed. This means that if the name of the secondary connecting matches the name of the secondary connected in the previous session, the old session is bound once again.
     - If there is no match, or if a batch region is connecting, the first available session is allocated.
     - CSNC attempts to attach the required transaction, identified in the attach header included in the data stream. It is possible for a request to arrive for this session before the session has been freed from the transaction that last used it. In such a case, the transaction to be attached is added to the delay-queue.
     - The input data stream is built into a TIOA for the session.
  3. If this region is a secondary, and there is no task associated with the connection, and the connection is in quiesce, CSNC disconnects the session.
  4. If this region is a primary, and it has received a "disconnect" request from the connected secondary, CSNC disconnects the session if:
     - There is no associated TCTTE
     - There is no task associated with the link.
- If CSNC has been resumed to complete interregion quiesce processing, it:
  1. Sends message DFHIR3762 to the CSMT log.
  2. Resumes any suspended mirror tasks with a facility address of zero, so they can detach themselves.
  3. Disable immediate and delay queues. Any remaining work on those queues (for example, old retry work which has not been serviced yet) is automatically discarded.
  4. Logs off from the interregion SVC.
  5. Detaches, using a DFHLFM TYPE=RETURN request.

DFHCRR (CICS session recovery module):

Whenever a new connection is established (via a successful CONNECT request), DFHCRNP links to DFHCRR at the secondary end of the connection (that is, at the source of the connection). DFHCRNP sends a data stream down to the other end of the connection (the primary end) which causes DFHCRNP to link to DFHCRR at the primary end. The two DFHCRRs exchange information in order to determine whether either end of the connection was in doubt when the previous use of the connection was terminated, and, if so, whether the two ends were in sync or out of sync. In the case of an in-doubt connection, the sequence numbers are compared, diagnostics are issued, and the session is freed.

DFHCRC (interregion abnormal exit module): This module contains the ESTAE exit routine corresponding to the ESTAE macro issued by DFHKESIP. It is invoked if the ESTAE exit, DFHKESTX, decides to continue the abend, or if an X22 abend (which can't be handled by DFHKESTX) occurs.

The purpose of the exit is to free links with other subsystems to which connection has been made by the interregion SVC, and to free links with the SVC itself. This is done by issuing to the SVC a CLEAR request (to break links with other subsystems).

DFHZCX (CICS terminal control routines): DFHZCX is a load module consisting of a set of object modules, including DFHZIS1 (ISC or IRC syncpoint) and DFHZIS2 (IRC internal functions).

DFHZIS2 provides the following routines:

I/O request routine (IORENT)
Provides a WRITE/WAIT/READ interface to interregion connections.

GETDATA routine (GDAENT)
Retrieves input data from an IRC connection and puts it into a TIOA.

RECEIVE routine (RECENT)
Receives unsolicited data (**begin-bracket** in SNA terms) and checks validity.

DISCONNECT routine (DSCENT)
Cleans up this end of a connection, and issues DISCONNECT request to DFHIRP.

OPRENT routine (OPRENT)
Issues an INSRV request to DFHIRP, in order to allow future connections between this subsystem and a specified subsystem.

RECABRT routine (RCAENT)
Is invoked when an ABORT FMH (FMH07) is received (indicating that the connected transaction has abended). The routine issues a message describing the failure.

STOP routine (STPENT)
Is invoked when communication with other address spaces is to be terminated. The routine issues a QUIESCE request to DFHIRP.

LOGOFF routine (LGFENT)
Is invoked when quiesce is complete (and during system termination and abend processing). The routine issues a LOGOFF request to the SVC routine.

DFHZIS1 also contains routines representing terminal control services which are supported by IRC (in common with VTAM). These routines include PREPARE, SPR, COMMIT, and ABORT.

DFHZCP (CICS terminal management program):

DFHZCP is a load module consisting of a set of object modules, including DFHZARQ (application request handler), DFHZISP (intersystem program allocation routines), and DFHZSUP (startup task).

DFHZARQ is used (in common with all other telecommunication access methods) to handle WRITE/WAIT/READ-level requests against IRC connections (sessions). Routine ZARQIRC in DFHZARQ specifically handles IRC requests by performing SNA request header processing and invoking IORENT (see DFHZCX) in order to perform the I/O on the session.

DFHZISP includes routines such as ALLOCATE and FREE.

Exits

No global user exit points are provided for this function.

Trace

The following point IDs are provided for this function:

- AP DDxx, for which the trace levels are IS 1 and IS 2.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 43. Intersystem communication (ISC)

CICS intersystem communication (ISC) allows the following:

- CICS-to-CICS communication
- CICS-to-IMS communication
- CICS-to-LUTYPE6.2 terminal or application communication.

These can be execute simultaneously within the same or a different CEC. ISC can use VTAM LU6.1 or LU6.2 (LU6.2 is preferred for CICS operation). For information about these methods of communication, see the *CICS Intercommunication Guide*.

The facilities provided by ISC include:

- Transaction routing
- Distributed transaction processing
- Function shipping
- Asynchronous processing
- Distributed program link
- SAA Communications interface.

For information about the design and operation of intersystem communication, see Chapter 100, "VTAM LU6.2" on page 691. For descriptions of the facilities provided by ISC, see Chapter 95, "Transaction routing" on page 653, Chapter 24, "Distributed transaction processing" on page 171, Chapter 40, "Function shipping" on page 333, and Chapter 67, "SAA Communications and Resource Recovery interfaces" on page 487.

Chapter 44. Interval control

Interval control provides various optional task-related functions based on specified intervals of time, or specified time of day.

Design overview

The following services are performed by interval control in response to a specific request from either an application program or another CICS function:

Time of day

The EXEC CICS ASKTIME command retrieves the current time-of-day in either binary or packed decimal format.

Time-dependent task synchronization

Time-dependent task synchronization provides the user with three optional services:

1. The EXEC CICS DELAY command allows a task to temporarily suspend itself for a specified period of time. When the time has elapsed, the task resumes execution.
2. The EXEC CICS POST command allows a task to be notified when the specified interval of time has elapsed or the specified time of day occurs. The task proceeds to execute while the time interval is elapsing.
3. The EXEC CICS CANCEL command allows a task to terminate its own or another task's request for a DELAY, POST or START service.

Automatic time-ordered transaction initiation

Automatic time-ordered transaction initiation provides for the automatic initiation of a transaction at a specified time of day (or after a specified interval of time has elapsed) and for the sending of data that is to be accessed by the transaction. The user can also cancel a pending request for automatic time-ordered transaction initiation.

Optional user exits are provided as follows:

- Before determining what type of request for time services was issued
- Upon expiration of a previously requested time-dependent event
- If a START request names an unknown terminal.

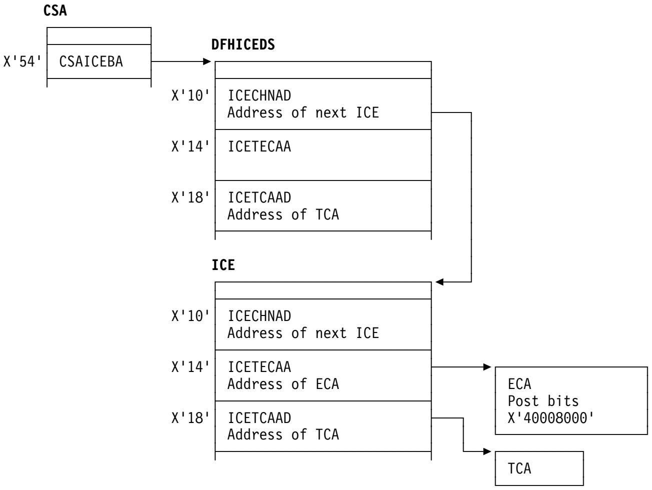
Time-of-day control

The EXEC CICS RESETTIME command causes CICS to reset its internal date and time of day information to accord with that of the operating system. This is done by calling DFHICP with a DFHIC TYPE=RESET macro. This macro is also issued by DFHAPTIM - the program run by the "midnight task" attached by interval control initialization - whenever it is resumed by the TI domain, i.e. at midnight.

DFHICP issues a KETI RESET_LOCAL_TIME call to the TI domain if the reason for the reset was a time of day change. This allows the TI domain to readjust its clocks to the operating system time. DFHICP then calls DFHTAJP to readjust other CICS clocks to match the operating system time and to make any necessary changes to the ICE chain resulting from possible changes in the time-to-expiry of time controlled ICEs. Finally DFHICP scans the ICE chain in order to process any that may have become expired as a result of the time change, and to reset the time interval for which the expiry task, DFHAPTIX, will wait, until the next ICE expires.

Control blocks

An interval control element (ICE—see Figure 78) is created for each time-dependent request received by interval control. These ICEs are chained from the CSA in expiration time-of-day sequence.



Note: An ECA (event control area) exists only after an EXEC CICS POST command.

Figure 78. Interval control element (ICE)

Expired time-ordered requests are processed by Interval Control when called from the DFHAPTIX module, which runs under a system task that has been resumed by the timer domain. The type of service represented by the expired ICE is initiated, if all resources required for the service are available, and the ICE is removed from the chain. If the resources are not available, the ICE remains on the chain and another attempt to initiate the requested service is made later.

See the *CICS Data Areas* manual for a detailed description of this control block.

Modules

DFHAPTIM, DFHAPTIX, DFHICP, DFHICRC, and DFHTAJP

Exits

There are three global user exit points in DFHICP: XICEXP, XICREQ, and XICTENF. See the *CICS Customization Guide* for further information.

Trace

The following point ID is provided for DFHICP:

- AP 00F3, for which the trace level is IC 1.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 45. Kernel domain (KE)

The kernel domain provides a consistent linkage and recovery environment for CICS.

The application programmer has no external interface to kernel linkage. However, services invoked by the application program result in execution of kernel linkage requests.

The CICS customization interface uses kernel linkage; this interface is described in the *CICS Customization Guide*.

The kernel domain, with its associated trace entries and dumped storage, becomes the first point of reference for problems that cause system recovery to be invoked. The kernel domain returns errors to the caller as response codes, if they seem to be of a form such that the caller can be expected to take alternative action.

For serious system-wide errors, the kernel domain terminates CICS with a system dump.

When the kernel domain terminates CICS following a program check or abend, messages and abend codes are produced to indicate the event that caused the kernel domain recovery routines to consider that the error was not recoverable.

Kernel domain's specific gates

Table 55 summarizes the kernel domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 55. Kernel domain's specific gates

Gate	Trace	Function	XPI
KEAR	KE 0701	DEREGISTER	NO
	KE 0702	READY	
		REGISTER	
		WAITPRED	
KEDD	KE 0201	ADD_DOMAIN	NO
	KE 0202	INQUIRE_DOMAIN_BY_TOKEN	NO
		INQUIRE_DOMAIN_BY_NAME	NO
		SET_ANCHOR	NO
		INQUIRE_ANCHOR	NO
		ADD_GATE	NO
		DELETE_GATE	NO
		INQUIRE_GLOBAL_TRACE	NO
		SET_GLOBAL_TRACE	NO
		INQUIRE_DOMAIN_TRACE	NO
		SET_DOMAIN_TRACE	NO
		INQUIRE_TASK_TRACE	NO
		SET_TASK_TRACE	NO
		PERFORM_SYSTEM_ACTION	NO
		SET_TRAP_OFF	NO
		SET_TRAP_ON	NO
		SET_DEFAULT_RECOVERY	NO
KEDS	KE 0502	ABNORMALLY_TERMINATE_TASK	NO
	KE 0503[3]	CREATE_TASK[4]	NO
		CREATE_TCB	NO
		DETACH_TERMINATED_OWN_TCBS	NO
		END_TASK	NO
		FREE_TCBS	NO
		PUSH_TASK	NO
		POP_TASK	NO
		READ_TIME	NO
		RESET_TIME	NO
		START_RUNAWAY_TIMER	NO
		STOP_RUNAWAY_TIMER	NO
		RESTORE_STIMER	NO
		SEND_DEFERRED_ABEND	NO
		START_PURGE_PROTECTION	YES
		STOP_PURGE_PROTECTION	YES
		PROCESS_KETA_ERROR	NO
KEGD	KE 0401	INQUIRE_KERNEL	NO
	KE 0402	SET_KERNEL	NO
KEIN	KE 0301	INITIALISE_KERNEL	NO
	KE 0302	SET_STATIC_TASKS	NO
		ADD_DYNAMIC_TASK	NO
		ADD_TEMPORARY_STATIC_TASK	NO
		DELETE_TASKS	NO
KETI	KE 0101	ADJUST_STCK_TO_LOCAL	NO
	KE 0102	CONVERT_TO_DECIMAL_TIME	NO
		CONVERT_TO_STCK_FORMAT	NO
		INQUIRE_DATE_FORMAT	NO
		INQ_LOCAL_DATETIME_DECIMAL	NO
		NOTIFY_RESET	NO
		REQUEST_NOTIFY_OF_A_RESET	NO
		RESET_LOCAL_TIME	NO
		SET_DATE_FORMAT	NO
KEXM	KE 0601	TRANSACTION_INITIALISATION	NO
	KE 0602		

KEAR gate, DEREGISTER function

The DEREGISTER function of the KEAR gate is used when performing a normal shutdown (and optionally at an immediate shutdown) to deregister CICS from the MVS automatic restart manager.

Input parameters: None.

[3] Only the following KEDS functions are traced:

SEND_DEFERRED_ABEND, START_PURGE_PROTECTION, STOP_PURGE_PROTECTION, and PROCESS_KETA_ERROR.

[4] The CREATE_TASK function is processed by the DFHKETA module; all other KEDS functions are processed by the DFHKEDS module.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|KERNERROR|PURGED

KEAR gate, READY function

The READY function of the KEAR gate is used at the end of CICS initialization to indicate to the MVS automatic restart manager. that this CICS region is ready for work.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|KERNERROR|PURGED

KEAR gate, REGISTER function

The REGISTER function of the KEAR gate is used very early in CICS initialization to register CICS with the MVS automatic restart manager.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEAR gate, WAITPRED function

The WAITPRED function of the KEAR gate is used to wait on predecessors in the restart policy for this CICS region, to ensure that prerequisite subsystems are available to CICS.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|KERNERROR|PURGED

KEDD gate, ADD_DOMAIN function

The ADD_DOMAIN function of the KEDD gate is used to add a new domain to the domain table.

Input parameters

DOMAIN_NAME is the 8-character domain name for the new domain to be added.

DOMAIN_TOKEN is the 31-bit constant that uniquely identifies the domain, for example, DFHSM_DOMAIN for storage manager domain.

ENTRY_POINT is the 31-bit address of the entry point for that domain, for example, A(X'80000000' + DFHSMDM) for storage manager domain.

[DOMAIN_AFFINITY] is the TCB that the domain has affinity with for TERMINATE_DOMAIN. It can have any one of these values:

STEP|RO|QR|CO|SZ

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUPLICATE_DOMAIN_TOKEN, DUPLICATE_DOMAIN_NAME
INVALID	INVALID_DOMAIN_TOKEN, INVALID_ENTRY_POINT

KEDD gate, INQUIRE_DOMAIN_BY_TOKEN function

The INQUIRE_DOMAIN_BY_TOKEN function of the KEDD gate is used to return the domain name for a specified domain token.

Input parameters

DOMAIN_TOKEN is the 31-bit constant that uniquely identifies the domain.

Output parameters

DOMAIN_NAME is the 8-character domain name for the new domain to be added.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DOMAIN_TOKEN_NOT_FOUND
INVALID	INVALID_DOMAIN_TOKEN

KEDD gate, INQUIRE_DOMAIN_BY_NAME function

The INQUIRE_DOMAIN_BY_NAME function of the KEDD gate is used to return the domain token for a given domain name.

Input parameters

DOMAIN_NAME is the 8-character domain name for the new domain to be added.

Output parameters

DOMAIN_TOKEN is the 31-bit constant that uniquely identifies the domain.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

DOMAIN_NAME_NOT_FOUND

KEDD gate, SET_ANCHOR function

The SET_ANCHOR function of the KEDD gate is used to establish the calling domain’s global storage pointer.

Input parameters

ANCHOR is the 31-bit address of the domain’s global storage.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] is returned when RESPONSE is INVALID. It has this value:

INVALID_DOMAIN_TOKEN

KEDD gate, INQUIRE_ANCHOR function

The INQUIRE_ANCHOR function of the KEDD gate is used to return the specified domain’s global storage pointer to the caller. If the domain token is omitted, the calling domain is assumed.

Input parameters

[DOMAIN_TOKEN] is the 31-bit constant that uniquely identifies the domain.

Output parameters

ANCHOR is the 31-bit address of the domain’s global storage.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DOMAIN_TOKEN_NOT_FOUND
INVALID	INVALID_DOMAIN_TOKEN

KEDD gate, ADD_GATE function

The ADD_GATE function of the KEDD gate is used to update the domain table to add a new gate to the calling domain’s gate table.

Input parameters

GATE_INDEX is the 31-bit constant that uniquely identifies the gate in the domain’s gate table.

ENTRY_POINT is the 31-bit address of the entry point for the gate.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUPLICATE_GATE_INDEX
INVALID	INVALID_ENTRY_POINT, INVALID_GATE_INDEX, INVALID_DOMAIN_TOKEN

KEDD gate, DELETE_GATE function

The DELETE_GATE function of the KEDD gate is used to delete an existing gate from the calling domain’s gate table.

Input parameters

GATE_INDEX is the 31-bit constant that uniquely identifies the gate in the domain’s gate table.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] When RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_GATE_INDEX, INVALID_DOMAIN_TOKEN

KEDD gate, INQUIRE_GLOBAL_TRACE function

The INQUIRE_GLOBAL_TRACE function of the KEDD gate is used to return the value of the global trace flags to the caller.

Input parameters: None.

Output parameters

[MASTER_TRACE_FLAG] determines whether tracing, for any of the trace destinations, is active. It can have either of these values:

ON|OFF

[SYSTEM_TRACE_FLAG] determines whether tracing is allowed for tasks for which standard tracing is in effect. It can have either of these values:

ON|OFF

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDD gate, SET_GLOBAL_TRACE function

The SET_GLOBAL_TRACE function of the KEDD gate is used to store the value of the global trace flags within the kernel.

Input parameters

[MASTER_TRACE_FLAG] determines whether tracing, for any of the trace destinations, is active. It can have either of these values:

ON|OFF

[SYSTEM_TRACE_FLAG] determines whether tracing is allowed for tasks for which standard tracing is in effect. It can have either of these values:

ON|OFF

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDD gate, INQUIRE_DOMAIN_TRACE function

The INQUIRE_DOMAIN_TRACE function of the KEDD gate is used to return the value of the specified domain's trace flags to the caller. If the domain token is omitted, the calling domain is assumed.

Input parameters

[DOMAIN_TOKEN] is the 31-bit constant that uniquely identifies the domain.

Output parameters

[STANDARD_TRACE_FLAGS] is the set of 32 bits which determines selectivity of tracing within the domain for standard tasks.

[SPECIAL_TRACE_FLAGS] is the set of 32 bits which determines selectivity of tracing within the domain for special tasks.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DOMAIN_TOKEN_NOT_FOUND
INVALID	INVALID_DOMAIN_TOKEN

KEDD gate, SET_DOMAIN_TRACE function

The SET_DOMAIN_TRACE function of the KEDD gate is used to store the value of the specified domain's trace flags in the kernel. If the domain token is omitted, the calling domain is assumed.

The current task's stack entries are updated to reflect the change. The trace count is incremented so that all other tasks have their stack entries refreshed when they are next dispatched.

Input parameters

[DOMAIN_TOKEN] is the 31-bit constant that uniquely identifies the domain.

[STANDARD_TRACE_FLAGS] is the set of 32 bits which determines selectivity of tracing within the domain for standard tasks.

[SPECIAL_TRACE_FLAGS] is the set of 32 bits which determines selectivity of tracing within the domain for special tasks.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DOMAIN_TOKEN_NOT_FOUND
INVALID	INVALID_DOMAIN_TOKEN

KEDD gate, INQUIRE_TASK_TRACE function

The INQUIRE_TASK_TRACE function of the KEDD gate is used to return the value of the calling task's trace flag to the caller.

Input parameters: None.

Output parameters

[TRACE_TYPE] determines whether standard, special, or no tracing is required for this task. It can have any one of these values:

STANDARD|SPECIAL|SUPPRESSED

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDD gate, SET_TASK_TRACE function

The SET_TASK_TRACE function of the KEDD gate is used to store the value of the task trace flag in the current task's task table[5] entry.

The current task's stack entries are updated to reflect the change.

Input parameters

TRACE_TYPE determines whether standard, special, or no tracing is required for this task. It can have any one of these values:

STANDARD|SPECIAL|SUPPRESSED

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDD gate, PERFORM_SYSTEM_ACTION function

The PERFORM_SYSTEM_ACTION function of the KEDD gate is used in exceptional circumstances either to terminate CICS (with or without a dump) or to take an MVS SDUMP.

Normally, these services are invoked from domains during preinitialization before the dump domain is available.

Input parameters

[TERMINATE_SYSTEM (YES, NO)] specifies whether CICS is to be terminated or not. It can have either of these values:

YES|NO

[DUMP_SYSTEM (YES, NO)] specifies whether an MVS SDUMP is to be taken or not. It can have either of these values:

YES|NO

[NORMAL_TERMINATION(YES, NO)] specifies whether CICS is being terminated normally. Normal termination includes controlled and immediate shutdowns. It can have either of these values:

YES|NO

The default value is NO.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDD gate, SET_TRAP_OFF function

The SET_TRAP_OFF function of the KEDD gate is used to reset the kernel global trap point.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDD gate, SET_TRAP_ON function

The SET_TRAP_ON function of the KEDD gate is used to set a kernel global trap point.

Input parameters

ENTRY_POINT is the 31-bit address of the kernel global trap.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] is returned when RESPONSE is INVALID. It has this value:

[5] **Task table**: A task table is a logical block of tasks, allocated together by the Kernel domain, and used to simplify the process of dynamically adding new tasks. Task tables are chained together, and vary in number.

INVALID_ENTRY_POINT

KEDD gate, SET_DEFAULT_RECOVERY function

The SET_DEFAULT_RECOVERY function of the KEDD gate is used to establish the calling domain’s default recovery routine. Used by the Application domain to identify DFHSRP as its default recovery routine.

Input parameters

ENTRY_POINT is the 31-bit address of the entry point for the recovery routine.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] is returned when RESPONSE is INVALID. It has this value:

INVALID_DOMAIN_TOKEN

KEDS gate, ABNORMALLY_TERMINATE_TASK function

The ABNORMALLY_TERMINATE_TASK function of the KEDS gate identifies the task which is to be abnormally terminated.

Input parameters

TASK_TOKEN identifies the task which is to be abnormally terminated.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	TERMINATE_FAILED

KEDS gate, CREATE_TASK function

The CREATE_TASK function of the KEDS gate is used to allocate a new executable task from the task table[6].

When the task is first dispatched, the Kernel domain issues a KEDS_TASK_REPLY request, which passes control to the Dispatcher domain’s task reply gate. (See “KEDS format, TASK_REPLY function” on page 368.)

The attach token input on the CREATE_TASK request is passed back to the dispatcher domain on the TASK_REPLY, to identify the CREATE_TASK and TASK_REPLY pair.

Note: The CREATE_TASK function is processed by the DFHKETA module.

Input parameters

ALLOCATION indicates whether or not the returned task should be allocated from those tasks pre-allocated for MXT. It can either of these values:

STATIC | DYNAMIC

ATTACH_TOKEN is the 31-bit token that uniquely identifies the request. This token is returned on the corresponding TASK_REPLY to identify the request.

Output parameters

TASK_TOKEN is the 31-bit token that uniquely identifies the newly created task.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	INQUIRE_ERROR
EXCEPTION	ADD_TASK_ERROR

KEDS gate, CREATE_TCB function

The CREATE_TCB function of the KEDS gate creates the default task [7] for a new MVS TCB, and MVS posts the TCB to start execution.

The kernel invokes the dispatcher domain at its KEDS gate with a TCB_REPLY request, under the new TCB’s default task.

The attach token is used to identify the CREATE_TCB and TCB_REPLY pair.

Input parameters

[6] **Task table**: A task table is a logical block of tasks, allocated together by the Kernel domain, and used to simplify the process of dynamically adding new tasks. Task tables are chained together, and vary in number.

[7] **Default task**: The task, associated with the TCB, that executes the dispatcher loop which chooses the next CICS task (system or non-system) to be dispatched, or if no CICS task is to be dispatched, issues an MVS WAIT.

ATTACH_TOKEN is the 31-bit token that uniquely identifies the request. This token is returned on the corresponding TCB_REPLY to identify the request.

ESSENTIAL_TCB indicates whether CICS is to be terminated if a TCB in this mode has its ESTAE exit driven for a non recoverable error.

EXEC_CAPABLE indicates whether support should be provided under the new TCB for CICS API commands.

INHERIT_SUBSPACE indicates whether TCBs in this mode are to inherit the subspace of the attaching TCB.

LE_ENVIRONMENT indicates whether CICS should tell LE that it is running in a CICS environment under this TCB. If LE_CICS is specified, LE will issue CICS API commands.

[MODE] specifies the mode of the new TCB. It can have any one of these values:

RO|QR|CO|SZ|RP|FO

PARENT_MODENAME identifies the mode of the TCB that is to ATTACH the new TCB.

PRTY_RELATIVE_TO_QR gives the priority of this TCB relative to QR.

TCB_KEY specifies the key to be specified on the ATTACH of TCBs in this mode. The value ends up in TCBPKF.

Output parameters

TASK_TOKEN is the 31-bit token that uniquely identifies the new TCB's task.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	INQUIRE_ERROR
EXCEPTION	ADD_TASK_ERROR, ADD_TCB_ERROR, ATTACH_KTCB_ERROR

KEDS gate, DETACH_TERMINATED_OWN_TCBS function

The DETACH_TERMINATED_OWN_TCBS function of the KEDS gate detaches any terminated TCBs which were attached by the TCB on which this function is invoked.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have this value:

OK

KEDS gate, END_TASK function

The END_TASK function of the KEDS gate is used to free any resources that have been acquired by the kernel domain during the lifetime of the current task and need freeing before the end of the task.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any one of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDS gate, FREE_TCBS function

The FREE_TCBS function of the KEDS gate conditionally frees control blocks, in collaboration with the Dispatcher for re-use, associated with any detached TCBs.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have this value:

OK

KEDS gate, PUSH_TASK function

Given a TCB executing its default task, the PUSH_TASK function of the KEDS gate is used to make it execute a CICS task instead.

Input parameters

TASK_TOKEN is the 31-bit token that identifies the CICS task to be executed.

Output parameters

[INTERVAL] is a doubleword containing the CPU time used by the task while it was pushed.

RESPONSE is the domain's response to the call. It can have any one of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDS gate, POP_TASK function

Given a TCB executing the current CICS task, the POP_TASK function of the KEDS gate is used to make it execute its default task instead.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDS gate, READ_TIME function

The READ_TIME function of the KEDS gate is used to obtain the total CPU time that the current task has taken so far and the accumulated CPU time for the current TCB.

Input parameters: None.

Output parameters

[INTERVAL] A doubleword containing the total CPU time used so far.

[ACCUM_TIME] A doubleword containing the accumulated CPU time used so far by the current TCB.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDS gate, RESET_TIME function

The RESET_TIME function of the KEDS gate is used to reset the total CPU time that the current task has taken so far.

Input parameters: None.

Output parameters

[INTERVAL] A doubleword containing the total CPU time used so far.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDS gate, STOP_RUNAWAY_TIMER function

The STOP_RUNAWAY_TIMER function of the KEDS gate is used to inhibit runaway detection for the current task. The remaining runaway interval is preserved until a START_RUNAWAY_TIMER request is issued. The stop runaway count is incremented by one; this allows STOP_RUNAWAY_TIMER requests to be nested.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDS gate, START_RUNAWAY_TIMER function

The START_RUNAWAY_TIMER function of the KEDS gate is used to resume runaway timing for the current task. This reduces the stop runaway count by one. The timer is resumed only when all outstanding STOP_RUNAWAY_TIMER requests have been canceled.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDS gate, RESTORE_STIMER function

The RESTORE_STIMER function of the KEDS gate is used to restore the kernel's STIMER exit after MVS requests that use the MVS STIMER macro internally.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KEDS gate, SEND_DEFERRED_ABEND function

The SEND_DEFERRED_ABEND function of the KEDS gate is used by the transaction manager to implement the deferred purge function. If a purge request is made against a task that is not in a suitable state to be purged, this function defers the abend of that task until the task is no longer protected against purge.

This function is used by the transaction manager to implement the deferred purge function.

Input parameters

[DS_TASK_TOKEN] is the 31-bit dispatcher token that identifies the CICS task to be abended. If not supplied, DS_TASK_TOKEN defaults to the current task.

ABEND_CODE is the four-character abend code for the abend.

[FORCE] indicates whether or not the deferred abend is to be forced. It can have either of these values:

YES|NO

The default is NO.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER`

KEDS gate, START_PURGE_PROTECTION function

The START_PURGE_PROTECTION function of the KEDS gate is used to inhibit purge, but not force-purge, for the current task.

In general, each START_PURGE_PROTECTION call should have a corresponding STOP_PURGE_PROTECTION function call to end the purge protection period on completion of any program logic that needs such protection.

This function increments by one the purge protection count for the task. You can issue several START_PURGE_PROTECTION commands for the same task, to increase the count for the task. (To enable the task to purged, the count must be decremented to zero by issuing STOP_PURGE_PROTECTION commands.)

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER`

KEDS gate, STOP_PURGE_PROTECTION function

The STOP_PURGE_PROTECTION function of the KEDS gate is used to enable again purge for the current task after purge has been suspended by a previous START_PURGE_PROTECTION function call.

This function decrements by one the purge protection count for the task. To enable the task to purged, the count must be decremented to zero by issuing the appropriate number of STOP_PURGE_PROTECTION commands.

You must design your exit programs to ensure that purge protection is correctly cancelled. For more information about using these functions to stop and start purge protection, see the *CICS Customization Guide*.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER`

KEDS gate, PROCESS_KETA_ERROR function

The PROCESS_KETA_ERROR function of the KEDS gate is used to handle any errors for the DFHKETA module. (The DFHKETA module handles the performance sensitive KEDS functions, and calls the DFHKEDS module when its recovery routine is invoked.)

Input parameters

ERROR_DATA address of the error data that describes the error that has occurred in the DFHKETA module.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER`

KEGD gate, INQUIRE_KERNEL function

The INQUIRE_KERNEL function of the KEGD gate is used to obtain the global data maintained by the kernel.

Input parameters: None.

Output parameters

[CICS_SVC_NUMBER] is the 8-bit CICS service SVC number.

[SPECIFIC_APPLID] is the 8-character specific applid that identifies the CICS system in the VTAM network.

[GENERIC_APPLID] is the 8-character generic applid that identifies the active and alternate CICS systems to VTAM in an XRF environment.

[XRF_COMMAND_LIST] is the 8-character name of the command list table used by the XRF alternate CICS region.

[ALTERNATE_XRF_IDS] is the 8-character name of the recoverable service table used if the CICS region is running with XRF and DBCTL.

[SYSID] is the 4-character ZCP system entry name.

[SIT_NAME] is the 8-character SIT name.

[OS_PARMS] is the 8-byte block containing the 31-bit address and 31-bit length of the MVS parameters.

[OP_SYS] is the 1-character operating system identifier, for example, 'B' = MVS.

[OP_REL] is the 2-byte operating system release and modification level.

[HPO] specifies whether CICS is to use the VTAM high performance option. It can have either of these values:

`YES|NO`

[SYSTEM_RUNAWAY_LIMIT] the ICVR time to be used by all tasks that have been defined to have the default runaway limit in the system.

[CPU_MONITORING] specifies whether the kernel is to perform CPU monitoring. It can have either of these values:

```
YES|NO
```

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

KEGD gate, SET_KERNEL function

The SET_KERNEL function of the KEGD gate is used to change the global data maintained by the kernel.

Input parameters

[CICS_SVC_NUMBER] is the 8-bit CICS service SVC number.

[SPECIFIC_APPLID] is the 8-character specific applid that identifies the CICS system in the VTAM network.

[GENERIC_APPLID] is the 8-character generic applid that identifies the active and alternate CICS systems to VTAM in an XRF environment.

[XRF_COMMAND_LIST] is the 8-character name of the command list table used by the XRF alternate CICS region.

[ALTERNATE_XRF_IDS] is the 8-character name of the recoverable service table used if the CICS region is running with XRF and DBCTL.

[SYSID] is the 4-character ZCP system entry name.

[SIT_NAME] is the 8-character name of the system initialization table.

[HPO] specifies whether CICS is to use the VTAM high performance option. It can have either of these values:

```
YES|NO
```

[SYSTEM_RUNAWAY_LIMIT] the ICVR time to be used by all tasks that have been defined to have the default runaway limit in the system.

[CPU_MONITORING] specifies whether the kernel is to perform CPU monitoring. It can have either of these values:

```
YES|NO
```

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

KETI gate, RESET_LOCAL_TIME function

The RESET_LOCAL_TIME function of the KETI gate is used by the AP domain to inform KETI that a local time reset has occurred.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any one of these values:

```
OK|INVALID|KERNERROR|PURGED|DISASTER
```

KETI gate, REQUEST_NOTIFY_OF_A_RESET function

The REQUEST_NOTIFY_OF_A_RESET function of the KETI gate requests a shoulder tap from KETI whenever the local time is reset.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any one of these values:

```
OK|INVALID|KERNERROR|PURGED|DISASTER
```

KETI gate, SET_DATE_FORMAT function

The SET_DATE_FORMAT function of the KETI gate is used to set the date format for the timer domain.

Input parameters

DATE_FORMAT is the format to be set as the default for the timer domain. It can have any one of these values:

```
YYMMDD|DDMMYY|MMDDYY
```

Output parameters

RESPONSE is the domain's response to the call. It can have any one of these values:

```
OK|INVALID|KERNERROR|PURGED|DISASTER
```

KETI gate, INQUIRE_DATE_FORMAT function

The INQUIRE_DATE_FORMAT function of the KETI gate is used to return the current date format.

Input parameters: None.

Output parameters

DATE_FORMAT is the current default date format for the timer domain. It can have any one of these values:

```
YYMMDD|DDMMYY|MMDDYY
```

RESPONSE is the domain's response to the call. It can have any one of these values:

`OK|INVALID|KERNERROR|PURGED|DISASTER`

KETI gate, INQ_LOCAL_DATETIME_DECIMAL function

The INQ_LOCAL_DATETIME_DECIMAL function of the KETI gate is used to return the local date, and the local time in decimal format.

Input parameters: None.

Output parameters

DECIMAL_DATE is an 8-character date in the format determined by FULL_DATE_FORMAT.

DECIMAL_TIME is the current local decimal time in the format HHMMSS.

DECIMAL_MICROSECONDS is the 6-character microseconds portion of DECIMAL_TIME.

FULL_DATE_FORMAT is the current full date format determined by the default date format of the timer domain. It can have any one of these values:

`YYYYMMDD|DDMMYYYY|MMDDYYYY`

RESPONSE is the domain's response to the call. It can have any one of these values:

`OK|INVALID|KERNERROR|PURGED|DISASTER`

KETI gate, CONVERT_TO_DECIMAL_TIME function

The CONVERT_TO_DECIMAL_TIME function of the KETI gate is used to convert dates and times in the internal store clock (STCK) format to decimal format.

Input parameters

STCK_TIME is a doubleword containing a date and time in STCK format.

Output parameters

DECIMAL_DATE is an 8-character date in the format determined by FULL_DATE_FORMAT

DECIMAL_TIME is the current local decimal time in the format HHMMSS

DECIMAL_MICROSECONDS is the 6-character microseconds portion of DECIMAL_TIME

FULL_DATE_FORMAT is the current full date format determined by the default date format of the timer domain. It can have any one of these values:

`YYYYMMDD|DDMMYYYY|MMDDYYYY`

RESPONSE is the domain's response to the call. It can have any one of these values:

`OK|INVALID|KERNERROR|PURGED|DISASTER`

KETI gate, CONVERT_TO_STCK_FORMAT function

The CONVERT_TO_STCK_FORMAT function of the KETI gate is used to convert times and dates to STCK format.

Input parameters

DECIMAL_TIME is the current local decimal time in the format HHMMSS.

[DECIMAL_DATE] is an optional 8-character date in the format determined either by FULL_DATE_FORMAT or by the default for the timer domain if FULL_DATE_FORMAT is omitted.

[INSTANCE] is required only if DECIMAL_DATE is omitted. It can have either of these values:

`LAST|NEXT`

[FULL_DATE_FORMAT] is the current full date format. It can have any one of these values:

`YYYYMMDD|DDMMYYYY|MMDDYYYY`

Output parameters

STCK_TIME is a doubleword containing the GMT STCK value corresponding to the input local time.

RESPONSE is the domain's response to the call. It can have any one of these values:

`OK|INVALID|KERNERROR|PURGED|DISASTER`

KEXM gate, TRANSACTION_INITIALISATION function

The TRANSACTION_INITIALISATION function of the KEXM gate is used to perform kernel initialisation during XM task-reply.

Input parameters

TRANSACTION_TOKEN is a token identifying the transaction for which kernel initialization is to be performed.

Output parameters

RESPONSE is the domain's response to the call. It can have any one of these values:

`OK|INVALID|KERNERROR|PURGED|DISASTER`

Kernel domain's generic formats

Table 56 on page 368 describes the generic formats owned by the kernel domain, and shows the functions performed on the calls.

Table 56. Generic formats owned by the kernel domain

Format	Calling module	Function
KEDS	DFHKETA DFHKETCB	TASK_REPLY TCB_REPLY
KETI	DFHKETI	NOTIFY_RESET

In the descriptions of the formats that follow, the "input" parameters are input not to the kernel domain, but to the domain being called by the kernel domain. Similarly, the "output" parameters are output by the domain that was called by the kernel domain, in response to the call.

KEDS format, TASK_REPLY function

The TASK_REPLY function of the KEDS format is issued by the kernel to the issuer of CREATE_TASK, under the new task.

Input parameters

ATTACH_TOKEN is the 31-bit token that uniquely identifies the corresponding CREATE_TASK request.

TASK_TOKEN is the 31-bit token that uniquely identifies the new task.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|INVALID|KERNERROR|PURGED|DISASTER

KEDS format, TCB_REPLY function

The TCB_REPLY function of the KEDS format is issued by the kernel to the issuer of CREATE_TCB, under the new TCB's default task.

Input parameters

ATTACH_TOKEN is the 31-bit token that uniquely identifies the corresponding CREATE_TCB request.

TASK_TOKEN is the 31-bit token that uniquely identifies the new TCB's task.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER

KETI format, NOTIFY_RESET function

The NOTIFY_RESET function of the KETI format is used by KETI itself to inform domains that a RESET has occurred.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any one of these values:

OK|KERNERROR|PURGED|DISASTER

Control blocks

Figure 79 on page 369 shows the MVS TCB structure used by CICS. Other TCBs are attached under the quasi-reentrant TCB by IBM DATABASE 2 (DB2) or IMS/ESA code, if those products are being used.

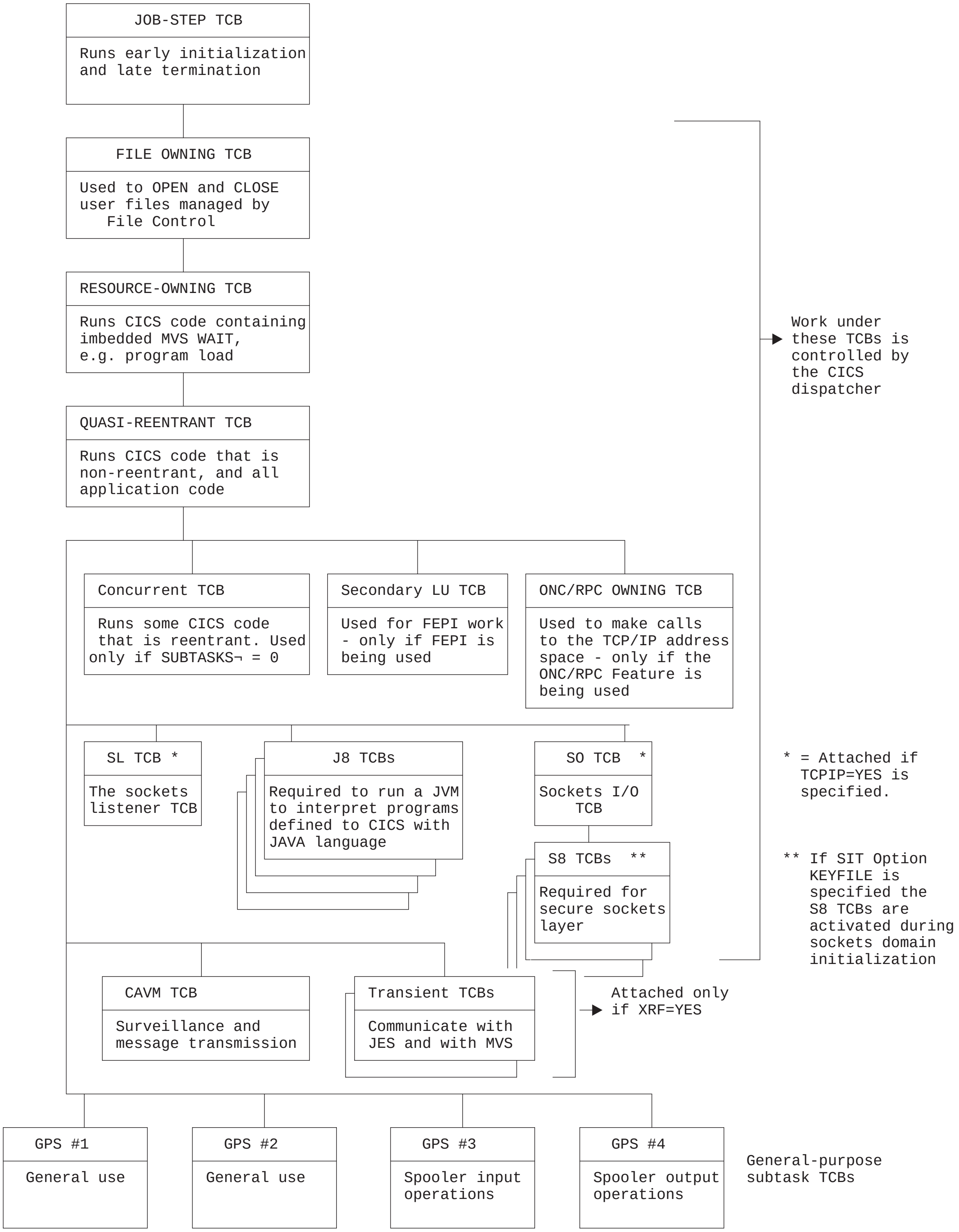

JOB-STEP TCB
Runs early initialization and late termination
FILE OWNING TCB
Used to OPEN and CLOSE user files managed by File Control
RESOURCE-OWNING TCB
Runs CICS code containing imbedded MVS WAIT, e.g. program load
QUASI-REENTRANT TCB
Runs CICS code that is non-reentrant, and all application code
Work under these TCBs is controlled by the CICS dispatcher
Concurrent TCB
Runs some CICS code that is reentrant. Used only if SUBTASKS¬ = 0
Secondary LU TCB
Used for FEPI work - only if FEPI is being used
ONC/RPC OWNING TCB
Used to make calls to the TCP/IP address space - only if the ONC/RPC Feature is being used
SL TCB *
The sockets listener TCB
J8 TCBs
Required to run a JVM to interpret programs defined to CICS with JAVA language
SO TCB *
Sockets I/O TCB
S8 TCBs **
Required for secure sockets layer
* = Attached if TCPIP=YES is specified.
** If SIT Option KEYFILE is specified the S8 TCBs are activated during sockets domain initialization
CAVM TCB
Surveillance and message transmission
Transient TCBs
Communicate with JES and with MVS
Attached only if XRF=YES
GPS #1
General use
GPS #2
General use
GPS #3
Spooler input operations
GPS #4
Spooler output operations
General-purpose subtask TCBs

Figure 79. MVS TCB structure used by CICS

Modules

Module	Function
DFHKEAR	Implements KEAR service requests.
DFHKEDCL	Implements domain call requests.
DFHKEDD	Services KEDD-format requests.
DFHKEDRT	Implements domain return requests.
DFHKEDS	Services KEDS-format requests.
DFHKEDUF	Offline dump formatting routine to format the kernel domain control blocks.
DFHKEEDA	Handles deferred abends
DFHKEGD	Services KEGD-format requests.
DFHKEIN	Implements kernel domain initialization.
DFHKELCL	Implements LIFO Push.
DFHKELOC	Offline dump formatting routine to locate the kernel domain anchor blocks.
DFHKELRT	Implements LIFO Pop.
DFHKERCD	Constructs the kernel domain error data for error handling routines.
DFHKERER	Updates the kernel domain error table for error handling routines.
DFHKERET	Implements RESET_ADDRESS requests.
DFHKERKE	Handles KERNERROR responses for domain call requests which cannot handle them.
DFHKERPC	Implements recovery percolation both from RECOVERY_PERCOLATE requests and also other recovery events that, because of the existing environment, must be percolated.
DFHKERRI	Responsible for actually passing control to a recovery routine.
DFHKERRQ	Implements RECOVERY_REQUEST requests.
DFHKERRU	Implements runaway task error handling.
DFHKERRX	Implements RECOVERY_EXIT requests.
DFHKESCL	Implements subroutine call requests.
DFHKESFM	Handles freeing of stack segments.
DFHKESGM	Handles allocation of new stack segments.
DFHKESIP	Receives control from and returns control to MVS.
DFHKESRT	Implements subroutine return requests.
DFHKESTX	Is the CICS ESTAE exit and passes control to the appropriate level of recovery routine.
DFHKESVC	Provides authorised services for kernel domain functions.
DFHKETA	Implements KEDS CREATE_TASK requests.
DFHKETCB	Receives control from MVS for a kernel domain TCB.
DFHKETI	Provides service time functions at the KETI gate.
DFHKETIX	Performs task CPU monitoring functions and task runaway detection.
DFHKETRI	Offline trace formatting routine for kernel domain trace entries.
DFHKETXR	Allows an attaching TCB to detmine that a TCB (but not a specific TCB) which it attached, has terminated. This allows for the possibility of initiating a more timely detach of TCBs which have terminated normally, and to detect TCBs which have prematurely terminated.
DFHKEXM	Implements KEXM_FORMAT requests.

Exits

No global user exit points are provided in this domain.

Trace

The point IDs for the kernel domain are of the form KE xxxx; the corresponding trace levels are KE 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 46. Loader domain (LD)

The loader domain is used by the domains of the CICS system to obtain access to storage-resident copies of nucleus and application programs, maps, and tables. In order to provide this, the loader domain interfaces with MVS to perform the loading of programs into the CICS dynamic storage areas (DSAs), and the scanning of the MVS link pack area (LPA).

The most common functions provided by the loader domain are:

ACQUIRE_PROGRAM used to obtain the load point and entry point addresses and length of a usable program copy, and to reserve the copy for use by the caller.

RELEASE_PROGRAM used to inform the loader domain that a specific program copy is no longer required.

DEFINE_PROGRAM used to inform the loader domain of the CICS attributes of a program.

REFRESH_PROGRAM used to request the loader domain to rescan the LPA or DFHRPL library for a new copy of a program.

The loader domain is utilized by many domains in the system, but its most common user is the program manager domain, for access to application programs. The program manager domain issues the following requests:

ACQUIRE_PROGRAM whenever a program issues a LINK, XCTL, or LOAD command to link to, transfer control to, or load another program.

DEFINE_PROGRAM as part of a request to define or autoinstall a program, mapset, or partitionset.

RELEASE_PROGRAM whenever a called program issues a RETURN command to return control to the calling program, or a program issues a RELEASE command to release a loaded program.

REFRESH_PROGRAM as part of an EXEC CICS SET PROGRAM NEWCOPY or PHASEIN request.

Loader domain’s specific gate

Table 57 summarizes the loader domain’s specific gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and whether or not the functions are available through the exit programming interface (XPI).

Table 57. Loader domain’s specific gate

Gate	Trace	Function	XPI
LDLD	LD 0001	ACQUIRE_PROGRAM	YES
	LD 0002	RELEASE_PROGRAM	YES
		REFRESH_PROGRAM	NO
		DEFINE_PROGRAM	YES
		INQUIRE_PROGRAM	NO
		DELETE_PROGRAM	YES
		START_BROWSE	NO
		GET_NEXT_PROGRAM	NO
		GET_NEXT_INSTANCE	NO
		END_BROWSE	NO
		IDENTIFY_PROGRAM	NO
		SET_OPTIONS	NO
		INQUIRE_OPTIONS	NO
		CATALOG_PROGRAMS	NO

LDLD gate, ACQUIRE_PROGRAM function

The ACQUIRE_PROGRAM function of the LDLD gate is used to obtain the entry point and load point addresses and the length of a usable copy of the named program. The program must previously have been identified to the system in a DEFINE request, either during this session or in a previous session, if the catalog is in use.

Input parameters

PROGRAM_NAME specifies the name of the required program.

PROGRAM_TOKEN is a valid program-identifying token as returned by a previous DEFINE or ACQUIRE request for the same program name.

[SUSPEND] indicates whether the caller expects to receive control with an exception response if the loader encounters a shortage of virtual storage, or other transient error conditions. It can have either of these values:

YES|NO

If there is insufficient storage to satisfy the request, SUSPEND(YES) causes the caller to be suspended until the request can be satisfied, and SUSPEND(NO) causes an exception response (reason NO_STORAGE) to be returned to the caller.

Output parameters

ENTRY_POINT is the address of the entry point of the program instance.

[LOAD_POINT] is the address of the load point of the program instance.

[PROGRAM_LENGTH] is the length of the program instance in bytes.

[NEW_PROGRAM_TOKEN] is the identifying token that may be used on subsequent ACQUIRE or RELEASE calls for this program name.

[PROGRAM_ATTRIBUTE] reflects the program attribute from the program definition, and is used by the program manager domain to recognize RELOAD programs.

[LOCATION] determines where the program instance for which the LOAD_POINT and ENTRY_POINT have been returned resides.

[COPY_STATUS] indicates whether this request resulted in a physical load of the program into storage, and is used by the program manager domain to recognize that a COBOL program requires initialization.

[FETCH_TIME] is the time taken to load the program from the DFHRPL library. This is represented as the middle 4 bytes of a doubleword stored clock (STCK) value. If the acquired program resides in the MVS link pack area (LPA) or has already been loaded into one of the CICS dynamic storage areas (DSAs), the returned value is zero.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LIBRARY_IO_ERROR, OS_STORAGE_SHORTAGE, ABEND, LOOP
EXCEPTION	PROGRAM_NOT_DEFINED, PROGRAM_NOT_FOUND, NO_STORAGE
INVALID	INVALID_PROGRAM_TOKEN

LDLD gate, RELEASE_PROGRAM function

The RELEASE_PROGRAM function of the LDLD gate is used to inform the loader domain that use of a copy of the named program is no longer required. The use count of the specified program instance is decremented; if the use count reaches zero, and the program is eligible to be removed from memory, it is removed from memory.

Input parameters

PROGRAM_NAME specifies the name of the program to be released.

PROGRAM_TOKEN is the identifying token returned by the ACQUIRE request for this program.

ENTRY_POINT specifies the address of the entry point of the module.

Output parameters

[LOAD_POINT] is the address of the load point of the program instance.

[PROGRAM_LENGTH] is the length of the program instance in bytes.

[LOCATION] determines where the program instance for which the LOAD_POINT and ENTRY_POINT have been returned resides.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	PROGRAM_NOT_DEFINED, PROGRAM_NOT_IN_USE
INVALID	INVALID_PROGRAM_TOKEN, INVALID_ENTRY_POINT

LDLD gate, REFRESH_PROGRAM function

The REFRESH_PROGRAM function of the LDLD gate is used to inform the loader domain that a new version of the program has been cataloged, and that this version of the named program should be used for all future ACQUIRE requests.

Input parameters

PROGRAM_NAME specifies the name of the program that is to have a new version used.

Output parameters

[NEW_VERSION_FOUND] indicates whether a new version of the program has been found.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LIBRARY_IO_ERROR, OS_STORAGE_SHORTAGE, ABEND, LOOP
EXCEPTION	PROGRAM_NOT_DEFINED, PROGRAM_NOT_FOUND

LDLD gate, DEFINE_PROGRAM function

The DEFINE_PROGRAM function of the LDLD gate is used to introduce a new program to the CICS system or to update the details of an existing program.

Input parameters

PROGRAM_NAME specifies the name of the program whose attributes are to be set.

CATALOG_MODULE indicates whether the program definition should be written to one of the catalogs. It can have either of these values:

YES|NO

UPDATE indicates whether the loader domain should update the program definition if the loader domain already has a program definition for the program. If UPDATE(NO) is specified, and the loader domain already has a program definition for the specified program, PROGRAM_ALREADY_DEFINED is returned. It can have either of these values:

YES|NO

[EXECUTION_KEY] is the execution key for the program. This is used to determine which DSA the program instance resides in. It can have either of these values:

USER|CICS

[PROGRAM_TYPE] is the type of program copy to be used. It can have any of these values:

PRIVATE|SHARED|TYPE_ANY

[PROGRAM_USAGE] defines whether the program is part of the CICS nucleus, or is an application program defined by the user. This determines whether the program definition is written to the local catalog or to the global catalog. It can have either of these values:

NUCLEUS|APPLICATION

[PROGRAM_ATTRIBUTE] is a residency attribute to be associated with the program. It can have any of these values:

RESIDENT|REUSABLE|TRANSIENT|RELOAD

[REQUIRED_AMODE] is the addressing mode required by CICS for the program. A program that does not have the required residency mode is not loaded. It can have any of these values:

24|31|AMODE_ANY

[REQUIRED_RMODE] is the residency mode required by CICS for the program. A program that does not have the required mode requirements is not loaded. It can have any of these values:

24|RMODE_ANY

Output parameters

[NEW_PROGRAM_TOKEN] is an identifying token that can be used on subsequent ACQUIRE or RELEASE calls for this program name.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	CATALOG_NOT_OPERATIONAL, CATALOG_ERROR, INVALID_PROGRAM_NAME, PROGRAM_ALREADY_DEFINED
INVALID	INVALID_MODE_COMBINATION, INVALID_TYPE_ATTRIB_COMBIN

LDLD gate, INQUIRE_PROGRAM function

The INQUIRE_PROGRAM function of the LDLD gate is used to return the details of a specific program.

Input parameters

PROGRAM_NAME specifies the name of the program whose attributes are being requested.

PROGRAM_TOKEN is a valid program token as returned by a previous DEFINE or ACQUIRE request, or obtained from the PPT entry, for the program.

Output parameters

[NEW_PROGRAM_TOKEN] is an identifying token that can be used on subsequent ACQUIRE or RELEASE calls for this program name.

[PROGRAM_TYPE] is the current program copy type.

[PROGRAM_USAGE] is the current usage definition.

[EXECUTION_KEY] is the execution key for the program.

[PROGRAM_ATTRIBUTE] is the current residency attribute of the program.

[SPECIFIED_AMODE] is the addressing mode required by CICS for the program. A program that does not have the required residency mode is not loaded. If REQUIRED_AMODE was omitted when the program was defined, AMODE_NOT_SPECIFIED is returned.

[SPECIFIED_RMODE] is the residency mode required by CICS for the program. A program that does not have the required residency mode is not loaded. If REQUIRED_RMODE was omitted when the program was defined, RMODE_NOT_SPECIFIED is returned.

[PROGRAM_LENGTH] is the length of the program in bytes. If the program has not been used, this is zero.

[PROGRAM_USE_COUNT] is the cumulative use count of the program.

[PROGRAM_USER_COUNT] is the current number of users of the program.

[LOAD_POINT] is the address of the load point of the last program instance created for this program name.

[ENTRY_POINT] is the address of the entry point of the last program instance created for this program name.

[LOCATION] indicates where the program for which the LOAD_POINT and ENTRY_POINT have been returned resides.

[ACCESS] is the type of storage that the program resides in.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	PROGRAM_NOT_DEFINED
INVALID	INVALID_PROGRAM_TOKEN

NEW_PROGRAM_TOKEN is the identifying token that may be used on subsequent INQUIRE calls for this program.

LDLD gate, DELETE_PROGRAM function

The DELETE_PROGRAM function of the LDLD gate is used to remove a program from the CICS system. All subsequent ACQUIRE requests for the named program fail with a reason of PROGRAM_NOT_DEFINED. Any instance of the program in use at the time the DELETE is received continue to exist until a RELEASE request reduces the use count to zero, at which time the instance is removed from memory.

Input parameters

PROGRAM_NAME specifies the name of the program to be removed.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	PROGRAM_NOT_DEFINED

LDLD gate, START_BROWSE function

The START_BROWSE function of the LDLD gate is used to start a browse session.

Input parameters

[PROGRAM_NAME] specifies the name of the program whose attributes are to be returned.

[ENTRY_POINT] is the address of the entry point of the last program instance created for this program name.

Output parameters

BROWSE_TOKEN is a token used to refer to this browse session on subsequent browse requests.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

LDLD gate, GET_NEXT_PROGRAM function

The GET_NEXT_PROGRAM function of the LDLD gate is used to perform an INQUIRE function for the next program in the alphabetic sequence of programs in the current browse session.

Input parameters

BROWSE_TOKEN is a valid browse token as returned by the preceding START_BROWSE request.

Output parameters

[PROGRAM_NAME] is the name of the program whose attributes have been returned.

[PROGRAM_TYPE] is the current program copy type.

[PROGRAM_USAGE] is the current usage definition.

[EXECUTION_KEY] is the execution key for the program.

[PROGRAM_ATTRIBUTE] is the current residency attribute of the program.

[SPECIFIED_AMODE] is the current addressing mode required by CICS for the program. If REQUIRED_AMODE was omitted when the program was defined, AMODE_NOT_SPECIFIED is returned.

[SPECIFIED_RMODE] is the current residency mode required by CICS for the program. If REQUIRED_RMODE was omitted when the program was defined, RMODE_NOT_SPECIFIED is returned.

[PROGRAM_LENGTH] is the length of the program in bytes. If the program has not been used, this is zero.

[PROGRAM_USE_COUNT] is the cumulative use count of the program.

[PROGRAM_USER_COUNT] is the current number of users of the program.

[LOAD_POINT] is the address of the load point of the last program instance created for this program name.

[ENTRY_POINT] is the address of the entry point of the last program instance created for this program name.

[LOCATION] indicates where the program for which the LOAD_POINT and ENTRY_POINT have been returned resides.

[ACCESS] is the type of storage that the program resides in.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	END_LIST
INVALID	INVALID_BROWSE_TOKEN

LDLD gate, GET_NEXT_INSTANCE function

The GET_NEXT_INSTANCE function of the LDLD gate is used to browse the current program instances in ascending load point address sequence.

Input parameters

BROWSE_TOKEN is a valid browse token as returned by the preceding START_BROWSE request.

Output parameters

[PROGRAM_NAME] is the name of the program of which this is an instance.

[PROGRAM_TYPE] is the current program copy type.

[PROGRAM_USAGE] is the current usage definition.

[EXECUTION_KEY] is the execution key for the program.

[PROGRAM_ATTRIBUTE] is the current residency attribute of the program.

[SPECIFIED_AMODE] is the current addressing mode required by CICS for the program. If REQUIRED_AMODE was omitted when the program was defined, AMODE_NOT_SPECIFIED is returned.

[SPECIFIED_RMODE] is the current residency mode required by CICS for the program. If REQUIRED_RMODE was omitted when the program was defined, RMODE_NOT_SPECIFIED is returned.

[PROGRAM_LENGTH] is the length of the program in bytes. If the program has not been used, this is zero.

[ENTRY_POINT] is the address of the entry point of the last program instance created for this program name.

[LOAD_POINT] is the address of the load point of the last program instance created for this program name.

[LOCATION] indicates where the program instance for which the LOAD_POINT and ENTRY_POINT have been returned resides.

[ACCESS] is the type of storage that the program resides in.

[INSTANCE_USE_COUNT] is the current number of users of this instance.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	END_LIST
INVALID	INVALID_BROWSE_TOKEN

LDLD gate, END_BROWSE function

The END_BROWSE function of the LDLD gate is used to end a browse session.

Input parameters

BROWSE_TOKEN is the token identifying this browse session.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_BROWSE_TOKEN

LDLD gate, IDENTIFY_PROGRAM function

The IDENTIFY_PROGRAM function of the LDLD gate is used to locate the program instance which contains the specified address.

Input parameters

ADDRESS is a storage address.

Output parameters

[PROGRAM_NAME] is the name of the program of which this is an instance.

[PROGRAM_TYPE] is the current program copy type.

[PROGRAM_USAGE] is the current usage definition.

[EXECUTION_KEY] is the execution key for the program.

[PROGRAM_ATTRIBUTE] is the current residency attribute of the program.

[SPECIFIED_AMODE] is the addressing mode required by CICS for the program. A program that does not have the required residency mode is not loaded. If REQUIRED_AMODE was omitted when the program was defined, AMODE_NOT_SPECIFIED is returned.

[SPECIFIED_RMODE] is the residency mode required by CICS for the program. A program that does not have the required residency mode is not loaded. If REQUIRED_RMODE was omitted when the program was defined, RMODE_NOT_SPECIFIED is returned.

[PROGRAM_LENGTH] is the length of the program in bytes. If the program has not been used, this is zero.

[ENTRY_POINT] is the address of the entry point of the last program instance created for this program name.

[LOAD_POINT] is the address of the load point of the last program instance created for this program name.

[LOCATION] indicates where the program instance for which the LOAD_POINT and ENTRY_POINT have been returned resides.

[ACCESS] is the type of storage that the program resides in.

[INSTANCE_USE_COUNT] is the current number of users of this instance.

[CSECT_NAME] is the name of the CSECT within the module which contains the address. If no CSECT is available, the module name is returned.

[OFFSET_INTO_CSECT] is the offset of the address within the CSECT. If no CSECT is available, the module name is returned.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	INSTANCE_NOT_FOUND

LDLD gate, SET_OPTIONS function

The SET_OPTIONS function of the LDLD gate is used to set loader global options.

Input parameters

LLACOPY indicates whether the loader is to use the MVS macro LLACOPY or BLDL to locate programs. It can have any of these values:

YES|NO|NEWCOPY

[SHARED_PROGRAMS] indicates whether the loader is to use LPA-resident programs to satisfy ACQUIRE requests. It can have either of these values:

YES|NO

[STORAGE_FACTOR] indicates the percentage of system free storage that may be occupied by program instances that have a zero use count.

[PRVMOD] is a list of the names of modules that are not to be used from the MVS link pack area (LPA), but instead are to be loaded as private copies from the DFHRPL library.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	CATALOG_NOT_OPERATIONAL, CATALOG_ERROR
INVALID	INVALID_STORAGE_FACTOR

LDLD gate, INQUIRE_OPTIONS function

The INQUIRE_OPTIONS function of the LDLD gate is used to return loader global options.

Input parameters: None.

Output parameters

[SHARED_PROGRAMS] indicates whether the loader is utilizing LPA-resident programs to satisfy ACQUIRE requests.

[STORAGE_FACTOR] indicates the percentage of system free storage that may be occupied by program instances that have a zero use count.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

LDLD gate, CATALOG_PROGRAMS function

The CATALOG_PROGRAMS function of the LDLD gate is used at the end of CICS initialization to request the loader domain to catalog all the program definitions that need cataloging. The call is issued by the DFHSIJ1 module.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	CATALOG_NOT_OPERATIONAL, CATALOG_ERROR

Loader domain's generic gates

Table 58 summarizes the loader domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 58. Loader domain's generic gates

Gate	Trace	Function	Format
DMDM	LD 6001 LD 6002	PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
STST	LD 5001 LD 5002	COLLECT_STATISTICS COLLECT_RESOURCE_STATS	STST
SMNT	LD 4001 LD 4002	STORAGE_NOTIFY	SMNT

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—"Domain manager domain's generic formats" on page 195

Format STST—"Statistics domain's generic format" on page 521

Format SMNT—"Storage manager domain's generic format" on page 536

In preinitialization processing, the LDLD gate is added, enabling programs to be loaded.

In initialization processing, on a cold start, the loader domain purges the loader program definitions (for user application programs and non-nucleus CICS modules) from the CICS global catalog. The loader domain then reads program definitions from the local catalog, and makes them available to CICS.

On a warm or emergency start, the loader domain reads program definitions from the global and local CICS catalogs, and makes them available to CICS.

For any type of start, the loader domain loads the subset of CICS nucleus programs that are defined as resident.

In quiesce and termination processing, the loader domain performs only internal routines.

Modules

Module	Function
DFHLDDM	Handles the following requests: PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHLDDMI	Reinstates any program resources defined during previous runs of CICS. It is called by DFHLDDM.
DFHLDDUF	Formats the loader domain control blocks in a CICS system.
DFHLDLD	Directs the following requests to DFHLDLD1, DFHLDLD2, or DFHLDLD3, as appropriate: ACQUIRE_PROGRAM RELEASE_PROGRAM REFRESH_PROGRAM DEFINE_PROGRAM DELETE_PROGRAM INQUIRE_PROGRAM START_BROWSE GET_NEXT_PROGRAM GET_NEXT_INSTANCE END_BROWSE IDENTIFY_PROGRAM SET_OPTIONS INQUIRE_OPTIONS CATALOG_OPTIONS
DFHLDLD1	Handles the following requests: ACQUIRE_PROGRAM RELEASE_PROGRAM REFRESH_PROGRAM
DFHLDLD2	Handles the following requests: DEFINE_PROGRAM DELETE_PROGRAM
DFHLDLD3	Handles the following requests: INQUIRE_PROGRAM START_BROWSE GET_NEXT_PROGRAM GET_NEXT_INSTANCE END_BROWSE IDENTIFY_PROGRAM SET_OPTIONS INQUIRE_OPTIONS CATALOG_OPTIONS
DFHLDNT	Handles the following request: STORAGE_NOTIFY

Module	Function
DFHLDST	Handles the following requests: COLLECT_STATISTICS COLLECT_RESOURCE_STATS
DFHLDSVC	Provides authorized services for loader domain functions that involve MVS load facilities.
DFHLDTRI	Provides a trace interpretation routine for CICS dumps and traces.

Exits

No global user exit points are provided in this domain.

Trace

The point IDs for the loader domain are of the form LD xxxx; the corresponding trace levels are LD 1, LD 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 47. Lock manager domain (LM)

The lock manager domain (also sometimes known simply as "lock manager") provides both locking and associated queuing facilities for CICS resources. Before using these facilities, a resource must add a named lock for itself. This lock can then be requested as either exclusive or shared. If an exclusive lock is obtained, no other task may obtain the lock with that name; if a shared lock is obtained, multiple tasks may obtain that lock, and the exclusive lock with that name cannot be acquired.

Lock manager domain's specific gate

Table 59 summarizes the lock manager domain's specific gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and whether or not the functions are available through the exit programming interface (XPI).

Table 59. Lock manager domain's specific gate

Gate	Trace	Function	XPI
LMLM	LM 0003	ADD_LOCK	NO
	LM 0004	DELETE_LOCK	NO
		LOCK	NO
		UNLOCK	NO
		TEST_LOCK_OWNER	NO

LMLM gate, ADD_LOCK function

The ADD_LOCK function of the LMLM gate is used to add a named lock to LM's state.

Input parameters

LOCK_NAME is an 8-character name.

Output parameters

LOCK_TOKEN is the 8-character token that uniquely identifies the lock, returned to the caller on the this call.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|INVALID|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	INSUFFICIENT_STORAGE, ABEND, LOOP

LMLM gate, LOCK function

The LOCK function of the LMLM gate is used to request the lock.

Input parameters

LOCK_TOKEN is the token returned to the caller on the ADD_LOCK call.

MODE defines the type of lock. It can have either of these values:

EXCLUSIVE|SHARED

[WAIT] indicates whether a task is suspended (CICS) or a LOCK_BUSY is to be returned as a reason output parameter (NO). It can have either of these values:

CICS|NO

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|PURGED|INVALID|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	INSUFFICIENT_STORAGE, ABEND, LOOP
EXCEPTION	LOCK_TOKEN_NOT_FOUND, DUPLICATE_LOCK_OWNER, LOCK_BUSY
Note: DUPLICATE_LOCK_OWNER is returned when a resource requests a lock twice without unlocking during the same task: this is often treated in the same way as OK by the requesting resource.	

LMLM gate, UNLOCK function

The UNLOCK function of the LMLM gate is used to release the lock.

Input parameters

LOCK_TOKEN is the token returned to the caller on the ADD_LOCK call.

MODE defines the type of lock to be released. It can have either of these values:

EXCLUSIVE|SHARED

[OWNER_TOKEN] defines the owner of the lock.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

RESPONSE	Possible REASON values
EXCEPTION	LOCK_TOKEN_NOT_FOUND, SHARED_LOCK_FREE, NOT_LOCK_OWNER

LMLM gate, TEST_LOCK_OWNER function

The TEST_LOCK_OWNER function of the LMLM gate is used to test the owner of a lock for self.

Input parameters

LOCK_TOKEN is the token returned to the caller on the ADD_LOCK call.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LOCK_TOKEN_NOT_FOUND, NOT_LOCK_OWNER
DISASTER	ABEND, LOOP

LMLM gate, DELETE_LOCK function

The DELETE_LOCK function of the LMLM gate is used to delete the named lock from LM's state.

Input parameters

LOCK_TOKEN is the token returned to the caller on the ADD_LOCK call.

[OWNER_TOKEN] defines the owner of the lock.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|INVALID|DISASTER|KERNERROR
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	LOCK_TOKEN_NOT_FOUND, NOT_LOCK_OWNER

Lock manager domain's generic gates

Table 60 summarizes the lock manager domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 60. Lock manager domain's generic gates

Gate	Trace	Function	Format
DMDM	LM 0001 LM 0002	PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
DSNT	LM 0005 LM 0006	DISPATCHER_NOTIFY	DSNT

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—"Domain manager domain's generic formats" on page 195

Format DSNT—"Dispatcher domain's generic formats" on page 167

In preinitialization processing, gates are added to make lock manager services available to other domains.

In initialization, quiesce, and termination processing, the lock manager domain performs only internal routines.

Modules

Module	Function
DFHLMDM	Handles the following requests: PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHLMDS	Handles transaction manager domain MXT_CHANGE_NOTIFY requests.
DFHLMDUF	Formats the LM domain control blocks
DFHLMLM	Handles the following requests: ADD_LOCK DELETE_LOCK LOCK TEST_LOCK_OWNER UNLOCK
DFHLMTRI	Interprets LM domain trace entries

Exits

No global user exit points are provided in this domain.

Trace

The point IDs for the lock manager domain are of the form LM xxxx; the corresponding trace levels are LM 1, LM 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 48. Log manager domain (LG)

The log manager domain (also sometimes known simply as "log manager" or "logger") provides facilities for Recovery Manager to:

- Write records to the CICS system log
- Read records from the CICS system log
- Maintain the system log deleting obsolete records and shunting old, but still needed, records to a secondary system log.

It also provides facilities to:

- Write user journal, forward recovery and auto journals records to MVS system logger logstreams or the MVS SMF log.
- Install, discard and inquire for Journalmodel resource definitions
- Auto-install, discard, inquire and set for Journal definitions
- Connect, disconnect and define for MVS system logger logstreams
- Collect statistics for Journal and Logstream usage.

Log manager domain's specific gates

Table 61 summarizes the log manager domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and whether or not the functions are available through the exit programming interface (XPI).

Table 61. Log manager domain's specific gate

Gate	Trace	Function	XPI
LGGL	LG 0201	OPEN	NO
	LG 0202	WRITE	NO
		FORCE	NO
		CLOSE	NO
		WRITE_JNL	NO
		FORCE_JNL	NO
		UOW_TIME	NO
		INITIALIZE	NO
LGJN	LG 0301	INQUIRE	NO
	LG 0302	START_BROWSE	NO
	LG 0314	GET_NEXT	NO
	LG 0325	END_BROWSE	NO
		SET	NO
		DISCARD	NO
		EXPLICIT_OPEN	NO
		IMPLICIT_OPEN	NO
		INITIALIZE	NO
		STREAM_FAIL	NO
		PROCESS_STATISTICS	NO
LGLD	LG 0401	INQUIRE	NO
	LG 0402	START_BROWSE	NO
	LG 0411	GET_NEXT	NO
	LG 0412	END_BROWSE	NO
	LG 0415	MATCH	NO
		INSTALL	NO
		DISCARD	NO
		INITIALIZE	NO
LGST	LG 0501	INQUIRE	NO
	LG 0502	START_BROWSE	NO
	LG 0514	GET_NEXT	NO
	LG 0517	END_BROWSE	NO
	LG 0526	CONNECT	NO
		DISCONNECT	NO
		INITIALIZE	NO
LGPA	LG 0601	INQUIRE_PARAMETERS	YES
	LG 0602	SET_PARAMETERS	YES
LGLB	LG 2001	CONNECT	NO
	LG 2002	DISCONNECT	NO
		GL_WRITE	NO
		GL_FORCE	NO
		DISCONNECT_ALL	NO
LGCC	LG 2101	SYSINI	NO
	LG 2102	CREATE_CHAIN_TOKEN	NO
		RELEASE_CHAIN_TOKEN	NO
		RESTORE_CHAIN_TOKEN	NO
		START_BROWSE_CHAINS	NO
		BROWSE_CHAINS_GET_NEXT	NO
		END_BROWSE_CHAINS	NO
		DELETE_ALL	NO
		SET_HISTORY	NO
		DELETE_HISTORY	NO
		SET_KEYPOINT_FREQUENCY	NO
		INQUIRE_KEYPOINT_FREQUENCY	NO
		SET_INHIBIT_DELETE	NO
		INQUIRE_INHIBIT_DELETE	NO
LGWF	LG 2201	WRITE	NO
	LG 2202	FORCE_DATA	NO
LGCB	LG 2301	START_CHAIN_BROWSE	NO
	LG 2302	CHAIN_BROWSE_GET_NEXT	NO
		END_CHAIN_BROWSE	NO
LGBA	LG 2401	START_BROWSE_ALL	NO
	LG 2402	BROWSE_ALL_GET_NEXT	NO
		END_BROWSE_ALL	NO
LGMV	LG 2501	MOVE_CHAIN	NO
	LG 2502		
LGSR	LG 2601	WRITE	NO
	LG 2602	FORCE_DATA	NO

LGBA gate, BROWSE_ALL_GET_NEXT function

Returns the next record in the browse all object.

Input parameters

None

Output parameters

USER_TOKEN is a user token that was passed in by RESTORE_CHAIN_TOKEN.

USER_DATA is the address of the CICS record just read from the CICS system log.

USER_DATA_LENGTH is the length of the CICS record just read from the chain.

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	END_OF_DATA

LGBA gate, END_BROWSE_ALL function

Destroys the browse all object.

Input parameters

None

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGBA gate, START_BROWSE_ALL function

Creates a browse all object for the CICS system log.

Input parameters

None

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCB gate, CHAIN_BROWSE_GET_NEXT function

Creates a browse object for the chain denoted by CHAIN_TOKEN.

Input parameters

CHAIN_TOKEN is a chain token.

Output parameters

USER_DATA is the address of the CICS record just read from the chain.

USER_DATA_LENGTH is the length of the CICS record just read from the chain.

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	END_OF_DATA

LGCB gate, END_CHAIN_BROWSE function

Destroys the chain browse object denoted by CHAIN_TOKEN.

Input parameters

CHAIN_TOKEN is a chain token.

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCB gate, START_CHAIN_BROWSE function

Creates a browse object for the chain denoted by CHAIN_TOKEN.

Input parameters

CHAIN_TOKEN is a chain token.

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCC gate, SYSINI function

Creates a primary and secondary log stream objects of type MVS that comprises the CICS system log.

Input parameters

None

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCC gate, CREATE_CHAIN_TOKEN function

Creates a CHAIN TOKEN.

Input parameters

None

Output parameters

CHAIN_TOKEN is a new chain token token, which can be used as input to RELEASE_CHAIN_TOKEN, RESTORE_CHAIN_TOKEN, START_CHAIN_BROWSE, CHAIN_BROWSE_GET_NEXT, END_CHAIN_BROWSE, MOVE_CHAIN

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCC gate, RELEASE_STORE_CHAIN_TOKEN function

Destroys the chain token in CHAIN_TOKEN

Input parameters

CHAIN_TOKEN is a chain token that must have been created by CREATE_CHAIN_TOKEN or RESTORE_CHAIN_TOKEN

Output parameters

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCC gate, RESTORE_CHAIN_TOKEN function

Creates a chain token and adds the last record (viewed as a chain element) read from the system log during a BROWSE_ALL_GET_NEXT

Input parameters

USER_TOKEN is a user token that is returned by BROWSE_CHAINS_GET_NEXT and BROWSE_ALL_GET_NEXT.

Output parameters

CHAIN_TOKEN is a new chain token token, which can be used as input to RELEASE_CHAIN_TOKEN, RESTORE_CHAIN_TOKEN, START_CHAIN_BROWSE, CHAIN_BROWSE_GET_NEXT, END_CHAIN_BROWSE, MOVE_CHAIN.

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCC gate, START_BROWSE_CHAINS function

Creates a chains browse object and initializes the browse cursor position.

Input parameters

None

Output parameters

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCC gate, BROWSE_CHAINS_GET_NEXT function

Returns the next chain token and moves the browse cursor position to the next chain.

Input parameters

None

Output parameters

CHAIN_TOKEN is the chain token of the next chain in the chains browse list.

USER_TOKEN is a user token that was passed in by RESTORE_CHAIN_TOKEN.

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	END_OF_CHAINS

LGCC gate, END_BROWSE_CHAINS function

Destroys the browse chains object.

Input parameters

None

Output parameters

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCC gate, DELETE_ALL function

Deletes all of the data on both log streams of the CICS system log.

Input parameters

None

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCC gate, SET_HISTORY function

Evaluates and saves the current history point for both log streams of the CICS system log. The history point of a log stream is the oldest block id that CICS knows of on the log stream.

Input parameters

None

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCC gate, DELETE_HISTORY function

Deletes all blocks of data, for both log streams of the CICS system log, that are older than the corresponding history point saved during a call of SET_HISTORY.

Input parameters

None

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCC gate, SET_KEYPOINT_FREQUENCY function

Sets the activity frequency to KEYPOINT_FREQUENCY.

Input parameters

None

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	OUT_OF_RANGE

LGCC gate, INQUIRE_KEYPOINT_FREQUENCY function

Returns the activity keypoint frequency value in KEYPOINT_FREQUENCY.

Input parameters

None

Output parameters

KEYPOINT_FREQUENCY is the current keypoint frequency value.

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGCC gate, SET_INHIBIT_DELETE function

Sets a flag to the value of INHIBIT_DELETE. This flag controls the deletion of data from the log streams of the CICS system log.

Input parameters

None

Output parameters

KEYPOINT_FREQUENCY is the current keypoint frequency value.

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call.

LGGL gate, OPEN function

Opens a general log and returns a log token. The log token is used by the WRITE, FORCE and CLOSE operations.

Input parameters

STREAM_NAME The 26-byte log stream name to be opened

JNL_NAME The 8-byte journal name to be opened

Either STREAM_NAME or JNL_NAME must be specified

COMPONENT Identifies the component (e.g. FC) opening this stream

[USER_TOKEN] A token that identifies to the calling component why this log stream was opened. It will be passed to the ERROR gate in the event that an error is detected on the log stream. For example for file control it might contain a pointer to the DSNBx

[ERROR_GATE] The domain gate number that the logger should call using ERROR if an error occurs accessing the log stream.

Output parameters

LOG_TOKEN The token to be used on subsequent WRITE, FORCE, CLOSE requests.

LOG_TYPE The associated log stream type: It can have any one of these values:

MVS	MVS logger stream
SMF	SMF logging
DUMMY	No logging

JNL_STREAM The MVS logstream name associated with the journal being opened

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ERROR_OPENING_LOG, LOG_IS_SYSTEM_LOG, LOG_IS_DISABLED, LOG_NOT_DEFINED, LOG_HAS_FAILED, INVALID_JNL_NAME
INVALID	INVALID_PARAMETERS

LGGL gate, WRITE function

Write a record to a general log identified by a token from a previous OPEN.

Input parameters

LOG_TOKEN The token returned by OPEN

DATA The address of a reusable Iliffe vector describing the items of data to be written to the log stream.

[FORCE_NOW] Indicates that the caller wishes to wait until the data has been successfully written to the log stream. It can have either of these values:

`YES|NO`

Default is NO

[FORCE_AT_SYNC] Indicates that the caller wishes the log stream to be forced when the associated transaction reaches Syncpoint. It can have either of these values:

`YES|NO`

Default is NO

Note: Force_at_Sync can be used in conjunction with FORCE_NOW. This is needed by File control for ESDS writes which have to be forced immediately but which also need the UOW structure to allow the calculation of Fuzzy backup recovery times.

Output parameters

[FORCE_TOKEN] A token to be used on a subsequent FORCE to ensure that a specific records and any prior records have been hardened

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	WRITE_ERROR, BUFFER_LENGTH_ERROR
INVALID	UNKNOWN_LOG_TOKEN

LGGL gate, FORCE function

Ensures that the previously written records have been flushed from the buffer and hardened on the chosen log stream

Input parameters

LOG_TOKEN The token returned by OPEN

[FORCE_TOKEN] Token returned by WRITE to indicate a specific record to be written. If omitted all records are forced.

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	WRITE_ERROR
INVALID	UNKNOWN_LOG_TOKEN

LGGL gate, CLOSE function

Invalidates the LOG_TOKEN, on the last usage of a log stream disconnects from the log stream

Input parameters

LOG_TOKEN The token returned by OPEN

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	WRITE_ERROR
INVALID	UNKNOWN_LOG_TOKEN

LGGL gate, WRITE_JNL function

Write a record to a general log identified by a journal name

Input parameters

JNL_NAME The 8-byte journal name to be written to

DATA The address of a reusable Iliffe vector describing the items of data to be written to the log stream.

[FORCE_NOW] Indicates that the caller wishes to wait until the data has been successfully written to the log stream. It can have either of these values:

YES|NO

Default is NO

[FORCE_AT_SYNC] Indicates that the caller wishes the log stream to be forced when the associated transaction reaches Syncpoint. It can have either of these values:

YES|NO

Default is NO

Note: Force_at_Sync can be used in conjunction with FORCE_NOW. This is needed by File control for ESDS writes which have to be forced immediately but which also need the UOW structure to allow the calculation of Fuzzy backup recovery times.

COMPONENT Identifies the component (e.g. TC) writing this stream

SUSPEND Supported for compatibility with old EXEC interface. Causes BUFFER_FULL exception to be raised if there is no space rather than waiting for space. The task may still be suspended for many other reasons! It can have either of these values:

YES|NO

Default is YES

Output parameters

[FORCE_TOKEN] A token to be used on a subsequent FORCE_JNL to ensure that a specific record and any prior records have been hardened

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	WRITE_ERROR, ERROR_OPENING_LOG, LOG_IS_SYSTEM_LOG, LOG_IS_DISABLED, LOG_HAS_FAILED, LOG_NOT_DEFINED, BUFFER_FULL, INVALID_JNL_NAME, BUFFER_LENGTH_ERROR

LGGL gate, FORCE_JNL function

Ensures that the previously written records have been hardened on the chosen log.

Input parameters

JNL_NAME The 8-byte journal name to be forced

[FORCE_TOKEN] Token returned by WRITE_JNL to indicate a specific record to be written. If omitted all records are forced.

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	WRITE_ERROR, LOG_IS_NOT_ACTIVE, LOG_IS_SYSTEM_LOG, LOG_IS_DISABLED, LOG_HAS_FAILED

LGGL gate, UOW_TIME function

Returns the oldest active transactions first log write time for use in calculating the recovery time for Backup while open.

Usually called by AKP processing when calculating the recovery time for non-RLS BWO files

Input parameters

UOW_TIME_STAMP The 8-byte STCK format time of the oldest active transaction that has written log records with the FORCE_AT_SYNC option, or current time if there are no active transactions.

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call

LGGL gate, INITIALIZE function

Establish subpools, locks, and anchor control blocks

Called as subroutine during domain initialization.

Input parameters: None

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] No reason codes are defined for this call

LGJN gate, INQUIRE function

Returns information about the current state of a user journal

Also causes the stats information for a particular journal to be updated, when called as part of a FORCE_JNL request from LGGL.

Input parameters

JNL_NAME The 8-byte Journal name to be inquired upon

[FORCE] Indicates that a force of the data in the buffer has been requested.

This is used to indicate when the stats field in the journal info, which records the number of flushes, needs incrementing.

Output parameters

[LOG_TYPE] The associated log stream type:

MVS	MVS logger stream
SMF	SMF logging
DUMMY	No logging

[JNL_STATUS] The associated log stream status:

Note: Status will always appear as disconnected for journals that have not been used as user journals (i.e. system logs, forward recovery logs, fc auto journals) even though they may be in use

CONNECTED Stream is currently connected
DISCONNECTED Stream is not currently connected
DISABLED Stream has been disabled by SPI/CEMT function
FAILED The MVS log stream has failed

[STREAM_NAME] The associated MVS log stream name. Blank for SMF or DUMMY

[SYSTEM_LOG] Whether or not the journal is a system log. It can have either of these values:

YES|NO

[STREAM_TOKEN] The log stream token if the journal is currently connected to an MVS log stream or the logbuf token for an SMF journal.

If specified the stream shared lock will be acquired and it its the callers responsibility to free the lock when they have finished with the stream token.

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_JNL_NAME

LGJN gate, START_BROWSE function

Initialize browse token for subsequent GET_NEXT requests

Input parameters: None.

Output parameters

BROWSE_TOKEN Token for use on subsequent GET_NEXT requests

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] None defined for this call

LGJN gate, GET_NEXT function

Return information for next Journal.

Input parameters

BROWSE_TOKEN Token returned by START_BROWSE

Output parameters

JNL_NAME The next 8-byte Journal name found

[LOG_TYPE] The associated log stream type:

MVS	MVS logger stream
SMF	SMF logging
DUMMY	No logging

[JNL_STATUS] The associated log stream status:

Note: Status will always appear as disconnected for journals that have not been used as user journals (i.e. system logs, forward recovery logs, fc auto journals) even though they may be in use

CONNECTED Stream is currently connected
DISCONNECTED Stream is not currently connected
DISABLED Stream has been disabled by SPI/CEMT function

FAILED The MVS log stream has failed

[STREAM_NAME] The associated MVS log stream name. Blank for SMF or DUMMY

[SYSTEM_LOG] Whether or not the journal is a system log. It can have either of these values:

`YES|NO`

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_MORE_DATA_AVAILABLE
INVALID	INVALID_BROWSE_TOKEN

LGJN gate, END_BROWSE function

Terminate browse and invalidate browse token

Input parameters

BROWSE_TOKEN Token returned by START_BROWSE

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_BROWSE_TOKEN

LGJN gate, SET function

Update the status of the Journal.

Will create journal if it does not currently exist (except for FLUSH)

Input parameters

JNL_NAME The 8-byte Journal name to be updated

JNL_STATUS The new status for the journal:

CONNECTED Stream is to be connected
DISCONNECTED Stream is to be disconnected
DISABLED Stream is to be disabled from further use
FLUSH The current log buffers are to be written to the log stream

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	JNL_ALREADY_IN_REQ_STATE, JNL_IS_NOT_ACTIVE, LOG_IS_SYSTEM_LOG, SYSTEM_LOG_CONFLICT, UNKNOWN_JNL_NAME, UNABLE_TO_CREATE_JNL, ERROR_OPENING_LOG, JNL_HAS_FAILED, INVALID_JNL_NAME, WRITE_ERROR,

LGJN gate, DISCARD function

Remove a journal from the set of known journals to clean up the catalog or to allow it to be reinstalled with a new set of attributes.

Input parameters

JNL_NAME The 8-byte Journal name to be discarded

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LOG_IS_SYSTEM_LOG, UNKNOWN_JNL_NAME

LGJN gate, EXPLICIT_OPEN function

Inquire on a journal and if the journal does not already exist in the set of known journals perform the autoinstall process to define it.

The stream is explicitly opened for each call and so must eventually be explicitly closed using the LGST DISCONNECT function

Input parameters

JNL_NAME The 8-byte Journal name to be Explicit_Opened

SYSTEM_LOG Whether or not this journal is to be used as a system log It can have either of these values:

`YES|NO`

Output parameters

[LOG_TYPE] The associated log stream type:

MVS MVS logger stream
SMF SMF logging
DUMMY No logging

[JNL_STATUS] The associated log stream status:

Note: Status will always appear as disconnected for journals that have not been used as user journals (i.e. system logs, forward recovery logs, fc auto journals) even though they may be in use

CONNECTED	Stream is currently connected
DISCONNECTED	Stream is not currently connected
DISABLED	Stream has been disabled by SPI/CEMT function
FAILED	The MVS log stream has failed

STREAM_TOKEN The log stream token if the journal is currently connected to an MVS log stream or the logbuf token for an SMF journal.

[STREAM_NAME] The associated MVS log stream name. Blank for SMF or DUMMY

[LOG_TOKEN] The buffer manager's log token for the log stream

[STRUCTURE_NAME] is the 16 byte name of the coupling facility structure of the log stream.

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNABLE_TO_CREATE_JNL, SYSTEM_LOG_CONFLICT, JNL_IS_DISABLED, JNL_HAS_FAILED, ERROR_OPENING_LOG, INVALID_JNL_NAME

LGJN gate, IMPLICIT_OPEN function

Inquire on a journal and if the journal does not already exist in the set of known journals perform the autoinstall process to define it. If the associated log stream has not been opened then it is opened and the stream token returned.

Input parameters

JNL_NAME The 8-byte Journal name to be Explicit_Opened

SYSTEM_LOG Whether or not this journal is to be used as a system log It can have either of these values:

YES|NO

[FORCE] Indicates that a force of the data in the buffer has been requested.

This is used to indicate when the stats field in the journal info, which records the number of flushes, needs incrementing. It can have either of these values:

YES|NO

[WRITE_BYTES] The number of bytes of data being written, as a 64 bit value.

This field is used to update the bytes counter in the stats information for a journal, and also indicates that the writes counter also needs incrementing.

Output parameters

[LOG_TYPE] The associated log stream type:

MVS	MVS logger stream
SMF	SMF logging
DUMMY	No logging

[JNL_STATUS] The associated log stream status:

Note: Status will always appear as disconnected for journals that have not been used as user journals (i.e. system logs, forward recovery logs, fc auto journals) even though they may be in use

CONNECTED	Stream is currently connected
DISCONNECTED	Stream is not currently connected
DISABLED	Stream has been disabled by SPI/CEMT function
FAILED	The MVS log stream has failed

[STREAM_NAME] The associated MVS log stream name. Blank for SMF or DUMMY

STREAM_TOKEN The log stream token if the journal is currently connected to an MVS log stream or logbuf token for SMF.

If specified the stream shared lock will be acquired and it its the callers responsibility to free the lock when they have finished with the stream token.

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNABLE_TO_CREATE_JNL, SYSTEM_LOG_CONFLICT, JNL_IS_DISABLED, JNL_HAS_FAILED, ERROR_OPENING_LOG, INVALID_JNL_NAME

LGJN gate, INITIALIZE function

Establish subpools, locks, and anchor control blocks

Called as subroutine during domain initialization.

Input parameters: None

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] None defined for this call

LGJN gate, STREAM_FAIL function

Marks all journals that have used the failing log stream as failed, issues a message, and closes the stream connection. This ensures that all subsequent activity for the log stream is rejected until either CICS is restarted or the operator explicitly reactivates the journal

Input parameters

STREAM_TOKEN The token of the log stream that has failed

STREAM_NAME The name of the log stream that has failed

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] None defined for this call

LGJN gate, PROCESS_STATISTICS function

Deal with the various types of requests for journal statistics using the information in the STST parameter list.

Input parameters

STATS_PARMS The address of the STST parameter list.

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_JNL_NAME, NO_JOURNALS_DEFINED

LGLB gate, CONNECT function

Creates a log stream object and if of type MVS, a connection is made to the log stream, denoted by its name, through the MVS logger.

Input parameters

STREAM_NAME is the name of the log stream to be connected. Only valid if the log type is MVS.

SYSTEM_LOG is the system log indicator, which can assume the following values:

YES	The log stream being connected is part of the CICS system log.
NO	The log stream being connected is general log.

LOG_TYPE is the log stream type, which can assume the following values:

MVS	A MVS logger log stream
SMF	The MVS SMF log
DUMMY	A dummy log

JOURNAL_NAME is the journal name associated with the log stream on this request.

[STRUCTURE_NAME] is the 16 byte name of the coupling facility structure of the log stream.

Output parameters

LOGBUF_TOKEN is the token denoting the connected log stream, which can be used as input to GL_WRITE, GL_FORCE and DISCONNECT.

RESPONSE is the response code, possible values are:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LOG_NOT_DEFINED, CONNECT_FAILURE

LGLB gate, DISCONNECT function

Destroys the log stream object and if it is of type MVS, disconnects from the MVS logger.

Input parameters

LOGBUF_TOKEN is the token of the log stream created during a call of CONNECT.

Output parameters

RESPONSE is the response code, possible values are:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LOG_NOT_DEFINED, CONNECT_FAILURE

LGLB gate, GL_WRITE function

Writes a record to a general log denoted by LOGBUF_TOKEN.

Input parameters

LOGBUF_TOKEN is the token of the log stream created during a call of CONNECT.

DATA is the address of the data to be written.

COMPONENT identifies the original CICS component making this request.

SUSPEND is a task suspend indicator, which can assume the following values:

YES	The task may be suspended if necessary.
NO	If there is no buffer space immediately available without suspending the current task then return an exception with a reason of BUFFER_FULL

JOURNAL_NAME is the journal name associated with the log stream on this request.

Output parameters

FORCE_TOKEN is the token denoting the output buffer which includes the data of this request. This token can be used as input to GL_FORCE.

RESPONSE is the response code, possible values are:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BUFFER_FULL, BUFFER_LENGTH_ERROR, WRITE_FAILURE

LGLB gate, GL_FORCE function

Ensures that the output buffer denoted by FORCE_TOKEN for the log stream denoted by LOGBUF_TOKEN has been written to the physical media.

Input parameters

LOGBUF_TOKEN is the token of the log stream created during a call of CONNECT.

FORCE_TOKEN is the token denoting the output buffer containing the data written during a call of GL_WRITE. A null token denotes the current output buffer.

Output parameters

RESPONSE is the response code, possible values are:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	WRITE_FAILURE

LGLB gate, DISCONNECT_ALL function

Ensures that any data in the output buffer has been written to the physical media before the stream connection is destroyed for all connected streams.

Input parameters

None.

Output parameters

RESPONSE is the response code, possible values are:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] No reason codes are defined for this call

LGLD gate, INQUIRE function

Returns information about the current state of a JournalModel

Input parameters

JOURNALMODEL_NAME The 8-byte JournalModel name to be inquired upon

Output parameters

[JNL_TEMPLATE] The associated journal name template

[LOG_TYPE] The associated log stream type:

MVS	MVS logger stream
SMF	SMF logging
DUMMY	No logging

[STREAM_PROTOTYPE] The associated MVS log stream name prototype

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_JOURNALMODEL_NAME

LGLD gate, START_BROWSE function

Initialize browse token for subsequent GET_NEXT requests

Input parameters: None

Output parameters

BROWSE_TOKEN Token for use on subsequent GET_NEXT requests

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] None defined for this function.

LGLD gate, GET_NEXT function

Return information for next JournalModel entry

Input parameters

BROWSE_TOKEN Token returned by START_BROWSE

Output parameters

JOURNALMODEL_NAME The next 8-byte JournalModel name

[JNL_TEMPLATE] The associated journal name template

[LOG_TYPE] The associated log stream type:

MVS	MVS logger stream
SMF	SMF logging
DUMMY	No logging

[STREAM_PROTOTYPE] The associated MVS log stream name prototype

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_MORE_DATA_AVAILABLE
INVALID	INVALID_BROWSE_TOKEN

LGLD gate, END_BROWSE function

Terminate browse and invalidate browse token

Input parameters

BROWSE_TOKEN Token returned by START_BROWSE

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_BROWSE_TOKEN

LGLD gate, MATCH function

Find JournalModel entry that best matches a journal name. Variables in the stream name prototype are resolved and the resultant stream name is returned.

Input parameters

JNL_NAME The journal name to be matched

Output parameters

LOG_TYPE The associated log stream type:

MVS	MVS logger stream
SMF	SMF logging
DUMMY	No logging

STREAM_NAME The MVS log stream name

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_JNL_NAME

LGLD gate, INSTALL function

Create/replace JournalModel entry

Input parameters

JOURNALMODEL_NAME The 8-byte JournalModel name

JNL_TEMPLATE The associated journal name template

LOG_TYPE The associated log stream type:

MVS	MVS logger stream
SMF	SMF logging
DUMMY	No logging

STREAM_PROTOTYPE The associated MVS log stream name prototype

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_JNL_TEMPLATE, INVALID_STREAM_PROTOTYPE

LGLD gate, DISCARD function

Remove a JournalModel from the set of defined JournalModels

Input parameters

JOURNALMODEL_NAME The 8-byte JournalModel name to be discarded

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_JOURNALMODEL_NAME

LGLD gate, INITIALIZE function

Establish subpools, locks, and anchor control blocks

Called as subroutine during domain initialization.

Input parameters: None

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] None defined for this function.

LGMV gate, MOVE_CHAIN function

Destroys the chain browse object denoted by CHAIN_TOKEN.

Input parameters

CHAIN_TOKEN is a chain token denoting the chain to be moved.

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] None defined for this function.

LGPA gate, INQUIRE_PARAMETERS function

Inquire logger domain parameters.

Input parameters: None

Output parameters

[KEYPOINT_FREQUENCY] How often, in terms of physical writes to the system log, activity keypoints are initiated. A value of zero indicates that activity keypoints are not initiated.

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] None defined for this function.

LGPA gate, SET_PARAMETERS function

Set logger domain parameters.

Input parameters

[KEYPOINT_FREQUENCY] How often, in terms of physical writes to the system log, activity keypoints should be initiated. A value of zero indicates that activity keypoints should not be initiated.

Non-zero values outside the range from 200 to 65535 inclusive are invalid and cause the OUT_OF_RANGE exception to be returned.

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	OUT_OF_RANGE

LGSR gate, LOGSTREAM_STATS function

Collects, and resets if required, the log stream statistics of either the log stream denoted by LOGSTREAM_NAME or of all log streams known to the log manager.

Input parameters

[ALL] if specified then the request is for all log streams of type MVS known to the log manager.

[LOGSTREAM_NAME] if specified then this is a log stream name, which must be of type MVS.

STATS_BUFFER_ADDR is the address of a buffer to put the log stream statistics record(s).

STATS_BUFFER_LENGTH is the length of the buffer.

[RESET] is a request qualifier that assumes the following values:

YES	The log stream statistics data are to be reset after collection.
NO	The log stream statistics data are not to be reset.

Output parameters

RESPONSE is the log manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LOG_NOT_DEFINED

LGST gate, INQUIRE function

Returns information about the current state of a stream name

Input parameters

STREAM_NAME The 26-byte stream name

Output parameters

[USE_CT] The current number of users of the stream

[SYSTEM_LOG] Whether or not this is a CICS system log It can have either of these values:

YES|NO

[FAILED] Whether or not the stream has failed It can have either of these values:

YES|NO

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_STREAM_NAME

LGST gate, START_BROWSE function

Initialize browse token for subsequent GET_NEXT requests

Input parameters: None

Output parameters

BROWSE_TOKEN Token for use on subsequent GET_NEXT requests

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] None defined for this function.

LGST gate, GET_NEXT function

Return information for next stream entry

Input parameters

BROWSE_TOKEN Token returned by START_BROWSE

Output parameters

STREAM_NAME The 26-byte stream name

[USE_CT] The current number of users of the stream

[SYSTEM_LOG] Whether or not this is a CICS system log It can have either of these values:

YES|NO

[FAILED] Whether or not the stream has failed It can have either of these values:

YES|NO

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_MORE_DATA_AVAILABLE
INVALID	INVALID_BROWSE_TOKEN

LGST gate, END_BROWSE function

Terminate browse and invalidate browse token

Input parameters

BROWSE_TOKEN Token returned by START_BROWSE

Output parameters

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_BROWSE_TOKEN

LGST gate, CONNECT function

Connect to an MVS log stream, or increment use count on subsequent call.

Input parameters

STREAM_NAME The 26-byte stream name

SYSTEM_LOG Whether or not this is a CICS system log It can have either of these values:

YES|NO

Output parameters

STREAM_TOKEN A token to represent this stream

[STRUCTURE_NAME] is the 16 byte name of the coupling facility structure of the log stream.

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SYSTEM_LOG_CONFLICT, LOG_HAS_FAILED, DEFINE_FAILURE, CONNECT_FAILURE,

LGST gate, DISCONNECT function

Decrement the stream use count and disconnect from the MVS logger on last use

Input parameters

STREAM_TOKEN The token returned by CONNECT

Output parameters

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] None defined for this function.

LGST gate, INITIALIZE function

Establish subpools, locks, and anchor control blocks

Called as subroutine during domain initialization.

Input parameters: None

Output parameters

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] None defined for this function.

LGWF gate, FORCE_DATA function

Ensures that the output buffer denoted by FORCE_TOKEN has been written to the physical media.

Input parameters

FORCE_TOKEN is a token denoting the output buffer containing the data written during a call of GL_WRITE. A null token denotes the current output buffer.

Output parameters

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	AKP_KICK_OFF

LGWF gate, WRITE function

Writes a record to the CICS system log.

Input parameters

DATA is the address of the data to be written.

CHAIN_TOKEN is a token denoting the chain that this record belongs. A chain token is created by CREATE_CHAIN_TOKEN and RESTORE__CHAIN_TOKEN

SUSPEND is a task suspend indicator, which can assume the following values:

YES The task may be suspended if necessary.
NO If there is no buffer space immediately available without suspending the current task then return an exception with a reason of BUFFER_FULL

FORCE is a request qualifier, which can assume the following values:

YES The data of this request including any other data already in the output buffer is to be written to the physical media before returning.
NO The data of this request need only be written to the output buffer, but may get written to the physical media.

RAISE_LENGERR is a request qualifier, which can assume the following values:

YES If the data length is too large to fit into the output buffer then an EXCEPTION condition is returned to the caller.
NO If the data length is too large to fit into the output buffer then the log manager terminates CICS.

Output parameters

FORCE_TOKEN is the token denoting the output buffer which includes the data of the request. This token can be used as input to GL_FORCE.

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BUFFER_FULL, AKP_KICK_OFF, BUFFER_LENGTH_ERROR

Log manager domain’s generic gates

Table 62 summarizes the log manager domain’s generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and the generic format for calls to the gate.

Table 62. Log manager domain’s generic gate

Gate	Trace	Function	Format
APUE	LG 0101 LG 0102	SET_EXIT_STATUS	APUE
DMDM	LG 0101 LG 0102	INITIALISE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
STST	LG 0701 LG 0702	COLLECT_STATISTICS COLLECT_RESOURCE_STATISTICS	STST

You can find descriptions of these functions and their input and output parameters, in the section. dealing with the corresponding generic format, in “Domain manager domain’s generic formats” on page 195.

In Initialization processing, the log manager domain retrieves Journal and Journalmodel information from the catalog and initializes the system log except on a cold start when system log initialization occurs after group list install has completed.

In Quiesce processing, the log manager disconnects from MVS log streams after all transactions have completed.

Log manager domain’s call back gates

Table 62 summarizes the log manager domain’s call back gates. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and the format for calls to the gate.

Table 63. Log manager domain’s call back gate

Gate	Trace	Function	Format
RMRO	LG 0201 LG 0202	PERFORM_COMMIT PERFORM_PREPARE START_BACKOUT DELIVER_BACKOUT_DATA END_BACKOUT PERFORM_SHUNT PERFORM_UNSHUNT	RMRO

You can find descriptions of these functions and their input and output parameters, in the section. dealing with the recovery manager formats, in Chapter 63, “Recovery Manager Domain (RM)” on page 457.

For PERFORM_PREPARE, PERFORM_COMMIT, END_BACKOUT the log manager forces any log buffers written using the FORCE_AT_SYNCH option of the LGGL WRITE gate to the MVS system logger. For the other RMRO gate functions the log manager does nothing.

Log manager domain’s call back format

Table 64 describes the call back format owned by the log manager domain and shows the function performed on the calls.

Table 64. Call back format owned by the log manager domain

Format	Calling module	Function
LGGL	DFHLGGL	ERROR

In the descriptions of the formats that follow, the “input” parameters are input not to log manager domain, but to the domain being called by the log manager. Similarly, the “output” parameters are output by the domain that was called by log manager domain, in response to the call.

LGGL gate, ERROR function

This is a back-to-front or outbound function. The logger will call the domain that issued OPEN, using the gate number specified in ERROR_GATE, when a long term error condition is detected on the opened log stream.

The called domain should take any recovery action needed and close the log stream (if appropriate).

Called by the logger during log stream error processing.

Note: An error call back could occur while an Open or Close request for the associated log-token is still in progress.

Input parameters

ERROR_TYPE Indicates the severity of the error: It can have either of these values:

`LONG_TERM|RECOVERED`

STREAM_NAME The 26-byte name of the failing log stream name

[JNL_NAME] The 8-byte journal name if the open was by journal name

COMPONENT The 2-byte component id supplied on OPEN

USER_TOKEN The 8-byte token supplied on OPEN, this allows the opening domain to determine what resource (eg DSNB) this open is associated with.

LOG_TOKEN The token returned by OPEN

Output parameters

RESPONSE is the log manager domain’s response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] No reason codes are defined for this call

Modules

Module	Function
DFHLGDM	Log manager domain initialization and termination. Also handles exit activation for XLGSTRM and XRSINDI. Handles the DMDM and APUE gate functions
DFHLGDUF	A routine to format system dump information
DFHLGGL	Handles the LGGL and RMRO gate functions
DFHLGHB	Assesses the availability of the MVS system logger
DFHLGICV	Log record conversion for SSI exit
DFHLGIGT	Log record get routine for SSI exit
DFHLGILA	Lexical analysis for SSI exit
DFHLGIMS	Message composer for SSI exit
DFHLGIPA	Parser for SSI exit
DFHLGIPI	Parse interface for SSI exit
DFHLGISM	Parse message exit for SSI exit
DFHLGJN	Handles the LGJN gate functions
DFHLGLD	Handles the LGLD gate functions
DFHLGPA	Handles the LGPA gate functions
DFHLGSC	Handles the STST gate functions
DFHLGST	Handles the LGST gate functions
DFHLGSSI	Handles the batch QSAM access to CICS logstreams via the DD SUBSYS=(LOGR...) SSI interface
DFHLGTRI	A routine to format trace points
DFHL2DM	Initializes the ’L2’ part of the Log Manager Domain
DFHL2TRI	A routine to format the ’L2’ trace points
DFHL2LB	Handles the LGLB gate functions
DFHL2SR	Handles the LGSR gate functions
DFHL2WF	Handles the LGWF gate functions
DFHL2CC	Handles the LGCC gate functions
DFHL2CB	Handles the LGCB gate functions
DFHL2BA	Handles the LGBA gate functions
DFHL2MV	Handles the LGMV gate functions
DFHL2BL1	Initializes the Block class data
DFHL2BL2	Retrieves the current block on the CICS system log
DFHL2BS1	Initializes the BrowseableStream class data
DFHL2BS2	Creates a BrowseableStream class instance
DFHL2BS3	Destroys a BrowseableStream class instance
DFHL2BS4	Destroys all BrowseableStream class instance
DFHL2CH1	Initializes the Chain class data
DFHL2CH2	Creates a Chain class instance
DFHL2CH3	Handles start chain browse
DFHL2CH4	Handles chain browse get next
DFHL2CH5	Handles end chain browse
DFHL2CHA	Handles start browse all
DFHL2CHN	Handles browse all get next
DFHL2CHL	Handles end browse all
DFHL2CHH	Handles start browse chains
DFHL2CHG	Handles browse chains get next
DFHL2CHI	Handles end browse chains
DFHL2CHR	Handles chain restore
DFHL2CHS	handles set history point
DFHL2CHE	Handles delete at history point
DFHL2CHM	Handles move chain
DFHL2HS2	Handles the log stream connect request to the MVS logger
DFHL2HS3	Handles the log stream disconnect request to the MVS logger
DFHL2HS4	Handles the log stream delete all request to the MVS logger
DFHL2HS5	Handles the log stream delete history request to the MVS logger
DFHL2HS6	Handles the log stream start browse block request to the MVS logger
DFHL2HS7	Handles the log stream start browse cursor request to the MVS logger
DFHL2HS8	Handles the log stream read browse cursor request to the MVS logger
DFHL2HS9	Handles the log stream end browse cursor request to the MVS logger
DFHL2HSG	Handles the log stream read browse block request to the MVS logger
DFHL2HSJ	Handles the log stream end browse block request to the MVS logger
DFHL2OFI	Initializes the ObjectFactory instance data
DFHL2SL1	Initializes the SystemLog class data
DFHL2SLN	Handles system log log stream open request
DFHL2SLE	Handles system log log stream failure notification
DFHL2SR1	Initializes the Stream class data
DFHL2SR2	Creates a Stream class instance
DFHL2SR3	Destroys a Stream class instance
DFHL2SR4	Collect and resets Stream statistics
DFHL2SR5	Destroys all Stream class instances
DFHL2VPX	Initializes the VariablePool class data

Exits

Two global user exit points are provided in this domain.

XLGSTRM This exit is called prior to defining a new log stream to the MVS system logger

XRSINDI This exit is called when a Journal or Journalmodel is installed or discarded. It is also called when CICS connects or disconnects an MVS system logger logstream.

See *CICS Customization Guide* for further information.

Trace

The point IDs for the log manager domain are of the form LG xxxx; the corresponding trace levels are LG 1, LG 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 49. Master terminal program

The master terminal program enables dynamic control of the system. Using this function an operator can change the values of parameters used by CICS, alter the status of system resources, terminate tasks, and shut down the CICS system.

Design overview

The master terminal program is invoked by the CEMT transaction. The user enters a command to INQUIRE about or SET the status of a set of resources, and the command outputs a display that shows the resultant status of the resources. For a CEMT SET command, this display can be overtyped to alter the status of most of the resources displayed.

Commands are analyzed using the same techniques as the command interpreter described in Chapter 17, "Command interpreter" on page 139. A language table is used to define the syntax of commands and the contents of parameter lists which must be passed to DFHEIP to allow execution. In effect, each CEMT command results in the execution of a series of EXEC CICS INQUIRE and SET commands.

The master terminal program is also used by the CEST and CEOT transactions, which provide subsets of the functions available with CEMT. CEST is for supervisory operators and allows access to a limited set of resources. CEOT only allows changes to the status of the operator's own terminal.

Modules

Module	Function
DFHEMTP	Invoked by CEMT. Checks that the terminal is suitable. Obtains and initializes working storage. Loads the language table DFHEITMT. Links to DFHEMTD.
DFHEOTP	Same as DFHEMTP but invoked by CEOT and loads the language table DFHEITOT.
DFHESTP	Same as DFHEMTP but invoked by CEST and loads the language table DFHEITST.
DFHEMTD	Receives data from the terminal and sends back a display. Analyzes commands and overtypes. Constructs parameter lists for DFHEIP, which it calls. Deals with PF keys.
DFHEITMT	Command language table for CEMT.
DFHEITOT	Command language table for CEOT.
DFHEITST	Command language table for CEST.

Exits

No global user exit points are provided for this function.

Trace

No trace points are provided for this function.

Chapter 50. Message domain (ME)

The message domain acts as a repository for CICS messages, and handles the sending of messages to transient data destinations or to the console. It also provides an interface for returning the text of a message to the caller.

Message domain's specific gates

Table 65 summarizes the message domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 65. Message domain's specific gates

Gate	Trace	Function	XPI
MEBM	None	INQUIRE_MESSAGE_DEFINITION INQUIRE_MESSAGE_LENGTH RETRIEVE_MESSAGE	NO NO NO
MEME	ME 0301 ME 0302	CONVERSE INQUIRE_MESSAGE INQUIRE_MESSAGE_LENGTH RETRIEVE_MESSAGE SEND_MESSAGE VALIDATE_LANGUAGE_CODE VALIDATE_LANGUAGE_SUFFIX	NO NO NO NO NO NO NO
MESR	ME 0201 ME 0202	SET_MESSAGE_OPTIONS	NO

MEBM gate, RETRIEVE_MESSAGE function

The RETRIEVE_MESSAGE function of the MEBM gate is used to retrieve the message text and build the message into a buffer.

Input parameters

MESSAGE_TABLE is a table containing all the message definitions for the message domain.

[COMPONENT_ID] is the component identifier for the message.

MESSAGE_NUMBER is the numeric message identifier.

MESSAGE_BUFFER is the buffer to receive the message text.

[INSERT1] through [INSERT10] are user-supplied inserts, if these are required by the message definition.

[SYMPTOM_BUFFER] is the buffer to receive a symptom string for the message.

[SUPPRESS_SRBUILD] indicates whether or not a symptom record build is suppressed. It can have either of these values:

`YES|NO`

[MODULE_NAME] is the name of the module in error, supplied as data for the symptom string.

[MODULE_PTF] is the PTF level of the module in error, supplied as data for the symptom string.

[UPPERCASE] determines whether or not messages should be converted to uppercase. It can have either of these values:

`YES|NO`

Output parameters

RESPONSE is the domain's response to the call. It can have either of these values:

`OK|EXCEPTION`

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

`MESSAGE_CANNOT_BE_PRODUCED`

MEBM gate, INQUIRE_MESSAGE_LENGTH function

The INQUIRE_MESSAGE_LENGTH function of the MEBM gate is used to find the length of the message in order to obtain the appropriate sized buffer to retrieve the message.

Input parameters

MESSAGE_TABLE is a table containing all the message definitions for messages output by the message domain.

[COMPONENT_ID] is the component identifier for the message.

MESSAGE_NUMBER is the numeric message identifier.

[INSERT1] through [INSERT10] are user-supplied inserts, if these are required by the message definition.

Output parameters

MESSAGE_LENGTH is the length of the message being inquired on.

RESPONSE is the domain's response to the call. It can have either of these values:

`OK|EXCEPTION`

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

`MESSAGE_CANNOT_BE_FOUND`

MEBM gate, INQUIRE_MESSAGE_DEFINITION function

The INQUIRE_MESSAGE_DEFINITION function of the MEBM gate is used to return the action and severity codes of a message.

Input parameters

MESSAGE_TABLE is a table containing all the message definitions for the message domain.

[COMPONENT_ID] is the component identifier for the message.

MESSAGE_NUMBER is the numeric message identifier.

Output parameters

SEVERITY_CODE is the severity of the message.

ACTION_CODE is the action code for the message.

RESPONSE is the domain’s response to the call. It can have either of these values:

`OK|EXCEPTION`

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

`MESSAGE_CANNOT_BE_FOUND`

MEME gate, SEND_MESSAGE function

The SEND_MESSAGE function of the MEME gate is used to send a message to one or more destinations.

Input parameters

[COMPONENT_ID] is the component identifier for the message.

MESSAGE_NUMBER is the numeric message identifier.

[PRODUCT] is an optional product identifier.

[MSGTABLE] indicates that the feature message table is to be used.

[SYSTEM_DUMPCODE] is the dump code to be used when the message domain requests a dump on behalf of its caller.

[TERMINATE_CICS] specifies whether the caller requests CICS to be terminated.

[INSERT1] through [INSERT10] are user-supplied inserts, if these are required by the message definition.

[TRANID] is the transaction identifier to be used to override the tranid obtained by the message domain.

[TERMID] is the terminal identifier to be used to override the termid obtained by the message domain.

[NETNAME] is the network name to be used to override the netname obtained by the message domain.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, INVALID, or PURGED. Possible values are:

RESPONSE	Possible REASON values
DISASTER	INVALID_MODULE_PTR, INVALID_TEMPLATE, ABEND, INSUFFICIENT_STORAGE
INVALID	INVALID_COMPONENT_TYPE, INVALID_DBCS_FORMAT, INVALID_DESTINATION, INVALID_FUNCTION, INVALID_INSERT, INVALID_MEFO_RESPONSE, MESSAGE_NOT_FOUND, MESSAGE_SET_NOT_FOUND, MISSING_INSERT, OPT_INSERT_NOT_FOUND, RETRY_MSG_LOCATE
PURGED	TDQ_PURGED

MEME gate, CONVERSE function

The CONVERSE function of the MEME gate is used to send a message and receive a reply.

Input parameters

[COMPONENT_ID] is the component identifier for the message.

MESSAGE_NUMBER is the numeric message identifier.

[PRODUCT] is an optional product identifier.

[INSERT1] through [INSERT10] are user-supplied inserts, if these are required by the message definition.

[TRANID] is the transaction identifier to be used to override the tranid obtained by the message domain.

[TERMID] is the terminal identifier to be used to override the termid obtained by the message domain.

[NETNAME] is the network name to be used to override the netname obtained by the message domain.

[REPLY_BUFFER] is the buffer into which the text reply is to be returned.

REPLY_FORMAT (VALUE|TEXT_OR_VALUE|TEXT) indicates the format of the reply. It can be one of these formats:

`VALUE|TEXT_OR_VALUE|TEXT`

Output parameters

[REPLY_INDEX] is the number of the template reply option that matches the user’s reply text.

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	INVALID_MODULE_PTR, INVALID_TEMPLATE, MAX_REPLIES_EXCEEDED, ABEND, INSUFFICIENT_STORAGE
EXCEPTION	REPLY_BUFFER_TOO_SMALL
INVALID	INVALID_COMPONENT_TYPE, INVALID_DESTINATION, INVALID_FUNCTION, INVALID_INSERT, INVALID_REPLY_BUFFER, MESSAGE_NOT_FOUND, MESSAGE_SET_NOT_FOUND, MISSING_INSERT, OPT_INSERT_NOT_FOUND, REPLY_BUFFER_REQUIRED, REPLY_INDEX_REQUIRED, RETRY_MSG_LOCATE

MEME gate, RETRIEVE_MESSAGE function

The RETRIEVE_MESSAGE function of the MEME gate is used to retrieve a message text.

Input parameters

[COMPONENT_ID] is the component identifier for the message.

MESSAGE_NUMBER is the numeric message identifier.

MESSAGE_BUFFER is the buffer to receive the message text.

[PRODUCT] is an optional product identifier.

[MSGTABLE] indicates that the feature message table is to be used.

[LANGUAGE] is an optional language code.

[INSERT1] through [INSERT10] are user-supplied inserts, if these are required by the message definition.

[TRANID] is the transaction identifier to be used to override the tranid obtained by the message domain.

[TERMID] is the terminal identifier to be used to override the termid obtained by the message domain.

[NETNAME] is the network name to be used to override the netname obtained by the message domain.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, INSUFFICIENT_STORAGE, INVALID_MODULE_PTR, INVALID_TEMPLATE
EXCEPTION	MSG_BUFFER_TOO_SMALL, REPLY_BUFFER_TOO_SMALL
INVALID	INVALID_COMPONENT_TYPE, INVALID_FUNCTION, INVALID_INSERT, INVALID_MESSAGE_BUFFER, MESSAGE_NOT_FOUND, MESSAGE_SET_NOT_FOUND, MISSING_INSERT, OPT_INSERT_NOT_FOUND, RETRY_MSG_LOCATE

MEME gate, INQUIRE_MESSAGE_LENGTH function

The INQUIRE_MESSAGE_LENGTH function of the MEME gate is used to find the length of the message in order to obtain the appropriate size buffer to retrieve the message.

Input parameters

[COMPONENT_ID] is the component identifier for the message.

MESSAGE_NUMBER is the numeric message identifier.

[PRODUCT] is an optional product identifier.

[MSGTABLE] indicates that the feature message table is to be used.

[LANGUAGE] is an optional language code.

[INSERT1] through [INSERT10] are user-supplied inserts, if these are required by the message definition.

Output parameters

MESSAGE_LENGTH is the length of the message being inquired on.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, INSUFFICIENT_STORAGE, INVALID_MODULE_PTR, INVALID_TEMPLATE
INVALID	INVALID_COMPONENT_TYPE, INVALID_FUNCTION, INVALID_INSERT, MESSAGE_NOT_FOUND, MESSAGE_SET_NOT_FOUND, MISSING_INSERT, OPT_INSERT_NOT_FOUND, RETRY_MSG_LOCATE

MEME gate, VALIDATE_LANGUAGE_CODE function

The VALIDATE_LANGUAGE_CODE function of the MEME gate is used to determine whether a specific three-letter IBM standard national language code is valid. If it is valid, this function returns the equivalent one-character CICS language suffix. The IBM standard three-character codes, and their corresponding one-character CICS language suffices, are listed in Table 66.

Input parameters

LANGUAGE_CODE is the three-character national language code to be validated.

Output parameters

[LANGUAGE_SUFFIX] is the one-character CICS language suffix that corresponds to the input LANGUAGE_CODE.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|DISASTER|EXCEPTION|INVALID
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND
EXCEPTION	LANGUAGE_CODE_INVALID, LANGUAGE_NOT_SUPPORTED
INVALID	INVALID_FUNCTION

Table 66. Languages and their codes

NATLANG code	NLS code	Language
A	ENG	Alternative English
Q	ARA	Arabic
1	BEL	Byelorussian
L	BGR	Bulgarian
B	PTB	Brazilian Portuguese
T DBCS	CHT	Traditional Chinese
C DBCS	CHS	Simplified Chinese
2	CSY	Czech
D	DAN	Danish
G	DEU	German
O	ELL	Greek
S	ESP	Spanish
W	FIN	Finnish
F	FRA	French
X	HEB	Hebrew
3	HRV	Croatian
4	HUN	Hungarian
J	ISL	Icelandic
I	ITA	Italian
H DBCS	KOR	Korean
M	MKD	Macedonian
9	NLD	Dutch
N	NOR	Norwegian
5	PLK	Polish
P	PTG	Portuguese
6	ROM	Romanian
R	RUS	Russian
Y	SHC	Serbo-Croatian (Cyrillic)
7	SHL	Serbo-Croatian (Latin)
V	SVE	Swedish
Z	THA	Thai
8	TRK	Turkish
U	UKR	Ukrainian

Notes:

1. **DBCS** denotes Double-Byte Character Set languages.
2. A for *alternative English*. Code letter A means “alternative English” to distinguish your edited English message tables from the default US English message tables supplied by CICS. The default US English tables are designated by the language code letter E.
3. The NATLANG code for the selected language is used as the suffix of your edited message data sets that you can create using the message editing utility. For more information about the message editing utility, see *CICS Operations and Utilities Guide*.

MEME gate, VALIDATE_LANGUAGE_SUFFIX function

The VALIDATE_LANGUAGE_SUFFIX function of the MEME gate is used to determine whether a specific one-character CICS language suffix is valid. If it is valid, this function returns the equivalent three-character IBM standard national language code. The IBM standard three-character codes, and their corresponding one-character CICS language suffices, are listed in Table 66.

Input parameters

LANGUAGE_SUFFIX is the one-character CICS language code to be validated.

Output parameters

[LANGUAGE_CODE] is the three-character CICS language suffix that corresponds to the input LANGUAGE_SUFFIX.

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|DISASTER|EXCEPTION|INVALID`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND
EXCEPTION	LANGUAGE_NOT_SUPPORTED, LANGUAGE_SUFFIX_INVALID
INVALID	INVALID_FUNCTION

MEME gate, INQUIRE_MESSAGE function

The INQUIRE_MESSAGE function of the MEME gate is used to find the system default language as a one-character CICS language suffix and a three-character IBM standard national language code.

Input parameters: None.

Output parameters

DEFAULT_LANGUAGE_CODE is the three-character code for the default language.

DEFAULT_LANGUAGE_SUFFIX is the one-character suffix for the default language.

RESPONSE is the domain’s response to the call. It can have either of these values:

`OK|DISASTER|INVALID`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND
INVALID	INVALID_FUNCTION

MESR gate, SET_MESSAGE_OPTIONS function

The SET_MESSAGE_OPTIONS function of the MESR gate is used to set the various message options specified by the system initialization parameters MSGCASE, MSGLVL, and NATLANG.

Input parameters

[LANGUAGES_USED] is a list of the languages used in the system.

[MESSAGE_LEVEL] can be 0 or 1. 0 means that information messages do not appear (are suppressed) at the console.

[MESSAGE_CASE] is either MIXED for mixed-case messages, or UPPER for messages to be folded to uppercase.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is INVALID. It has this value:

`INVALID_FUNCTION`

Message domain’s generic gate

Table 67 summarizes the message domain’s generic gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and the generic format for calls to the gate.

Table 67. Message domain’s generic gate

Gate	Trace	Function	Format
DMDM	ME 0101 ME 0102	PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM

You can find descriptions of these functions and their input and output parameters, in the section dealing with the corresponding generic formats, in “Domain manager domain’s generic formats” on page 195.

In preinitialization processing, the message domain sets the following message options:

- The national languages to be supported during this CICS run
- The message level for initialization messages
- The message case.

For a cold start, the information comes from the system initialization parameters; for any other type of start, the information comes from the local catalog, but is then modified by any relevant system initialization parameters.

The message domain does no quiesce processing or termination processing.

Modules

Module	Function
DFHCMAC	Displays messages and codes online for the CMAC transaction
DFHMEBM	Is executed in an offline environment, and is provided for use by batch utility programs
DFHMEBU	Builds a message into a buffer, and also builds a symptom string when required
DFHMEDM	Performs the necessary domain manager functions; that is, preinitialize, initialize, quiesce, and terminate for the message domain
DFHMEDUF	ME domain offline dump formatting routine
DFHMEFO	Formats a long message into lines of specified length
DFHMEIN	Provides all the data required to build a message
DFHMEME	Handles the following functions: **SEND_MESSAGE** sends a message to any individual or combination of MVS/MCS consoles, or CICS TD queues. **CONVERSE** sends a message to any individual or combination of MVS/MCS consoles and receives a reply from one of them. **RETRIEVE_MESSAGE** builds a message and places it in a buffer passed by the caller. **INQUIRE_MESSAGE_LENGTH** returns the length of a terminal end user message. **INQUIRE_MESSAGE** returns the requested data, held by the ME domain (for example, Default_Language). **VALIDATE_LANGUAGE_CODE** checks whether a three-character language code is valid. **VALIDATE_LANGUAGE_SUFFIX** checks whether a one-character language suffix is valid.
DFHMESR	Collects the system initialization parameter overrides for a particular CICS start
DFHMETRI	ME domain offline trace interpretation routine
DFHMEWS	Writes a symptom record containing a symptom string to SYS1.LOGREC by using the MVS SYMRBLD macro
DFHMEWT	Provides support to execute the MVS WTOR SVC

Exits

There is one global user exit point in the message domain: XMEOUT. See the *CICS Customization Guide* for further information.

Trace

The point IDs for the message domain are of the form ME xxxx; the corresponding trace levels are ME 1, ME 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 51. Message generation program

The message generation program provides an interface for sending CICS messages to the terminal user only.

Design overview

The input to the message generation program (DFHMGP) consists of the binary number of the message to be produced, the identifier of the component issuing the message, and any information to be inserted in the message. DFHMGP builds the complete message using a prototype held in the message prototype control table, also known as the message generation table (DFHMGT). The message text itself is held not in DFHMGT but in the message domain, from which it is retrieved by the DFHMGPME routine (a component of the DFHMGP load module) when required. DFHMGP finally sends the message to the appropriate terminal.

The prototype statements are invocations of the DFHMGM TYPE=TEXT macro, and are contained in copybooks held in DFHMGT.

The message prototype control table consists of a series of copybooks, DFHMGTnn, each of which contains 1 through 100 messages. They are arranged in such a way that each DFHMGTnn copybook contains prototypes for messages that have identifiers of the form DFHccnnxx, where cc is the 2-character identifier of the component issuing the message, nn is the numerical part of the copybook name, and xx is in the range 00 through 99. For example, the prototype for message DFHAC2214 (belonging to the AC component) is in copybook DFHMGT22.

Within each copybook are invocations of DFHMGM in ascending message number order. All messages sent to the terminal end user have both OPTION=NLS and COMPID specified on their DFHMGM invocations.

The main operands of the DFHMGM TYPE=TEXT macro are:

- MSGNO = actual message number
- COMPID = 2-character identifier of component issuing the message (this forms part of the message identifier)
- OPTION = any special options, for example, (NLS) for messages that require NLS enabling.

Other operands are provided on the DFHMGM invocations, but in general these are no longer used.

Modules

DFHMGP, DFHMGT

Exits

No global user exit points are provided for this function.

Trace

The following point ID is provided for this function:

- AP 00E0, for which the trace level is AP 1.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 52. Message switching

This function provides the user with a general-purpose message-switching capability while CICS is running.

The facility, which can route messages to one or more destinations, is initiated by the CMSG transaction, or a user-chosen replacement, read from the terminal. For further information about this transaction, see the *CICS Supplied Transactions* manual.

Design overview

Message switching runs as a task under CICS. A terminal operator requests activation of this task by entry of the CMSG transaction identifier (or another installation-defined 4-character transaction identifier), followed by appropriate parameters. After it has been initiated, message switching interfaces with CICS basic mapping support (BMS) and CICS control functions.

Although message switching appears conversational to the terminal operator, the message switching task is terminated with each terminal response. Conversation is forced, if continuation is possible, by effectively terminating the transaction with an EXEC CICS RETURN TRANSID(xxxx) command, where xxxx is the transaction identifier taken from the task's PCT entry.

Figure 80 shows the message-switching interfaces.

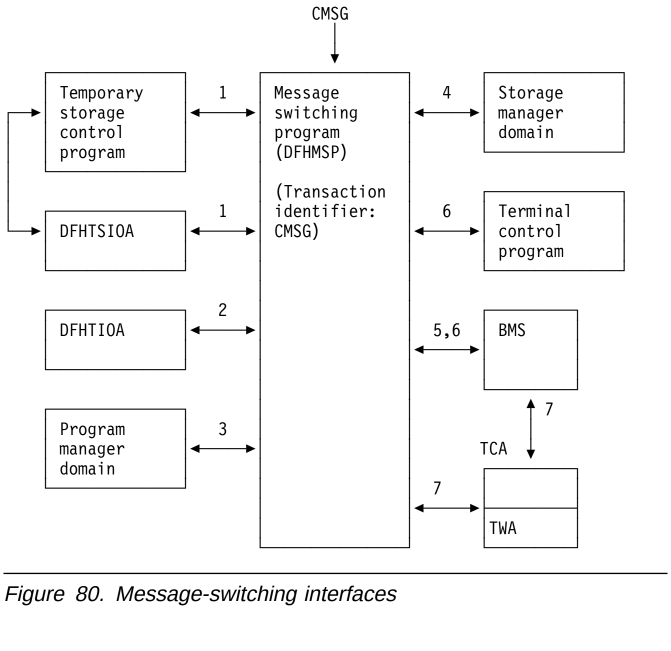


Figure 80. Message-switching interfaces

Notes:

1. If the first 4 characters of the terminal input/output area (TIOA) (not including a possible set buffer address (SBA) sequence from an IBM 3270 Information Display System) do not match the transaction identifier in the task's PCT entry, this task must have started as part of a conversation in which a previous task has set up the next transaction identifier. A 'C' immediately following the transaction identifier is also a forced continuation. In such a case, information has been stored in, and has to be retrieved from, temporary storage (using a record key of 1-byte X'FC', 4-byte terminal identifier, and 3-byte C'MSG') to allow the task to resume where it left off.
2. The operands in the input TIOA are processed and their values and status are stored in the TWA.
3. If a ROUTE operand specifies terminal list tables (TLTs) for a standard routing list, the program manager domain is called to load the requested TLTs.
4. Message switching requests storage areas for:
   - Building route lists (one or more segments, each of which has room for the number of destinations specified by MSRTELNG, an EQU within the program).
   - Constructing a record to be placed in temporary storage.
   - Providing the message text to BMS in any of the following situations:
     - Message parts from previous inputs exceed the current TIOA size
     - A message is completed in the current TIOA but has parts from previous inputs
     - A heading has been requested but the message in the current TIOA is too close to TIOADBA to allow the header to be inserted.
5. Message switching requests BMS routing functions by means of the DFHBMS TYPE=ROUTE macro. The message text is sent using DFHBMS TYPE=TEXTBLD, and completion of the message is indicated by DFHBMS TYPE=PAGEOUT. BMS returns the status of destinations and any error indications in response to the DFHBMS TYPE=CHECK macro.
6. Message switching interfaces with BMS using DFHBMS TYPE=(EDIT,OUT) and with CICS terminal control using DFHTC TYPE=WRITE for the IBM 3270 Information Display System only, in providing responses to terminals. These can indicate normal completion, signal that input is to continue, or provide notification of input error.
7. Like any other task, message switching has a task control area (TCA) in which values may be placed prior

to issuing CICS macros, and from which any returned values can be retrieved after an operation. All values for the DFHBMS TYPE=ROUTE macro are placed in the TCA because they are created at execution time. The TWA is used for storing status information (partly saved in temporary storage across conversations) and space for work. The DFHMSP module is reentrant.

Control blocks

See the list of control blocks in Chapter 9, "Basic mapping support" on page 63.

Modules

DFHMSP (the message switching program) is invoked by the CMSG transaction. DFHMSP's purpose is to route a message entered at the terminal to one or more operator-defined terminals or to other operators.

Exits

No global user exit points are provided for this function.

Trace

No trace points are provided for this function.

External interfaces

See Figure 80 on page 411 for external calls made to other areas or domains.

Chapter 53. Monitoring domain (MN)

The monitoring domain is responsible for all monitoring functions within CICS. These functions enable the user to measure the amount of CPU, storage, temporary-storage requests, and so on used per task, and hence charge customers for computing services and help review the performance of a CICS system.

Monitoring domain’s specific gates

Table 68 summarizes the monitoring domain’s specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 68. Monitoring domain’s specific gates

Gate	Trace	Function	XPI
MNMN	MN 0201	EXCEPTION_DATA_PUT	NO
	MN 0202	PERFORMANCE_DATA_PUT	NO
		INQUIRE_MONITORING_DATA	YES*
		MONITOR	YES
MNSR	MN 0301	SET_MCT_SUFFIX	NO
	MN 0302	SET_MONITORING	NO
		INQ_MONITORING	NO
MNXM	MN 0A01	TRANSACTION_INITIALIZATION	NO
	MN 0A02	TRANSACTION_TERMINATION	NO
			NO

* In a modified form, without a transaction number.

MNMN gate, EXCEPTION_DATA_PUT function

The EXCEPTION_DATA_PUT function of the MNMN gate is used to produce an exception record at the completion of an EXCEPTION condition.

Input parameters

EXCEPTION_START is the start time of the exception in stored clock (STCK) format.

EXCEPTION_STOP is the stop time of the exception in STCK format.

RESOURCE_TYPE is the type of resource for which the exception data is to be recorded.

RESOURCE_ID is the identifier of the resource for which the exception data is to be recorded.

EXCEPTION_TYPE is the type of exception to be recorded.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, INVALID_MONITORING_TOKEN, LOOP

MNMN gate, PERFORMANCE_DATA_PUT function

The PERFORMANCE_DATA_PUT function of the MNMN gate is used to produce a performance record and reset task monitoring information for a conversational task or a syncpoint.

Input parameters

RECORD_TYPE is the reason for the record to be output.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, INVALID_MONITORING_TOKEN, LOOP

MNMN gate, INQUIRE_MONITORING_DATA function

The INQUIRE_MONITORING_DATA function of the MNMN gate is used to access a transaction’s monitoring information.

Input parameters

[TRANSACTION_NUMBER] is the transaction number for which monitoring data is required.

DATA_BUFFER specifies the address and length of a buffer for the monitoring data.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	MONITOR_DATA_UNAVAILABLE, LENGTH_ERROR

MNMN gate, MONITOR function

The MONITOR function of the MNMN gate is called to process a user event-monitoring point (EMP).

Input parameters

POINT is a value in the range 0 through 255 corresponding to a monitoring point identifier defined in the monitoring control table (MCT).

[ENTRYNAME] is an ID qualifier, 1 through 8 bytes, corresponding to an entry name specified in the MCT.

[DATA1] supplies 4 bytes of data to be used in the operations performed by this user's EMP.

[DATA2] supplies 4 bytes of data to be used in the operations performed by this user's EMP.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, INVALID_MONITORING_TOKEN, LOOP
EXCEPTION	POINT_NOT_DEFINED, DATA1_NOT_SPECIFIED, DATA2_NOT_SPECIFIED, INVALID_DATA1_VALUE, INVALID_DATA2_VALUE

MNSR gate, SET_MCT_SUFFIX function

The SET_MCT_SUFFIX function of the MNSR gate is used to identify to the monitoring domain the suffix of the monitoring control table (MCT).

Input parameters

SUFFIX is the 2-character MCT suffix.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	MCT_NOT_FOUND

MNSR gate, SET_MONITORING function

The SET_MONITORING function of the MNSR gate is used to set the monitoring classes on or off and to change the monitoring options.

Input parameters

[CONVERSE] indicates if a transaction performance class record is to be produced for conversational tasks for each pair of terminal control I/O requests. It can have either of these values:

`YES|NO`

[EXCEPTION_STATUS] indicates the exception class monitoring setting. It can have either of these values:

`ON|OFF`

[FREQUENCY] is the interval for which monitoring automatically produces a transaction performance class record for any long-running transaction. Frequency times are 0, or in the range 001500 through 240000. The default frequency value is 0, which means that frequency monitoring is inactive.

[MONITORING_STATUS] indicates the monitoring status setting. It can have either of these values:

`ON|OFF`

[PERFORMANCE_STATUS] indicates the performance class monitoring setting. It can have either of these values:

`ON|OFF`

[SUBSYSTEM_ID] specifies the 4-character subsystem-id to be used in the sysevent records. The default is the first four character of the generic applid. implicit syncpoint (unit-of-work).

[SYNCPOINT] indicates if a transaction performance class record is to be produced when a transaction takes an explicit or implicit syncpoint (unit-of-work). It can have either of these values:

`YES|NO`

[SYSEVENT_STATUS] indicates the SYSEVENT class monitoring setting. It can have either of these values:

`ON|OFF`

[TIME] indicates whether the monitoring timestamp fields returned on the INQUIRE_MONITORING_DATA function are to be in GMT or Local time. It can have either of these values:

`GMT|LOCAL`

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	INVALID_FREQUENCY

MNSR gate, INQ_MONITORING function

The INQ_MONITORING function of the MNSR gate is used to enquire on the monitoring classes and the monitoring options.

Input parameters: None.

Output parameters

CONVERSE indicates if a transaction performance class record is to be produced for conversational tasks for each pair of terminal control I/O requests. It can have either of these values:

YES|NO

EXCEPTION_STATUS indicates whether exception class monitoring is active. It can have either of these values:

ON|OFF

FREQUENCY is the interval for which monitoring automatically produces a transaction performance class record for any long-running transaction. Frequency times are 0, or in the range 001500 through 240000. The default frequency value is 0, which means that frequency monitoring is inactive.

MONITORING_STATUS indicates whether monitoring is active. It can have either of these values:

ON|OFF

PERFORMANCE_STATUS indicates whether performance class monitoring is active. It can have either of these values:

ON|OFF

SUBSYSTEM_ID specifies the 4-character subsystem-id to be used in the sysevent records. The default is the first four character of the generic applid. implicit syncpoint (unit-of-work).

SYNCPOINT indicates if a transaction performance class record is to be produced when a transaction takes an explicit or implicit syncpoint (unit-of-work). It can have either of these values:

YES|NO

SYSEVENT_STATUS indicates whether SYSEVENT class monitoring is active. It can have either of these values:

ON|OFF

TIME indicates whether the monitoring timestamp fields returned on the INQUIRE_MONITORING_DATA function are to be in GMT or Local time. It can have either of these values:

GMT|LOCAL

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	SUBSYSTEM_ID_NOT_AVAILABLE

MNXM gate, TRANSACTION_INITIALIZATION function

The TRANSACTION_INITIALIZATION function of the MNXM gate is used to inform the monitoring domain of a transaction attach request so that the monitoring domain can allocate task monitoring storage.

Input parameters

TASK_ATTACH_TIME is the time when this task was attached.

TCLASS_DELAY_TIME is the time this task was delayed due to the transaction class (if any) limit for this transaction being reached.

MXT_DELAY_TIME is the time this task was delayed due to the maximum user task limit (MXT) being reached.

INITIAL_DISPATCH_TIME is the time when this task was first dispatched after attach.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, INVALID_MONITORING_TOKEN, LOOP

MNXM gate, TRANSACTION_TERMINATION function

The TRANSACTION_TERMINATION function of the MNXM gate is used to inform the monitoring domain of a transaction detach request, so that the monitoring domain can report on task monitoring information and then release the storage.

Input parameters: None.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, INVALID_MONITORING_TOKEN, LOOP

Monitoring domain's generic gates

Table 69 summarizes the monitoring domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 69. Monitoring domain's generic gates

Gate	Trace	Function	Format
APUE	MN 0601 MN 0602	SET_EXIT_STATUS	APUE
DMDM	MN 0101 MN 0102	INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
STST	MN 0401 MN 0402	COLLECT_STATISTICS COLLECT_RESOURCE_STATS	STST
TISR	MN 0801 MN 0802	NOTIFY	TISR
XMNT	MN 0901 MN 0902	MXT_CHANGE_NOTIFY	XMNT

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format APUE—"Application domain's generic formats" on page 42

Format DMDM—"Domain manager domain's generic formats" on page 195

Format STST—"Statistics domain's generic format" on page 521

Format TISR—"Timer domain's generic format" on page 606

Format XMNT—"Transaction manager domain's generic format" on page 646 .

In initialization processing, the monitoring domain sets the initial monitoring options:

- Monitoring control table suffix
- Initial monitoring status
- Initial event monitoring status
- Initial exception class monitoring status
- Initial performance class monitoring status
- Initial converse option
- Initial syncpoint option
- Initial time option
- Initial frequency option
- Initial subsystem id.

For a cold start, the information comes from the system initialization parameters; for any other type of start, the information comes from the global catalog, but is then modified by any relevant system initialization parameters.

In addition:

- If necessary, the monitoring control table (MCT) is loaded and initialized.
- If performance class monitoring is active, CPU timing is started.
- The monitoring domain user exit gate is enabled.
- Messages are sent to the console to indicate whether monitoring is active, and what MCT suffix (if any) is being used.

In quiesce processing, the monitoring domain waits for all transactions that it is monitoring to terminate. Then the final data in the performance class buffer, if any, is written to SMF.

The monitoring domain does no termination processing.

Modules

Module	Function
DFHMNDM	Handles the following requests: INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHMNDUF	Formats the MN domain control blocks in a CICS system dump
DFHMNMN	Handles the following requests: EXCEPTION_DATA_PUT PERFORMANCE_DATA_PUT INQUIRE_MONITORING_DATA MONITOR
DFHMNNT	Handles the following request: MXT_CHANGE_NOTIFY
DFHMNSR	Handles the following requests: SET_MCT_SUFFIX SET_MONITORING INQ_MONITORING
DFHMNST	Handles the following requests: COLLECT_STATISTICS COLLECT_RESOURCE_STATS
DFHMNSU	Handles monitoring domain subroutine requests of format MNSU: UPDATE_CATALOGUE MONITORING_DATASET_PUT SYSEVENT_WRITE
DFHMNSVC	Provides SMFEWTM and SYSEVENT authorized services with GTF tracing (GTRACE)

Module	Function
DFHMNTI	Handles the following request: NOTIFY
DFHMNTRI	Provides a trace interpretation routine for CICS dumps and traces
DFHMNUE	Provides a SET_EXIT_STATUS (services user exit) routine to enable or disable an exit
DFHMNXM	Handles the following requests: TRANSACTION_INITIALIZATION TRANSACTION_TERMINATION

Exits

There is one global user exit point in the monitoring domain: XMNOUT. See the *CICS Customization Guide* for further information.

Trace

The point IDs for the monitoring domain are of the form MN xxxx; the corresponding trace levels are MN 1, MN 3, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 54. Multiregion operation (MRO)

CICS multiregion operation (MRO) enables CICS regions that are running in the same MVS image, or in the same MVS sysplex, to communicate with each other. MRO does not support communication between a CICS system and a non-CICS system such as IMS.[8]

ACF/VTAM and SNA networking facilities are not required for MRO. The support within CICS that enables region-to-region communication is called **interregion communication**

The facilities provided by MRO include:

- Transaction routing
- Distributed transaction processing
- Function shipping
- Asynchronous processing
- Distributed program link.

For more information about the design and implementation of interregion communication facilities, see Chapter 42, "Interregion communication (IRC)" on page 345. For descriptions of the facilities provided by MRO, see:

- Chapter 23, "Distributed program link" on page 169
- Chapter 24, "Distributed transaction processing" on page 171
- Chapter 40, "Function shipping" on page 333
- Chapter 95, "Transaction routing" on page 653.

[8] The external CICS interface (EXCI) uses a specialized form of MRO link to support: communication between MVS batch programs and CICS; DCE remote procedure calls to CICS programs.

Chapter 55. Node abnormal condition program

DFHZNAC is a CICS program used by terminal control to analyze abnormal terminal conditions that are logical unit or node errors detected by VTAM. VTAM notifies the CICS terminal control program that there is a terminal error, and the terminal control program places the terminal out of service. The terminal control program then invokes DFHZNAC, which writes any error messages to the CSNE transient data destination.

Design overview

The node abnormal condition program (DFHZNAC) can be called for any of several reasons:

- As a central point of control for most VTAM-related error situations, error actions can be standardized in table form, allowing for easy addition and alteration to the way conditions are processed.
- Some exception conditions that are not errors are also processed by DFHZNAC, but some exception conditions that are errors are not processed by DFHZNAC.
- It provides a single point of user interface to those who want to change the default actions for an error requiring at most one user program (NEP)—see Chapter 56, "Node error program" on page 425.

To process conditions that are not associated with a known terminal, the dummy TCTTE is used. It is invoked by placing a TCTTE on the system error queue with a 1-byte code relating to the condition. Placing it on the queue makes the TCTTE 'temporary OUTSERV' (TCTTESOS); that is, the decision is pending the outcome of DFHZNAC.

The activate scan routine (DFHZACT) is responsible for attaching the CSNE transaction to run DFHZNAC; this is done during CICS initialization. The CSNE transaction remains in the system until CICS or VTAM is quiesced. If DFHZNAC itself abends, or VTAM is closed and then restarted, DFHZACT attaches a new CSNE transaction when there is more work for DFHZNAC to do.

There is only ever one CSNE transaction in the system at any one time. (This should not be confused with the CSNE transaction that is attached by the remote delete processing of autoinstall.)

Once DFHZNAC has been called, it runs down the system error queue, processing each error for each TCTTE on the queue. When there is no more work to be done, DFHZNAC suspends itself, to be resumed by DFHZACT when further processing is required.

Note that the system error queue need not be empty before DFHZNAC terminates; errors can be left on the queue to be processed later. For example, in an XRF environment, some error codes cannot be handled until the alternate CICS system has taken over; that is, it has passed the 'initialization complete' stage. If DFHZNAC is passed a TCTTE indicating such an error, it leaves that entry on the queue.

Node abnormal condition program (NACP) processing involves mapping the error code (placed into the TCTTE by a DFHZERRM macro call) to a set of actions, performing any specific processing for that error code, accumulating the actions for all the error codes in that TCTTE, and then performing the actions.

Figure 81 on page 422 shows the NACP error code processing. The numbers in Figure 81 refer to the following notes, which use the table entry for DFHZC3424 as the example:

```
DFHZNCM MSGNO=3424,
        E1=S88,
        E2=NULL,
        E3=NULL,
        E4=NULL,
        ACT=(ABSEND,ABRECV,ABTASK,CLSDST,SIMLOG),
        CODE=NSP02,
        TYPE=ENTRY
```

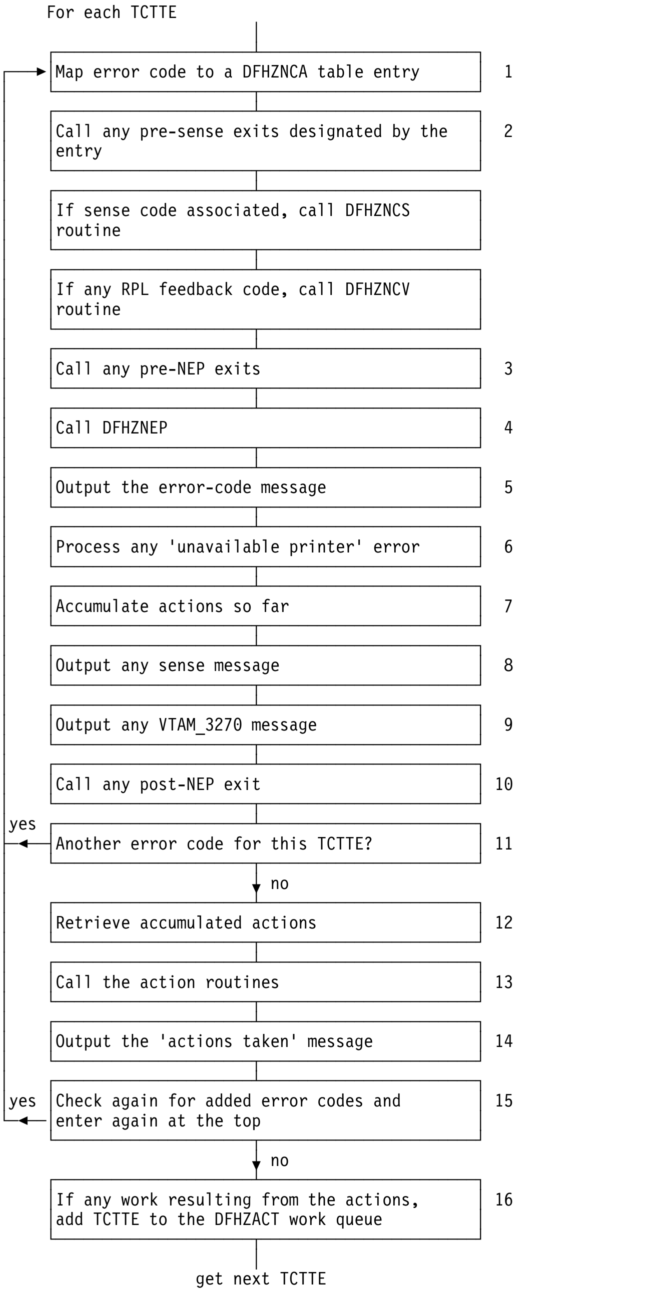

For each TCTTE
Map error code to a DFHZNCA table entry
1
Call any pre-sense exits designated by the entry
2
If sense code associated, call DFHZNCS routine
If any RPL feedback code, call DFHZNCV routine
Call any pre-NEP exits
3
Call DFHZNEP
4
Output the error-code message
5
Process any 'unavailable printer' error
6
Accumulate actions so far
7
Output any sense message
8
Output any VTAM_3270 message
9
Call any post-NEP exit
10
yes
Another error code for this TCTTE?
11
no
Retrieve accumulated actions
12
Call the action routines
13
Output the 'actions taken' message
14
yes
Check again for added error codes and enter again at the top
15
no
If any work resulting from the actions, add TCTTE to the DFHZACT work queue
16
get next TCTTE

Figure 81. NACP error code processing

Notes:

1. The error codes in TCTEVRC* and default actions are defined in the VTAM-associated errors section of the *CICS Trace Entries*.

   In the example, TCTVRC5 contains X'5C', which equates to TCZNSP02 (ref CODE=NSP02).
2. Errors that involve SNA sense have it saved in TCTEVNSS. It is processed by code in copy book DFHZNCS.
3. Call any pre-NEP exits specified by the table entry; for example, E1=S88 references routine NAPES88.
4. Call the node error program (NEP), passing a parameter list via a COMMAREA. This call may or may not change the default actions. The operation of the NEP is described in the *CICS Customization Guide* and the Chapter 56, "Node error program" on page 425.
5. Output error-code message associated with the table entry (DFHZC3424 from MSGNO=3424) to the CSNE log.
6. Check for 'unavailable printer error'—this caters for a screen copy request that is unable to find an eligible printer if the first choice is unavailable.
7. Because there can be multiple error codes, the actions are accumulated now and performed together later.
8. Output any sense message resulting from the DFHZNCS call, to the CSNE log.
9. Output any VTAM_3270 message resulting from the DFHZNCS call (if it was non-SNA) to the CSNE log.
10. Call the post-NEP exit, if any (E4=NULL, no routine).
11. Loop for each error code in TCTEVRC*.
12. When all the error codes for this TCTTE that can be processed at this time have been processed, retrieve the actions that have been accumulated, such as ACT=(ABSEND, ABRECV, ABTASK, CLSDST, SIMLOG).
13. Call the action routine to process each of the actions.
14. Output the 'actions taken' message DFHZC3437 to the CSNE log.
15. Check again for any error codes added asynchronously while the CSNE transaction was running.
16. Queue any work resulting from the actions to the activate scan routine.

Control blocks

DFHZNAC references CSA, its own TCA, JCA, TCT prefix, TIOA, NIB, PCT, SIT, TCTWE, VTAM RPL, VTAM ACB, and the NACP/NEP communication area.

As would be expected, however, the processing mainly concerns access to the TCTTE, and to the NACP/NEP communication area (COMMAREA), which is mapped by the DFHNEPCA DSECT.

See the *CICS Data Areas* manual or the *CICS Customization Guide* for a detailed description of the NEP communication area.

Modules

Module	Function
DFHZNAC	Processes the system error queue of TCTTEs and contains the central structure of NACP, outlined in Figure 81 on page 422. It contains the following copy books:
DFHZNCA	This copy book contains the exit routines for each error code and the error code table itself built by DFHZNCM macros.
DFHZNCE	Links to the user node error program (DFHZNEP) and responds to the action flag settings in the NACP/NEP COMMAREA.
DFHZNCS	Processes the SNA sense codes and contains the sense code tables built using a combination of DFHZMJM and DFHZNCM macros.
DFHZNCV	Contains the VTAM return code table.
DFHZNCM	The macro to build the error code table.
DFHZMJM	The macro to build the sense code table.

Exits

No global user exit points are provided for this function.

Trace

The following point IDs are provided for the node abnormal condition program, as part of terminal control:

- AP FCxx, for which the trace levels are TC 1, TC 2, and Exc
- AP FD7E, for which the trace level is TC 1.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Statistics

The only statistical field that DFHZNAC updates is TCTTETE. Because DFHZNAC is the main module for terminal errors, it has primary responsibility for updating the node error count.

Chapter 56. Node error program

CICS provides a user-replaceable node error program, DFHZNEP, which assists the user in the following ways:

- It provides a general environment within which it is easy for users to add their own error processors.
- It provides the fundamental error recovery actions for a VTAM 3270 network.
- It serves as the default node error program (NEP), where the user selects a NEP at system initialization.

The DFHZNEP program can be one of the following:

- The CICS-supplied default NEP
- A skeleton sample NEP generated using the DFHSNEP macro
- A user-written NEP generated using the DFHSNEP macro.

Design overview

The purpose of the NEP is to allow user-dependent processing whenever a communication system event is reported to CICS. An example of the processing that can be done is to analyze the event and override the default action set by DFHZNAC. When NEP processing is complete, control returns to DFHZNAC.

The default node error program sets the 'print TCTTE' action flag (TWAOTCTE in the user option byte TWAOPT1, defined in DFHNEPCA) if a VTAM storage problem has been detected; otherwise, it performs no processing, and leaves the action flags set by DFHZNAC unchanged.

The skeleton sample NEP provided by CICS can provide extended error handling for VTAM terminals, and is generated by means of the DFHSNEP macro. This procedure is described in the *CICS Customization Guide*.

The DFHSNEP macro can also be used to generate a user-written NEP. Interactions between the applications and VTAM depend on characteristics of the transactions and the installation. Each system has different characteristics. The CICS-provided skeleton NEP is a framework for a user-written NEP to handle network error conditions that may be unique to a particular installation.

Guidance information about NEP coding is given in the *CICS Recovery and Restart Guide*. Reference information about NEP coding is given in the *CICS Customization Guide*.

Modules

DFHZNEP

Exits

No global user exit points are provided for this function.

Trace

No trace points are provided specifically for this function; however, trace entries are made from DFHZNAC immediately before and after calling the node error program.

Point IDs AP FC71 and AP FC72, with a trace level of TC 1, correspond to these trace entries.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 57. Parameter manager domain (PA)

The parameter manager domain (also sometimes known simply as “parameter manager”) provides a facility to inform CICS domains of system parameters during CICS initialization. These **system initialization parameters** are specified in the system initialization table (SIT), and as temporary override parameters read from the SYSIN data stream or specified interactively at the system console.

The parameter manager domain also provides an operator correction facility for incorrectly specified system initialization parameter keywords early in CICS initialization. To use this facility, the user must specify the PARMERR system initialization parameter.

Parameter manager domain’s specific gate

Table 70 summarizes the parameter manager domain’s specific gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and whether or not the functions are available through the exit programming interface (XPI).

Table 70. Parameter manager domain’s specific gate

Gate	Trace	Function	XPI
PAGP	PA 0101	FORCE_START	NO
	PA 0102	GET_PARAMETERS	NO
		INQUIRE_START	NO

PAGP gate, FORCE_START function

The FORCE_START function of the PAGP gate is used to override the type of start requested by the START system initialization parameter. It is currently used to force START=AUTO if the MVS automatic restart manager indicates that CICS is being automatically restarted with the original startup JCL (so that CICS does not get a COLD start that the original JCL might have asked for).

Input parameters

START_TYPE specifies the type of CICS start to be forced. It can have either of these values:

COLD|AUTO

Output parameters

RESPONSE is the parameter manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_POSSIBLE

PAGP gate, GET_PARAMETERS function

The GET_PARAMETERS function of the PAGP gate is used to get the initialization parameters for a requesting domain.

Input parameters

FORCE_ALL specifies whether all parameters are required, even on a non-cold start. It can have either of these values:

YES|NO

Output parameters

PARAMETERS_TRANSFERRED indicates to the calling domain whether any system parameters were transferred successfully by the parameter manager domain. It can have either of these values:

YES|NO

RESPONSE is the parameter manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER

PAGP gate, INQUIRE_START function

The INQUIRE_START function of the PAGP gate is used to find out the type of start that CICS is to perform. This information is used to determine whether domains need to perform a cold or warm start.

Input parameters: None.

Output parameters

START specifies the type of start CICS is to perform. It can have any one of these values:

COLD|WARM|LOGTERM

RESPONSE is the parameter manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER

Parameter manager domain's generic gate

Table 71 on page 428 summarizes the parameter manager domain's generic gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and the generic format for calls to the gate.

Table 71. Parameter manager domain's generic gate

Gate	Trace	Function	Format
DMDM	PA 0201 PA 0202	PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM

You can find descriptions of these functions and their input and output parameters, in the section dealing with the corresponding generic format, in "Domain manager domain's generic formats" on page 195.

In preinitialization processing, the parameter manager domain reads system initialization (override) parameters from the startup job stream and, if requested, from the SYSIN data set and the console.

If a system initialization table (SIT) has been specified, that is loaded into storage. Otherwise, the default SIT is loaded. The override parameters are applied to the SIT, and related parameters are checked for consistency. Errors are reported, but no action is taken.

The parameter manager domain also provides services to other domains as they preinitialize. It informs them of the type of start (cold or auto), and supplies information as required from the SIT.

In initialization processing, the parameter manager domain waits for all the other domains to complete their initialization, and then writes a warm start record to the catalog.

The parameter manager domain does no quiesce processing or termination processing.

Modules

Module	Function
DFHPADM	Parameter manager domain initialization and termination
DFHPADUF	An offline routine to format system dump information
DFHPAGP	Passes initialization parameters to domains requesting GET_PARAMETERS
DFHPAIO	Communicates with the SYSIN data set and operator console
DFHPASY	System initialization override parameter checker and syntax parser
DFHPATRI	An offline routine to format trace points

Exits

No global user exit points are provided in this domain.

Trace

The point IDs for the parameter manager domain are of the form PA xxxx; the corresponding trace levels are PA 1, PA 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 58. Partner resource manager

The partner resource manager (an OCO component of the AP domain) is responsible for managing all operations involving the partner resource table (PRT). A PARTNER definition is required for every remote partner referenced in SAA communications interface calls (see Chapter 67, "SAA Communications and Resource Recovery interfaces" on page 487). Partner resources are installed either at system initialization or using CEDA INSTALL, and can be discarded using either the CEMT transaction or EXEC CICS commands.

The partner resource manager is implemented as a set of subroutine interfaces.

Functions provided by the partner resource manager

Table 72 summarizes the external subroutine interfaces provided by the partner resource manager. It shows the subroutine call formats, the level-1 trace point IDs of the modules providing the functions for these formats, and the functions provided.

Table 72. Partner resource manager's subroutine interfaces

Format	Trace	Function
PRCM	AP 0F36 AP 0F37	INQUIRE_PARTNER START_PARTNER_BROWSE GET_NEXT_PARTNER END_PARTNER_BROWSE
PRFS	AP 0F34 AP 0F35	LOCATE_AND_LOCK_PARTNER
PRIN	AP 0F20 AP 0F21	START_INIT COMPLETE_INIT
PRPT	AP 0F30 AP 0F31	ADD_REPLACE_PARTNER DELETE_PARTNER

PRCM format, INQUIRE_PARTNER function

The INQUIRE_PARTNER function of the PRCM format is used to retrieve the installed definition of a specified partner, consisting of the remote transaction program name (TP name), network identifier, netname (network LU name), and profile name.

Input parameters

PARTNER_NAME is the 8-character name of the entry whose contents are to be retrieved.

TP_NAME is a buffer for the output TP name.

Output parameters

NETWORK is the 8-character network identifier.

NETNAME is the 8-character netname.

PROFILE_NAME is the 8-character CICS profile name.

RESPONSE is the subroutine's response to the call. It can have any of these values:

`OK|EXCEPTION|KERNERROR`

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

`PARTNER_NOT_FOUND`

PRCM format, START_PARTNER_BROWSE function

The START_PARTNER_BROWSE function of the PRCM format is used to initiate a browse of the partner resource table. The browse starts at the beginning of the table.

Input parameters: None.

Output parameters

BROWSE_TOKEN is the token identifying the browse session initiated by this call.

RESPONSE is the subroutine's response to the call. It can have any of these values:

`OK|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER. It has this value:

`GETMAIN_FAILED`

PRCM format, GET_NEXT_PARTNER function

The GET_NEXT_PARTNER function of the PRCM format is used to retrieve the information stored in the next partner found in a sequential browse of the partner resource table.

Input parameters

BROWSE_TOKEN is the token identifying this browse session.

TP_NAME is a buffer for the output TP name.

Output parameters

PARTNER_NAME is the 8-character name of the entry retrieved.

NETWORK is the 8-character network identifier.

NETNAME is the 8-character netname.

PROFILE_NAME is the 8-character CICS profile name.

RESPONSE is the subroutine's response to the call. It can have any of these values:

`OK|EXCEPTION|KERNERROR`

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

```
END_OF_LIST
```

PRCM format, END_PARTNER_BROWSE function

The END_PARTNER_BROWSE function of the PRCM format is used to terminate a browse of the partner resource table.

Input parameters

BROWSE_TOKEN is the token identifying this browse session.

Output parameters

RESPONSE is the subroutine's response to the call. It can have either of these values:

```
OK|KERNERROR
```

PRFS format, LOCATE_AND_LOCK_PARTNER function

The LOCATE_AND_LOCK_PARTNER function of the PRFS format is used to retrieve the information stored in a named entry in the partner resource table. A table manager read lock is applied to the entry.

Input parameters

PARTNER_NAME is the 8-character name of the entry whose contents are to be retrieved.

TP_NAME is a buffer for the output TP name.

Output parameters

NETWORK is the 8-character network identifier.

NETNAME is the 8-character netname.

PROFILE_NAME is the 8-character CICS profile name.

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|EXCEPTION|KERNERROR
```

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

```
PARTNER_NOT_FOUND
```

PRIN format, START_INIT function

The START_INIT function of the PRIN format is used to attach a CICS task to perform initialization of the partner resource manager.

Input parameters: None.

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|DISASTER|KERNERROR
```

[REASON] is returned when RESPONSE is DISASTER. It can have either of these values:

RESPONSE	Possible REASON values
DISASTER	GETMAIN-FAILED, ADD_SUSPEND_FAILED

PRIN format, COMPLETE_INIT function

The COMPLETE_INIT function of the PRIN format is used to wait for the initialization task attached by the START_INIT function to complete processing.

Input parameters: None.

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|DISASTER|KERNERROR
```

[REASON] is returned when RESPONSE is DISASTER. It has this value:

```
INIT_TASK_FAILED
```

PRPT format, ADD_REPLACE_PARTNER function

The ADD_REPLACE_PARTNER function of PRPT format is used to add a named entry to the partner resource table. The new entry replaces the existing entry (if any) with the specified name.

Input parameters

PARTNER_NAME is the 8-character name of the entry whose contents are to be added or replaced.

NETWORK is the 8-character network identifier.

NETNAME is the 8-character netname.

PROFILE_NAME is the 8-character CICS profile name.

TP_NAME specifies the address and length of a buffer containing the TP name.

SYSTEM_STATUS specifies the status of the CICS system at the time of the call. It can have any one of these values (ONLINE here means during execution):

```
COLD_START|WARM_START|ONLINE
```

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	CATALOG_WRITE_FAILED, GETMAIN_FAILED
EXCEPTION	PARTNER_IN_USE

PRPT format, DELETE_PARTNER function

The DELETE_PARTNER function of the PRPT format is used to delete a named entry in the partner resource table.

Input parameters

PARTNER_NAME is the 8-character name of the entry to be deleted.

SYSTEM_STATUS is the status of the CICS system at the time of the call. It can have any one of these values (ONLINE here means during execution):

```
COLD_START|WARM_START|ONLINE
```

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|KERNERROR
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	CATALOG_DELETE_FAILED
EXCEPTION	PARTNER_IN_USE, PARTNER_NOT_FOUND

Modules

Module	Function
DFHAPTRR	Interprets partner resource manager trace entries
DFHPRCM	Handles the following requests: INQUIRE_PARTNER START_PARTNER_BROWSE GET_NEXT_PARTNER END_PARTNER_BROWSE
DFHPRDUF	Formats the partner resource manager control blocks in a CICS system dump
DFHPRFS	Handles the following request: LOCATE_AND_LOCK_PARTNER
DFHPRIN1	Handles the following requests: START_INIT COMPLETE_INIT
DFHPRIN2	Runs as a CICS task to perform initialization of the partner resource manager
DFHPRPT	Handles the following requests: ADD_REPLACE_PARTNER DELETE_PARTNER
DFHPRRP	Initializes the partner resource table at CICS startup

Exits

No global user exit points are provided for this component.

Trace

The following point ID is provided for the partner resource manager:

- AP 0F20 through AP 0F3F, for which the trace levels are AP 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 59. Program control

The program control program, DFHPCP, is an interface routine which supports DFHPC LINK, ABEND, SETXIT and RESETXIT calls issued in other CICS modules and invokes the appropriate program manager domain function.

In previous releases DFHPCP provided the functions that are now provided by the Program Manager Domain, and other domains.

Design overview

Services in response to requests

The following services are performed by DFHPCP in response to DFHPC requests from other CICS functions, where those functions have not been converted to use domain interfaces :

Link (LINK)
Builds a parameter list and issues DFHPGLK FUNCTION(LINK) domain call.

Handle Abend (SETXIT)
If SETXIT macro specifies an abend routine address, then DFHPCP builds a parameter list and issues a DFHPGHM FUNCTION(SET_ABEND) OPERATION(HANDLE) call. If SETXIT macro does not specify an abend routine address, then DFHPCP builds a parameter list and issues a DFHPGHM FUNCTION(SET_ABEND) OPERATION(CANCEL) call.

RESETXIT
DFHPCP builds a parameter list and issues a DFHPGHM FUNCTION(SET_ABEND) OPERATION(RESET) call. If SETXIT macro does not specify an abend routine address, then DFHPCP builds a parameter list and issues a DFHPGHM CANCEL call.

Abend (ABEND)
If it is an ABEND request without an existing TACB, then the parameter list is built for this abend. A DFHABAB(CREATE_ABEND_RECORD) is issued to build the TACB. Else a DFHABAB(UPDATE_ABEND_RECORD) is issued with the name of the failing program is issued. A DFHABAB(START_ABEND) call is then made to issue the abend. If the DFHABAB(START_ABEND) call returns control to this module, it is because the exit XPCTA has been invoked and modified the return address. Control is passed to the modified address in the requested execution key.

Modules

DFHEPC

Call mechanism: Branched to from DFHEIP.

Entry address: DFHEPCNA. Stored in the CSA in a field named CSAEPC.

Purpose: DFHEPC is DFHEIP’s program control interface. It supports the following EXEC CICS requests

- LINK
- XCTL
- RETURN
- LOAD
- RELEASE
- ABEND
- HANDLE ABEND

It routes a local request to the PG domain, or to DFHABAB (EXEC CICS ABEND) It routes a remote EXEC CICS LINK request to the intersystem module, DFHISP.

Called by: DFHEPC is called exclusively by DFHEIP.

Inputs: The application parameter list.

Outputs: Updated EIB.

Operation

LINK
If SYSID is remote, ships the link request through the DFHISP module.

If SYSID is local:

- Builds parameter list and calls DFHPGLE FUNCTION(LINK_EXEC)
- Checks the response.
- If response indicates the program is remote, ships the link request through the DFHISP module.
- Sets up EIBRESP (and, if needed, EIBRESP2).
- Returns control to DFHEIP.

XCTL
Builds parameter list and calls DFHPGXE FUNCTION(PREPARE_XCTL_EXEC)

Checks the response

Sets up EIBRESP (and, if needed, EIBRESP2).

If the PGXE request failed, then returns control to DFHEIP

If the PGXE request was successful, then return control to DFHAPLI as for EXEC CICS RETURN. (DFHAPLI will then invoke the program specified on EXEC CICS XCTL).

RETURN

Builds parameter list and calls DFHPGRE FUNCTION(PREPARE_RETURN_EXEC) (this call is bypassed if there are no options (COMMAREA, TRANSID, INPUTMSG) specified on EXEC CICS RETURN

. Checks the response

. Sets up EIBRESP (and, if needed, EIBRESP2).

. If the PGRE request failed, then returns control to DFHEIP

. If the PGRE request was successful (or was bypassed), then return control to DFHAPLI which completes the return to the calling program or to Transaction Manager.

LOAD

Builds parameter list and calls DFHPGLD FUNCTION(LOAD_EXEC)

Checks the response

Sets up EIBRESP (and, if needed, EIBRESP2).

If the PGLD request was successful, then set the return parameters in the application parameter list.

Returns control to DFHEIP.

RELEASE

Builds parameter list and calls DFHPGLD FUNCTION(RELEASE_EXEC)

Checks the response

Sets up EIBRESP (and, if needed, EIBRESP2).

Returns control to DFHEIP.

HANDLE ABEND

For HANDLE ABEND PROGRAM, perform resource security check and check whether program name is known.

Builds parameter list and calls DFHPGHM FUNCTION(SET_ABEND)

- OPERATION(HANDLE) for HANDLE ABEND PROGRAM or LABEL
- OPERATION(CANCEL) for HANDLE ABEND CANCEL
- OPERATION(RESET) for HANDLE ABEND

Checks the response

Sets up EIBRESP (and, if needed, EIBRESP2).

Returns control to DFHEIP.

ABEND

Builds parameter list and calls DFHABAB FUNCTION(CREATE_ABEND_RECORD) and FUNCTION(START_ABEND).

DFHABAB START_ABEND does not normally return, as control is passed to a program or label specified on a HANDLE ABEND, or the program is terminated abnormally.

The XPCTA user exit can request retry. In this case DFHABAB START_ABEND returns to DFHEPC passing back the retry parameters. DFHEPC sets the registers and other values and branches to the specified retry address.

How loaded: At CICS startup, as part of the building of the CICS nucleus. The nucleus is built by DFHSIB1, which uses its nucleus build list to determine the content and characteristics of the CICS nucleus.

Exits

There are two global user exit points in DFHEPC: XPCREQ and XPCREQC.

There are two global user exit points in DFHABAB: XPCABND and XPCTA.

There are two global user exit points in DFHAPLI1: XPCFTCH and XPCHAIR.

There is one global user exit point in DFHERM: XPCHAIR.

There is one global user exit point in DFHUEH: XPCHAIR.

For further information, see the *CICS Customization Guide*.

Trace

The following point IDs are provided for entry to and exit from DFHPCPG:

- AP 2000, for which the trace level is PC 1
- AP 2001, for which the trace level is PC 1.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 60. Program error program

CICS provides a dummy program error program (DFHPEP) that does nothing except give control back to the abnormal condition program (DFHACP), which is invoked during transaction abend processing.

You can provide some additional routines to handle programming errors. For instance, it is possible to disable the transaction code associated with the program in error, thus preventing the recurrence of the error until it can be corrected; send messages to the end-user terminal; initiate a new transaction; or record abend information in transient data.

Design overview

To provide corrective action in response to a programming error, you can code a program error program (DFHPEP). This program can then be assembled and link-edited to replace the dummy DFHPEP.

If provided, this program is invoked by the abnormal condition program (DFHACP) whenever a task terminates due to a task abnormal condition. However, it will **NOT** be called if a task is terminated due to an attach failure (for example the transaction is not defined) or when CICS deliberately terminates a task to alleviate a stall.

The user can perform any kind of corrective action within a program error program.

Guidance information about PEP coding is given in the *CICS Recovery and Restart Guide*. Reference information about PEP coding is given in the *CICS Customization Guide*.

Control blocks

The control block associated with the program error program is: DFHPEP_COMMAREA, the commarea passed to DFHPEP.

See the *CICS Data Areas* manual for a detailed description of this control block.

Modules

DFHPEP

Exits

No global user exit points are provided for this function.

Trace

No trace points are provided for this function.

Chapter 61. Program manager domain (PG)

The program manager domain provides support for the following areas of CICS:

- Program control functions; EXEC CICS LINK, XCTL, LOAD, RELEASE, and RETURN
- Transaction ABEND and condition handling functions; EXEC CICS ABEND, HANDLE ABEND, HANDLE CONDITION and HANDLE AID
- Related functions such as invoking user-replaceable modules, global user exits, and task-related user exits
- Autoinstall for programs, mapsets, and partitionsets.

Program manager domain's specific gates

Table 73 summarizes the program manager domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 73. Program manager domain's specific gates

Gate	Trace	Function	XPI
PGAI	PG 0E01 PG 0E02	Kernel subroutine called internally from program manager	NO NO
PGAQ	PG 0401 PG 0402	INQUIRE_AUTOINSTALL SET_AUTOINSTALL	YES YES
PGDD	PG 0301 PG 0302	DEFINE_PROGRAM DELETE_PROGRAM	NO NO
PGEX	PG 0C01 PG 0C02	INITIALIZE_EXIT TERMINATE_EXIT	NO NO
PGHM	PG 0700 PG 0701	SET_CONDITIONS IGNORE_CONDITIONS INQ_CONDITION SET_AIDS INQ_AID SET_ABEND INQ_ABEND PUSH_HANDLE POP_HANDLE FREE_HANDLE_TABLES CLEAR_LABELS	NO NO
PGIS	PG 0500 PG 0501	INQUIRE_PROGRAM INQUIRE_CURRENT_PROGRAM SET_PROGRAM START_BROWSE_PROGRAM GET_NEXT_PROGRAM END_BROWSE_PROGRAM REFRESH_PROGRAM	YES YES YES YES YES YES NO
PGLD	PG 0601 PG 0602	LOAD_EXEC LOAD RELEASE_EXEC RELEASE	NO NO NO NO
PGLE	PG 1101 PG 1102	LINK_EXEC	NO
PGLK	PG 0B01 PG 0B02	LINK LINK_PLT	NO NO
PGLU	PG 0A01 PG 0A02	LINK_URM	NO NO
PGPG	PG 0901 PG 0902	INITIAL_LINK	NO NO
PGRE	PG 1201 PG 1202	PREPARE_RETURN_EXEC	NO
PGXE	PG 1301 PG 1302	PREPARE_XCTL_EXEC	NO NO
PGXM	PG 0901 PG 0902	INITIALIZE_TRANSACTION TERMINATE_TRANSACTION	NO NO

Note: PGRE is only called for EXEC RETURN statements which have input parameters (COMMAREA, INPUTMSG, or TRANSID) specified. If no input parameters are specified, there is no trace of PGRE after the EIP trace of the RETURN statement.

PGAQ gate, INQUIRE_AUTOINSTALL function

The INQUIRE_AUTOINSTALL function of the PGAQ gate is used to inquire about attributes of the program autoinstall function.

Input parameters: None.

Output parameters

[AUTOINSTALL_STATE] is the state of the program autoinstall function. It can have either of these values:

ACTIVE|INACTIVE

[AUTOINSTALL_CATALOG] identifies if program autoinstall events are cataloged. It can have any of these values:

MODIFY|NONE|ALL

[AUTOINSTALL_EXIT_NAME] is the name of the program autoinstall exit program.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FUNCTION

PGAQ gate, SET_AUTOINSTALL function

The SET_AUTOINSTALL function of the PGAQ gate is used to set attributes of the program autoinstall function.

Input parameters

[AUTOINSTALL_STATE] is the state of the program autoinstall function. It can have either of these values:

ACTIVE|INACTIVE

[AUTOINSTALL_CATALOG] identifies if program autoinstall events are cataloged. It can have any of these values:

MODIFY|NONE|ALL

[AUTOINSTALL_EXIT_NAME] is the name of the program autoinstall exit program.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FUNCTION

PGDD gate, DEFINE_PROGRAM function

The DEFINE_PROGRAM function of the PGDD gate is used to define a program resource.

Input parameters

Note: Specify either the PROGRAM_NAME parameter or the CATALOG_ADDRESS parameter, not both.

PROGRAM_NAME is the name of the program resource to be defined.

CATALOG_ADDRESS is the token identifying the program resource to be defined.

[CEDF_STATUS] indicates whether or not the EDF diagnostic screens are displayed when the program is running under the control of the execution diagnostic facility (EDF). It can have either of these values:

CEDF|NOCEDF

[LANGUAGE_DEFINED] is the language to be defined for the program. It can have any of these values:

ASSEMBLER|C370|COBOL|LE370|PLI|NOT_DEFINED

[AVAIL_STATUS] defines whether (ENABLED) or not (DISABLED) the program can be used. It can have either of these values:

ENABLED|DISABLED

[MODULE_TYPE] is the type of program resource to be defined: It can have any of these values:

PROGRAM|MAPSET|PARTITIONSET

[DATA_LOCATION] defines whether the program can handle only 24-bit addresses (data located below the 16MB line) can handle 31-bit addresses (data located above or below the 16MB line). The DATALOCATION options are independent from the addressing mode of the link-edited program. It can have either of these values:

ANY|BELOW

[EXECUTION_SET] indicates whether you want CICS to link to and run the program as if it were running in a remote CICS region (with or without the API restrictions of a DPL program). It can have either of these values:

FULLAPI|DPLSUBSET

[REMOTE_PROGID] is the name by which the program is known in the remote CICS region. If you specify REMOTE_SYSID and omit REMOTE_PROGID, the REMOTE_PROGID parameter defaults to the same name as the local name (that is, the PROGRAM_NAME value).

[REMOTE_SYSID] is the name of a remote CICS region if you want CICS to ship a distributed program link (DPL) request to another CICS region.

[REMOTE_TRANID] is the name of the transaction you want the remote CICS to attach, and under which it is to run the remote program.

[EXECUTION_KEY] is the key in which CICS gives control to the program, and determines whether the program can modify CICS-key storage. It can have either of these values:

CICS|USER

Note: If the program is link-edited with the RENT attribute and the RMODE(ANY) mode statement, CICS loads the program into extended the read-only DSA(ERDSA), regardless of the EXECKEY option. The ERDSA is allocated from read-only extended storage only if RENTPGM=PROTECT is specified as a system initialization parameter.

[PROGRAM_TYPE] is the type of program. It can have any of these values:

PRIVATE|SHARED|TYPE_ANY

[PROGRAM_USAGE] defines whether the program is to be used as a CICS nucleus program or as a user application program. It can have either of these values:

NUCLEUS|APPLICATION

[PROGRAM_ATTRIBUTE] defines the residence status of the program, and when the storage for this program is released. It can have any of these values:

RESIDENT|REUSABLE|TRANSIENT|RELOAD|TEST

[REQUIRED_AMODE] is the addressing mode of the program. It can have any of these values:

24|31|AMODE_ANY

[REQUIRED_RMODE] is the residence mode of the program. It can have any of these values:

24|RMODE_ANY

Output parameters

NEW_PROGRAM_TOKEN is the token assigned to program.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, CATALOG_NOT_OPERATIONAL, CATALOG_ERROR, INSUFFICIENT_STORAGE, LOCK_ERROR
EXCEPTION	PROGRAM_ALREADY_DEFINED, PROGRAM_IN_USE
INVALID	INVALID_CATALOG_ADDRESS, INVALID_FUNCTION, INVALID_MODE_COMBINATION, INVALID_PROGRAM_NAME, INVALID_TYPE_ATTRIB_COMBIN

PGDD gate, DELETE_PROGRAM function

The DELETE_PROGRAM function of the PGDD gate is used to delete a program resource.

Input parameters

PROGRAM_NAME is the name of the program resource to be defined.

Output parameters

NEW_PROGRAM_TOKEN is the token assigned to program.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOCK_ERROR
EXCEPTION	PROGRAM_NOT_DEFINED, PROGRAM_NAME_STARTS_DFH, PROGRAM_IS_URM, PROGRAM_IN_USE
INVALID	INVALID_FUNCTION

PGEX gate, INITIALIZE_EXIT function

The INITIALIZE_EXIT function of the PGEX gate is used to initialize an exit program.

Input parameters

PROGRAM_NAME is the name, 1 through 8 alphanumeric characters, of the program to be initialized.

LOAD_PROGRAM defines whether or not the program is to be loaded when initialized. It can have either of these values:

`YES|NO`

SYSTEM_AUTOINSTALL defines whether CICS is to autoinstall the program if there is no associated PROGRAM resource definition. It can have either of these values:

`YES|NO`

[LPA_ELIGIBLE] defines whether or not the program can be loaded into the MVS link pack area (LPA). It can have either of these values:

`YES|NO`

Output parameters

PROGRAM_TOKEN is the token assigned to program.

[ENTRY_POINT] is the token defining the entry point of the program.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	AUTOINSTALL_URM_FAILED, AUTOINSTALL_MODEL_NOT_DEF, AUTOINSTALL_INVALID_DATA, AUTOINSTALL_FAILED, PROGRAM_NOT_AUTHORIZED, PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE, REMOTE_PROGRAM
INVALID	INVALID_INITIALIZE_REQUEST, INVALID_FUNCTION

PGEX gate, TERMINATE_EXIT function

The TERMINATE_EXIT function of the PGEX gate is used to terminate an exit program.

Input parameters

PROGRAM_TOKEN is the token identifying the program to be terminated.

RELEASE_PROGRAM defines whether or not the program is to be released when terminated. It can have either of these values:

`YES|NO`

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	PROGRAM_NOT_AUTHORIZED, PROGRAM_NOT_DEFINED, PROGRAM_NOT_IN_USE, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE

RESPONSE	Possible REASON values
INVALID	INVALID_PROGRAM_TOKEN, INVALID_FUNCTION

PGHM gate, SET_CONDITIONS function

The SET_CONDITIONS function of the PGHM gate is used to process for user EXEC CICS HANDLE CONDITION commands, and to save the details of the condition into the current condition handle table.

Input parameters

IDENTIFIERS is the token identifying the conditions to be handled.

LABELS_FLAGS is the token identifying the number of conditions in this command that have associated labels.

[LABELS] is the token identifying the condition labels (the locations within the program to be branched to if the condition occurs).

[LANGUAGE] is the program language. It can have any of these values:

`ASSEMBLER|C370|COBOL|LE370|PLI`

[CURRENT_EXECUTION_KEY] is an 8-bit value indicating the current program execution key (at the time the EXEC CICS HANDLE CONDITION command was issued).

[USERS_RSA_POINTER] is the address of the user program Register Save Area into which the program's registers are saved at each EXEC CICS command execution.

Output parameters

[FASTPATH_FLAGS] identifies the fastpath flag settings for the following conditions handled by the user: RDATT, WRBRK, EOF, NOSPACE, QBUSY, NOSTG, ENQBUSY, NOJBUFSP, SIGNAL, OVERFLOW, SYSBUSY, SESSBUSY.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION, MISSING_PARAMETER

PGHM gate, INQ_CONDITIONS function

The INQ_CONDITIONS function of the PGHM gate is invoked when a condition has occurred, and returns to the caller about details of the condition for user EXEC CICS HANDLE CONDITION commands.

Input parameters

CONDITION is an 8-bit value identifying the condition.

Output parameters

STATUS identifies the status of the condition. It can have any of these values:

`DEFAULT|HANDLED|IGNORED`

[LABEL] is the token identifying the condition label within the program to be branched to if the condition occurs.

[LANGUAGE] is the program language. It can have any of these values:

`ASSEMBLER|C370|COBOL|LE370|PLI`

[CURRENT_EXECUTION_KEY] is an 8-bit value indicating the current program execution key (at the time the EXEC CICS HANDLE CONDITION command was issued).

[USERS_RSA_POINTER] is the address of the user program Register Save Area into which the program's registers are saved at each EXEC CICS command execution.

[PROGRAM_MASK] identifies the program mask at the time the HANDLE CONDITION command was executed.

[GOTOL] is the token identifying the condition label within the program to be branched to if the condition is ignored.

[ABEND_CODE] is the four-character abend code to be issued if CICS drives the system default, which is to abend the transaction.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION, MISSING_PARAMETER

PGHM gate, IGNORE_CONDITIONS function

The IGNORE_CONDITIONS function of the PGHM gate is used to ignore the conditions for user EXEC CICS IGNORE CONDITION commands.

Input parameters

IDENTIFIERS is the token identifying the conditions to be ignored.

Output parameters

[FASTPATH_FLAGS] identifies the fastpath flag settings for the conditions.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION, MISSING_PARAMETER

PGHM gate, SET_AID function

The SET_AID function of the PGHM gate is invoked in response to a user EXEC CICS HANDLE AID command, and saves the details of the handle into the current aid Handle Table.

Input parameters

IDENTIFIERS is the token identifying the aids to be handled.

LABELS_FLAGS is the token identifying the number of aids in this command that have associated labels.

[LABELS] is the token identifying the condition labels (the locations within the program to be branched to if the aid occurs).

[LANGUAGE] is the program language. It can have any of these values:

ASSEMBLER|C370|COBOL|LE370|PLI

[CURRENT_EXECUTION_KEY] is an 8-bit value indicating the current program execution key (at the time the EXEC CICS HANDLE AID command was issued).

[USERS_RSA_POINTER] is the address of the user program Register Save Area into which the program's registers are saved at each EXEC CICS command execution.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION, MISSING_PARAMETER

PGHM gate, INQ_AID function

The INQ_AID function of the PGHM gate is invoked when an aid has occurred, and returns to the caller details of the handle aid for user EXEC CICS HANDLE AID commands.

Input parameters

AID is an 8-bit value identifying the aid.

Output parameters

[LABEL] is the token identifying the condition label within the program to be branched to if the aid occurs.

[LANGUAGE] is the program language. It can have any of these values:

ASSEMBLER|C370|COBOL|LE370|PLI

[CURRENT_EXECUTION_KEY] is an 8-bit value indicating the current program execution key (at the time the EXEC CICS HANDLE AID command was issued).

[USERS_RSA_POINTER] is the address of the user program Register Save Area into which the program's registers are saved at each EXEC CICS command execution.

[PROGRAM_MASK] identifies the program mask at the time the HANDLE CONDITION command was executed.

[GOTOL] is the token identifying the condition label within the program to be branched to if the condition is ignored.

[ABEND_CODE] is the four-character abend code to be issued if CICS drives the system default, which is to abend the transaction.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION, MISSING_PARAMETER

PGHM gate, SET_ABEND function

The SET_ABEND function of the PGHM gate is invoked in response to a user EXEC CICS HANDLE ABEND command, and saves the details of the handle into the current abend Handle Table.

Input parameters

OPERATION identifies what is to be done if the abend occurs. It can have any of these values:

HANDLE|CANCEL|RESET

Note: Specify either the LABEL parameter or the PROGRAM parameter, not both.

[LABEL] is the token identifying the condition label within the program to be branched to if the abend occurs.

[PROGRAM] is the name of the program to which control will be passed if the abend occurs.

[LANGUAGE] is the program language. It can have any of these values:

ASSEMBLER|C370|COBOL|LE370|PLI

[CURRENT_EXECUTION_KEY] is an 8-bit value indicating the current program execution key (at the time the EXEC CICS HANDLE ABEND command was issued).

[USERS_RSA_POINTER] is the address of the user program Register Save Area into which the program’s registers are saved at each EXEC CICS command execution.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION, MISSING_PARAMETER

PGHM gate, INQ_ABEND function

The INQ_ABEND function of the PGHM gate is invoked when an abend has occurred, and returns to the caller details of the handle abend for user EXEC CICS HANDLE AID commands.

Input parameters: None.

Output parameters

STATUS identifies the status of the condition. It can have either of these values:

DEFAULT|HANDLED

[LABEL] is the token identifying the condition label within the program branched to when the abend occurred.

[PROGRAM] is the name of the program to which control was passed when the abend occurred.

[LANGUAGE] is the program language. It can have any of these values:

ASSEMBLER|C370|COBOL|LE370|PLI

[CURRENT_EXECUTION_KEY] is an 8-bit value indicating the current program execution key (at the time the EXEC CICS HANDLE AID command was issued).

[USERS_RSA_POINTER] is the address of the user program Register Save Area into which the program’s registers are saved at each EXEC CICS command execution.

[PROGRAM_MASK] identifies the program mask at the time the HANDLE CONDITION command was executed.

[GOTOL] is the token identifying the condition label within the program to be branched to if the condition is ignored.

[HANDLE_COUNT] is the number of times that this abend code has been handled.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION, MISSING_PARAMETER

PGHM gate, PUSH_HANDLE function

The PUSH_HANDLE function of the PGHM gate is invoked for a user EXEC CICS PUSH command.

Input parameters: None.

Output parameters

[FASTPATH_FLAGS] identifies the fastpath flag settings for the conditions.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION, MISSING_PARAMETER

PGHM gate, POP_HANDLE function

The POP_HANDLE function of the PGHM gate is invoked for a user EXEC CICS POP command.

Input parameters: None.

Output parameters

[FASTPATH_FLAGS] identifies the fastpath flag settings for the conditions.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

RESPONSE	Possible REASON values
EXCEPTION	NO_PREVIOUS_PUSH
INVALID	INVALID_FUNCTION, MISSING_PARAMETER

PGHM gate, FREE_HANDLE_TABLES function

The FREE_HANDLE_TABLES function of the PGHM gate is invoked by CICS during program termination processing and frees all storage relating to the Handle State for that program level.

Input parameters: None.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION, MISSING_PARAMETER

PGHM gate, CLEAR_LABELS function

The CLEAR_LABELS function of the PGHM gate is invoked by CICS during XCTL processing and frees all storage relating to the Handle State for that program (except for the initial default state) and removes all user-defined label handles.

Input parameters: None.

Output parameters

[FASTPATH_FLAGS] identifies the fastpath flag settings for the conditions.

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION, MISSING_PARAMETER

PGIS gate, INQUIRE_PROGRAM function

The INQUIRE_PROGRAM function of the PGIS gate is used to inquire about attributes of a program.

Input parameters

Note: Specify either the PROGRAM_NAME parameter or the PROGRAM_TOKEN parameter, not both.

PROGRAM_NAME is the name of the program.

PROGRAM_TOKEN is the token identifying the program.

Output parameters

[CEDF_STATUS] indicates whether or not the EDF diagnostic screens are displayed when the program is running under the control of the execution diagnostic facility (EDF) It can have any of these values:

`CEDF|NOCEDF|NOT_APPLIC`

[HOLD_STATUS] is the hold status of the program (that is, for how long the program is to be loaded). It can have any of these values:

`TASK_LIFE|CICS_LIFE|NOT_APPLIC`

[LOAD_STATUS] is the load status of the program (that is, whether or not the program can be loaded). It can have any of these values:

`LOADABLE|NOT_LOADABLE|NOT_LOADED|NOT_APPLIC`

[INSTALL_TYPE] is the method used to install the PROGRAM resource definition. It can have any of these values:

`RDO|CATALOG|GROUPLIST|AUTO|SYSAUTO|MANUAL`

[LANGUAGE_DEFINED] is the language defined for the program. It can have any of these values:

`ASSEMBLER|C370|COBOL|LE370|PLI|`
`NOT_DEFINED|NOT_APPLIC`

[LANGUAGE_DEDUCED] is the language deduced by CICS for the program. It can have any of these values:

`ASSEMBLER|C370|COBOL|COBOL2|LE370|PLI|`
`NOT_DEDUCED|NOT_APPLIC`

[AVAIL_STATUS] defines whether (ENABLED) or not (DISABLED) the program can be used. It can have either of these values:

`ENABLED|DISABLED`

[MODULE_TYPE] is the type of program resource to be defined: It can have any of these values:

`PROGRAM|MAPSET|PARTITIONSET`

[DATA_LOCATION] defines whether the program can handle only 24-bit addresses (data located below the 16MB line) can handle 31-bit addresses (data located above or below the 16MB line). The DATALOCATION options are independent from the addressing mode of the link-edited program. It can have either of these values:

`ANY|BELOW|NOT_APPLIC`

[EXECUTION_SET] indicates whether you want CICS to link to and run the program as if it were running in a remote CICS region (with or without the API restrictions of a DPL program). It can have either of these values:

FULLAPI|DPLSUBSET|NOT_APPLIC

[REMOTE_PROGID] is the name by which the program is known in the remote CICS region. If you specify REMOTE_SYSID and omit REMOTE_PROGID, the REMOTE_PROGID parameter defaults to the same name as the local name (that is, the PROGRAM_NAME value.

[REMOTE_SYSID] is the name of a remote CICS region if you want CICS to ship a distributed program link (DPL) request to another CICS region.

[REMOTE_TRANID] is the name of the transaction you want the remote CICS to attach, and under which it is to run the remote program.

[EXECUTION_KEY] is the key in which CICS gives control to the program, and determines whether the program can modify CICS-key storage. It can have either of these values:

CICS|USER|NOT_APPLIC

Note: If the program is link-edited with the RENT attribute and the RMODE(ANY) mode statement, CICS loads the program into extended the read-only DSA(ERDSA), regardless of the EXECKEY option. The ERDSA is allocated from read-only extended storage only if RENTPGM=PROTECT is specified as a system initialization parameter.

[PROGRAM_TYPE] is the type of program. It can have any of these values:

PRIVATE|SHARED|TYPE_ANY|NOT_APPLIC

[PROGRAM_USAGE] defines whether the program is to be used as a CICS nucleus program or as a user application program. It can have either of these values:

NUCLEUS|APPLICATION

[PROGRAM_ATTRIBUTE] defines the residence status of the program, and when the storage for this program is released. It can have any of these values:

RESIDENT|REUSABLE|TRANSIENT|RELOAD|TEST

[SPECIFIED_AMODE] is the addressing mode of the program. It can have any of these values:

24|31|AMODE_ANY|AMODE_NOT_SPECIFIED

[SPECIFIED_RMODE] is the residence mode of the program. It can have any of these values:

24|RMODE_ANY|RMODE_NOT_SPECIFIED

[PROGRAM_LENGTH] is the length of the program. returned by the loader domain on the ACQUIRE_PROGRAM call.

[PROGRAM_USE_COUNT] is the number of times that the program has been used.

[PROGRAM_USER_COUNT] is the number of different users that have invoked the program.

[LOAD_POINT] is the load point address of the program returned by the loader domain on the ACQUIRE_PROGRAM call.

[ENTRY_POINT] is the entry point address of the program returned by the loader domain on the ACQUIRE_PROGRAM call.

[LOCATION] defines where the program resides. It can have any of these values:

CDSA|ECDSA|SDSA|ESDSA|RDSA|ERDSA|LPA|ELPA|NONE

[ACCESS is the type of access for the program. It can have any of these values:

USER|CICS|READ_ONLY|NONE

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOCK_ERROR
EXCEPTION	PROGRAM_NOT_DEFINED_TO_LD, PROGRAM_NOT_DEFINED_TO_PG,
INVALID	INVALID_PROGRAM_TOKEN

PGIS gate, INQUIRE_CURRENT_PROGRAM function

The INQUIRE_CURRENT_PROGRAM function of the PGIS gate is used to inquire about the current attributes of a program (for the current invocation of the program).

Input parameters: None.

Output parameters

[CEDF_STATUS] indicates whether or not the EDF diagnostic screens are displayed when the program is running under the control of the execution diagnostic facility (EDF) It can have any of these values:

CEDF|NOCEDF|NOT_APPLIC

[HOLD_STATUS] is the hold status of the program (that is, for how long the program is to be loaded). It can have any of these values:

TASK_LIFE|CICS_LIFE|NOT_APPLIC

[LOAD_STATUS] is the load status of the program (that is, whether or not the program can be loaded). It can have any of these values:

LOADABLE|NOT_LOADABLE|NOT_LOADED|NOT_APPLIC

[INSTALL_TYPE] is the method used to install the PROGRAM resource definition. It can have any of these values:

RDO|CATALOG|GROUPLIST|AUTO|SYSAUTO|MANUAL

[LANGUAGE_DEFINED] is the language defined for the program. It can have any of these values:

ASSEMBLER|C370|COBOL|LE370|PLI|
NOT_DEFINED|NOT_APPLIC

[LANGUAGE_DEDUCED] is the language deduced by CICS for the program. It can have any of these values:

ASSEMBLER|C370|COBOL|COBOL2|LE370|PLI|
NOT_DEDUCED|NOT_APPLIC

[AVAIL_STATUS] defines whether (ENABLED) or not (DISABLED) the program can be used. It can have either of these values:

ENABLED|DISABLED

[MODULE_TYPE] is the type of program resource to be defined: It can have any of these values:

PROGRAM|MAPSET|PARTITIONSET

[DATA_LOCATION] defines whether the program can handle only 24-bit addresses (data located below the 16MB line) can handle 31-bit addresses (data located above or below the 16MB line). The DATALOCATION options are independent from the addressing mode of the link-edited program. It can have either of these values:

ANY|BELOW|NOT_APPLIC

[EXECUTION_SET] indicates whether you want CICS to link to and run the program as if it were running in a remote CICS region (with or without the API restrictions of a DPL program). It can have any of these values:

FULLAPI|DPLSUBSET|NOT_APPLIC

[REMOTE_DEFINITION] defines whether the program is local or remote. It can have either of these values:

LOCAL|REMOTE

[REMOTE_PROGID] is the name by which the program is known in the remote CICS region. If you specify REMOTE_SYSID and omit REMOTE_PROGID, the REMOTE_PROGID parameter defaults to the same name as the local name (that is, the PROGRAM_NAME value).

[REMOTE_SYSID] is the name of a remote CICS region if you want CICS to ship a distributed program link (DPL) request to another CICS region.

[REMOTE_TRANID] is the name of the transaction you want the remote CICS to attach, and under which it is to run the remote program.

[EXECUTION_KEY] is the key in which CICS gives control to the program, and determines whether the program can modify CICS-key storage. It can have any of these values:

CICS|USER|NOT_APPLIC

Note: If the program is link-edited with the RENT attribute and the RMODE(ANY) mode statement, CICS loads the program into extended the read-only DSA(ERDSA), regardless of the EXECKEY option. The ERDSA is allocated from read-only extended storage only if RENTPGM=PROTECT is specified as a system initialization parameter.

NEW_PROGRAM_TOKEN is the token assigned to program.

[CURRENT_PROGRAM_NAME] is the current name of the program.

[INVOKING_PROGRAM_NAME] is the name of the program invoking this program.

[RETURN_PROGRAM_NAME] is the name of the program to which control will be returned when this program has ended.

[CURRENT_CEDF_STATUS] indicates whether or not the EDF diagnostic screens are displayed when the program is running under the control of the execution diagnostic facility (EDF) It can have either of these values:

CEDF|NOCEDF

[CURRENT_EXECUTION_SET] indicates whether the program is running with or without the API restrictions of a DPL program. It can have any of these values:

FULLAPI|DPLSUBSET

[CURRENT_ENVIRONMENT] indicates the current environment in which the program is running. It can have any of these values:

EXEC|GLUE|PLT|SYSTEM|TRUE|URM

[CURRENT_AMODE] is the addressing mode of the program. It can have either of these values:

24|31

[CURRENT_LOAD_POINT] is the current load point address of the program returned by the loader domain on the ACQUIRE_PROGRAM call.

[CURRENT_ENTRY_POINT] is the current entry point address of the program returned by the loader domain on the ACQUIRE_PROGRAM call.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOCK_ERROR
EXCEPTION	NO_CURRENT_PROGRAM

PGIS gate, SET_PROGRAM function

The SET_PROGRAM function of the PGIS gate is used to set the characteristics of a program when it is loaded.

Input parameters: note.Specify either the PROGRAM_NAME parameter or the PROGRAM_TOKEN parameter, not both.

PROGRAM_NAME is the name of the program.

PROGRAM_TOKEN is the token identifying the program.

[CEDF_STATUS] indicates whether or not the EDF diagnostic screens are displayed when the program is running under the control of the execution diagnostic facility (EDF) It can have either of these values:

`CEDF|NOCEDF`

[AVAIL_STATUS] defines whether (ENABLED) or not (DISABLED) the program can be used. It can have either of these values:

`ENABLED|DISABLED`

[EXECUTION_SET] indicates whether you want CICS to link to and run the program as if it were running in a remote CICS region (with or without the API restrictions of a DPL program). It can have either of these values:

`FULLAPI|DPLSUBSET`

[EXECUTION_KEY] is the key in which CICS gives control to the program, and determines whether the program can modify CICS-key storage. It can have either of these values:

`CICS|USER`

Note: If the program is link-edited with the RENT attribute and the RMODE(ANY) mode statement, CICS loads the program into extended the read-only DSA(ERDSA), regardless of the EXECKEY option. The ERDSA is allocated from read-only extended storage only if RENTPGM=PROTECT is specified as a system initialization parameter.

[PROGRAM_TYPE] is the type of program. It can have any of these values:

`PRIVATE|SHARED|TYPE_ANY`

[PROGRAM_USAGE] defines whether the program is to be used as a CICS nucleus program or as a user application program. It can have either of these values:

`NUCLEUS|APPLICATION`

[PROGRAM_ATTRIBUTE] defines the residence status of the program, and when the storage for this program is released. It can have any of these values:

`RESIDENT|REUSABLE|TRANSIENT|RELOAD|TEST`

[REQUIRED_AMODE] is the addressing mode of the program. It can have any of these values:

`24|31|AMODE_ANY`

[REQUIRED_RMODE] is the residence mode of the program. It can have any of these values:

`24|RMODE_ANY`

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, CATALOG_NOT_OPERATIONAL, CATALOG_ERROR, LOCK_ERROR
EXCEPTION	PROGRAM_NOT_DEFINED_TO_PG, CEDF_STATUS_NOT_FOR_REMOTE, CEDF_STATUS_NOT_FOR_MAPSET, CEDF_STATUS_NOT_FOR_PTNSET, EXEC_SET_NOT_FOR_REMOTE, EXEC_SET_NOT_FOR_MAPSET, EXEC_SET_NOT_FOR_PTNSET, EXEC_KEY_NOT_FOR_REMOTE, EXEC_KEY_NOT_FOR_MAPSET, EXEC_KEY_NOT_FOR_PTNSET, PROG_TYPE_NOT_FOR_REMOTE
INVALID	INVALID_MODE_COMBINATION, INVALID_PROGRAM_NAME, INVALID_PROGRAM_TOKEN, INVALID_TYPE_ATTRIB_COMBIN

PGIS gate, START_BROWSE_PROGRAM function

The START_BROWSE_PROGRAM function of the PGIS gate is used to start browsing through program definitions, optionally starting at the given program definition.

Input parameters

[PROGRAM_NAME] is the optional name of the program definition at which you want to start browsing.

Output parameters

BROWSE_TOKEN is a token identifying the program definition being browsed.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, INVALID_DIRECTORY, LOCK_ERROR

PGIS gate, GET_NEXT_PROGRAM function

The GET_NEXT_PROGRAM function of the PGIS gate is used to get the next program definition to be browse.

Input parameters

BROWSE_TOKEN is a token identifying the program definition to be browsed.

Output parameters

[CEDF_STATUS] indicates whether or not the EDF diagnostic screens are displayed when the program is running under the control of the execution diagnostic facility (EDF) It can have any of these values:

```
CEDF|NOCEDF|NOT_APPLIC
```

[HOLD_STATUS] is the hold status of the program (that is, for how long the program is to be loaded). It can have any of these values:

```
TASK_LIFE|CICS_LIFE|NOT_APPLIC
```

[LOAD_STATUS] is the load status of the program (that is, whether or not the program can be loaded). It can have any of these values:

```
LOADABLE|NOT_LOADABLE|NOT_LOADED|NOT_APPLIC
```

[INSTALL_TYPE] is the method used to install the PROGRAM resource definition. It can have any of these values:

```
RDO|CATALOG|GROUPLIST|AUTO|SYSAUTO|MANUAL
```

[LANGUAGE_DEFINED] is the language defined for the program. It can have any of these values:

```
ASSEMBLER|C370|COBOL|LE370|PLI|
NOT_DEFINED|NOT_APPLIC
```

[LANGUAGE_DEDUCED] is the language deduced by CICS for the program. It can have any of these values:

```
ASSEMBLER|C370|COBOL|COBOL2|LE370|PLI|
NOT_DEDUCED|NOT_APPLIC
```

[AVAIL_STATUS] defines whether (ENABLED) or not (DISABLED) the program can be used. It can have either of these values:

```
ENABLED|DISABLED
```

[MODULE_TYPE] is the type of program resource to be defined: It can have any of these values:

```
PROGRAM|MAPSET|PARTITIONSET
```

[DATA_LOCATION] defines whether the program can handle only 24-bit addresses (data located below the 16MB line) can handle 31-bit addresses (data located above or below the 16MB line). The DATALOCATION options are independent from the addressing mode of the link-edited program. It can have either of these values:

```
ANY|BELOW|NOT_APPLIC
```

[EXECUTION_SET] indicates whether you want CICS to link to and run the program as if it were running in a remote CICS region (with or without the API restrictions of a DPL program). It can have either of these values:

```
FULLAPI|DPLSUBSET|NOT_APPLIC
```

[REMOTE_PROGID] is the name by which the program is known in the remote CICS region. If you specify REMOTE_SYSID and omit REMOTE_PROGID, the REMOTE_PROGID parameter defaults to the same name as the local name (that is, the PROGRAM_NAME value.

[REMOTE_SYSID] is the name of a remote CICS region if you want CICS to ship a distributed program link (DPL) request to another CICS region.

[REMOTE_TRANID] is the name of the transaction you want the remote CICS to attach, and under which it is to run the remote program.

[EXECUTION_KEY] is the key in which CICS gives control to the program, and determines whether the program can modify CICS-key storage. It can have either of these values:

```
CICS|USER|NOT_APPLIC
```

Note: If the program is link-edited with the RENT attribute and the RMODE(ANY) mode statement, CICS loads the program into extended the read-only DSA(ERDSA), regardless of the EXECKEY option. The ERDSA is allocated from read-only extended storage only if RENTPGM=PROTECT is specified as a system initialization parameter.

[PROGRAM_TYPE] is the type of program. It can have any of these values:

```
PRIVATE|SHARED|TYPE_ANY|NOT_APPLIC
```

[PROGRAM_USAGE] defines whether the program is to be used as a CICS nucleus program or as a user application program. It can have either of these values:

```
NUCLEUS|APPLICATION
```

[PROGRAM_ATTRIBUTE] defines the residence status of the program, and when the storage for this program is released. It can have any of these values:

```
RESIDENT|REUSABLE|TRANSIENT|RELOAD|TEST
```

[SPECIFIED_AMODE] is the addressing mode of the program. It can have any of these values:

```
24|31|AMODE_ANY|AMODE_NOT_SPECIFIED
```

[SPECIFIED_RMODE] is the residence mode of the program. It can have any of these values:

```
24|RMODE_ANY|RMODE_NOT_SPECIFIED
```

[PROGRAM_LENGTH] is the length of the program. returned by the loader domain on the ACQUIRE_PROGRAM call.

[PROGRAM_USE_COUNT] is the number of times that the program has been used.

[PROGRAM_USER_COUNT] is the number of different users that have invoked the program.

[LOAD_POINT] is the load point address of the program returned by the loader domain on the ACQUIRE_PROGRAM call.

[ENTRY_POINT] is the entry point address of the program returned by the loader domain on the ACQUIRE_PROGRAM call.

[LOCATION] defines where the program resides. It can have any of these values:

CDSA|ECDSA|SDSA|ESDSA|RDSA|ERDSA|LPA|ELPA|NONE

[ACCESS is the type of access for the program. It can have any of these values:

USER|CICS|READ_ONLY|NONE

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOCK_ERROR
EXCEPTION	INVALID_BROWSE_TOKEN, END_LIST

PGIS gate, END_BROWSE_PROGRAM function

The END_BROWSE_PROGRAM function of the PGIS gate is used to end browsing through program definitions.

Input parameters

BROWSE_TOKEN is a token identifying the last program definition that was browsed.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOCK_ERROR
EXCEPTION	INVALID_BROWSE_TOKEN, END_LIST

PGIS gate, REFRESH_PROGRAM function

The REFRESH_PROGRAM function of the PGIS gate is used to inform the loader domain that a new copy of a named program is now available for use in the relocatable program library.

Input parameters

PROGRAM_NAME is the name of the program being refreshed.

Output parameters

VERSION is the version of the program after the REFRESH_PROGRAM function call. It can have either of these values:

NEW|OLD

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOCK_ERROR
EXCEPTION	PROGRAM_LOADED_CICS_LIFE, PROGRAM_NOT_DEFINED_TO_LD, PROGRAM_NOT_DEFINED_TO_PG, PROGRAM_NOT_FOUND, REMOTE_PROGRAM

PGLD gate, LOAD_EXEC function

The LOAD_EXEC function of the PGLD gate is used to load a program in response to an EXEC CICS LOAD command.

Input parameters

PROGRAM_NAME is the name of the program being refreshed.

HOLD_LIFETIME determines for how long the program is to be loaded; that is, for the life-time of CICS (or until explicitly deleted) or for the lifetime of the task (unless explicitly deleted by the task). It can have either of these values:

CICS_LIFE|TASK_LIFE

Output parameters

LOAD_POINT is the current load point address of the program returned by the loader domain on the ACQUIRE_PROGRAM call.

ENTRY_POINT is the current entry point address of the program returned by the loader domain on the ACQUIRE_PROGRAM call.

[PROGRAM_LENGTH] is the length of the program returned by the loader domain on the ACQUIRE_PROGRAM call.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE, REMOTE_PROGRAM, NOT_AUTHORIZED, AUTOINSTALL_URM_FAILED, AUTOINSTALL_INVALID_DATA, AUTOINSTALL_MODEL_NOT_DEF, AUTOINSTALL_FAILED, NOT_INITIALIZED
INVALID	INVALID_FUNCTION

PGLD gate, LOAD function

The LOAD function of the PGLD gate is used to load a program in response to a CICS internal load request.

Input parameters

PROGRAM_NAME is the name of the program being refreshed.

HOLD_LIFETIME determines for how long the program is to be loaded; that is, for the life-time of CICS (or until explicitly deleted) or for the lifetime of the task (unless explicitly deleted by the task). It can have either of these values:

`CICS_LIFE|TASK_LIFE`

[MODULE_TYPE] is the type of program to be loaded: It can have any of these values:

`PROGRAM|MAPSET|PARTITIONSET`

SYSTEM_AUTOINSTALL defines whether CICS is to autoinstall the program if there is no associated PROGRAM resource definition. It can have either of these values:

`YES|NO`

[LPA_ELIGIBLE] defines whether or not the program can be loaded into the MVS link pack area (LPA). It can have either of these values:

`YES|NO`

Output parameters

LOAD_POINT is the current load point address of the program returned by the loader domain on the ACQUIRE_PROGRAM call.

ENTRY_POINT is the current entry point address of the program returned by the loader domain on the ACQUIRE_PROGRAM call.

[PROGRAM_LENGTH] is the length of the program returned by the loader domain on the ACQUIRE_PROGRAM call.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE, REMOTE_PROGRAM, AUTOINSTALL_URM_FAILED, AUTOINSTALL_INVALID_DATA, AUTOINSTALL_MODEL_NOT_DEF, AUTOINSTALL_FAILED
INVALID	INVALID_FUNCTION

PGLD gate, RELEASE_EXEC function

The RELEASE_EXEC function of the PGLD gate is used to release a program in response to an EXEC CICS RELEASE command.

Input parameters

PROGRAM_NAME is the name of the program being released.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_AUTHORIZED, NOT_INITIALIZED, PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_IN_USE, PROGRAM_NOT_LOADED, PROGRAM_RELOAD_YES, RELEASE_ISSUING_PROGRAM, REMOTE_PROGRAM
INVALID	INVALID_FUNCTION

PGLD gate, RELEASE function

The RELEASE function of the PGLD gate is used by CICS internal modules to release a program in response previously loaded by a PGLD LOAD request.

Input parameters

PROGRAM_NAME is the name of the program being released.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_IN_USE, PROGRAM_NOT_LOADED, PROGRAM_RELOAD_YES, REMOTE_PROGRAM
INVALID	INVALID_FUNCTION

PGLE gate, LINK_EXEC function

The LINK_EXEC function of the PGLE gate is used to link to a program in response to a user EXEC CICS LINK command.

Input parameters

PROGRAM_NAME is the name of the program to be linked.

[COMMAREA] is the optional communications area to be made available to the linked program.

[HANDLE_ABEND_PGM] defines whether or not the program is to run as an abend handler program. It can have either of these values:

YES|NO

[INPUTMSG] is a data area to be supplied to the linked program on its first execution of an EXEC CICS RECEIVE command.

[SYNCONRETURN] defines whether or not a syncpoint is to be taken on return from the linked program. It can have either of these values:

YES|NO

Output parameters

[REMOTE_PROGRAM_NAME] is the name by which the program is known in the remote CICS region. If you specify REMOTE_SYSID and omit REMOTE_PROGID, the REMOTE_PROGID parameter defaults to the same name as the local name (that is, the PROGRAM_NAME value).

[REMOTE_SYSID] is the name of a remote CICS region if you want CICS to ship a distributed program link (DPL) request to another CICS region.

[REMOTE_TRANID] is the name of the transaction you want the remote CICS to attach, and under which it is to run the remote program.

[ABEND_CODE] is the four-character abend code to be issued if there is an exception response with reason TRANSACTION_ABEND.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	AUTOINSTALL_FAILED, AUTOINSTALL_INVALID_DATA, AUTOINSTALL_MODEL_NOT_DEF, AUTOINSTALL_URM_FAILED, DESTRUCTIVE_OVERLAP, INVALID_COMMAREA_ADDR, INVALID_COMMAREA_LEN, INVALID_INPUTMSG_LEN, INVALID_TERMINAL_TYPE, NOT_INITIALIZED, PROGRAM_NOT_AUTHORIZED, PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE, REMOTE_PROGRAM, TRANSACTION_ABEND

PGLK gate, LINK function

The LINK function of the PGLK gate is used by CICS internal modules to link to a program.

Input parameters

PROGRAM_NAME is the name of the program being linked.

SYSTEM_AUTOINSTALL defines whether CICS is to autoinstall the program if there is no associated PROGRAM resource definition. It can have either of these values:

YES|NO

[LPA_ELIGIBLE] defines whether or not the program can be loaded into the MVS link pack area (LPA). It can have either of these values:

YES|NO

[PARMLIST_PTR] is the address of a parameter list passed by the CICS program initiating the PGLK link to the new program.

Output parameters

[ABEND_CODE] is the four-character abend code to be issued if there is an exception response with reason TRANSACTION_ABEND.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE, REMOTE_PROGRAM, AUTOINSTALL_URM_FAILED, AUTOINSTALL_MODEL_NOT_DEF, AUTOINSTALL_INVALID_DATA, AUTOINSTALL_FAILED, TRANSACTION_ABEND
INVALID	INVALID_FUNCTION

PGLK gate, LINK_PLT function

The LINK_PLT function of the PGLK gate is used by CICS internal modules to link to a program in the program list table.

Input parameters

PROGRAM_NAME is the name of the program being linked.

SYSTEM_AUTOINSTALL defines whether CICS is to autoinstall the program if there is no associated PROGRAM resource definition. It can have either of these values:

YES|NO

[LPA_ELIGIBLE] defines whether or not the program can be loaded into the MVS link pack area (LPA). It can have either of these values:

YES|NO

Output parameters

[ABEND_CODE] is the four-character abend code to be issued if there is an exception response with reason TRANSACTION_ABEND.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE, REMOTE_PROGRAM, AUTOINSTALL_URM_FAILED, AUTOINSTALL_MODEL_NOT_DEF, AUTOINSTALL_INVALID_DATA, AUTOINSTALL_FAILED, TRANSACTION_ABEND
INVALID	INVALID_FUNCTION

PGLU gate, LINK_URM function

The LINK_URM function of the PGLU gate is used by CICS internal modules to link to a user-replaceable module (program).

Input parameters

PROGRAM_NAME is the name of the program to be linked.

SYSTEM_AUTOINSTALL defines whether CICS is to autoinstall the program if there is no associated PROGRAM resource definition. It can have either of these values:

YES|NO

[LPA_ELIGIBLE] defines whether or not the program can be loaded into the MVS link pack area (LPA). It can have either of these values:

YES|NO

[COMMAREA] is the optional communications area to be made available to the linked program.

Output parameters

[ABEND_CODE] is the four-character abend code to be issued if there is an exception response with reason URM_ABEND.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION or INVALID Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE, REMOTE_PROGRAM, AUTOINSTALL_URM_FAILED, AUTOINSTALL_MODEL_NOT_DEF, AUTOINSTALL_INVALID_DATA AUTOINSTALL_FAILED, INVALID_COMMAREA_LEN, INVALID_COMMAREA_ADDR, AMODE_ERROR, URM_ABEND, DESTRUCTIVE_OVERLAP
INVALID	INVALID_FUNCTION

PGPG gate, INITIAL_LINK function

The INITIAL_LINK function of the PGPG gate is used to link to the first program of a transaction.

Input parameters

PROGRAM_NAME is the name of the program being linked.

Output parameters

[ABEND_CODE] is the four-character abend code to be issued if there is an exception response with reason TRANSACTION_ABEND.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	AUTOINSTALL_FAILED, AUTOINSTALL_INVALID_DATA, AUTOINSTALL_MODEL_NOT_DEF, AUTOINSTALL_URM_FAILED, DESTRUCTIVE_OVERLAP, INVALID_TERMINAL_TYPE, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE, PROGRAM_NOT_DEFINED, REMOTE_PROGRAM, TRANSACTION_ABEND

PGRE gate, PREPARE_RETURN function

The PREPARE_RETURN function of the PGRE gate is used to process the communications area, inputmsg data, and transaction identifier from a user EXEC CICS RETURN command.

Input parameters

[TRANSID] is the four-character transaction identifier.

[COMMAREA] is the optional communications area made available to the linked program.

[INPUTMSG] is a data area to be supplied to the linked program on its first execution of an EXEC CICS RECEIVE command.

[IMMEDIATE] Indicates whether or not the transaction specified in TRANSID is to be attached as the next transaction regardless of any other transactions enqueued by ATI for this terminal. It can have either of these values:

YES|NO

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_COMMAREA_ADDR, INVALID_COMMAREA_LEN, INVALID_INPUTMSG_LEN, INVALID_TERMINAL_TYPE, INVALID_REQUEST_FROM_EXIT, INVALID_RETURN_REQUEST, NOT_INITIALIZED NO_TERMINAL TRANSID_NO_TERMINAL

PGXE gate, PREPARE_XCTL_EXEC function

The PREPARE_XCTL_EXEC function of the PGXE gate is used to process the communications area, inputmsg data, and transaction identifier from a user EXEC CICS XCTL command.

Input parameters

PROGRAM_NAME is the name of the program to which control is to be passed.

[COMMAREA] is the optional communications area made available to the linked program.

[INPUTMSG] is a data area to be supplied to the linked program on its first execution of an EXEC CICS RECEIVE command.

Output parameters

[ABEND_CODE] is the four-character abend code to be issued if CICS drives the system default, which is to abend the transaction.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	AUTOINSTALL_FAILED, AUTOINSTALL_INVALID_DATA, AUTOINSTALL_MODEL_NOT_DEF, AUTOINSTALL_URM_FAILED, DESTRUCTIVE_OVERLAP, INVALID_COMMAREA_ADDR, INVALID_COMMAREA_LEN, INVALID_INPUTMSG_LEN, INVALID_TERMINAL_TYPE, INVALID_REQUEST_FROM_EXIT, NOT_INITIALIZED, PROGRAM_NOT_AUTHORIZED, PROGRAM_NOT_DEFINED, PROGRAM_NOT_ENABLED, PROGRAM_NOT_LOADABLE, REMOTE_PROGRAM, TRANSACTION_ABEND

PGXM gate, INITIALIZE_TRANSACTION function

The INITIALIZE_TRANSACTION function of the PGXM gate is used to initialize a transaction, and set up storage for the transaction.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FUNCTION

PGXM gate, TERMINATE_TRANSACTION function

The TERMINATE_TRANSACTION function of the PGXM gate is used to terminate a transaction, and clean up the transaction-related storage at task termination.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FUNCTION

Program manager domain's generic gates

Table 74 summarizes the program manager domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 74. Program manager domain's generic gates

Gate	Trace	Function	Format
PGDM	PG 0101 PG 0102	INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
PGST	PG 0F01 PG 0F02	COLLECT_STATISTICS COLLECT_RESOURCE_STATS	STST
PGUE	PG 1001 PG 1002	SET_EXIT_STATUS	APUE

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format APUE—"Application domain's generic formats" on page 42

Format DMDM—"Domain manager domain's generic formats" on page 195

Format STST—"Statistics domain's generic format" on page 521

Initialize domain

There are two phases to initialization of the program manager domain:

1. The DFHPGDM module creates the PG domain anchor block, the PPT directory, and the PG Lock. It also adds subpools and gates, determines whether a cold, warm, or emergency start is needed, and waits for the global catalog to be available.
2. For a warm or emergency start, the DFHPGDM module rebuilds the PPT and restores the program autoinstall system initialization parameters from the global catalog entries. (It calls the parameter manager to obtain other system initialization parameter values.)

   For a cold start, the DFHPGDM module purges all the PPT entries from the global catalog.

Quiesce domain

In quiesce processing, the program manager domain:

- Sets the PG state to quiescing.
- Ensures that the statistics domain has gathered the PG statistics by issuing a WAIT_PHASE for STATISTICS_UNAVAILABLE.

  This also ensures synchronization with the AP domain quiesce activity.
- Does ***not*** delete PG gates; PG functions remain available. However, use of programs after this point does not appear in statistics. (DFHSTP issues a PC LINK/ PGLK LINK to DFHWKP after AP domain waits for STATISTICS_UNAVAILABLE).
- Does ***not*** write PPT entries to the global catalog. (PPT entries are only written to the catalog when they are installed or changed.)
- (Finally) Sets the PG state to quiesced.

Terminate domain

In terminate processing, the program manager domain sets the PG state to terminated, and makes the program manager domain unavailable to EXEC CICS commands.

Modules

Module	Function
DFHPGAI	A kernel subroutine called internally from the Program Manager to support the autoinstall for programs function.
DFHPGAQ	Handles the following requests: INQUIRE_AUTOINSTALL SET_AUTOINSTALL
DFHPGDD	Handles the following requests: DEFINE_PROGRAM DELETE_PROGRAM
DFHPGDM	Handles the following requests: INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHPGDUF	PG domain offline dump formatting routine
DFHPGEX	Handles the following requests: INITIALIZE_EXIT TERMINATE_EXIT

Module	Function
DFHPGHM	Handles the following requests: SET_CONDITIONS IGNORE_CONDITIONS INQ_CONDITION SET_AIDS INQ_AID SET_ABEND INQ_ABEND PUSH_HANDLE POP_HANDLE FREE_HANDLE_TABLES CLEAR_LABELS
DFHPGIS	Handles the following requests: INQUIRE_PROGRAM INQUIRE_CURRENT_PROGRAM SET_PROGRAM START_BROWSE_PROGRAM GET_NEXT_PROGRAM END_BROWSE_PROGRAM REFRESH_PROGRAM
DFHPGLD	Handles the following requests: LOAD_EXEC LOAD RELEASE_EXEC RELEASE
DFHPGLE	Handles the following requests: LINK_EXEC
DFHPGLK	Handles the following requests: LINK, LINK_PLT
DFHPGLU	Handles the following requests: LINK_URM
DFHPGPG	Handles the following requests: INITIAL_LINK
DFHPGRE	Handles the following requests: PREPARE_RETURN_EXEC
DFHPGRP	Program manager domain recovery program, responsible for recovering program definitions from the global catalog.
DFHPGST	Handles the following requests: COLLECT_STATISTICS COLLECT_RESOURCE_STATS
DFHPGUE	Handles program manager domain service requests.
DFHPGTRI	Interprets PG domain trace entries
DFHPGXE	Handles the following requests: PREPARE_XCTL_EXEC
DFHPGXM	Handles the following requests: INITIALIZE_TRANSACTION TERMINATE_TRANSACTION

Exits

No global user exit points are provided in this domain.

Trace

The point IDs for the program manager domain are of the form PG xxxx; the corresponding trace levels are PG 1, PG 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 62. Program preparation utilities

The program preparation utilities consist of the command-language translators, which are utility programs that run offline to translate CICS application programs using command-level CICS requests. They convert the EXEC commands into call statements in the language in which the EXEC commands are embedded. Versions of the translator program are available for:

- COBOL (DFHECP1$)
- PL/I (DFHEPP1$)
- C/370 (DFHEDP1$)
- Assembler language (DFHEAP1$).

Design overview

The command-language translators manage storage by creating a stack from a single area allocated at the start of the program.

Because the input is free-format, the translators move it into a buffer area that can hold data spanning two or more source records. The analysis of the source is mainly table driven.

The translators build the replacement source code for each EXEC command in a form appropriate to the language:

- For COBOL, the replacement code contains a series of MOVE statements, followed by a CALL statement.
- For PL/I, the replacement code contains a declaration of an entry variable followed by a CALL statement. These statements are contained within a DO group.
- For C/370, the replacement code contains a function call (dfhexec) and may also contain assignment statements.
- For assembler language, the replacement code is an invocation of the DFHECALL macro.

Errors in the source can be detected. Spelling corrections are made to the source, and any unrecognizable or duplicate keywords and options are ignored. For COBOL, PL/I, and C/370, the translator produces error diagnostics that are collected together on the output listing. The assembler language translator, however, produces error diagnostics in the translated output following the EXEC command in which the error occurred.

Modules

DFHECP1$, DFHEPP1$, DFHEDP1$, DFHEAP1$

Exits

Global user exit points are not applicable to offline utilities.

Trace

Trace points are not applicable to offline utilities.

Chapter 63. Recovery Manager Domain (RM)

Recovery Manager (RM) is a domain which is responsible for ensuring that the resource updates for a unit of work are all committed or all backed out, including updates across multiple systems.

Resource Owners, such as File Control, are responsible for processing update requests from applications and for backing out updates. Recovery Manager provides interfaces which Resource Owners use to participate in a unit of work. So Recovery Manager coordinates the Resource Owners ensuring that they all either commit or back out the updates for a particular unit of work. Each Resource Owner protects Recovery Manager from the details of how its resources are managed.

Updates on multiple systems are also coordinated by Recovery Manager. However, since systems are connected in a variety of ways, Recovery Manager uses Recovery Manager Connectors (RMCs) to communicate with remote systems. RMCs, such as the LU 6.2 RMC, are responsible for adapting the Recovery Manager protocols to the inter-system protocols. RMCs protect Recovery Manager from the details of the various inter-system protocols.

Additionally, Recovery Manager supports failures such as a system crash, a remote connection failure, or a local resource failure (e.g. an I/O error). It also supports the forward recovery of local resources allowing them to be reconstructed to a consistent state.

Recovery Manager Domain's specific gates

Table 75 summarizes the Recovery Manager domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and whether or not the functions are available through the exit programming interface (XPI).

Table 75. Recovery Manager domain's specific gate

Gate	Trace	Function	XPI
RMUW	RM 0201	CREATE_UOW	NO
	RM 0202	INQUIRE_UOW_ID	NO
		INQUIRE_UOW_TOKEN	NO
		INQUIRE_UOW	NO
		SET_UOW	NO
		COMMIT_UOW	NO
		FORCE_UOW	NO
		START_UOW_BROWSE	NO
		GET_NEXT_UOW	NO
		END_UOW_BROWSE	NO
		BACKOUT_UOW	NO
		BIND_UOW_TO_TXN	NO
		REATTACH_REPLY	NO
RMLN	RM 0301	ADD_LINK	NO
	RM 0302	DELETE_LINK	NO
		INQUIRE_LINK	NO
		SET_LINK	NO
		ISSUE_PREPARE	NO
		INBOUND_FLOW	NO
		INITIATE_RECOVERY	NO
		SET_RECOVERY_STATUS	NO
		REPORT_RECOVERY_STATUS	NO
		TERMINATE_RECOVERY	NO
		SET_MARK	NO
		START_LINK_BROWSE	NO
		GET_NEXT_LINK	NO
		END_LINK_BROWSE	NO
RMNM	RM 0161	INQUIRE_LOGNAME	NO
	RM 0162	SET_LOGNAME	NO
		CLEAR_PENDING	NO
RMCD	RM 0121	REGISTER	NO
	RM 0122	SET_GATE	NO
		INQUIRE_CLIENT_DATA	NO
		SET_CLIENT_DATA	NO
RMDM	RM 0101	INQUIRE_STARTUP	NO
	RM 0102	SET_STARTUP	NO
		SET_LOCAL_LU_NAME	NO
		SET_PARAMETERS	NO
RMKD	RM 0231	KEYPOINT_DATA	NO
	RM 0232		
RMRE	RM 0231	APPEND	NO
	RM 0232	FORCE	NO
		REMOVE	NO
		AVAIL	NO
		REQUEST_FORGET	NO
RMSL	RM 06E1	TAKE_ACTIVITY_KEYPOINT	NO
	RM 06E2		
RMWT	RM 0201	INQUIRE_WORK_TOKEN	NO
	RM 0202	SET_WORK_TOKEN	NO
		START_WORK_TOKEN_BROWSE	NO
		GET_NEXT_WORK_TOKEN	NO
		END_WORK_TOKEN_BROWSE	NO

RMUW gate, CREATE_UOW function

Create a unit of work object under the currently executing transaction.

Input parameters

UOW_ID An optional parameter specifying the network UOWID to be given to the unit of work object. This parameter will be present if the unit of work being created is part of a distributed unit of work that originated on another system.

HEURISM An optional parameter specifying whether the unit of work should take a unilateral decision if a failure occurs in the in doubt window? It can have any one of these values:

YES|NO

CHOICE An optional parameter specifying whether the unit of work should commit or backout if requested to take a unilateral decision. It can have any one of these values:

FORWARD|BACKWARD

INDOUBT_TIMEOUT_INTERVAL An optional parameter specifying the period of time that the unit of work should be prepared to wait in doubt.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

RMUW gate, INQUIRE_UOW_ID function

Return the network and local UOWIDs of the unit of work of the currently executing transaction.

Input parameters

UOW_ID An optional parameter specifying a buffer in which the network UOWID will be returned.

Output parameters

LOCAL_UOW_ID An optional parameter to receive the local UOWID.

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

RMUW gate, INQUIRE_UOW_TOKEN function

Return the token identifying the unit of work object with the specified local UOWID.

Input parameters

LOCAL_UOW_ID The local UOWID of the required unit of work.

Output parameters

UOW_TOKEN A token identifying the unit of work object.

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND

RMUW INQUIRE_UOW function

This function is used to query information about a particular unit of work.

Input parameters

UOW_TOKEN An optional parameter specifying a token used to identify the unit of work object being queried.

TRANSACTION_TOKEN An optional parameter specifying a token of a transaction whose unit of work object is to be queried.

UOW_ID An optional parameter specifying a buffer in which the network UOWID will be returned.

LOGNAME An optional parameter specifying a buffer in which the log name of the coordinating system will be returned.

LOCAL_ACCESS_ID An optional parameter specifying a buffer in which the local access id of resource causing the unit of work to shunt will be returned.

REMOTE_ACCESS_ID An optional parameter specifying a buffer in which the netname of coordinating system will be returned.

LINK_ID An optional parameter specifying a buffer in which the termid of the link to the coordinating system will be returned.

Output parameters

OUT_UOW_TOKEN The token used to identify the unit of work object.

LOCAL_UOW_ID The local unit of work id.

TRANID The tranid of the task that created the unit of work object.

TERMID The termid associated with the task that created the unit of work object.

TERMINAL_LUNAME The terminal LU name associated with the task that created the unit of work object.

USERID The userid associated with the task that created the unit of work object.

CHOICE The choice of whether the unit of work should commit or backout if requested to take a unilateral decision. It can have any one of these values:

```
FORWARD|BACKWARD
```

UOW_STATUS The status of the unit of work. It can have any one of these values:

```
FORWARD|BACKWARD|IN_DOUBT|IN_FLIGHT|
HEURISTIC_FORWARD|HEURISTIC_BACKWARD
```

SHUNTED The unit of work may or may not be shunted. It can have any one of these values:

```
YES|NO
```

DURATION An 8 byte Store Clock representation of the time the unit of work changed state.

CREATION_TIME An 8 byte Store Clock representation of the time the unit of work was created.

CLIENT_NAME The name of the Recovery Manager client that owns the resource that has caused the unit of work to shunt.

ACCESS_ID_TYPE The type of resource that has caused the unit of work to shunt. It can have any one of these values:

`LOCAL|REMOTE`

TRANNUM The task number of the task that created the unit of work.

OP_ID The Operator Id associated with the task that created the unit of work.

FIRST_UOW_FOR_TXN It can have any one of these values:

`YES|NO`

HEURISM Whether the unit of work should take a unilateral decision if a failure occurs in the in doubt window? It can have any one of these values:

`YES|NO`

AWAITING_FORGET The unit of work might have completed syncpoint processing, and be merely waiting for confirmation that subordinates have completed theirs. It can have any one of these values:

`YES|NO`

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND

RMUW gate, SET_UOW function

This function is used to set characteristics of the currently executing unit of work.

Input parameters

HEURISM Determines whether the unit of work will take a unilateral decision if a failure occurs in the in doubt window, or waits for communication with the coordinating system to be reestablished. It can have any one of these values:

`YES|NO`

HEURISTIC_CAUSE An indication of the reason a unilateral decision must be taken. It can have any one of these values:

`TD_CLIENT|LU61_CLIENT|MRO_CLIENT|`
`RMI_CLIENT|OTHER_CLIENT`

Output parameters

USERID When requested this parameter causes the userid associated with unit of work to be reset to that of the currently executing transaction.

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND

RMUW gate, COMMIT_UOW function

This function attempts to commit the changes made in a unit of work.

Input parameters

CONTINUE Is the task continuing into a following, new unit of work. This parameter can have any one of these values:

`YES|NO`

Output parameters

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ROLLBACK, LOCAL_NO_VOTE, REMOTE_NO_VOTE, REMOTE_NO_DECISION, HEURISTIC_READONLY_COMMIT, HEURISTIC_READONLY_BACKOUT, HEURISTIC_BACKOUT, LINKS_INVALID, HEURISTIC_COMMIT, INDOUBT_FAILURE, COMMIT_FAILURE, REMOTE_COMMIT_ABENDED

RMUW gate, FORCE_UOW function

This function forces an in doubt unit of work to unilaterally commit or backout its changes rather than continue waiting for resynchronization with the coordinating system.

Input parameters

UOW_TOKEN The token identifying the unit of work object.

DIRECTION Parameter specifying whether to commit (FORWARD), backout (BACKWARD) or obey the ACTION attribute in the definition of the originating transaction. It can have any one of these values:

FORWARD|BACKWARD|HEURISTIC

HEURISTIC_CAUSE The reason for the force. It can have any one of these values:

OPERATOR|TIMEOUT|OTHER_CAUSE

Output parameters

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND, RESYNCH_IN_PROGRESS, UOW_NOT_INDOUBT

RMUW gate, START_UOW_BROWSE function

This function is used to start a browse of unit of work objects in the system.

Input parameters

SHUNTED The browse can be of only shunted units of work, only non-shunted units of work or all units of work. This parameter can have any one of these values:

YES|NO|BOTH

Output parameters

BROWSE_TOKEN A token to be used on subsequent GET_NEXT_UOW calls.

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND

RMUW gate, GET_NEXT_UOW function

This function returns information about the next unit of work object in the browse.

Input parameters

BROWSE_TOKEN A token obtained from a previous START_UOW_BROWSE call.

UOW_ID An optional parameter specifying a buffer in which the network UOWID will be returned.

LOGNAME An optional parameter specifying a buffer in which the log name of the coordinating system will be returned.

LOCAL_ACCESS_ID An optional parameter specifying a buffer in which the local access id of resource causing the unit of work to shunt will be returned.

REMOTE_ACCESS_ID An optional parameter specifying a buffer in which the netname of coordinating system will be returned.

LINK_ID An optional parameter specifying a buffer in which the termid of the link to the coordinating system will be returned.

Output parameters

OUT_UOW_TOKEN The token used to identify the unit of work object.

LOCAL_UOW_ID The local unit of work id.

TRANID The tranid of the task that created the unit of work object.

TERMID The termid associated with the task that created the unit of work object.

TERMINAL_LUNAME The terminal LU name associated with the task that created the unit of work object.

USERID The userid associated with the task that created the unit of work object.

CHOICE The choice of whether the unit of work should commit or backout if requested to take a unilateral decision. It can have any one of these values:

FORWARD|BACKWARD

UOW_STATUS The status of the unit of work. It can have any one of these values:

FORWARD|BACKWARD|IN_DOUBT|IN_FLIGHT|
HEURISTIC_FORWARD|HEURISTIC_BACKWARD

SHUNTED The unit of work may or may not be shunted. It can have any one of these values:

YES|NO

DURATION An 8 byte Store Clock representation of the time the unit of work changed state.

CREATION_TIME An 8 byte Store Clock representation of the time the unit of work was created.

CLIENT_NAME The name of the Recovery Manager client that owns the resource that has caused the unit of work to shunt.

ACCESS_ID_TYPE The type of resource that has caused the unit of work to shunt. It can have any one of these values:

LOCAL|REMOTE

TRANNUM The task number of the task that created the unit of work.

OP_ID The Operator Id associated with the task that created the unit of work.

FIRST_UOW_FOR_TXN It can have any one of these values:

`YES|NO`

HEURISM Whether the unit of work should take a unilateral decision if a failure occurs in the in doubt window? It can have any one of these values:

`YES|NO`

AWAITING_FORGET The unit of work might have completed syncpoint processing, and be merely waiting for confirmation that subordinates have completed theirs. It can have any one of these values:

`YES|NO`

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_BROWSE_TOKEN, BROWSE_END

RMUW gate, END_UOW_BROWSE function

This function is used at the end of a browse of the unit of work objects in the system.

Input parameters

BROWSE_TOKEN A token obtained from a previous START_UOW_BROWSE call.

Output parameters

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_BROWSE_TOKEN

RMUW gate, BACKOUT_UOW function

This function causes the changes in a unit of work to be backed out.

Input parameters

CONTINUE This parameter indicates whether the task is continuing into a following, new unit of work. This parameter can have any one of these values:

`YES|NO`

RESTART This parameter is only applicable when CONTINUE(NO) is specified and indicates whether or not transaction restart will be performed.

Output parameters

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BACKOUT_FAILURE, COMMIT_FAILURE, ROLLBACK_NOT_SUPPORTED, REMOTE_COMMIT_ABENDED

RMUW gate, BIND_UOW_TO_TXN function

Make the specified unit of work the current unit of work for the current transaction.

Input parameters

UOW_TOKEN The token identifying the unit of work object.

Output parameters

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

RMUW gate, REATTACH_REPLY function

This function gives control to Recovery Manager to do its unshunt processing under a re-attached transaction.

Input parameters

UOW_TOKEN The token identifying the unit of work object.

Output parameters

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

RMLN gate, ADD_LINK function

This function adds a link to a remote system to a unit of work. The unit of work is distributed across more than one system and Recovery Manager will manage the syncpoint processing between systems.

Input parameters

CLIENT_NAME Name of the communications protocol used on the link. It can have any one of these values:

IRC |IRCO|LU61|LU62|RMI |IND

LOGNAME_BUFFER An optional parameter specifying a buffer containing the logname of the remote system.

REMOTE_ACCESS_ID_BUFFER A buffer containing the netname of the remote system, or the name of the External Resource Manager.

LINK_ID_BUFFER A buffer containing the termid of the session to the remote system, or the External Resource Manager qualifier.

LINK_ID_SOURCE An optional parameter specifying whether the local or remote system allocated the session. It can have any one of these values:

LOCAL|REMOTE

RMC_TOKEN A token to be passed to the client on all callback functions.

LAST A parameter specifying whether the remote system supports the last agent optimization. It can have any one of these values:

YES|NO|MAYBE|DESIRABLE

PRESUMPTION A parameter specifying whether the remote system assumes the presume abort or presume nothing protocols. It can have any one of these values:

ABORT|NOTHING

PRELOGGING A parameter specifying whether the client requires to be called with the PERFORM_PRELOGGING callback function. It can have any one of these values:

YES|NO

SINGLE_UPDATER A parameter specifying whether the remote system supports the single updater optimization. It can have any one of these values:

YES|NO

COORDINATOR A parameter specifying whether the remote system is the coordinator of the distributed unit of work. It can have any one of these values:

YES|NO

INITIATOR A parameter specifying whether the remote system is the initiator of the syncpoint. It can have any one of these values:

YES|NO

RECOVERY_STATUS A parameter specifying whether recoverable work has taken place as part of the distributed unit of work on the remote system. It can have any one of these values:

NECESSARY|UNNECESSARY|SYNC_LEVEL_1

Output parameters

LINK_TOKEN A token identifying the new Recovery Manager Link object.

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	CLIENT_UNKNOWN, COORDINATOR_ALREADY

RMLN gate, DELETE_LINK function

This function removes a link to a remote system from a unit of work. The remote system will not now be included in syncpoint processing for the current unit of work.

Input parameters

LINK_TOKEN A token identifying the Recovery Manager Link object.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LINK_UNKNOWN

RMLN gate, INQUIRE_LINK function

This function returns information about a given Recovery Manager Link object.

Input parameters

LINK_TOKEN A token identifying a Recovery Manager Link object.

RESOLVE_TO_CURRENT_LINK Up to two Recovery Manager Link objects may be associated with a token. This optional parameter specifies whether to return information about the most recent or not. It can have any one of these values:

YES|NO

REMOTE_ACCESS_ID_BUFFER A buffer in which the netname of the remote system, or External Resource Manager name will be returned.

LOGNAME_BUFFER A buffer in which the logname of the remote system will be returned.

LINK_ID_BUFFER A buffer in which the termid of the session to the remote system, or External Resource Manager qualifier will be returned.

Output parameters

CLIENT_NAME The name of the protocol that owns the Recovery Manager Link object. It can have any one of these values:

IRC |IRCO|LU61|LU62|RMI |IND

COORDINATOR Whether the remote system is the coordinator of the distributed unit of work. It can have any one of these values:

YES|NO

INITIATOR Whether the remote system is the initiator of the syncpoint of the distributed unit of work. It can have any one of these values:

YES|NO

LAST Whether the remote system supports the last agent optimization. It can have any one of these values:

YES|NO|MAYBE

SINGLE_UPDATER Whether the remote system supports the single updater optimization. It can have any one of these values:

YES|NO

PRESUMPTION Whether the remote system assumes the presume abort or presume nothing protocols. It can have any one of these values:

ABORT|NOTHING

RECOVERY_STATUS Whether recoverable work has taken place as part of the distributed unit of work on the remote system. It can have any one of these values:

NECESSARY|UNNECESSARY|SYNC_LEVEL_1

FORGET Whether all obligations to the remote system with respect to recovery have been discharged. It can have any one of these values:

YES|NO

MARK Whether the Recovery Manager Link object has been marked during resynchronization. It can have any one of these values:

YES|NO

UNSHUNTED Whether the unit of work is not currently shunted. It can have any one of these values:

YES|NO

RESYNC_SCHEDULED Whether resynchronization activity has been scheduled. It can have any one of these values:

YES|NO

ACCESSIBLE Whether the communications link to the remote system is active or not. It can have any one of these values:

YES|NO|SHUNTED

LINK_ID_SOURCE Whether the local or remote system allocated the session. It can have any one of these values:

LOCAL|REMOTE

UOW_TOKEN The token identifying the unit of work object.

LOCAL_UOW_ID The local unit of work id of the unit of work to which the Recovery Manager Link object belongs.

HEURISM Whether the unit of work to which the Recovery Manager Link object belongs will take a unilateral decision if a failure occurs in the in doubt window. It can have any one of these values:

YES|NO

RMC_TOKEN A token to be passed to the client on all callback functions.

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LINK_UNKNOWN

RMLN gate, SET_LINK function

This function is used to set characteristics of a Recovery Manager Link object.

Input parameters

LINK_TOKEN A token used to identify a Recovery Manager Link object.

RESOLVE_TO_CURRENT_LINK Up to two Recovery Manager Link objects may be associated with a token. This optional parameter specifies whether to set characteristics of the most recent or not. It can have any one of these values:

YES|NO

LOGNAME_BUFFER An optional parameter specifying a buffer containing a logname to be associated with the Recovery Manager Link object.

COORDINATOR A parameter specifying whether the remote system is the coordinator of the distributed unit of work. It can have any one of these values:

YES|NO

INITIATOR A parameter specifying whether the remote system is the initiator of the syncpoint. It can have any one of these values:

YES|NO

RECOVERY_STATUS A parameter specifying whether recoverable work has taken place as part of the distributed unit of work on the remote system. It can have any one of these values:

NECESSARY|UNNECESSARY|SYNC_LEVEL_1

SINGLE_UPDATER A parameter specifying whether the remote system supports the single updater optimization. It can have any one of these values:

YES|NO

PRELOGGING A parameter specifying whether the client requires to be called with the PERFORM_PRELOGGING callback function. It can have any one of these values:

YES|NO

LINK_ID_BUFFER A buffer containing the termid of the session to the remote system, or the External Resource Manager qualifier.

LINK_ID_SOURCE An optional parameter specifying whether the local or remote system allocated the session. It can have any one of these values:

LOCAL|REMOTE

UNSHUNTED A parameter specifying whether the unit of work is not currently shunted. It can have any one of these values:

YES|NO

RESYNC_SCHEDULED A parameter specifying whether resynchronization activity has been scheduled. It can have any one of these values:

YES|NO

ACCESSIBLE A parameter specifying that the communications link to the remote system has failed. It can have any one of these values:

NO|SHUNTED

FORGET A parameter specifying whether all obligations to the remote system with respect to recovery have been discharged. It can have any one of these values:

YES|NO

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LINK_UNKNOWN, COORDINATOR_ALREADY, INITIATOR_ALREADY

RMLN gate, ISSUE_PREPARE function

This function performs phase 1 of syncpoint processing on the specified Recovery Manager Link object.

Input parameters

LINK_TOKEN A token used to identify a Recovery Manager Link object.

CONTINUE Is the task continuing into a following, new unit of work. This parameter can have any one of these values:

YES|NO

Output parameters

VOTE The vote from the client owning the Recovery Manager Link object. This parameter can have any one of these values:

YES|NO|NO_CONTINUE|READ_ONLY

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LINK_UNKNOWN, COORDINATOR_ALREADY, INITIATOR_ALREADY, PREPARE_REJECTED

RMLN gate, INBOUND_FLOW function

This function is used to notify Recovery Manager of the successful completion of syncpoint processing on the remote system, or a communications failure with the remote system.

Input parameters

LINK_TOKEN A token used to identify a Recovery Manager Link object.

FLOW A parameter specifying successful completion (DATA) or communication failure (UNBIND). It can have any one of these values:

DATA|UNBIND

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LINK_UNKNOWN, LINK_INACCESSIBLE

RMLN gate, INITIATE_RECOVERY function

This function identifies a Recovery Manager Link object in an in doubt failed unit of work and marks it as being resynchronized.

Input parameters

UOW_ID An optional parameter specifying a buffer containing the network UOWID of the unit of work to be resynchronized.

LOCAL_UOW_ID An optional parameter specifying the local UOWID.

CLIENT_NAME The name of the Recovery Manager client that owns the Recovery Manager Link object over which resynchronization is to take place.

REMOTE_ACCESS_ID_BUFFER A buffer containing the netname of the remote system, or the name of the External Resource Manager of the Recovery Manager Link object over which resynchronization is to take place.

LINK_ID_BUFFER A buffer containing the termid of the session to the remote system, or the External Resource Manager qualifier of the Recovery Manager Link object over which resynchronization is to take place.

LINK_ID_SOURCE An optional parameter specifying whether the local or remote system allocated the session associated with the Recovery Manager Link object over which resynchronization is to take place. It can have any one of these values:

LOCAL|REMOTE

DIRECTION A parameter specifying whether the resynchronization activity was initiated by the local or remote system. It can have any one of these values:

INBOUND|OUTBOUND

Output parameters

UOW_TOKEN The token identifying the unit of work object. to which the Recovery Manager Link object being resynchronized belongs.

LINK_TOKEN A token identifying the Recovery Manager Link object being resynchronized.

COORDINATOR A parameter specifying whether the remote system is the coordinator of the distributed unit of work. It can have any one of these values:

YES|NO

INITIATOR A parameter specifying whether the remote system is the initiator of the syncpoint. It can have any one of these values:

YES|NO

PRESUMPTION Whether the remote system assumes the presume abort or presume nothing protocols. It can have any one of these values:

ABORT|NOTHING

UOW_STATUS The status of the unit of work object that the Recovery Manager Link object belongs to. It can have any one of these values:

INDOUBT|FORWARD|BACKWARD|
HEURISTIC_FORWARD|HEURISTIC_BACKWARD

FAILURE_TIME An 8 byte Store Clock representation of the in doubt failure time.

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LINK_UNKNOWN, RECOVERY_ALREADY_IN_PROG, LINK_ACTIVE

RMLN gate, SET_RECOVERY_STATUS function

This function is used to notify an Recovery Manager Link object of the outcome of a distributed unit of work which failed in the in doubt window. It results in the shunted unit of work the Recovery Manager Link object belongs to unshunting and committing or backing out its resource updates as appropriate.

Input parameters

LINK_TOKEN A token identifying the Recovery Manager Link object being resynchronized.

DIRECTION A parameter specifying whether the resynchronization activity was initiated by the local or remote system. It can have any one of these values:

INBOUND|OUTBOUND

REMOTE_UOW_STATUS The status of the unit of work in the remote system. It can have any one of these values:

INDOUBT|HEURISTIC_FORWARD|HEURISTIC_BACKWARD|
FORWARD|BACKWARD|HEURISTIC_MIXED|COLD|RESET|UNKNOWN

TOLERATE_VIOLATIONS A parameter specifying the rules to be used to detect resynchronization protocol violations. It can have any one of these values:

YES|NO

Output parameters

UOW_STATUS The status (as a result of the resynchronization) of the unit of work object to which the Recovery Manager Link object belongs. It can have any one of these values:

INDOUBT|HEURISTIC_FORWARD|HEURISTIC_BACKWARD|
FORWARD|BACKWARD

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LINK_UNKNOWN, RECOVERY_NOT_IN_PROGRESS, ALREADY_SET

RMLN gate, REPORT_RECOVERY_STATUS function

This function is similar to SET_RECOVERY_STATUS but is applicable in the case of Presumed Abort or Last Agent resynchronization where the coordinator has backed out and has no record of the UOW. The participant may have gone indoubt, and needs to resynchronize.

Input parameters

UOW_ID A parameter specifying a buffer containing the network UOWID of the unit of work to be resynchronized.

REMOTE_ACCESS_ID_BUFFER A buffer containing the netname of the remote system, or the name of the External Resource Manager of the Recovery Manager Link object over which resynchronization is to take place.

REMOTE_UOW_STATUS The status of the unit of work in the remote system. It can have any one of these values:

INDOUBT|HEURISTIC_FORWARD|HEURISTIC_BACKWARD|
HEURISTIC_MIXED

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMLN gate, TERMINATE_RECOVERY function

Input parameters

LINK_TOKEN A token identifying the Recovery Manager Link object being resynchronized.

DIRECTION A parameter specifying whether the resynchronization activity was initiated by the local or remote system. It can have any one of these values:

INBOUND|OUTBOUND

FORGET A parameter specifying whether all obligations to the remote system with respect to recovery have been discharged. It can have any one of these values:

YES|NO

OPERATOR_INITIATED A parameter specifying whether the function is the result of an explicit user action. It can have any one of these values:

YES|NO

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LINK_UNKNOWN, RECOVERY_NOT_IN_PROGRESS, SET_NOT_DONE

RMLN gate, SET_MARK function

This function marks a Recovery Manager Link object during recovery.

Input parameters

LINK_TOKEN A token identifying the Recovery Manager Link object to be marked.

MARK It can have any one of these values:

YES|NO

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LINK_UNKNOWN, LINK_ACTIVE, RECOVERY_IN_PROGRESS

RMLN gate, START_LINK_BROWSE function

This function starts a browse of Recovery Manager Link objects. The browse can return either

- all the Recovery Manager Link objects in the system owned by a particular Recovery Manager client and associated with a particular remote system or External Resource Manager, or
- all Recovery Manager Link objects belonging to a particular unit of work object.

Input parameters

CLIENT_NAME The name of a Recovery Manager client.

REMOTE_ACCESS_ID_BUFFER A buffer containing the netname of the remote system, or the name of the External Resource Manager.

UOW_TOKEN The token identifying a unit of work object.

Output parameters

LINK_BROWSE_TOKEN A token to be used during a browse of all Recovery Manager Link objects for a particular Recovery Manager client.

UOW_BROWSE_TOKEN A token to be used during a browse of all Recovery Manager Link objects for a particular unit of work object.

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UOW_UNKNOWN, CLIENT_UNKNOWN

RMLN gate, GET_NEXT_LINK function

This function returns information about the next Recovery Manager Link object in a browse.

Input parameters

LINK_BROWSE_TOKEN A token identifying a browse of all the Recovery Manager Link objects belonging to a particular Recovery Manager client.

UOW_BROWSE_TOKEN A token identifying a browse of all the Recovery Manager Link objects belonging to a particular unit of work object.

REMOTE_ACCESS_ID_BUFFER A buffer in which the netname of the remote system, or External Resource Manager name will be returned.

LOGNAME_BUFFER A buffer in which the logname of the remote system will be returned.

LINK_ID_BUFFER A buffer in which the termid of the session to the remote system, or External Resource Manager qualifier will be returned.

Output parameters

LINK_TOKEN

CLIENT_NAME The name of the protocol that owns the Recovery Manager Link object. It can have any one of these values:

```
IRC |IRCO|LU61|LU62|RMI |IND
```

COORDINATOR Whether the remote system is the coordinator of the distributed unit of work. It can have any one of these values:

```
YES|NO
```

INITIATOR Whether the remote system is the initiator of the syncpoint of the distributed unit of work. It can have any one of these values:

```
YES|NO
```

LAST Whether the remote system supports the last agent optimization. It can have any one of these values:

```
YES|NO|MAYBE
```

SINGLE_UPDATER Whether the remote system supports the single updater optimization. It can have any one of these values:

```
YES|NO
```

PRESUMPTION Whether the remote system assumes the presume abort or presume nothing protocols. It can have any one of these values:

```
ABORT|NOTHING
```

RECOVERY_STATUS Whether recoverable work has taken place as part of the distributed unit of work on the remote system. It can have any one of these values:

```
NECESSARY|UNNECESSARY|SYNC_LEVEL_1
```

FORGET Whether all obligations to the remote system with respect to recovery have been discharged. It can have any one of these values:

```
YES|NO
```

MARK Whether the Recovery Manager Link object has been marked during resynchronization. It can have any one of these values:

```
YES|NO
```

UNSHUNTED Whether the unit of work is not currently shunted. It can have any one of these values:

```
YES|NO
```

RESYNC_SCHEDULED Whether resynchronization activity has been scheduled. It can have any one of these values:

```
YES|NO
```

ACCESSIBLE Whether the communications link to the remote system is active or not. It can have any one of these values:

```
YES|NO|SHUNTED
```

LINK_ID_SOURCE Whether the local or remote system allocated the session. It can have any one of these values:

```
LOCAL|REMOTE
```

UOW_TOKEN The token identifying the unit of work object.

LOCAL_UOW_ID The local unit of work id of the unit of work to which the Recovery Manager Link object belongs.

HEURISM Whether the unit of work to which the Recovery Manager Link object belongs will take a unilateral decision if a failure occurs in the in doubt window. It can have any one of these values:

```
YES|NO
```

RMC_TOKEN A token to be passed to the client on all callback functions.

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UOW_UNKNOWN, END_BROWSE
INVALID	INVALID_BROWSE

RMLN gate, END_LINK_BROWSE function

This function is used to terminate a browse of Recovery Manager Link objects.

Input parameters

LINK_BROWSE_TOKEN A token identifying a browse of all the Recovery Manager Link objects belonging to a particular Recovery Manager client.

UOW_BROWSE_TOKEN A token identifying a browse of all the Recovery Manager Link objects belonging to a particular unit of work object.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_BROWSE

RMNM gate, INQUIRE_LOGNAME function

This function returns the logname and data associated with the specified remote system being communicated with via the specified Recovery Manager client.

Input parameters

CLIENT_NAME Name of a Recovery Manager client.

REMOTE_ACCESS_ID_BUFFER A buffer containing the netname of the remote system.

LOGNAME_BUFFER A buffer to be used to return the logname.

RMC_DATA_BUFFER A buffer to be used to return data owned by the Recovery Manager client.

Output parameters

IN_USE Whether there are any Recovery Manager Link object in the system associated with the logname. It can have any one of these values:

```
YES|NO
```

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND, UNKNOWN_CLIENT

RMNM gate, SET_LOGNAME function

This function is used to associate a logname and some data with the netname of a remote system for a specified Recovery Manager client.

Input parameters

CLIENT_NAME A name of a Recovery Manager client.

REMOTE_ACCESS_ID_BUFFER A buffer containing the netname of a remote system.

LOGNAME_BUFFER A buffer containing the logname to be associated with the netname.

RMC_DATA_BUFFER A buffer containing data to be associated with the netname.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_CLIENT

RMNM gate, CLEAR_PENDING function

This function is used to remove Recovery Manager Link objects associated with a specified remote system. Affected indoubt units of work will take a unilateral decision to commit or backout their resource updates.

Input parameters

CLIENT_NAME A name of a Recovery Manager client.

REMOTE_ACCESS_ID_BUFFER A buffer containing the netname of the remote system.

COLD A parameter specifying whether the remote system has a new log and so has lost recovery information with respect to units of work in this system. It can have any one of these values:

YES|NO

ALL A parameter specifying whether only Recovery Manager Link objects with the same logname as that currently associated with the remote system should be removed or all Recovery Manager Link objects.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND

RMCD gate, REGISTER function

This function is used to register a Recovery Manager client.

Input parameters

CLIENT_NAME A name of a Recovery Manager client.

CLIENT_TYPE Whether the client owns local (RO) or remote (RMC) resources. It can have any one of these values:

RO|RMC

GATE An optional parameter specifying the kernel gate that services the client's callback functions.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ALREADY_REGISTERED, TOO_LATE

RMCD gate, SET_GATE function

This function is used to inform Recovery Manager of the kernel gate that services a Recovery Manager clients callback functions.

Input parameters

CLIENT_NAME A name of a Recovery Manager client.

GATE A parameter specifying the kernel gate that services the client's callback functions.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_CLIENT, GET_ALREADY_SET

RMCD gate, INQUIRE_CLIENT_DATA function

This function returns data associated with a Recovery Manager client.

Input parameters

CLIENT_NAME A name of a Recovery Manager client.

CLIENT_DATA_BUFFER A buffer to contain the data returned.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_CLIENT, CLIENT_DATA_TOO_LONG

RMCD gate, SET_CLIENT_DATA function

This function associates some data with a Recovery Manager client.

Input parameters

CLIENT_NAME A name of a Recovery Manager client.

CLIENT_DATA_BUFFER A buffer containing the data to be associated with the Recovery Manager client.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_CLIENT, CLIENT_DATA_TOO_LONG

RMDM gate, INQUIRE_STARTUP function

This function returns information about the type of system start being performed.

Input parameters: None

Output parameters

STARTUP It can have any one of these values:

`COLD|WARM|EMERGENCY`

ALL A value specifying whether all components are cold starting. It can have any one of these values:

`YES|NO`

INITIAL_START A value specifying whether the cold start is in fact an initial one. It can have any one of these values:

`YES|NO`

LAST_COLD_START_TIME An 8 byte Store Clock representation of the last cold start time.

LAST_EMER_START_TIME An 8 byte Store Clock representation of the last emergency start time.

LAST_INIT_START_TIME An 8 byte Store Clock representation of the last initial start time.

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

RMDM gate, SET_STARTUP function

This function sets the type of start that will be performed when this system is next restarted.

Input parameters

STARTUP The type of start. It can have any one of these values:

`COLD|NORESTART`

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

RMDM gate, SET_LOCAL_LU_NAME function

This function sets the local LU name, that is used in the generation of network UOWIDs by in this system.

Input parameters

LOCAL_LU_NAME A parameter specifying the local LU name.

LOCAL_LU_NAME_LENGTH A parameter specifying the length of the local LU name.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

RMDM gate, SET_PARAMETERS function

This function is used only by Parameter Manager Domain to inform Recovery Manager of initialization parameters.

Input parameters

DELETE_LOG An optional parameter specifying whether an initial start has been requested in the System Initialization Table, and so the contents of the system log should be deleted. It can have any one of these values:

`YES|NO`

STARTUP An optional parameter used in the case where OFFSITE=YES has been specified as a SIT override. It can only have the value `EMERGENCY`.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

RMKD gate, KEYPOINT_DATA function

This function writes Recovery Manager client data to the system log for keypointing purposes.

Input parameters

CLIENT_NAME A name of a Recovery Manager client.

DATA Address of an extended Iliffe vector. An extended Iliffe vector consists of a linked list of at least one element. Each element of the linked list consists of a variable length array of address length pairs. Each address and length field is four bytes long. The top bit of each address is off except for the last which may be on.

If an address is binary zero, then this terminates the element and the linked list.

If an address has the top bit on, then it terminates the element and points to the next element in the linked list.

An extended Iliffe vector simply represents the block of data formed by concatenating all the blocks which are pointed to by address length pairs in the vector which have the address top bit off. The order is from front to back of the linked list and from low to high index within each array.

REMARK An optional parameter for the benefit of trace to describe the data being logged.

RAISE_INV_DATA_LENGTH An optional parameter specifying whether the caller wishes to be informed of there being to much data to be logged. It can have any one of these values:

YES|NO

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_DATA_LENGTH, INVALID_CLIENT_NAME, NO_DATA

RMRE gate, APPEND function

This function writes data to the system log. The data written is associated with the current unit of work of the currently executing transaction if either FORWARD_DATA(YES) or BACKWARD_DATA(YES) is specified.

Input parameters

CLIENT_NAME A name of a Recovery Manager client.

RESOURCE_ID A parameter specifying the name of the resource with which the data to be logged is associated.

DATA Address of an extended Iliffe vector. An extended Iliffe vector consists of a linked list of at least one element. Each element of the linked list consists of a variable length array of address length pairs. Each address and length field is four bytes long. The top bit of each address is off except for the last which may be on.

If an address is binary zero, then this terminates the element and the linked list.

If an address has the top bit on, then it terminates the element and points to the next element in the linked list.

An extended Iliffe vector simply represents the block of data formed by concatenating all the blocks which are pointed to by address length pairs in the vector which have the address top bit off. The order is from front to back of the linked list and from low to high index within each array.

FORCE_DATA A parameter specifying whether the data is forced out on to the non-volatile log or can merely be written to the volatile log buffer. It can have any one of these values:

YES|NO

FORWARD_DATA A parameter specifying whether the data is used for forward recovery purposes. It can have any one of these values:

YES|NO

BACKWARD_DATA A parameter specifying whether the data is used for backward recovery purposes. It can have any one of these values:

YES|NO

REMARK An optional parameter for the benefit of trace to describe the data being logged.

LOG_BUFFER_SUSPEND An optional parameter specifying whether the caller can tolerate the task suspending to wait for space in a log buffer. It can have any one of these values:

YES|NO

RAISE_INV_DATA_LENGTH An optional parameter specifying whether the caller wishes to be informed of there being to much data to be logged. It can have any one of these values:

YES|NO

Output parameters

FORCE_TOKEN A token that can be used to force the data on to the non-volatile log with the FORCE function of the RMRE gate.

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_DATA_LENGTH, INSUFFICIENT_BUFFER_SPACE, INVALID_CLIENT_NAME, INVALID_RESOURCE_ID, NO_DATA

RMRE gate, FORCE function

This function forces data written previously to a log buffer to the non-volatile log.

Input parameters

FORCE_TOKEN A token returned on a previous call to the APPEND function of the RMRE gate.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMRE gate, REMOVE function

This function removes data logged by a Recovery Manager client and associated with a particular local resource from a unit of work.

Input parameters

UOW_ID The network UOWID under which the data was logged.

LOCAL_UOW_ID The local UOWID under which the data was logged.

CLIENT_NAME The name of the Recovery Manager client that logged the data.

LOCAL_ACCESS_ID The name of the local resource with which the logged data was associated.

Output parameters

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UOW_NOT_SHUNTED, UOW_NOT_BACKWARDS, INVALID_CLIENT_NAME, INVALID_LOCAL_ACCESS_ID

RMRE gate, AVAIL function

This function informs Recovery Manager that a local resource has become available. It is used when either a backout failure or a commit failure has previously occurred and the resource (or reason for the failure) has now cleared - or there is now reason to believe it may have cleared.

Input parameters

CLIENT_NAME The name of the Recovery Manager client that owns the local resource.

LOCAL_ACCESS_ID The name of the local resource.

Output parameters

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LOCAL_ACCESS_ID_UNKNOWN

RMRE gate, REQUEST_FORGET function

This function associates a Recovery Manager client and a named local resource with a requirement to engage in forget processing.

Input parameters

CLIENT_NAME The name of the Recovery Manager client that owns the local resource.

LOCAL_ACCESS_ID The name of the local resource.

Output parameters

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_CLIENT_NAME, INVALID_LOCAL_ACCESS_ID

RMSL gate, TAKE_ACTIVITY_KEYPOINT function

This function performs the activity associated with taking a keypoint.

Input parameters: None

Output parameters

RESPONSE is the Recovery Manager domain’s response to the call. It can have any one of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	None

RMWT gate, INQUIRE_WORK_TOKEN function

This function returns the value of the work token belonging to the named Recovery Manager client in a particular unit of work object.

Input parameters

UOW_TOKEN An optional parameter specifying the token identifying a unit of work object. If not specified the work token from the current unit of work of the currently executing transaction is returned.

CLIENT_NAME The name of a Recovery Manager client.

Output parameters

WORK_TOKEN The value of the Recovery Manager clients work token in the specified unit of work object.

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND

RMWT gate, START_WORK_TOKEN_BROWSE function

This function starts a browse of a all the non-zero work tokens in the system for a specific Recovery Manager client.

Input parameters

CLIENT_NAME The name of a Recovery Manager client.

Output parameters

BROWSE_TOKEN A token to be used during the browse.

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND

RMWT gate, GET_NEXT_WORK_TOKEN function

This function returns the next non-zero work token for the Recovery Manager client specified on the START_WORK_TOKEN_BROWSE. The token used to identify the unit of work object and local UOWID associated with the work token are also optionally returned.

Input parameters

BROWSE_TOKEN A token identifying the browse.

Output parameters

WORK_TOKEN The value of the Recovery Manager clients work token.

UOW_TOKEN The token identifying the unit of work object.

LOCAL_UOW_ID The local UOWID.

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_BROWSE_TOKEN, BROWSE_END

RMWT gate, END_WORK_TOKEN_BROWSE function

This function terminates a browse of work tokens.

Input parameters

BROWSE_TOKEN A token identifying the browse.

Output parameters

RESPONSE is the Recovery Manager domain's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_BROWSE_TOKEN

Recovery Manager domain's generic gates

Table 76 summarizes the Recovery Manager domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and the generic format for calls to the gate.

Table 76. Recovery Manager domain's generic gate

Gate	Trace	Function	Format
DMDM	RM 0101 RM 0102	INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM

You can find descriptions of these functions and their input and output parameters, in the section. dealing with the corresponding generic format, in Chapter 27, "Domain manager domain (DM)" on page 191.

In Initialization processing, the Recovery Manager

- Obtains initialization parameters from Parameter Manager,
- Determines the type of start to be performed,
- Processes it's data from the Global Catalog,
- Processes recovery information from the System Log.

In Quiesce processing, the Recovery Manager takes the warm keypoint.

Recovery Manager domain’s call back formats

Table 77 describes the call back format owned by the Recovery Manager domain and shows the function performed on the calls.

Table 77. Call back format owned by the Recovery Manager domain

Format	Calling module	Function
RMRO	DFHRMUO	PERFORM_COMMIT
	DFHRMUP	
	DFHRMUQ	
	DFHRMUW	
	DFHRMUO	PERFORM_PREPARE
	DFHRMRO2	START_BACKOUT
	DFHRMRO3	DELIVER_BACKOUT_DATA
	DFHRMRO4	END_BACKOUT
	DFHRMROS	PERFORM_SHUNT
	DFHRMROU	PERFORM_UNSHUNT
RMDE	DFHRMR1S	START_DELIVERY
	DFHRMR1D	DELIVER_RECOVERY
	DFHRMR1E	END_DELIVERY
	DFHRMR1D	DELIVER_FORGET
RMKP	DFHRMR1K	TAKE_KEYPOINT
RMLK	DFHRMLSP	PERFORM_PRELOGGING
	DFHRMLSP	PERFORM_PREPARE
	DFHRMLSD	REPLY_DO_COMMIT
	DFHRMLSD	SEND_DO_COMMIT
	DFHRMLSO	PERFORM_COMMIT
	DFHRMLSS	PERFORM_SHUNT
	DFHRMLSU	PERFORM_UNSHUNT

In the descriptions of the formats that follow, the “input” parameters are input not to Recovery Manager domain, but to the domain being called by the Recovery Manager. Similarly, the “output” parameters are output by the domain that was called by Recovery Manager domain, in response to the call.

RMRO gate, PERFORM_COMMIT function

This function requires the Recovery Manager client to perform phase 2 of syncpoint processing.

Input parameters

WORK_TOKEN The Recovery Manager client’s work token for the syncpointing unit of work.

CONTINUE A parameter specifying whether the current transaction will continue into a following unit of work. It can have any one of these values:

YES|NO

UOW_STATUS The status of the current unit of work. It can have any one of these values:

FORWARD|BACKWARD

RESTART An optional parameter specifying whether a backing out transaction will be restarted. It can have any one of these values:

YES|NO

Output parameters

FORGET_RECORD A value specifying whether all obligations to this Recovery Manager client have been discharged. It can have any one of these values:

YES|NO

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMRO gate, PERFORM_PREPARE function

This function requires the Recovery Manager client to perform phase 1 of syncpoint processing.

Input parameters

WORK_TOKEN The Recovery Manager client’s work token for the syncpointing unit of work.

CONTINUE A parameter specifying whether the current transaction will continue into a following unit of work. It can have any one of these values:

YES|NO

Output parameters

VOTE A value specifying the Recovery Manager client’s vote on the outcome of the syncpointing unit of work. It can have any one of these values:

YES|NO|NO_CONTINUE|READ_ONLY

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMRO gate, START_BACKOUT function

This function notifies the Recovery Manager client that backout processing is about to be performed for the unit of work.

Input parameters

WORK_TOKEN The Recovery Manager client’s work token for the syncpointing unit of work.

CONTINUE A parameter specifying whether the current transaction will continue into a following unit of work. It can have any one of these values:

YES|NO

REMOVE A parameter specifying whether or not the backout is due to an invocation of the REMOVE function of the RMRE gate. It can have any one of these values:

YES|NO

Output parameters

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMRO gate, DELIVER_BACKOUT_DATA function

This function requires the Recovery Manager client process backout data from the system log for the unit of work.

Input parameters

WORK_TOKEN The Recovery Manager client’s work token for the syncpointing unit of work.

DATA A buffer containing the data previously logged with BACKWARD_DATA(YES) via the APPEND function of the RMRE gate.

RESOURCE_ID An optional parameter specifying the name of the resource with which the logged data is associated.

CONTINUE A parameter specifying whether the current transaction will continue into a following unit of work. It can have any one of these values:

YES|NO

FORWARD_DATA A parameter specifying whether or not the data was originally logged as FORWARD_DATA. It can have any one of these values:

YES|NO

REMOVE A parameter specifying whether or not the backout is due to an invocation of the REMOVE function of the RMRE gate. It can have any one of these values:

YES|NO

CLUSTER_ID A buffer to receive a symbolic name identifying the resource.

LOCAL_ACCESS_ID A buffer to receive the specific name of the resource

Output parameters

KEEP A value specifying whether the backout action failed, implying the record should be kept and not forgotten. It can have any one of these values:

YES|NO

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMRO gate, END_BACKOUT function

This function notifies the Recovery Manager client that backout processing has completed for the unit of work.

Input parameters

WORK_TOKEN The Recovery Manager client’s work token for the syncpointing unit of work.

CONTINUE A parameter specifying whether the current transaction will continue into a following unit of work. It can have any one of these values:

YES|NO

REMOVE A parameter specifying whether or not the backout is due to an invocation of the REMOVE function of the RMRE gate. It can have any one of these values:

YES|NO

Output parameters

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMRO gate, PERFORM_SHUNT function

This function notifies the Recovery Manager client that the unit of work is about to shunt.

Input parameters

WORK_TOKEN The Recovery Manager client’s work token for the syncpointing unit of work.

CONTINUE A parameter specifying whether the current transaction will continue into a following unit of work. It can have any one of these values:

YES|NO

Output parameters

NEXT_WORK_TOKEN A value for the Recovery Manager client’s work token in the following unit of work.

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMRO gate, PERFORM_UNSHUNT function

This function notifies the Recovery Manager client that the unit of work is unshunting.

Input parameters

WORK_TOKEN The Recovery Manager client’s work token for the syncpointing unit of work.

Output parameters

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMDE gate, START_DELIVERY function

This function notifies the Recovery Manager client that system recovery processing is about to be performed.

Input parameters: None

Output parameters

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMDE gate, DELIVER_RECOVERY function

This function requires the Recovery Manager client to process recovery data from the system log.

Input parameters

RESOURCE_ID An optional parameter specifying the name of the resource with which the logged data is associated.

DATA A buffer containing the data previously logged with BACKWARD_DATA(YES) via the APPEND function of the RMRE gate.

FORWARD_DATA A parameter specifying whether or not the data was originally logged as FORWARD_DATA. It can have any one of these values:

YES|NO

BACKWARD_DATA A parameter specifying whether or not the data was originally logged as BACKWARD_DATA. It can have any one of these values:

YES|NO

KEYPOINT A parameter specifying whether or not the data was logged as part of a keypoint. It can have any one of these values:

YES|NO

BACKED_OUT A parameter specifying whether or not the update the data is associated with backed out. It can have any one of these values:

YES|NO

UOW A parameter specifying whether the data is related to a particular unit of work. It can have any one of these values:

YES|NO

UOW_STATUS An optional parameter specifying the status of unit of work the data belongs to (if any). It can have any one of these values:

FORWARD|BACKWARD|IN_DOUBT|IN_FLIGHT

LOCAL_UOW_ID An optional parameter specifying the local UOWID of the unit of work the data belongs to (if any).

Output parameters

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMDE gate, END_DELIVERY function

This function notifies the Recovery Manager client that all recovery information from the system log has been processed.

Input parameters: None

Output parameters

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMDE gate, DELIVER_FORGET function

This function notifies the Recovery Manager client that FORGET processing is required for some resource in a unit of work.

Input parameters

LOCAL_ACCESS_ID A parameter specifying the name of the resource associated with the forget processing.

UOW It can only have the value YES.

UOW_STATUS The status of the unit of work. It can have any one of these values:

FORWARD|BACKWARD|IN_DOUBT|IN_FLIGHT

LOCAL_UOW_ID The local UOWID of the unit of work.

Output parameters

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMKP gate, TAKE_KEYPOINT function

This function requires the Recovery Manager client to perform keypoint processing.

Input parameters

SHUTDOWN A parameter specifying whether the keypoint is the warm keypoint taken during shutdown or an activity keypoint. It can have any one of these values:

YES|NO

Output parameters

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMLK gate, PERFORM_PRELOGGING function

This function notifies the Recovery Manager client that phase 1 of syncpoint processing is about to occur.

Input parameters

RMC_TOKEN The Recovery Manager client’s token associated with the Recovery Manager Link object.

INITIATOR A parameter specifying whether the remote system is the initiator of the syncpoint. It can have any one of these values:

YES|NO

COORDINATOR(YES]NO) A parameter specifying whether the remote system is the coordinator of the distributed unit of work. It can have any one of these values:

YES|NO

Output parameters

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMLK gate, PERFORM_PREPARE function

This function requires the Recovery Manager client perform phase 1 of syncpoint processing.

Input parameters

RMC_TOKEN The Recovery Manager client’s token associated with the Recovery Manager Link object.

CONTINUE A parameter specifying whether the current transaction will continue into a following unit of work. It can have any one of these values:

YES|NO

SYSTEM A parameter specifying whether PERFORM_PREPARE call is part of a syncpoint or the result of EXEC CICS ISSUE PREPARE. It can have any one of these values:

YES|NO

RECOVERY_STATUS A parameter specifying whether recoverable work has taken place as part of the distributed unit of work on the remote system. It can have any one of these values:

NECESSARY|UNNECESSARY|SYNC_LEVEL_1

Output parameters

VOTE A value specifying the Recovery Manager client’s vote on the outcome of the syncpointing unit of work. It can have any one of these values:

YES|NO|NO_CONTINUE|READ_ONLY|HEURISTIC_MIXED

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMLK gate, REPLY_DO_COMMIT function

This function requires the Recovery Manager client communicate the result of this systems phase 1 syncpoint processing to the coordinating system, and obtain the outcome of the distributed unit of work.

Input parameters

RMC_TOKEN The Recovery Manager client’s token associated with the Recovery Manager Link object.

CONTINUE A parameter specifying whether the current transaction will continue into a following unit of work. It can have any one of these values:

YES|NO

SINGLE_UPDATER A parameter specifying whether the single updater optimization is being performed. It can have any one of these values:

YES|NO

Output parameters

ACCESSIBLE A value specifying whether communication with the remote system failed. It can have any one of these values:

YES|NO|SHUNTED

VOTE A value specifying the outcome of the syncpointing unit of work. It can have any one of these values:

YES|NO|NO_CONTINUE|READ_ONLY|HEURISTIC_MIXED

RESPONSE is the Recovery Manager client’s response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMLK gate, SEND_DO_COMMIT function

This function requires the Recovery Manager client communicate the result of this systems phase 1 syncpoint processing to the last agent system, and obtain the outcome of the distributed unit of work.

Input parameters

RMC_TOKEN The Recovery Manager client's token associated with the Recovery Manager Link object.

CONTINUE A parameter specifying whether the current transaction will continue into a following unit of work. It can have any one of these values:

YES|NO

SINGLE_UPDATER A parameter specifying whether the single updater optimization is being performed. It can have any one of these values:

YES|NO

Output parameters

ACCESSIBLE A value specifying whether communication with the remote system failed. It can have any one of these values:

YES|NO|SHUNTED

VOTE A value specifying the outcome of the syncpointing unit of work. It can have any one of these values:

YES|NO|NO_CONTINUE|READ_ONLY|HEURISTIC_MIXED

RESPONSE is the Recovery Manager client's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMLK gate, PERFORM_COMMIT function

This function requires the Recovery Manager client perform phase 2 of syncpoint processing.

Input parameters

RMC_TOKEN The Recovery Manager client's token associated with the Recovery Manager Link object.

CONTINUE A parameter specifying whether the current transaction will continue into a following unit of work. It can have any one of these values:

YES|NO

SINGLE_UPDATER A parameter specifying whether the single updater optimization is being performed. It can have any one of these values:

YES|NO

UOW_STATUS The status of the syncpointing unit of work. It can have any one of these values:

FORWARD|BACKWARD

RESTART An optional parameter specifying whether a backing out transaction will be restarted. It can have any one of these values:

YES|NO

COORDINATOR A parameter specifying whether the remote system is the coordinator of the distributed unit of work. It can have any one of these values:

YES|NO

INITIATOR A parameter specifying whether the remote system is the initiator of the syncpoint. It can have any one of these values:

YES|NO

PRESUMPTION A parameter specifying whether the remote system assumes the presume abort or presume nothing protocols. It can have any one of these values:

ABORT|NOTHING

RECOVERY_STATUS A parameter specifying whether recoverable work has taken place as part of the distributed unit of work on the remote system. It can have any one of these values:

NECESSARY|UNNECESSARY|SYNC_LEVEL_1

Output parameters

ACCESSIBLE A parameter specifying that the communications link to the remote system has failed. It can have any one of these values:

YES|NO|SHUNTED

FORGET A parameter specifying whether all obligations to the remote system with respect to recovery have been discharged. It can have any one of these values:

YES|NO

PASS A parameter specifying whether an equivalent Recovery Manager Link object should be created in the following unit of work. It can have any one of these values:

YES|NO

ABEND A parameter specifying whether an abend occurred during the PERFORM_COMMIT call-back. It can have any one of these values:

YES|NO

NEXT_RECOVERY_STATUS A parameter specifying the initial RECOVERY_STATUS of the Recovery Manager Link object created in the following unit of work as a result of PASS(YES). It can have any one of these values:

NECESSARY|UNNECESSARY|SYNC_LEVEL_1|DEFAULT

RESPONSE is the Recovery Manager client's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMLK gate, PERFORM_SHUNT function

This function notifies the Recovery Manager client that the unit of work is shunting.

Input parameters

RMC_TOKEN The Recovery Manager client's token associated with the Recovery Manager Link object.

CONTINUE A parameter specifying whether the current transaction will continue into a following unit of work. It can have any one of these values:

YES|NO

RECOVERY_STATUS A parameter specifying whether recoverable work has taken place as part of the distributed unit of work on the remote system. It can have any one of these values:

NECESSARY|UNNECESSARY|SYNC_LEVEL_1

Output parameters

FORGET A parameter specifying whether all obligations to the remote system with respect to recovery have been discharged. It can have any one of these values:

YES|NO

RESPONSE is the Recovery Manager client's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

RMLK gate, PERFORM_UNSHUNT function

This function notifies the Recovery Manager client that the unit of work is unshunting.

Input parameters

LINK_TOKEN A token identifying the Recovery Manager Link object to be unshunted.

LOGNAME_BUFFER A parameter specifying a buffer containing the logname of the remote system.

REMOTE_ACCESS_ID_BUFFER A buffer containing the netname of the remote system, or the name of the External Resource Manager.

LINK_ID_BUFFER A buffer containing the termid of the session to the remote system, or the External Resource Manager qualifier.

LINK_ID_SOURCE An optional parameter specifying whether the local or remote system allocated the session. It can have any one of these values:

LOCAL|REMOTE

Output parameters

RESPONSE is the Recovery Manager client's response to the call. It can have any one of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

Modules

Module	Function
DFHRMCD	Handles the functions of the RMCD gate.
DFHRMCD1	Initialises the Client Directory Class.
DFHRMCD2	Quiesces the Client Directory Class.
DFHRMCI2	Sets the callback gate of a Recovery Manager client.
DFHRMCI3	Waits for a registered Recovery Manager client to set its callback gate.
DFHRMCI4	Waits for a registered Recovery Manager client to set its callback gate and calls it with a given parameter list.
DFHRMDM	Recovery Manager domain initialization and termination. Handles the DMDM and RMDM gate functions.
DFHRMUTL	Recovery Manager batch utility.
DFHRMDU0	Formats the Recovery Manager control blocks.
DFHRMDU2	Starts a browse of all Recovery Manager client work tokens during dump formatting.
DFHRMDU3	Gets the next Recovery Manager client work token during dump formatting.
DFHRMDU4	Ends a browse of all Recovery Manager client work tokens during dump formatting.
DFHRMLK1	Initialises the Recovery Manager Link Class.
DFHRMLK2	Handles the INITIATE_RECOVERY function of the RMLN gate.
DFHRMLK3	Inquires whether a Logname is in-use by any Recovery Manager Link.
DFHRMLK4	Handles the CLEAR_PENDING function for a particular Recovery Manager Link.
DFHRMLK5	Collects statistics from the Recovery Manager Link Class.
DFHRMLKQ	Quiesces the Recovery Manager Link Class.
DFHRMLN	Handles the functions of the RMLN gate.
DFHRMLSD	Asks the coordinator Recovery Manager Link to decide the outcome of the unit of work.
DFHRMLSF	Determines the reason for a unit of work being in doubt.
DFHRMLSO	Commits the Recovery Manager Links for a unit of work.
DFHRMLSP	Prepares the Recovery Manager Links for a unit of work.
DFHRMLSS	Shunts the Recovery Manager Links for a unit of work.
DFHRMLSU	Unshunts the Recovery Manager Links for a unit of work.
DFHRML1D	Reconstructs Recovery Manager Links from log records.
DFHRMNM	Handles the functions of the RMNM gate.
DFHRMNM1	Initialises the Recovery Manager Lognames Class.
DFHRMNS1	Initialises the Recovery Manager Logname Set Class.
DFHRMNS2	Quiesces the Recovery Manager Logname Set Class.
DFHRMOFI	Initialises a Recovery Manager Object Factory.
DFHRMRO	Handles the functions of the RMRO gate.
DFHRMROO	Handles FORGET processing for Recovery Manager Resource Owners.
DFHRMROS	Shunts a Recovery Manager Resource Owner.
DFHRMROU	Unshunts a Recovery Manager Resource Owner.
DFHRMROV	Handles AVAIL processing for Recovery Manager Resource Owners.
DFHRMRO1	Initialises the Recovery Manager Resource Owner Class.
DFHRMRO2	Signals start_backout to a Recovery Manager Resource Owner.

Module	Function
DFHRMRO3	Delivers backout data to a Recovery Manager Resource Owner.
DFHRMRO4	Signals end_backout to a Recovery Manager Resource Owner.
DFHRMR1D	Delivers recovery data to a Recovery Manager Resource Owner.
DFHRMR1E	Signals end of recovery to a Recovery Manager Resource Owner.
DFHRMR1K	Signals a keypoint to a Recovery Manager Resource Owner.
DFHRMR1S	Signals start of recovery to a Recovery Manager Resource Owner.
DFHRMSL	Handles the functions of the RMSL gate.
DFHRMSLF	Forces the System Log.
DFHRMSLJ	Checks for Chain independence during recovery.
DFHRMSLL	Closes a Chain on the System Log.
DFHRMSLO	Opens a Chain on the System Log.
DFHRMSLV	Moves a Chain on the System Log.
DFHRMSLW	Writes a record to a Chain on the System Log.
DFHRMSL1	Initialises the Recovery Manager System Log Class.
DFHRMSL2	Starts a browse of a Chain on the System Log.
DFHRMSL3	Reads a Record from a Chain on the System Log.
DFHRMSL4	Ends a browse of a Chain on the System Log.
DFHRMSL5	Performs restart processing for Recovery Manager System Log Class.
DFHRMSL6	Schedules keypoint activity.
DFHRMSL7	Performs keypoint processing.
DFHRMST	Handles STST functions for Recovery Manager.
DFHRMST1	Initializes the Recovery Manager Statistics Class.
DFHRMTRI	Formats Recovery Manager trace entries.
DFHRMUC	Creates a RMUW (unit of work) object.
DFHRMUO	Commits a unit of work.
DFHRMUW	Handles the functions of the RMUW gate.
DFHRMUWB	Handles data during backout of a unit of work.
DFHRMUWE	Handles activities when a unit of work is unshunted.
DFHRMUWF	Forces log records for a unit of work.
DFHRMUWH	Holds an RMUW object.
DFHRMUWJ	Forces a unit of work to take a unilateral decision.
DFHRMUWL	Handles notification that all remote remotes have finished processing.
DFHRMUWN	Schedules a unit of work to be unshunted.
DFHRMUWP	Handles notification that a local resource has become available.
DFHRMUWQ	Handles commit or backout of an unshunted, in doubt unit of work.
DFHRMUWS	Records the outcome of a unit of work during resynchronization.
DFHRMUWU	Records the local LU name.
DFHRMUWV	Handles notification that a local resource has become available.
DFHRMUWW	Writes a record belonging to a unit of work to the System Log.
DFHRMUW0	Releases an RMUW object.
DFHRMUW1	Initializes the Recovery Manager Unit of Work Class.
DFHRMUW2	Collects the Recovery Manager Unit of Work Class Statistics.
DFHRMUW3	Handles the INQUIRE_UOW_TOKEN function.
DFHRMU1C	Sets the Chain token for a unit of work.
DFHRMU1D	Handles log records of units of work during recovery.
DFHRMU1E	Signals that all records have been recovered from the System Log during recovery.
DFHRMU1F	Handles an in doubt wait timeout.
DFHRMU1J	Inquires whether all unit of work chains are disjoint.
DFHRMU1K	Keypoints a unit of work.
DFHRMU1L	Handle XMPP_FORCE_PURGE_INHIBIT_QUERY.
DFHRMU1N	Handle XMPP_FORCE_PURGE_INHIBIT_QUERY.
DFHRMU1Q	Handle the NOTIFY function of the TISR gate.
DFHRMU1R	Performs restart processing for Recovery Manager Unit of Work Class.
DFHRMU1S	Signals that recovery of log records is about to be performed.
DFHRMU1U	Process a unit of work after recovery.
DFHRMU1V	Requests time out interval notification for a unit of work.
DFHRMU1W	Cancels wait time out notification for a unit of work.
DFHRMVP1	Initializes the Recovery Manager Variable Length Subpool Class.
DFHRMXNE	Reattaches a transaction to process an unshunted unit of work.
DFHRMXN2	Schedules a keypoint.
DFHRMXN3	The keypoint program.
DFHRMXN4	Restarts the Recovery Manager Transaction Class.
DFHRMXN5	Increments Recovery Manager statistics for a Transaction.

Exits

None

Trace

The point IDs for the Recovery Manager domain are of the form RM xxxx the corresponding trace levels are RM 1, RM 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 64. RRMS domain (RX)

The RRMS domain is responsible for managing interaction with OS/390 Recoverable Resource Management Services (RRMS) and in particular, Resource Recovery Services (RRS) which is a component of RRMS.

RRMS domain's specific gates

Table 78 summarizes the RX domain’s specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and whether or not the functions are available through the exit programming interface (XPI).

Table 78. RX domain’s specific gate

Gate	Trace	Function	XPI
RXDM	RX 0101	INQUIRE_RRS SET_PARAMETERS	NO
	RX 0102		NO
RXUW	RX 0401	PUT_CLIENT_REQUEST	NO
	RX 0402	GET_CLIENT_REQUEST	NO
		INQUIRE	NO

RXDM gate, INQUIRE_RRS function

The INQUIRE_RRS function of the RXDM gate is used to determine the status of CICS's interface with OS/390 Recoverable Resource Management Services (RRMS).

Output Parameters

OPEN Returns YES or NO to indicate if the interface with RRMS is open.

[RESTART_STATE] Returns a value to indicate the state of restart processing with Resource Recovery Services (RRS). One of these values is returned:

```
NOT_STARTED Restart processing has not started
STARTING    Restart is in progress
COLD        Restart processing is complete, and
            RRS was cold started.
WARM        Restart processing is complete, and
            RRS was warm started.
```

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

RXDM gate, SET_PARAMETERS function

The SET_PARAMETERS function of the RXDM gate is used to pass the values of relevant System Initialization parameters to the domain.

Input Parameters

RRMS Specifies the value of the RRMS System Initialization Parameter. It can have one of these values:

```
YES|NO
```

Output Parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|
KERNERROR|PURGED
```

RXUW gate, PUT_CLIENT_REQUEST function

The PUT_CLIENT_REQUEST function of the RXDM gate is used to associate a request from a client with an RRS Unit of Recovery (UR).

Input parameters

TRANSACTION_ID The transaction id associated with the request. This parmeter is used to correlate succesive requests for the same transaction instance.

USERID The userid associated with the request. This parmeter is used to correlate succesive requests for the same transaction instance.

CONNECTION The connection on which the client request was received. This parameter is used to identify the source of the request in any messages that are issued.

CONTEXT_TOKEN The token representing the RRMS context for which the request is issued.

URID The identifier of the RRS Unit of Recovery associated with the context.

PASS_TOKEN A token used to protect against unauthorised use of the context token and URID.

CLIENT_TOKEN A token representing the client of the UR.

CLIENT_TYPE Indicates the type of client of the transaction. The only permissible value is `TERMINAL`

Output parameters

NEW_UR Indicates whether a new UR has been created for this request. It can have one of these values:

```
YES indicates that a new UR has been created
NO  indicates that the request was associated with
    an existing UR
```

UR_TOKEN is the token by which the UR associated with the request is known by the RX domain.

TRANSACTION_NUMBER The transaction number of the transaction associated with the request.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|
KERNERROR|PURGED
```

RXUW gate, GET_CLIENT_REQUEST function

The GET_CLIENT_REQUEST function of the RXDM gate is used to suspend a transaction until the PUT_CLIENT_REQUEST is issued for the same Unit of Recovery.

Input parameters

UR_TOKEN is the token by which the UR associated with the request is known by the RX domain.

[TIMEOUT] The time (in seconds) for which the transaction should be suspended. If this paramter is omitted, the transaction will be suspended indefinitely.

Output paramters

CLIENT_TOKEN A token representing the client of the UR.

CLIENT_TYPE Indicates the type of client of the transaction. The only possible value is TERMINAL

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|
KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are

```
SYNCPOINT RRS has requested a syncpoint
BACKOUT   RRS has requested rollback
RACE      RRS has requested syncpoint or rollback and
          a client request has been received at the
          same time
```

[REASON] is also returned when RESPONSE is PURGED. Possible values are

```
TASK_CANCELLED The task has been purged
TIMED_OUT      The request has timed out
```

RXUW gate, INQUIRE function

The INQUIRE function requests attributes of a Unit of Recovery

Input parameters

UR_TOKEN is the token which identifies the Unit of Recovery

Output parameters

[URID] The identifier of the Unit of Recovery used by RRMS.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|
KERNERROR|PURGED
```

Modules

Module	Function
DFHRXDM	RX domain management and global functions.
DFHRXUW	RX domain unit-of-work related functions.
DFHRXSVC	RX domain SVC code for RRMS authorized interface.
DFHRXXRG	RX domain Registration Services exits.
DFHRXXRM	RX domain Resource Manager exits.
DFHRXDUF	RX domain dump formatting.
DFHRXTRI	RX domain trace interpretation.

Exits

None

Trace

The point IDs for the RRMS domain are of the form RX xxxx the corresponding trace levels are RX 1, RX 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 65. Remote DL/I

An overall description of DL/I database support is given in Chapter 25, “DL/I database support” on page 177. This section gives information that is specific to remote DL/I.

Design overview

This section outlines what you must do to define remote DL/I support, and describes the functions of remote DL/I.

System definition

For a CICS system that supports only remote databases you must, in addition to providing the usual definitions that are required for function shipping, code a PSB directory (PDIR) using the DFHDLPSB macro. Every PDIR entry must have SYSIDNT specified. The PDIR system initialization parameter must be coded specifying the suffix of the PDIR.

DL/I PSB scheduling

When a CICS task requests the scheduling of a DL/I PSB by means of an EXEC DLI SCHEDULE request or DL/I PCB call, and the request is for a remote PSB, control is passed to DFHDLIRP. DFHDLIRP allocates a remote scheduling block (RSB) and issues a DFHIS TYPE=CONVERSE macro to ship the scheduling request to the owning system.

Database calls

For a remote DL/I database call, a DFHIS TYPE=CONVERSE macro is issued to ship the request to the owning system. The return codes are passed back to the user in the user interface block (UIB).

DL/I PSB termination

If a remote PSB is terminated, the actions performed are:

1. Free the RSB and local program communication block (PCB) storage.
2. If the DL/I PSB termination was not caused by a CICS syncpoint, request one now.

Control blocks

Figure 82 illustrates some of the control blocks used to support remote DL/I.

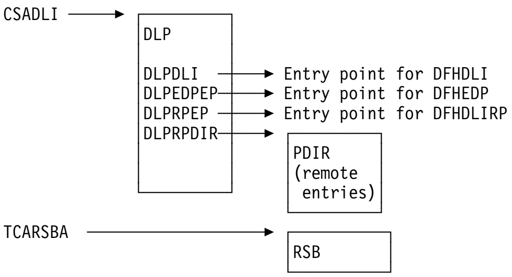
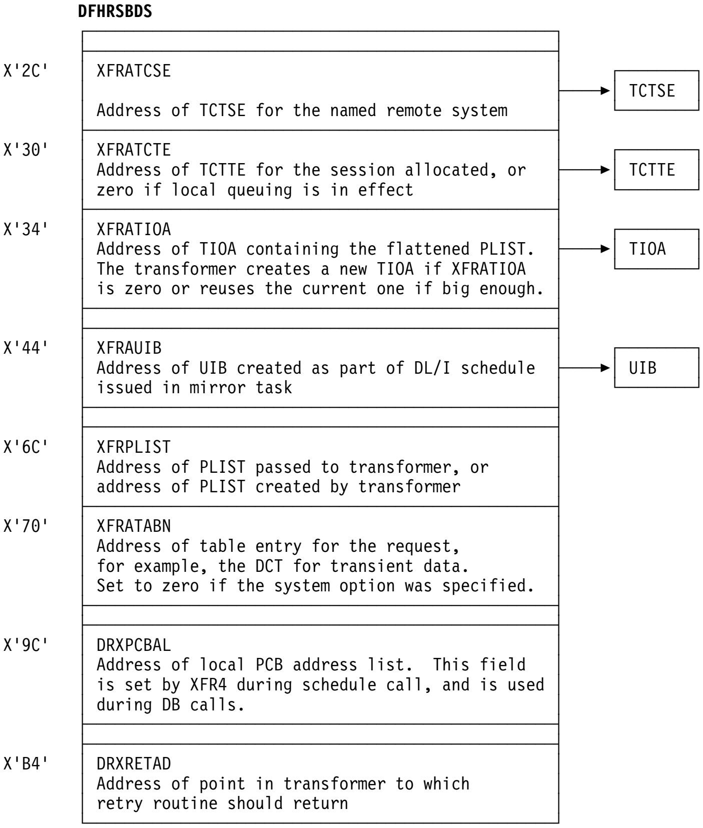


Figure 82. Some control blocks used for remote DL/I support

The DL/I interface parameter list (DLP) is described in “DL/I interface parameter list (DLP)” on page 178.

The remote PSB directory (PDIR) contains an entry for each remote PSB that can be used from an application program.

The remote scheduling block (RSB) (see Figure 83 on page 484) is acquired when a CICS task issues a PSB schedule request for a remote PSB. The RSB is freed when the task issues a SYNCPOINT or a DLI TERM request.



DFHRSBDS

X'2C'	XFRATCSE	Address of TCTSE for the named remote system	TCTSE
X'30'	XFRATCTE	Address of TCTTE for the session allocated, or zero if local queuing is in effect	TCTTE
X'34'	XFRATIOA	Address of TIOA containing the flattened PLIST. The transformer creates a new TIOA if XFRATIOA is zero or reuses the current one if big enough.	TIOA
X'44'	XFRAUIB	Address of UIB created as part of DL/I schedule issued in mirror task	UIB
X'6C'	XFRPLIST	Address of PLIST passed to transformer, or address of PLIST created by transformer	
X'70'	XFRATABN	Address of table entry for the request, for example, the DCT for transient data. Set to zero if the system option was specified.	
X'9C'	DRXPCBAL	Address of local PCB address list. This field is set by XFR4 during schedule call, and is used during DB calls.	
X'B4'	DRXRETAD	Address of point in transformer to which retry routine should return	

Figure 83. Remote scheduling block (RSB)

See the *CICS Data Areas* manual for a detailed description of these control blocks.

Chapter 66. Resource definition online (RDO)

The CEDA transaction creates and alters the definitions of system resources in the CICS system definition (CSD) data set.

RDO provides:

- Online transactions that can be used to **inspect**, **change**, and **install** resource definitions:
  - CEDA (inspect, change, and install)
  - CEDB (inspect and change)
  - CEDC (inspect only).
- A programmable interface to the CEDA transaction, using an EXEC CICS LINK command in the application program to invoke DFHEDAP directly. (For further information, see the *CICS Customization Guide.*)
- A set of system programmer API command (the EXEC CICS CREATE commands) for creating CICS resources dynamically.
- An offline utility, DFHCSDUP, to inspect or change resource definitions. (For a description of this utility, see Chapter 18, “CSD utility program (DFHCSDUP)” on page 141.)

Design overview

Resource definitions are maintained on the CICS system definition (CSD) data set. The resource definitions in the CSD data set can be viewed and changed using either the online CEDx transactions, or the offline utility DFHCSDUP.

Installation of resource definitions makes the definitions available to the running CICS system. Resource definitions can be installed at these times:

- When CICS is cold started, using the GRPLIST system initialization parameter.
- During a run of CICS, using the CEDA transaction.

When resource definitions are installed, they are made available through the appropriate resource managers.

Modules

The relationships between the components of RDO, and the components of some of the services it uses, are shown in Figure 84.

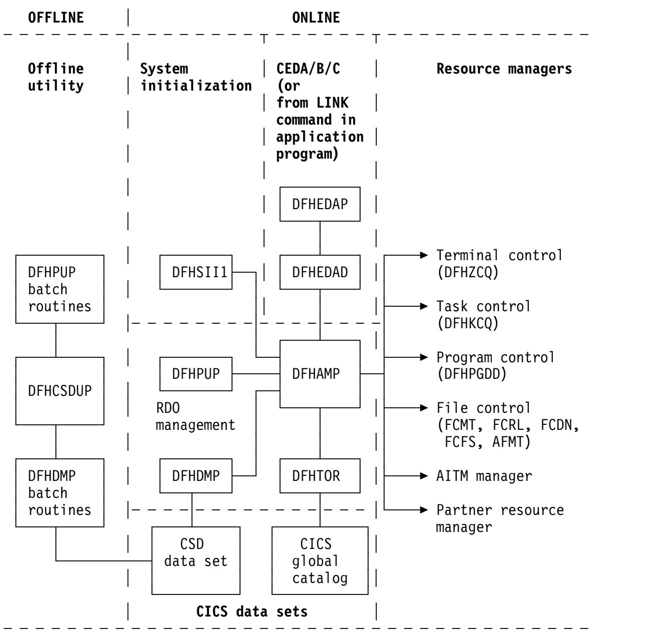


Figure 84. RDO interfaces

DFHEDAP and **DFHEDAD** control the CEDA, CEDB, and CEDC transactions. They provide screen management for the transactions, and invoke DFHAMP to implement any actions that are required.

DFHSII1 invokes DFHAMP when CICS is cold started, to install resource definitions for the current run. These resource definitions are specified by the GRPLIST system initialization parameter. DFHSII1 passes the GRPLIST system initialization parameter to DFHAMP.

DFHAMP, the allocation management program, manages all requests to view, change, and install resources. It uses the services provided by other parts of RDO, and by the resource managers:

- DFHAMP invokes **DFHPUP** and **DFHDMP** to read, write, and update resource definitions on the CSD data set:
  - DFHPUP, the parameter utility program, converts resource definition data between the parameter list format provided by DFHAMP and the record format needed by the CSD.
  - DFHDMP, the CSD management program, manages I/O of resource definition data to and from the CSD data set.
- DFHAMP invokes **DFHTOR**, the terminal object resolution program, to merge TERMINAL, TYPETERM, CONNECTION, and SESSION definitions:
  - When requests are made to install TERMINALs, TYPETERMs, CONNECTIONs, and SESSIONs, DFHTOR merges TYPETERM and TERMINAL

  information, and also CONNECTION and SESSION information, and passes this merged information back to DFHAMP.
  - DFHAMP passes the merged definitions to DFHZCQ to install in the running CICS system. Any merged TERMINAL definitions that are to be used as autoinstall terminal models are passed to the autoinstall terminal model (AITM) manager.
  - When TYPETERM definitions are installed, DFHTOR records the information about the CICS global catalog for subsequent use.
  - When the CHECK command is issued, DFHTOR checks the appropriate TERMINAL, TYPETERM, CONNECTION, and SESSION definitions for consistency.
- DFHAMP calls the appropriate resource managers to install resources in the running CICS system:
  - **DFHZCQ** is invoked to install CONNECTION, SESSION, and TERMINAL definitions.
  - **DFHAMXM** is invoked to install TRANSACTION and PROFILE definitions.
  - **DFHPGDD** is invoked to install PROGRAM, MAPSET, and PARTITIONSET definitions.
  - These subroutine "gates" are called to install resources related to file control:

    FCMT, for FCT entries
    FCRL, for LSR pools
    FCDN, for DSN blocks
    FCFS, to open and close files
    AFMT, for AFCT entries for files.
  - The **AITM manager** is invoked, using an AITM ADD_REPL_TERM_MODEL subroutine call (see Chapter 8, "Autoinstall terminal model manager" on page 59), to install autoinstall terminal models.
  - The **partner resource manager** is invoked, using a PRPT ADD_REPLACE_PARTNER subroutine call (see Chapter 58, "Partner resource manager" on page 429), to install partner resources for the SAA communications interface.

DFHEICRE processes all the EXEC CICS CREATE commands. It builds an internal DEFINE command for the resource to be created, and passes it to DFHCAP for interpretation. The encoded command is then passed directly to DFHAMP to install the resource in the running system. The CSD file is not accessed at all during this processing.

DFHCSDUP, the offline CICS system definition utility program, uses batch versions of routines from DFHPUP and DFHDMP to read, write, and update resource definitions on the CSD data set (see Chapter 18, "CSD utility program (DFHCSDUP)" on page 141).

For a detailed description of how the CEDA transaction handles terminal resources, see Chapter 86, "Terminal control" on page 585.

Exits

The XRSINDI global user exit is invoked at each install or EXEC CICS CREATE.

Trace

The following point IDs are provided, with a trace level of AP 1:

- AP 00EB (DFHAMP)
- AP 00EC (DFHDMP)
- AP 00EF (DFHTOR)
- AP 00E2 (DFHPUP).

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 67. SAA Communications and Resource Recovery interfaces

This section describes the CICS implementation of the Communications and Resource Recovery elements of the Systems Application Architecture Common Programming Interface (also known as the SAA Communications and SAA Resource Recovery interfaces respectively).

The SAA Communications and Resource Recovery interfaces are both call-based application programming interfaces that are common across all programming languages and across hardware systems.

The common programming interface (CPI) component of CICS, also sometimes known as the CP component, provides application programming interfaces that conform to SAA specifications for Communications and Resource Recovery interfaces.

Note: This CICS component does **not** currently handle any other SAA interface elements.

The CPI component is part of the AP domain, and is shipped as object code only (OCO).

The **SAA Communications interface** allows CICS applications to communicate via APPC (LU6.2) links to partner applications on any system that conforms to SAA standards. This interface consists of a set of defined verbs as program calls that are adapted for the language being used. For further information about the general call-based API, see the *SAA CPI Communications Reference* manual, SC26-4399.

The SAA Communications interface in CICS provides an alternative to the existing application interface for distributed transaction processing (see page 171). A single transaction can use EXEC CICS commands for one conversation while using SAA Communications calls for another (separate) conversation. Also, one end of a conversation can use EXEC CICS commands while the other end uses SAA Communications calls. However, it is not possible to use a mixture of EXEC CICS commands and SAA Communications calls on the same end of a conversation.

The **SAA Resource Recovery interface** provides an SAA application programming interface for commit and backout of recoverable resources. This interface consists of two defined verbs as program calls that are adapted for the language being used:

SRRCMIT	Commit
SRRBACK	Backout

For further information, see the *SAA CPI Resource Recovery Reference* manual, SC31-6821.

The SAA Resource Recovery interface in CICS provides an alternative to the use of EXEC CICS SYNCPOINT and EXEC CICS SYNCPOINT ROLLBACK commands. The SRRCMIT call is equivalent to the EXEC CICS SYNCPOINT command, and the SRRBACK call is equivalent to the EXEC CICS SYNCPOINT ROLLBACK command. A single application can use SAA Resource Recovery calls, EXEC CICS commands, or a mixture of both.

Design overview

This section describes the SAA Communications and Resource Recovery interfaces.

The SAA Communications interface

When an application issues an SAA Communications call, control passes via the DFHCPLC application link-edit stub to the common programming interface program (DFHCPI), which in turn passes the request to the DFHCPIC program load module. DFHCPIC verifies the parameters, checks the conversation state, and (if required) issues a DFHLUC macro call to invoke the LU6.2 application request logic module (DFHZARL). For details of DFHZARL, see Chapter 24, “Distributed transaction processing” on page 171.

Figure 85 shows how the SAA Communications interface support relates to CICS intersystem communication (ISC) using VTAM LU6.2. The numbers in Figure 85 refer to the notes that follow it. CMxxxx represents a program call defined in the SAA Communications interface.

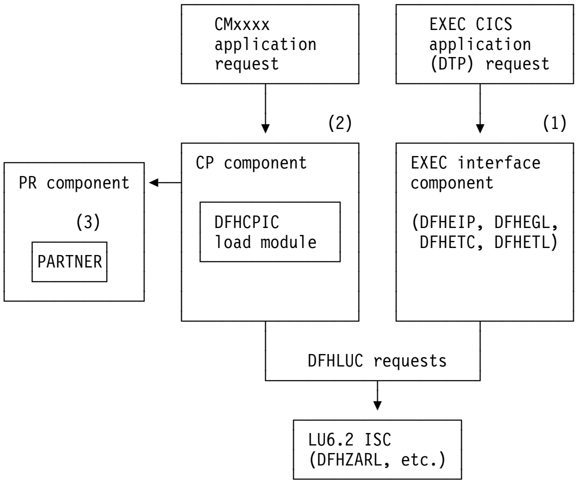


Figure 85. SAA Communications application request processing

Notes:

1. Distributed transaction processing (DTP) allows a transaction using EXEC CICS commands to communicate with a transaction running in another system. This is carried out by DFHEIP and related EXEC interface processor modules. For a VTAM LU6.2 intersystem link, each request is converted into DFHLUC macro requests that call DFHZARL.
2. The SAA Communications interface is implemented by the DFHCPIC load module within the CP (or CPI) component. DFHCPIC maps the CMxxxx application requests into DFHLUC macro calls.
3. To begin a conversation, the SAA Communications interface requires specific information (side information) about the partner program, including its name and system details. This is implemented within CICS as an RDO object called the PARTNER, which is encapsulated by the partner resource manager (PR) component. Further details of the PR component are given under Chapter 58, "Partner resource manager" on page 429.

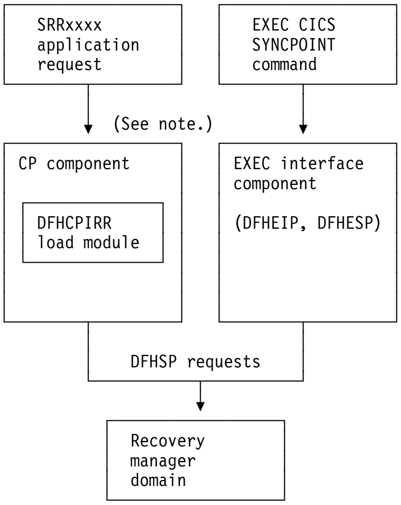
Using the SAA Communications interface on recoverable conversations: When using the SAA Communications interface on recoverable conversations (that is, conversations with the synclevel set to CM_SYNC_POINT), DFHLUC syncpoint requests are routed to DFHZARL via the SAA Communications interface syncpoint request handler (DFHCPSRH) in the DFHCPIC load module. This allows the conversation state to be tracked.

For the equivalent EXEC CICS synclevel 2 conversations, DFHLUC syncpoint requests pass directly to DFHZARL.

The SAA Resource Recovery interface

When an application issues an SAA Resource Recovery call, control passes via the DFHCPLRR application link-edit stub to the common programming interface program (DFHCPI), which in turn passes the request to the DFHCPIRR program load module. DFHCPIRR verifies the parameters, and (if required) issues an appropriate DFHSP macro call: DFHSP TYPE=USER for SRRCMIT, or DFHSP TYPE=ROLLBACK for SRRBACK.

Figure 86 shows how the SAA Resource Recovery interface support relates to the processing of EXEC CICS SYNCPOINT commands. The number in the figure refers to the accompanying note. SRRxxxx represents a program call defined in the SAA Resource Recovery interface, namely, SRRBACK or SRRCMIT.



Note: The SAA Resource Recovery interface is implemented by the DFHCPIRR load module within the CP (or CPI) component. DFHCPIRR maps SRRxxxx application requests into DFHSP macro calls.

Figure 86. SAA Resource Recovery application request processing

Functions provided by the CPI component

Table 79 summarizes the external subroutine interfaces provided by the CPI component. It shows the subroutine call formats, the level-1 trace point IDs of the modules providing the functions for these formats, and the functions provided.

Table 79. CPI component's subroutine interfaces

Format	Trace	Function
CPIN	AP 0C01 AP 0C02	START_INIT COMPLETE_INIT
CPSP	AP 0CD0 AP 0CD1	SYNCPOINT_REQUEST

CPIN format, START_INIT function

The START_INIT function of the CPIN format is used to attach a CICS task to perform initialization of the CPI component.

Input parameters: None.

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

OK|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	GETMAIN_FAILED, ADD_SUSPEND_FAILED

CPIN format, COMPLETE_INIT function

The COMPLETE_INIT function of the CPIN format is used to wait for the initialization task attached by the START_INIT function to complete processing.

Input parameters: None.

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|DISASTER|KERNERROR
```

[REASON] is returned when RESPONSE is DISASTER. It has this value:

```
INIT_TASK_FAILED
```

CPSP format, SYNCPOINT_REQUEST function

The SYNCPOINT_REQUEST function of the CPSP format is used to send LU6.2 syncpoint flows on recoverable conversations using the SAA Communications interface, and to update the conversation state as required.

Input parameters

CPC_ADDRESS is the address of the SAA Communications conversation control block (CPC).

LUC_ADDRESS is the address of the DFHLUC parameter list.

Output parameters

RESPONSE is the subroutine's response to the call. It can have either of these values:

```
OK|KERNERROR
```

Modules

Module	Function
DFHAPTRF	Trace interpreter for the SAA Communications and Resource Recovery interfaces
DFHCPARH	SAA Communications application request handler (entry processor for all application calls to the DFHCPIC load module, routing them to the appropriate DFHCPCxx module)
DFHCPCxx	Components of the DFHCPIC load module, each object module typically handling a different CMxxxx application request (see "CICS load modules" on page 808 for a list of object modules link-edited together to form the DFHCPIC load module, and Chapter 104, "CICS directory" on page 715 for brief descriptions of their functions)
DFHCPDUF	Offline system dump formatter for CP keyword
DFHCPI	Common programming interface program (link-edited with DFHEIP and DFHAICBP to form the DFHAIP load module)
DFHCPIN1	Initialization management program for the SAA Communications and Resource Recovery interfaces
DFHCPIN2	Runs as a CICS task to perform initialization for the SAA Communications and Resource Recovery interfaces
DFHCPIR	SAA Resource Recovery entry processor, handling all calls to the DFHCPIRR load module
DFHCPLC	Link-edit stub for applications using the SAA Communications interface
DFHCPLRR	Link-edit stub for applications using the SAA Resource Recovery interface
DFHCPSRH	SAA Communications syncpoint request handler (part of the DFHCPIC load module)

Exits

No global user exit points are provided for this component.

Trace

The following point ID is provided for this component:

- AP 0Cxx, for which the trace levels are CP 1, CP 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 68. Scheduler Services domain(SH)

The scheduler services domain (also sometimes known simply as "scheduler services") is used to harden schedule requests between UOWs and to route schedule requests to a target region identified by the distributed routing exit program. A schedule request may be viewed as a request to undertake a piece of work, execute a named transaction. The domain is part of CICS business transaction services.

Scheduler services domain's specific gate

Table 80 summarizes the scheduler services domain's specific gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and whether or not the functions are available through the exit programming interface (XPI).

Table 80. Scheduler services domain's specific gate

Gate	Trace	Function	XPI
SHPR	SH 0151	ADD_PENDING_REQUEST	NO
	SH 0152	DELETE_PENDING_REQUEST	NO
		SET_BOUND_REQUEST	NO
SHRT	SH 0141	SET_EXIT_PROGRAM	NO
	SH 0142	INQUIRE_EXIT_PROGRAM	NO
SHRQ	SH 0111	PERFORM_RESTART_DREDGE	NO
	SH 0112	PERFORM_REGULAR_DREDGE	NO
		PERFORM_SHUTDOWN	NO
SHRR	SH 0161	ROUTE_REQUEST	NO
	SH 0162	RECEIVE_REQUEST	NO
		RETRY_REQUEST	NO

SHPR gate, ADD_PENDING_REQUEST function

The ADD_PENDING_REQUEST function of the SHPR gate is used to add a pending schedule request to the scheduler services queue associated with this UOW. The pending schedule requests are hardened to the scheduler services local request queue (LRQ) as part of syncpoint processing.

Input parameters

TRANID is an 4-character transaction id.

USERID is an 8-character userid.

TIME is a string of length 8, used when a request is delayed for a period time.

TOKEN is a string of length 4, used to identify the pending queue.

BALANCE indicates whether this schedule request is eligible for workload balancing. It can have either of these values:

YES|NO

PTYPE is the 8-character process type.

PNAME is the 36-character process name.

ACTIVITY_ID is a block containing the activity id.

ACTIVITY_REQUEST_BLOCK is a block containing the BAM domain activity request block.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

SHPR gate, DELETE_PENDING_REQUEST function

The DELETE_PENDING_REQUEST of the SHPR gate is used to delete a pending request queue.

Input parameters

TOKEN is a string of length 4, which identifies the queue to be deleted.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|PURGED|INVALID|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	REQUEST_NOT_FOUND

SHPR gate, SET_BOUND_REQUEST function

The SET_BOUND_REQUEST function of the SHPR gate is used to update the schedule request to indicate that a process and/or activity has completed.

Input parameters

ACTIVITY_COMPLETE indicates whether the activity associated with this UOW has completed. It can have either of these values:

YES|NO

PROCESS_COMPLETE indicates whether the process associated with this UOW has completed. It can have either of these values:

YES|NO

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	REQUEST_NOT_FOUND

SHRT gate, SET_EXIT_PROGRAM function

The SET_EXIT_PROGRAM function of the SHRT gate is used to alter the distributed routing exit program, initially named on the DSRTPGM system initialisation parameter. The sysid of the local system is passed during CICS initialisation.

Input parameters

PROGRAM_NAME is the 8-character exit program name.

LOCAL_SYSID is the 4-character local sysid.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND

SHRT gate, INQUIRE_EXIT_PROGRAM function

The INQUIRE_EXIT_PROGRAM function of the SHRT gate is used to return the name of the distributed routing exit program, initially named on the DSRTPGM system initialisation parameter.

Input parameters

PROGRAM_NAME is the 8-character exit program name.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND

SHRQ gate, PERFORM_RESTART_DREDGE function

The PERFORM_RESTART_DREDGE of the SHRQ gate is used to initiate the dredging of expired schedule requests on the local request queue (LRQ) after a CICS system restart.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

SHRQ gate, PERFORM_REGULAR_DREDGE function

The PERFORM_REGULAR_DREDGE function of the SHRQ gate initiates the periodic dredging of expired schedule requests on the local request queue (LRQ).

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

SHRQ gate, PERFORM_SHUTDOWN function

The PERFORM_SHUTDOWN function of the SHRQ gate is used to stop dredging of schedule requests on the local request queue (LRQ), preventing any further CICS BTS work from being initiated.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

SHRR gate, ROUTE_REQUEST function

The ROUTE_REQUEST function of the SHRR gate is used to identify a target region to which a schedule request should be routed.

Input parameters

REQUEST_BUFFER is a buffer used to hold the schedule request which is to be routed.

Output parameters

SYSID is the 4-character sysid of the region to which the schedule request should be routed.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_REQUEST_FOUND, REQUEST_BUFFER_TOO_SMALL, NO_SYSTEM

SHRR gate, RECEIVE_REQUEST function

The RECIEVE_REQUEST function of the SHRR gate is used to receive a schedule request once it has been routed to the target region.

Input parameters

REQUEST_BUFFER is a buffer used to hold the received schedule request.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_REQUEST_RECEIVED

SHRR gate, RETRY_REQUEST function

The RETRY_REQUEST function of the SHRR gate is used obtain another target region if the initial attempt at routing the schedule request fails.

Input parameters

REQUEST_BUFFER is a buffer used to hold the schedule request which is to be routed.

ROUTE_ERROR indicates the reason why the routing of the schedule request failed. It can have a value of:

`SYSID_NOT_FOUND|SYSID_OUT_OF_SERVICE|NO_SESSIONS|ALLOCATE_REJECTED|QUEUE_PURGED|FUNC_NOT_SUPPORTED|LEGERR|PGMIDERR|INVREQ|NOTAUTH|TERMERR`

Output parameters

SYSID is the 4-character sysid of the region to which the schedule request should be routed.

LOCAL indicates whether we should retry the schedule request on the local region. It can take the values:

`YES|NO`

ABEND_CODE is the 4-character abend code.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|INVALID|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_REQUEST_FOUND, REQUEST_BUFFER_TOO_SMALL, NO_SYSTEM

Scheduler service domain's generic gates

Table 81 summarizes the scheduler services domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 81. Scheduler services domain's generic gates

Gate	Trace	Function	Format
DMDM	SH 0101 SH 0102	PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
XMAC	SH 0121 SH 0122	INIT_XM_CLIENT BIND_XM_CLIENT RELEASE_XM_CLIENT	XMAC
RMDE	SH 0131 SH 0132	START_DELIVERY DELIVER_RECOVERY END_DELIVERY	RMDE
RMKP	SH 0131 SH 0132	TAKE_KEYPOINT	RMKP
RMRO	SH 0131 SH 0132	PERFORM_PERPARE PERFORM_COMMIT PERFORM_SHUNT PERFORM_UNSHUNT START_BACKOUT DELIVER_BACKOUT END_BACKOUT	RMDE
TISR	SH 0701 SH 0702	NOTIFY	TISR
KETI	SH 0701 SH 0702	NOTIFY_RESET	KETI

For descriptions of these functions and their input and output parameters, refer to the §s dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—“Domain manager domain’s generic formats” on page 195

Format XMAC—Chapter 93, “Transaction manager domain (XM)” on page 627

Format RMDE—“Recovery Manager domain’s call back formats” on page 474

Format RMRO—“Recovery Manager domain’s call back formats” on page 474

Format RMKP—“Recovery Manager domain’s call back formats” on page 474

Format TISR—“Timer domain’s specific gate” on page 605

Format KETI—“Kernel domain’s specific gates” on page 357

When invoked for the DMDM INITIALIZE_DOMAIN function scheduler services obtains its anchor block and initializes its various classes. This would include starting the scheduler services system task , CSHY and obtaining the name of the distributed routing exit program named on the DSRTPGM system initialization parameter.

When invoked by transaction manager via the XMAC generic gate, for INIT_XM_CLIENT SH domain obtains a user token in order to set up the correct transaction environment. For BIND_XM_CLIENT SH domain initializes recoverable resources, which includes setting the RM work token and logging a backout request for this UOW. SH domain also determines the name of the program to be invoked on the initial program link.

When invoked for the RMRO PERFORM_PREPARE function SH domain prepares to commit the pending request for the UOW by adding them to the local request queue (LRQ). On receipt of the RMRO PERFORM_COMMIT the schedule requests for this UOW are committed or destroyed, depending upon whether we are committing forwards or backwards.

When invoked for the RMDE DELIVER_RECOVERY function SH domain recreates the pending request queues and in the case of inflight UOWs attempts to retry the associated BTS activation.

Scheduler services makes use of the TISR functions, REQUEST_ NOTIFY_INTERVAL and NOTIFY to deal with delayed schedule requests i.e. EXEC CICS DEFINE TIMER calls.

The KETI interface is used when the time is adjusted, causing the time at which delayed schedule requests are to expire to be recalculated.

Modules

Module	Function
DFHSHDM	Handles the following requests: PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHSHRM	Handles the following requests: PERFORM_PREPARE PERFORM_COMMIT START_BACKOUT DELIVER_BACKOUT END_BACKOUT PERFORM_SHUNT PERFORM_UNSHUNT TAKE_KEYPOINT START_DELIVERY DELIVER_RECOVERY END_DELIVERY
DFHSHXM	Handles the following requests: INIT_XM_CLIENT BIND_XM_CLIENT RELEASE_XM_CLIENT
DFHSHTI	Handles the following requests: NOTIFY NOTIFY_RESET
DFHSHRQ	Handles the following requests: PERFORM_RESTART_DREDGE PERFORM_REGULAR_DREDGE PERFORM_SHUTDOWN
DFHSHPR	Handles the following requests: ADD_PENDING_REQUEST DELETE_PENDING_REQUEST SET_BOUND_REQUEST
DFHSHRT	Handles the following requests: SET_EXIT_PROGRAM INQUIRE_EXIT_PROGRAM
DFHSHRR	Handles the following requests: ROUTE_REQUEST RECEIVE_REUEST RETRY_REQUEST
DFHSHSY	Implements the SH domain system task, CSHY.
DFHSHRRP	The SH domain request receiving program, the back-end to SH domain DPL requests.
DFHSHRSP	The SH domain request sending program, the front-end to SH domain DPL requests.
DFHSHDUF	Formats the SH domain control blocks
DFHSHTRI	Interprets SH domain trace entries
DFHSHRE1	Initializes the SH domain request class.
DFHSHOFI	Initializes the SH domain object factory class.
DFHSHVP1	Initializes the SH domain variable length storage class.
DFHSHRT1	Initializes the SH domain request routing class.

Module	Function
DFHSHRT2	Invokes the distributed routing exit program, named on the DSRTPGM system initialization parameter.
DFHSHRQ1	Initializes the SH domain request queue class.

Trace

The point IDs for the scheduler services domain are of the form SH xxxx; the corresponding trace levels are SH 1, SH 2, and Exc.

For more information about the trace points, see the *CICS User's Handbook*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Exits

No global user exit points are provided in this domain.

Chapter 69. Security manager domain

The security manager domain provides an optional facility for checking user authority to run transactions and access resources.

Security manager domain's specific gates

Table 82 summarizes the security manager domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 82. Security manager domain's specific gates

Gate	Trace	Function	XPI
XSAD	XS 0201	ADD_USER_WITH_PASSWORD,	NO
	XS 0202	ADD_USER_WITHOUT_PASSWORD	NO
	XS 0203	DELETE_USER_SECURITY	NO
	XS 0204	INQUIRE_USER_ATTRIBUTES	NO
	XS 0205	VALIDATE_USERID	NO
XSFL	XS 0501	FLATTEN_USER_SECURITY	NO
	XS 0502	UNFLATTEN_USER_SECURITY	NO
	XS 0503		
	XS 0504		
	XS 0505		
	XS 0509		
	XS 050A		
	XS 050B		
	XS 050C		
	XS 050D		
XSIS	XS 0301	INQUIRE_REGION_USERID	NO
	XS 0302	INQ_SECURITY_DOMAIN_PARMS	NO
	XS 0303	SET_SECURITY_DOMAIN_PARMS	
	XS 0304	SET_NETWORK_IDENTIFIER	
	XS 0305	SET_SPECIAL_TOKENS	
	XS 0306		
	XS 0307		
	XS 0308		
	XS 0309		
	XS 030A		
	XS 030B		
XSLU	XS 0801	GENERATE_APPC_BIND	NO
	XS 0802	GENERATE_APPC_RESPONSE	NO
	XS 0803	VALIDATE_APPC_RESPONSE	
	XS 0804		
	XS 0805		
	XS 0806		
	XS 0807		
	XS 0808		
	XS 0809		
	XS 080A		
XSPW	XS 0601	CREATE_PASSTICKET	NO
	XS 0602	INQUIRE_PASSWORD_DATA	NO
	XS 0603	UPDATE_PASSWORD	
	XS 0604		
	XS 0605		
	XS 0606		
XSRC	XS 0701	CHECK_CICS_RESOURCE	NO
	XS 0702	CHECK_CICS_COMMAND	NO
	XS 0703	CHECK_NON_CICS_RESOURCE	NO
	XS 0704	CHECK_SURROGATE_USER	NO
	XS 0705	REBUILD_RESOURCE_CLASSES	NO
	XS 0706		
	XS 0707		
	XS 0708		
	XS 0709		
	XS 070A		
	XS 070B		
	XS 070C		
	XS 070D		
	XS 070E		
XSXM	XS 0401	ADD_TRANSACTION_SECURITY	NO
	XS 0402	DEL_TRANSACTION_SECURITY	NO
	XS 0403	END_TRANSACTION	NO
	XS 0404		
	XS 0405		
	XS 0409		

XSAD gate, ADD_USER_WITH_PASSWORD function

The ADD_USER_WITH_PASSWORD function of the XSAD gate is used to add a user to the security domain and verify the associated password or oidcard.

Input parameters

USERID is the identifier of the user (a userid of 1 through 10 alphanumeric characters) to be added to the security domain.

USERID_LENGTH is the length of the USERID value.

[PASSWORD] is the current password, 1 through 10 alphanumeric characters, for the userid specified by the USERID value.

[PASSWORD_LENGTH] is the 8-bit length of the PASSWORD value. This parameter is only valid if PASSWORD is also specified.

[NEW_PASSWORD] is a new password, 1 through 10 alphanumeric characters, to be assigned to the userid (specified by the USERID value). This parameter is only valid if PASSWORD is also specified.

[NEW_PASSWORD_LENGTH] is the 8-bit length of the NEW_PASSWORD value. This parameter is only valid if NEW_PASSWORD is also specified.

[OIDCARD] is an optional oidcard (operator identification card); a 65-byte field containing further security data from a magnetic strip reader (MSR) on 32xx devices.

[GROUPID] is an optional identifier, 1 through 10 alphanumeric characters, of a RACF user group to which the userid (specified by the USERID value) is to be assigned.

[GROUPID_LENGTH] is the 8-bit length of the GROUPID value. This parameter is only valid if GROUPID is also specified.

[ENTRY_PORT_NAME] is an optional name of an entry port, 1 through 8 alphanumeric characters, to be assigned to the userid (specified by the USERID value).

[ENTRY_PORT_TYPE] is the type of the optional entry port to be assigned to the userid (specified by the USERID value). It can have either of these values:

```
TERMINAL|CONSOLE
```

This parameter is only valid if ENTRY_PORT_NAME is also specified.

SIGNON_TYPE is the type of signon for the userid (specified by the USERID value). It can have any of these values:

```
ATTACH_SIGN_ON|DEFAULT_SIGN_ON|IRC_SIGN_ON|
LU61_SIGN_ON|LU62_SIGN_ON|NON_TERMINAL_SIGN_ON|
PRESET_SIGN_ON|USER_SIGN_ON|XRF_SIGN_ON
```

Output parameters

SECURITY_TOKEN is the token identifying the userid.

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	APPLICATION_NOTAUTH, ENTRY_PORT_NOTAUTH, ESM_INACTIVE, ESM_TRANQUIL, GETMAIN_FAILURE , GROUP_ACCESS_REVOKED, INVALID_GROUPID , INVALID_NEW_PASSWORD, OIDCARD_NOTAUTH , OIDCARD_REQUIRED, PASSWORD_REQUIRED, PASSWORD_EXPIRED, PASSWORD_NOTAUTH, SECLABEL_FAILURE, SECURITY_INACTIVE, UNKNOWN_ESM_ERROR, USERID_NOT_IN_GROUP, USERID_REVOKED, USERID_UNDEFINED

XSAD gate, ADD_USER_WITHOUT_PASSWORD function

The ADD_USER_WITHOUT_PASSWORD function of the XSAD gate is used to add a user to the security domain *without* verification of a associated password or oidcard.

Input parameters

USERID is the identifier of the user (a userid of 1 through 10 alphanumeric characters) to be added to the security domain.

USERID_LENGTH is the 8-bit length of the USERID value.

[GROUPID] is an optional identifier, 1 through 10 alphanumeric characters, of a RACF user group to which the userid (specified by the USERID value) is to be assigned.

[GROUPID_LENGTH] is the 8-bit length of the GROUPID value. This parameter is only valid if GROUPID is also specified.

[GROUPID] is the RACF user group to which the userid (specified by the USERID value) is to be assigned.

[ENTRY_PORT_NAME] is an optional name of an entry port, 1 through 8 alphanumeric characters, to be assigned to the userid (specified by the USERID value).

[ENTRY_PORT_TYPE] is the type of the optional entry port to be assigned to the userid (specified by the USERID value). It can have either of these values:

```
TERMINAL|CONSOLE
```

This parameter is only valid if ENTRY_PORT_NAME is also specified.

SIGNON_TYPE is the type of signon for the userid (specified by the USERID value). It can have any of these values:

```
ATTACH_SIGN_ON|DEFAULT_SIGN_ON|IRC_SIGN_ON|
LU61_SIGN_ON|LU62_SIGN_ON|NON_TERMINAL_SIGN_ON|
PRESET_SIGN_ON|USER_SIGN_ON|XRF_SIGN_ON
```

Output parameters

SECURITY_TOKEN is the token identifying the userid.

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	APPLICATION_NOTAUTH, ENTRY_PORT_NOTAUTH, ESM_INACTIVE, ESM_TRANQUIL, GETMAIN_FAILURE , GROUP_ACCESS_REVOKED, INVALID_GROUPID , SECLABEL_FAILURE, SECURITY_INACTIVE, UNKNOWN_ESM_ERROR, USERID_NOT_IN_GROUP, USERID_REVOKED, USERID_UNDEFINED

XSAD gate, DELETE_USER_SECURITY function

The DELETE_USER_SECURITY function of the XSAD gate is used to delete the storage held to store the ACEE and ACEE pointer for the user represented by the security token.

Input parameters

SECURITY_TOKEN is the token identifying the userid.

SIGNOFF_TYPE is the type of signoff for the userid identified by the SECURITY_TOKEN value. It can have any of these values:

```
ABNORMAL_SIGN_OFF|ATTACH_SIGN_OFF|DEFERRED_SIGN_OFF|
DELETE_SIGN_OFF|LINK_SIGN_OFF|NON_TERMINAL_SIGN_OFF|
PRESET_SIGN_OFF|UNFLATTEN_USER_SIGN_OFF|
USER_SIGN_OFF|XRF_SIGN_OFF
```

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ESM_INACTIVE, ESM_TRANQUIL, INVALID_SECURITY_TOKEN, SECURITY_INACTIVE, SECURITY_TOKEN_IN_USE, UNKNOWN_ESM_ERROR

XSAD gate, INQUIRE_USER_ATTRIBUTES function

The INQUIRE_USER_ATTRIBUTES function of the XSAD gate is used to inquire about the attributes of the user represented by the security token.

Input parameters

SECURITY_TOKEN is the token identifying the userid.

[USERNAME] is an optional buffer into which the attributes of the user are placed.

Output parameters

[USERID] is the identifier of the user (a userid of 1 through 10 alphanumeric characters). the userid (specified by the SECURITY_TOKEN value) is assigned.

USERID_LENGTH is the length of the USERID value.

[CURRENT_GROUPID] is the identifier, 1 through 10 alphanumeric characters, of the current RACF user group to which the userid (specified by the SECURITY_TOKEN value) is assigned.

[CURRENT_GROUPID_LENGTH] is the 8-bit length of the GROUPID value.

[NATIONAL_LANGUAGE] is a three-character code identifying the national language for the userid. It can have any of the values in Table 83 on page 500.

[OPCLASS] is the operator class, in the range 1 through 24, for the userid.

[OPIDENT] is the operator identification code, 1 through 3 alphanumeric characters, for the userid.

[OPPRTYT] is the operator priority value, in the range 0 through 255 (where 255 is the highest priority), for the userid.

[TIMEOUT] is the number of minutes, in the range 0 through 60, that must elapse since the user last used the terminal before CICS "times-out" the terminal.

Notes:

1. CICS rounds values up to the nearest multiple of 5.
2. A TIMEOUT value of 0 means that the terminal is not timed out.

[XRFSOFF] indicates whether or not you want CICS to sign off the userid following an XRF takeover. It can have either of these values:

```
FORCE|NOFORCE
```

[ACEE_PTR] is a pointer to the access control environment element, the control block that is generated by an external security manager (ESM) when the user signs on. If the user is not signed on, the address of the CICS DFLTUSER's ACEEis returned. If an ACEE does not exist, CICS sets the pointer reference to the null value, X'FF000000'.

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	ESTAE_FAILURE, EXTRACT_FAILURE, INVALID_ACEE, INVALID_ESM_PARAMETER, INVALID_SECURITY_TOKEN, NOTAUTH, PROFILE_UNKNOWN, SECURITY_INACTIVE

Table 83. National language codes (three-characters)

Code	Language Name	Original Name	Principal Country
AFR	Afrikaans	Afrikaans	South Africa
ARA	Arabic	Arabi	Arab Countries
BEL	Byelorussian	Belaruskaja (mova)	Belarus
BGR	Bulgarian	Bulgarski	Bulgaria
CAT	Catalan	Catala	Spain
CHT	Traditional Chinese	Zhongwen	R.O.C.
CHS	Simplified Chinese		P.R.C.
CSY	Czech	Cesky	Czechoslovakia
DAN	Danish	Dansk	Denmark
DEU	German	Deutsch	Germany
DES	Swiss German	Schweizer-Deutsch	Switzerland
ELL	Greek	Ellinika	Greece
ENA	Australian English		Australia
ENG	UK English	English	United Kingdom
ENU	US English		United States
ENP	English Upper Case		United States
ESP	Spanish	Espanol	Spain
FAR	Farsi	Persian	Iran
FIN	Finnish	Suomi	Finland
FRA	French	Francais	France
FRB	Belgian French		Belgium
FRC	Canadian French		Canada
FRS	Swiss French	Suisse-francais	Switzerland
GAE	Irish Gaelic (Irish)	Gaeilge	Ireland
HEB	Hebrew	Ivrith	Israel
HRV	Croatian	Hrvatski	Croatia
HUN	Hungarian	Magyar	Hungary
ISL	Icelandic	Islenska	Iceland
ITA	Italian	Italiano	Italy
ITS	Swiss Italian	Italiano svizzero	Switzerland
JPN	Japanese	Nihongo	Japan
KOR	Korean	Choson-o; Hanguk-o	Korea
MKD	Macedonian	Makedonski	FYR Macedonia
NLD	Dutch	Nederlands	Netherlands
NLB	Belgian Dutch		Belgium
NOR	Norwegian - Bokmal	Norsk - Bokmal	Norway
NON	Norwegian - Nynorsk	Norsk - Nynorsk	Norway
PLK	Polish	Polski	Poland
PTG	Portuguese	Portugues	Portugal
PTB	Brazilian Portuguese		Brazil
RMS	Rhaeto-Romanic	Romontsch	Switzerland
ROM	Romanian	Romana	Romania
RUS	Russian	Russkij	Russia
SHC	Serbo-Croatian (Cyr)	Srpsko-hrvatski	Yugoslavia
SHL	Serbo-Croatian (Lat)		Yugoslavia
SKY	Slovakian	Slovensky	Czechoslovakia
SLO	Slovenian	Slovenski	Slovenia
SRL	Serbian (Latin)	Srpski (Latin)	Serbia-Montenegro
SRB	Serbian	Srpski	Serbia-Montenegro
SQI	Albanian	Shqip	Albania
SVE	Swedish	Svenska	Sweden
THA	Thai	Thai	Thailand
TRK	Turkish	Turkce	Turkey
UKR	Ukrainian	Ukrainska (mova)	Ukraine
URD	Urdu	Urdu	Pakistan

XSAD gate, VALIDATE_USERID function

The VALIDATE_USERID function of the XSAD gate is used to check whether the specified userid is valid. It is used especially when the userid has to be validated without the user being added to the system; usually because the userid was specified in a deferred START command, and the user does not need to be added to the system until the started task actually begins to execute.

Input parameters

USERID is the identifier of the user (a userid of 1 through 10 alphanumeric characters) to be added to the security domain.

USERID_LENGTH is the length of the USERID value.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	SECURITY_INACTIVE, USERID_NOT_DEFINED, USERID_NOT_DETERMINED
INVALID	INVALID_FORMAT, INVALID_FUNCTION

XSFL gate, FLATTEN_USER_SECURITY function

The FLATTEN_USER_SECURITY function of the XSFL gate is used to flatten the user's security state and place into the FLATTENED_SECURITY buffer provided.

Input parameters

SECURITY_TOKEN is the token identifying the userid.

FLATTENED_SECURITY is the buffer into which the flattened security state is placed.

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ESM_ABENDED ABEND, LOOP EXCEPTION
EXCEPTION	INVALID_SECURITY_TOKEN, SECURITY_INACTIVE, UNKNOWN_ESM_RESPONSE
INVALID	INVALID_FORMAT, INVALID_FUNCTION, INVALID_FLATTENED_BUFFER

XSFL gate, UNFLATTEN_USER_SECURITY function

The UNFLATTEN_USER_SECURITY function of the XSFL gate is used to unflatten the user security state data in the FLATTENED_SECURITY buffer, and add the userid to the security domain.

Input parameters

FLATTENED_SECURITY is a buffer containing flattened security state data for a userid.

Output parameters

SECURITY_TOKEN is the token identifying the userid.

[ACEE_PTR] is a pointer to the access control environment element, the control block that is generated by an external security manager (ESM) when the user signs on.

USERID is the identifier of the user (a userid of 1 through 10 alphanumeric characters). the userid (specified by the SECURITY_TOKEN value) is assigned.

USERID_LENGTH is the length of the USERID value.

CURRENT_GROUPID is the identifier, 1 through 10 alphanumeric characters, of the current RACF user group to which the userid is assigned.

CURRENT_GROUPID_LENGTH is the 8-bit length of the GROUPID value.

ENTRY_PORT_NAME is the name of an entry port, 1 through 8 alphanumeric characters, for the userid.

[ENTRY_PORT_TYPE] is the type of the entry port for the userid. It can have either of these values:

`TERMINAL|CONSOLE|NULL`

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ESM_ABENDED, ABEND, LOOP
EXCEPTION	SECURITY_INACTIVE, GETMAIN_FAILED, USERID_NOT_DEFINED, USERID_REVOKED, USERID_NOT_IN_GROUP, GROUP_ACCESS_REVOKED, ENTRY_PORT_NOTAUTH, APPLID_NOTAUTH, SECLABEL_CHECK_FAILED, ESM_INACTIVE, ESM_TRANQUIL, UNKNOWN_ESM_RESPONSE
INVALID	INVALID_FLATTENED_BUFFER, INVALID_FORMAT, INVALID_FUNCTION

XSIS gate, INQUIRE_REGION_USER function

The INQUIRE_REGION_USER function of the XSIS gate is used to return the userid and groupid associated with the jobstep that is currently executing this CICS region.

Input parameters: None.

Output parameters

REGION_USERID is the user identifier of the CICS jobstep (a userid of 1 through 8 alphanumeric characters).

REGION_USERID_LENGTH is the length of the REGION_USERID value.

[REGION_GROUPID] is the identifier, 1 through 8 alphanumeric characters, of the current RACF user group to which the region userid is assigned.

[REGION_GROUPID_LENGTH] is the 8-bit length of the REGION_GROUPID value.

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	ESM_INACTIVE
INVALID	INVALID_FORMAT, INVALID_FUNCTION

XSIS gate, INQ_SECURITY_DOMAIN_PARMS function

The INQ_SECURITY_DOMAIN_PARMS function of the XSIS gate is used to return the current values of parameters from the security state data.

Input parameters: None.

Output parameters

APPLID is the generic applid of the CICS region

CMDSEC indicates whether or the CICS region should obey the CMDSEC option specified on a transaction's resource definition. It can have either of these values:

YES|NO

ESMEXITS indicates whether or not installation data is to be passed via the RACROUTE interface to the ESM for use in user exits written for the ESM. It can have either of these values:

YES|NO

PREFIX returns the value of the prefix that is being applied to all resource names in authorization requests sent to the external security manager. It can contain 0 through 8 alphanumeric characters.

PSBCHK indicates whether or not DL/I security checking is to be performed for a remote terminal initiating a transaction with transaction routing. It can have either of these values:

YES|NO

RESSEC indicates whether the CICS region should obey the RESSEC option specified on a transaction's resource definition.

SECURITY indicates whether or not security is active for this CICS region. It can have either of these values:

YES|NO

XAPPC indicates whether or not session security checking is used when establishing APPC sessions. It can have either of these values:

YES|NO

[XCMD] indicates whether or not EXEC CICS commands are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for EXEC CICS commands.

[XDCT] indicates whether or not destination control entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for destination control entries.

[XFCT] indicates whether or not file control entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for file control entries.

[XJCT] indicates whether or not journal entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for journal entries.

[XPCT] indicates whether or not EXEC-started transactions entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for EXEC-started transactions entries.

[XPPT] indicates whether or not program entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for program entries.

[XPSB] indicates whether or not PSB entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for PSB entries.

[XTRAN] indicates whether or not attached transaction entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for attached transaction entries.

[XTST] indicates whether or not temporary storage entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for temporary storage entries.

XUSER indicates whether or not user entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for user entries.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|DISASTER|INVALID`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FORMAT, INVALID_FUNCTION

XSIS gate, SET_SECURITY_DOMAIN_PARMS function

At CICS startup, loads information for the security domain from the system initialization table (SIT) into the security state data.

Input parameters

APPLID is the generic applid of the CICS region

CMDSEC indicates whether or the CICS region should obey the CMDSEC option specified on a transaction’s resource definition. It can have either of these values:

YES|NO

ESMEXITS indicates whether or not installation data is to be passed via the RACROUTE interface to the ESM for use in user exits written for the ESM. It can have either of these values:

YES|NO

PREFIX specifies the prefix to be applied to resource name in any authorization requests send to the external security manager. It can be 1 through 8 alphanumeric characters, or the single character '*', which indicates that the CICS region userid is to be used as the prefix.

PSBCHK indicates whether or not DL/I security checking is to be performed for a remote terminal initiating a transaction with transaction routing. It can have either of these values:

YES|NO

RESSEC indicates whether the CICS region should obey the RESSEC option specified on a transaction’s resource definition.

SECURITY indicates whether or not security is active for this CICS region. It can have either of these values:

YES|NO

XAPPC indicates whether or not session security checking is used when establishing APPC sessions. It can have either of these values:

YES|NO

[XCMD] indicates whether or not EXEC CICS commands are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for EXEC CICS commands.

[XDCT] indicates whether or not destination control entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for destination control entries.

[XFCT] indicates whether or not file control entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for file control entries.

[XJCT] indicates whether or not journal entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for journal entries.

[XPCT] indicates whether or not EXEC-started transactions entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for EXEC-started transactions entries.

[XPPT] indicates whether or not program entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for program entries.

[XPSB] indicates whether or not PSB entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for PSB entries.

[XTRAN] indicates whether or not attached transaction entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for attached transaction entries.

[XTST] indicates whether or not temporary storage entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for temporary storage entries.

XUSER indicates whether or not user entries are checked by the ESM. It can have any of these values:

YES|name|NO

where *name* is your own resource class name for user entries.

Output parameters

RESPONSE is the domains response to the call. It can have any of these values:

OK|DISASTER|INVALID

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	CWA_WAIT_PHASE_FAILURE, INQUIRE_CWA_FAILURE, ABEND, LOOP
INVALID	INVALID_FORMAT, INVALID_FUNCTION

XSIS gate, SET_NETWORK_IDENTIFIER function

When CICS issues an OPEN ACB for VTAM, the CICS SVC is invoked to store the name (netid) of the local network combined with the local luname, and to RACLIST the profiles in the External Security Manager (ESM) APPCLU Class. If you have specified either of the SEC=NO or XAPPC=NO system initialization parameters, no action is performed, and the return code is set to OK.

If the RACLIST fails, and the CONDITIONAL parameter is NO, then CICS is terminated.

Input parameters

LOCAL_LUNAME is the VTAM LU name of the local CICS region.

LOCAL_LUNAME_LENGTH is the length of the VTAM LU name specified by LOCAL_LUNAME.

CONDITIONAL indicates whether or not CICS can tolerate errors in XSIS calls due to the APPCLU profiles not being in storage (LU6.2 connections cannot be validated). It can have either of these values:

YES|NO

Output parameters

RESPONSE is the domains response to the call. It can have any of these values:

OK|DISASTER|INVALID|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FORMAT, INVALID_FUNCTION

XSLU gate, GENERATE_APPC_BIND function

The GENERATE_APPC_BIND function of the XSLU gate generates a random number which is sent to the partner LU for partner verification.

Input parameters: None

Output parameters

RANDOM_STRING A random eight-character string.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|INVALID`

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT INVALID_FUNCTION

XSLU gate, GENERATE_APPC_RESPONSE function

The GENERATE_APPC_RESPONSE function of the XSLU gate encrypts the string received from the LU partner, and generates a new random string for the partner to validate.

Input parameters

LOCAL_LUNAME is the VTAM LU name of the local CICS region (sending the response).

REMOTE_LUNAME is the VTAM LU name of the remote CICS region (that sent the bind).

TEST_STRING is a random eight-character string receive with a bind request (RANDOM_STRING of the GENERATE_APPC_BIND function).

Output parameters

ENCRYPTED_TEST_STRING is an eight-character string formed by encrypting the test string using shared DES (Data Encryption Standard/System) encryption keys.

RANDOM_STRING is a random eight-character string.

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, ESM_ABENDED, ESTAE_FAILURE, EXTRACT_FAILURE
EXCEPTION	NOTAUTH, PROFILE_UNKNOWN, PROFILE_LOCKED, PROFILE_EXPIRED, SESSION_KEY_NULL, SECURITY_INACTIVE, UNKNOWN_ESM_RESPONSE
INVALID	INVALID_FORMAT INVALID_FUNCTION

XSLU gate, VALIDATE_APPC_RESPONSE function

The VALIDATE_APPC_RESPONSE function of the XSLU gate encrypts the string that was previously sent to the partner, and compares it with the encrypted string received from the partner.

Input parameters

LOCAL_LUNAME is the VTAM LU name of the local CICS region (validating the response).

REMOTE_LUNAME is the VTAM LU name of the remote CICS region (that sent the response).

TEST_STRING is a random eight-character string receive with a validate request (RANDOM_STRING of the GENERATE_APPC_RESPONSE function).

ENCRYPTED_TEST_STRING is an eight-character string formed by encrypting the test string using shared DES (Data Encryption Standard/System) encryption keys.

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, ESM_ABENDED, ESTAE_FAILURE, EXTRACT_FAILURE
EXCEPTION	NOTAUTH, VALIDATION_ERROR, PROFILE_UNKNOWN, PROFILE_LOCKED, PROFILE_EXPIRED, SESSION_KEY_NULL, SECURITY_INACTIVE, UNKNOWN_ESM_RESPONSE
INVALID	INVALID_FORMAT INVALID_FUNCTION

XSPW gate, CREATE_PASSTICKET function

The CREATE_PASSTICKET function of the XSPW gate is used to create a RACF PassTicket (an alternative to a password). When created, the RACF PassTicket can be presented for userid verification ***once only***.

Input parameters

APPLID is the application identifier for the CICS region.

[TRANSACTION_NUMBER] is an optional number that identifies a transaction from which the caller's security token is located. If not specified, the caller's security token is located from the principal security token associated with the current CICS task.

Output parameters

PASSTICKET is the 10-character passticket to be used for the CICS region specified by the APPLID value.

PASSTICKET_LENGTH is the 8-bit length of the PASSTICKET value.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	FUNCTION_UNAVAILABLE, PASSTICKET_NOT_CREATED, SECURITY_INACTIVE, TRANSACTION_NOT_FOUND, UNKNOWN_ESM_ERROR
INVALID	INVALID_APPLID, INVALID_FORMAT, INVALID_FUNCTION

XSPW gate, INQUIRE_PASSWORD_DATA function

The INQUIRE_PASSWORD_DATA function of the XSPW gate provides information from the ESM.

Input parameters

USERID is the identifier of the user (a userid of 1 through 10 alphanumeric characters) requesting the ESM information.

USERID_LENGTH is the length of the USERID value.

PASSWORD is the password, 1 through 10 alphanumeric characters, for the userid specified by the USERID value.

PASSWORD_LENGTH is the 8-bit length of the PASSWORD value.

Output parameters

[DAYS_LEFT] is the number of days left before the password must be changed.

[PASSWORD_FAILURES] is the number of times that the user has unsuccessfully entered tried to enter the password.

[EXPIRY_ABSTIME] is the date and time of when the password will expire.

[LASTUSE_ABSTIME] is the date and time of when the password was last used.

[CHANGE_ABSTIME] is the date and time of when the password was last changed.

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, ESM_ABENDED, ESTAE_FAILURE, EXTRACT_FAILURE
EXCEPTION	ESM_INACTIVE, PASSWORD_NOTAUTH, SECURITY_INACTIVE, UNKNOWN_ESM_ERROR, NOTAUTH, USERID_UNDEFINED, PASSWORD_EXPIRED, USERID_REVOKED
INVALID	INVALID_FORMAT INVALID_FUNCTION

XSPW gate, UPDATE_PASSWORD_DATA function

The UPDATE_PASSWORD_DATA function of the XSPW gate assigns a new password to the userid, if the current password is input correctly and the new password meets ESM and installation defined password quality rules.

Input parameters

USERID is the identifier of the user (a userid of 1 through 10 alphanumeric characters) requesting the ESM information.

USERID_LENGTH is the length of the USERID value.

PASSWORD is the current password, 1 through 10 alphanumeric characters, for the userid specified by the USERID value.

PASSWORD_LENGTH is the 8-bit length of the PASSWORD value.

NEW_PASSWORD is the new password, 1 through 10 alphanumeric characters, for the userid specified by the USERID value.

NEW_PASSWORD_LENGTH is the 8-bit length of the NEW_PASSWORD value.

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, ESM_ABENDED, ESTAE_FAILURE, EXTRACT_FAILURE
EXCEPTION	USERID_REVOKED, USERID_UNDEFINED, SECLABEL_FAILURE, PASSWORD_NOTAUTH, INVALID_NEW_PASSWORD, ESM_INACTIVE, SECURITY_INACTIVE, UNKNOWN_ESM_ERROR
INVALID	INVALID_FORMAT INVALID_FUNCTION

XSRC gate, CHECK_CICS_RESOURCE function

The CHECK_CICS_RESOURCE function of the XSRC gate performs CICS resource access checks.

Input parameters

RESOURCE is the name of the resource, padded with blanks to eight-characters.

RESOURCE_TYPE is the type of the resource. It can have any of these values:

`FILE|JOURNAL|PROGRAM|PSB|TDQUEUE|TRANSACTION|`
`TRANSATTACH|TSQUEUE`

ACCESS is the type of access to be made on the resource. It can have any of these values:

`EXECUTE|READ|UPDATE`

[LOGMESSAGE] indicates (optionally) whether access failures are logged to the CSCS transient data queue and the MVS System Management Facility (SMF). It can have either of these values:

`YES|NO`

[FORCE] indicates (optionally) whether or not security checking is forced regardless of the setting of RESSEC in the Security Domain’s transaction token. It can have either of these values:

`YES|NO`

Output parameters

[FAILING_USERID] is the userid that failed to access the resource.

[FAILING_USERID_LENGTH] is the length of the userid (specified by the FAILING_USERID value).

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOTAUTH

XSRC gate, CHECK_CICS_COMMAND function

The CHECK_CICS_COMMAND function of the XSRC gate performs CICS command access checks.

Input parameters

RESOURCE_TYPE is the type of the resource. It can have any of these values:

```
AUTINSTMODEL|AUTOINSTALL|CONNECTION|DELETSHIPPED|
DSNAME|DUMP|DUMPDS|EXITPROGRAM|FEPIRESOURCE|FILE|
IRBATCH|IRC|JOURNAL|JOURNALMODEL|LINE|LSRPOOL|
MAPSET|MODENAME|MONITOR|NONVTAM|PARTITIONSET|
PARTNER|PROFILE|PROGRAM|PSB|REQID|RESETTIME|
SECURITY|SESSIONS|SHUTDOWN|STATISTICS|STORAGE|
STREAMNAME|SYSDUMPCODE|SYSTEM|TASK|TCLASS|
TDQUEUE|TERMINAL|TIME|TRACE|TRACEDEST|
TRACEFLAG|TRACETYPE|TRANDUMPCODE|TRANSACTION|
TRANSATTACH|TSQUEUE|TYPETERM|UOW|UOWDSNFAIL|
UOWENQ|UOWLINK|VOLUME|VTAM
```

ACCESS is the type of access to be made on the resource. It can have any of these values:

`COLLECT|DEFINE|DISCARD|INQUIRE|PERFORM|SET`

[LOGMESSAGE] indicates (optionally) whether access failures are logged to the CSCS transient data queue and the MVS System Management Facility (SMF). It can have either of these values:

`YES|NO`

[FORCE] indicates (optionally) whether or not security checking is forced regardless of the setting of RESSEC in the Security Domain’s transaction token. It can have either of these values:

`YES|NO`

Output parameters

[FAILING_USERID] is the userid that failed to access the resource.

[FAILING_USERID_LENGTH] is the length of the userid (specified by the FAILING_USERID value).

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOTAUTH

XSRC gate, CHECK_SURROGATE_USER function

The CHECK_SURROGATE_USER function of the XSRC gate performs surrogate user checking.

Input parameters

USERID is the identifier of the surrogate user (a userid of 1 through 10 alphanumeric characters).

USERID_LENGTH is the length of the USERID value.

ACCESS is the type of access requested. It can have any of these values:

`INSTALL|START|CHANGE`

[LOGMESSAGE] indicates (optionally) whether access failures are logged to the CSCS transient data queue and the MVS System Management Facility (SMF). It can have either of these values:

`YES|NO`

[FORCE] indicates (optionally) whether or not security checking is forced regardless of the setting of RESSEC in the Security Domain’s transaction token. It can have either of these values:

`YES|NO`

Output parameters

[FAILING_USERID] is the userid that failed to access the resource.

[FAILING_USERID_LENGTH] is the length of the userid (specified by the FAILING_USERID value).

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOTAUTH

XSRC gate, CHECK_NON_CICS_RESOURCE function

The CHECK_NON_CICS_RESOURCE function of the XSRC gate performs non-CICS resource access checks.

Input parameters

RESOURCE_NAME is the address and length of the resource name, in the form RESOURCE_NAME(addr,length).

CLASSNAME is the ESM class name in which the resource is defined.

ACCESS is the type of access to be made on the resource. It can have any of these values:

`ALTER|CONTROL|READ|UPDATE`

[LOGMESSAGE] indicates (optionally) whether access failures are logged to the CSCS transient data queue and the MVS System Management Facility (SMF). It can have either of these values:

YES|NO

Output parameters

[FAILING_USERID] is the userid that failed to access the resource.

[FAILING_USERID_LENGTH] is the length of the userid (specified by the FAILING_USERID value).

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOTAUTH, ESM_NOT_PRESENT, ESM_INACTIVE, RESOURCE_NOT_FOUND, CLASS_NOT_FOUND, INVALID_RESOURCE_NAME

XSRC gate, REBUILD_RESOURCE_CLASSES function

The REBUILD_RESOURCE_CLASSES function of the XSRC gate rebuilds the resource-class profiles.

Input parameters: None.

Output parameters

[FAILING_USERID] is the userid that failed to access the resource.

[FAILING_USERID_LENGTH] is the length of the userid (specified by the FAILING_USERID value).

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SECURITY_INACTIVE, REBUILD_ERROR, REBUILD_ALREADY_ACTIVE

XSXM gate, ADD_TRANSACTION_SECURITY function

The ADD_TRANSACTION_SECURITY function of the XSXM gate sets the transaction options input to be stored as extended security tokens maintained by the transaction manager.

Input parameters

[PRINCIPAL_SECURITY_TOKEN] is the optional principal security token.

[SESSION_SECURITY_TOKEN] is the optional session security token.

[EDF_SECURITY_TOKEN] is the optional EDF security token.

Output parameters

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	GETMAIN_FAILED
EXCEPTION	NO_SECURITY_TOKEN
INVALID	INVALID_FORMAT, INVALID_FUNCTION

XSXM gate, DEL_TRANSACTION_SECURITY function

The DEL_TRANSACTION_SECURITY function of the XSXM gate deletes the security token of the specified token type for the transaction.

Input parameters

TOKEN_TYPE is the type of security token for the transaction. It can have any of these values:

PRINCIPAL|SESSION|EDF

Output parameters

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

Security manager domain's generic gates

Table 84 summarizes the security manager domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 84. Security manager domain's generic gates

Gate	Trace	Function	Format
XSDM	XS 0101 XS 0102	INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—"Domain manager domain's generic formats" on page 195

In initialization processing, the security manager domain performs internal routines, and sets the initial security options, as for "XSIS gate, SET_SECURITY_DOMAIN_PARMS function" on page 503.

For all starts the information comes from the system initialization parameters.

Security manager domain also issues console messages during initialization to report whether or not security is active.

In quiesce and termination processing, the security manager domain performs internal routines only.

Exits

No global user exit points are provided in this domain.

Modules

Module	Function
DFHXSAD	Handles the following requests: ADD_USER_WITH_PASSWORD, ADD_USER_WITHOUT_PASSWORD DELETE_USER_SECURITY INQUIRE_USER_ATTRIBUTES
DFHXSDM	Handles the following requests: INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHXSDUF	XS domain offline dump formatting routine
DFHXSFL	Handles the following requests: FLATTEN_USER_SECURITY UNFLATTEN_USER_SECURITY
DFHXSIS	Handles the following requests: INQUIRE_SECURITY_DOMAIN_PARMS INQUIRE_REGION_USERID SET_SECURITY_DOMAIN_PARMS SET_NETWORK_IDENTIFIER
DFHXSLU	Handles the following requests: GENERATE_APPC_BIND GENERATE_APPC_RESPONSE VALIDATE_APPC_RESPONSE
DFHXSPW	Handles the following requests: INQUIRE_PASSWORD_DATA UPDATE_PASSWORD
DFHXSRC	Handles the following requests: CHECK_CICS_RESOURCE CHECK_CICS_COMMAND CHECK_NON_CICS_RESOURCE CHECK_SURROGATE_USER REBUILD_RESOURCE_CLASSES
DFHXSSA	Manages the routing of all security domain supervisor requests, and handles those requests that are concerned with adding and deleting users.
DFHXSSB	Handles all the supervisor state interfaces with the ESM that are concerned with extracting data from the ESM's database.
DFHXSSC	Handles all the supervisor state interfaces with the ESM that are concerned with resource checking, including the building and deleting of in-storage profiles for the use of the resource check functions.
DFHXSSD	Handles supervisor state interfaces with RACF that are concerned with PassTicket generation.
DFHXSSI	Handles the following requests: DEACTIVATE_SECURITY INITIALIZE_SECURITY_SVC TERMINATE_SECURITY_SVC
DFHXSTRI	Interprets XS domain trace entries

Trace

The point IDs for the security manager domain are of the form XS xxxx; the corresponding trace levels are XS 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

External interfaces

The following external call is used by the security manager:

- MVS RACROUTE macro to request ESM services

Chapter 70. Sign-on component

The sign-on routine is a component of terminal control that associates users with terminals, connections, and sessions. Because it is a part of terminal control, it is logically part of the application (AP) domain.

Sign-on component’s subroutines

The sign-on component is entered as a single kernel-managed subroutine, DFHSNUS, which handles some function itself and also acts as a router to further kernel-managed subroutines. Table 85 summarizes the sign-on component’s subroutines. It shows the level-1 trace point IDs of the modules providing the functions for the subroutines, the functions provided by the subroutines, and whether or not the functions are available through the exit programming interface (XPI).

Table 85. Sign-on component’s subroutines

Subroutine	Trace	Function	XPI
DFHSNAS	AP 2050 AP 2051 AP 2052 AP 2053 AP 2054 AP 2055 AP 2056	SIGNON_ATI_SESSION SIGNOFF_ATI_SESSION	NO NO
DFHSNPU	AP 2070 AP 2071 AP 2072 AP 2073 AP 2074 AP 2075 AP 2076 AP 2077 AP 2078 AP 2079	SIGNON_PRESET_USERID SIGNOFF_PRESET_USERID	NO NO
DFHSNSG	AP 20C0 AP 20C1 AP 20C2 AP 20C3 AP 20C4 AP 20C5 AP 20C6	SIGNOFF_SURROGATE	NO
DFHSNSU	AP 2060 AP 2061 AP 2062 AP 2063 AP 2064 AP 2065 AP 2066 AP 2067 AP 2068 AP 2069 AP 206A AP 206B AP 206C AP 206D	SIGNON_SESSION_USERID SIGNOFF_SESSION_USERID	NO NO
DFHSNTU	AP 2080 AP 2081 AP 2082 AP 2083 AP 2084 AP 2085 AP 2086 AP 2087 AP 2088 AP 2089 AP 208A AP 208B AP 208C AP 208D AP 208E AP 208F AP 2090 AP 2091 AP 2092 AP 2093 AP 2094 AP 2095 AP 2096 AP 2097	SIGNON_TERMINAL_USER SIGNOFF_TERMINAL_USER	NO NO
DFHSNUS	AP 2040 AP 2041 AP 2042 AP 2043 AP 2044 AP 2045 AP 2046 AP 2047 AP 2048 AP 2049	SIGNON_ATTACH_HEADER SIGNOFF_ATTACH_HEADER	NO NO

DFHSNAS subroutine, SIGNON_ATI_SESSION function

The SIGNON_ATI_SESSION function of the DFHSNAS subroutine signs on the appropriate userid to a session when that session is being used by a trigger transaction specified in a DCT with DESTFAC=SYSTEM.

Input parameters

SESSION_TCTTE_PTR is the address of the TCTTE for the session to be signed on.

Output parameters

RESPONSE is the subroutine’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, UNEXPECTED_REASON, CORRUPT_USER_TOKEN, USER_DOMAIN_FAILURE, USER_TOKEN_MISMATCH
EXCEPTION	INVALID_TERMINAL_TYPE, TERMINAL_ALREADY_SIGNED_ON, SURROGATE_TERMINAL, SECURITY_INACTIVE

RESPONSE	Possible REASON values
INVALID	INVALID_FORMAT, INVALID_FUNCTION

DFHSNAS subroutine, SIGNOFF_ATI_SESSION function

The SIGNOFF_ATI_SESSION function of the DFHSNAS subroutine is used to reverse the effect of a SIGNON_ATI_SESSION.

Input parameters

SESSION_TCTTE_PTR is the address of the session TCTTE to be signed off.

Output parameters

RESPONSE is the subroutine's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, CORRUPT_USER_TOKEN, USER_DOMAIN_FAILURE, INVALID_USER_TOKEN
EXCEPTION	INVALID_TERMINAL_TYPE, TERMINAL_NOT_SIGNED_ON, SURROGATE_TERMINAL, SECURITY_INACTIVE,
INVALID	INVALID_FORMAT, INVALID_FUNCTION

DFHSNPU subroutine, SIGNON_PRESET_USERID function

The SIGNON_PRESET_USERID function of the DFHSNPU subroutine is used to sign on the userid specified in a terminal definition when that terminal is installed.

Input parameters

USERID is the userid to be assigned to the terminal.

USERID_LENGTH is the length of the userid.

TCTTE_PTR is the address of the TCTTE for the terminal to be given preset security.

[NATLANG_SUFFIX] is an optional one-character national language code to be assigned to the terminal, which will override any national language associated with the userid.

[MESSAGE] is an optional parameter that specifies whether a message is to be issued when the sign on completes successfully. It can have either of these values:

`YES|NO`

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the subroutine's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, EXCEPTION_UNKNOWN, CORRUPT_USER_TOKEN, MESSAGE_DOMAIN_FAILURE, USER_DOMAIN_FAILURE, GETMAIN_FAILED
EXCEPTION	INVALID_USERID, INVALID_NATIONAL_LANGUAGE, TERMINAL_ALREADY_SIGNED_ON, UNKNOWN_ESM_RESPONSE, SECURITY_INACTIVE, ESM_INACTIVE, TERMINAL_NOTAUTH, APPLICATION_NOTAUTH, USERID_REVOKED, TERMINAL_NOT_PRESET, GROUP_ACCESS_REVOKED, UNAVAILABLE_NATLANG, SECLABEL_CHECK_FAILED, ESM_TRANQUIL
INVALID	INVALID_FORMAT, INVALID_FUNCTION

DFHSNPU subroutine, SIGNOFF_PRESET_USERID function

The SIGNOFF_PRESET_USERID function of the DFHSNPU subroutine is used to sign off a preallocated userid from a terminal before it is deleted.

Input parameters

TCTTE_PTR is the address of the TCTTE for the terminal from which preset security is to be removed.

[MESSAGE] is an optional parameter that specifies whether a message is to be issued when the sign off completes successfully. It can have either of these values:

`YES|NO`

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the subroutine’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, CORRUPT_USER_TOKEN, FREEMAIN_FAILED
EXCEPTION	TERMINAL_NOT_SIGNED_ON, TERMINAL_NOT_PRESET, SECURITY_INACTIVE, ESM_INACTIVE, ESM_TRANQUIL, UNKNOWN_ESM_RESPONSE
INVALID	INVALID_FORMAT, INVALID_FUNCTION

DFHSNSG subroutine, SIGNOFF_SURROGATE function

The SIGNOFF_SURROGATE function of the DFHSNSG subroutine is used to sign off a userid from a surrogate terminal that is about to be deleted by the remote terminal builder. (The equivalent sign-on routine is always performed as an inline function, so no SIGNON call to DFHSNSG is ever traced.)

Input parameters

TCTTE_PTR is the address of the TCTTE for the surrogate terminal being signed off.

SESSION_TCTTE_PTR is the address of the TCTTE for the associated relay session.

Output parameters

RESPONSE is the subroutine’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

DFHSNSU subroutine, SIGNON_SESSION_USERID function

The SIGNON_SESSION_USERID function of the DFHSNSU subroutine is used to sign on the USERID (from the SESSIONS definition) or the SECURITYNAME (from the CONNECTION definition) for IRC, LU6.1, and LU6.2 sessions.

Input parameters

[USERID] is the userid to be signed on.

[USERID_LENGTH] is the length of the userid to be signed on.

SESSION_TCTTE_PTR is the address of the TCTTE for the session being signed on.

Output parameters

RESPONSE is the subroutine’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, USER_TOKEN_MISMATCH, MESSAGE_DOMAIN_FAILURE, SURROGATE_TERMINAL, USER_DOMAIN_FAILURE, XS_DOMAIN_FAILURE
EXCEPTION	INVALID_USERID, INVALID_TERMINAL_TYPE, TERMINAL_ALREADY_SIGNED_ON, UNKNOWN_ESM_RESPONSE, SECURITY_INACTIVE, ESM_INACTIVE, APPLICATION_NOTAUTH, USERID_REVOKED, GROUP_ACCESS_REVOKED, SECLABEL_CHECK_FAILED, ESM_TRANQUIL
INVALID	INVALID_FORMAT, INVALID_FUNCTION

DFHSNSU subroutine, SIGNOFF_SESSION_USERID function

The SIGNOFF_SESSION_USERID function of the DFHSNSU subroutine is used to reverse the effect of the SIGNON_SESSION_USERID function.

Input parameters: None

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the subroutine’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, TERMINAL_NOT_SIGNED_ON, CORRUPT_USER_TOKEN, INVALID_TERMINAL_TYPE, SURROGATE_TERMINAL, SECOND_DELETE_FAILED, MESSAGE_DOMAIN_FAILURE, USER_DOMAIN_FAILURE
EXCEPTION	SECURITY_INACTIVE, ESM_INACTIVE, ESM_TRANQUIL, UNKNOWN_ESM_RESPONSE
INVALID	INVALID_FORMAT, INVALID_FUNCTION

DFHSNTU subroutine, SIGNON_TERMINAL_USER function

The SIGNON_TERMINAL_USER function of the DFHSNTU subroutine is used to implement the EXEC CICS SIGNON command and signs on a specific user at the principal facility terminal.

Input parameters

USERID is the userid being signed on to the principal facility terminal.

USERID_LENGTH is the length of the userid.

[PASSWORD] is the optional password associated with the userid. The external security manager determines whether the password is required or not.

[PASSWORD_LENGTH] is the length of the password.

[NEW_PASSWORD] is the optional new password that is to replace the existing password

[NEW_PASSWORD_LENGTH] is the length of the new password.

[OIDCARD] is the text obtained from an operator identification card. The external security manager determines whether operator identification card data, or a password, or both, or neither, are required.

[GROUPID] is the optional group name to be associated with the userid for this sign on.

[GROUPID_LENGTH] is the length of the group name.

[NATIONAL_LANGUAGE] is the optional three-letter national language code to be associated with the terminal for the duration of this sign on. The code should be one of those specified in Table 83 on page 500.

[SCOPE_CHECK] is an optional parameter that specifies whether this sign on is to be subject to the constraints imposed by the SNSCOPE system initialization parameter. It can have either of these values:

YES|NO

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the subroutine’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, ADD_USER_FAILURE, GETMAIN_FAILED, EXCEPTION_UNKNOWN, INQUIRE_DEFAULT_ERROR, MESSAGE_DOMAIN_FAILURE, USER_DOMAIN_FAILURE, XMIQ_FAILURE, TCAM_POOL_STATE_ERROR, CORRUPT_USER_TOKEN, SNXR_FAILURE, SUSX_FAILURE
EXCEPTION	INVALID_USERID, INVALID_PASSWORD, INVALID_NEW_PASSWORD, INVALID_OIDCARD, INVALID_GROUPID, USERID_NOT_IN_GROUP, INVALID_TERMINAL_TYPE, INVALID_NATIONAL_LANGUAGE, UNAVAILABLE_NATLANG, TERMINAL_ALREADY_SIGNED_ON, USERID_ALREADY_SIGNED_ON, SURROGATE_TERMINAL, PRESET_SECURITY_TERMINAL, NO_TERMINAL_WITH_TASK, USERID_REQUIRED, PASSWORD_REQUIRED, NEW_PASSWORD_REQUIRED, OIDCARD_REQUIRED, UNKNOWN_ESM_RESPONSE, SECURITY_INACTIVE, ESM_INACTIVE, TERMINAL_NOTAUTH, APPLICATION_NOTAUTH, USERID_REVOKED, GROUP_ACCESS_REVOKED, SECLABEL_CHECK_FAILED, ESM_TRANQUIL
INVALID	INVALID_FORMAT, INVALID_FUNCTION

DFHSNTU subroutine, SIGNOFF_TERMINAL_USER function

The SIGNOFF_TERMINAL_USER function of the DFHSNTU subroutine is used to implement the EXEC CICS SIGNOFF command and reverses the effect of a SIGNON_TERMINAL_USER function. It effectively associates the terminal with the default userid specified in the DFLTUSER system initialization parameter.

Input parameters

[TCTTE_PTR] is the optional TCTTE address of a terminal that is to be signed off.

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the subroutine’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, FREEMAIN_FAILED, LOOP, XMIQ_FAILURE, ADD_TXN_USER_ERROR, TCAM_POOL_STATE_ERROR, INVALID_USER_TOKEN
EXCEPTION	INVALID_TERMINAL_TYPE, TERMINAL_NOT_SIGNED_ON, PRESET_SECURITY_TERMINAL, SURROGATE_TERMINAL, NO_TERMINAL_WITH_TASK, SECURITY_INACTIVE, ESM_INACTIVE, ESM_TRANQUIL, UNKNOWN_ESM_RESPONSE
INVALID	INVALID_FORMAT, INVALID_FUNCTION

DFHSNUS subroutine, SIGNON_ATTACH_HEADER function

The SIGNON_ATTACH_HEADER function of the DFHSNUS subroutine causes a sign on for the userid received in an LU6.2 function management header type 5, also known as an *attach header* or an FMH5.

Input parameters

TCTTE_PTR is the address of the TCTTE for which the FMH5 sign on is being performed.

[USERID] is the userid obtained from the FMH5, if any.

[USERID_LENGTH] is the length of the userid

[PASSWORD] is the password obtained fron the FMH5, if any.

[PASSWORD_LENGTH] is the length of the password.

[GROUPID] is the group name obtained from the profile name in the FMH5, if any.

[GROUPID_LENGTH] is the length of the group name.

[ENTRY_PORT_NAME] is the optional name of the entry port (terminal) at which the userid was signed on in the terminal-owning region.

[ENTRY_PORT_TYPE] is the optional terminal type associated with the port of entry. It can have either of these values:

```
TERMINAL|CONSOLE
```

[APPLID] is the optional applid at which the userid was signed on in the terminal-owning region.

ATTACHSEC_TYPE specifies whether the ATTACHSEC associated with the connection is LOCAL or not. It can have either of these values:

```
LOCAL|NON_LOCAL
```

ALREADY_VERIFIED specifies whether the already-verified indicator (AV) is present in the FMH5. It can have either of these values:

```
YES|NO
```

PERSISTENT_SIGNON specifies whether the persistent-sign on indicator (PV2) is present in the FMH5. It can have either of these values:

```
YES|NO
```

PERSISTENT_VERIFY specifies whether the persistent-verification indicator (PV1) is present in the FMH5. It can have either of these values:

```
YES|NO
```

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the subroutine’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, USER_DOMAIN_FAILURE, MESSAGE_DOMAIN_FAILURE, CORRUPT_USER_TOKEN, ZCUT_FAILURE
EXCEPTION	TERMINAL_ALREADY_SIGNED_ON, INVALID_USERID, INVALID_PASSWORD, INVALID_GROUPID, USERID_NOT_IN_GROUP, PRESET_SECURITY_TERMINAL, USERID_REQUIRED, PROTOCOL_VIOLATION, PASSWORD_REQUIRED, UNKNOWN_ESM_RESPONSE, SECURITY_INACTIVE, ESM_INACTIVE, TERMINAL_NOTAUTH, LUIT_ENTRY_NOT_FOUND, APPLICATION_NOTAUTH, USERID_REVOKED, GROUP_ACCESS_REVOKED, SECLABEL_CHECK_FAILED, SIGNON_SURROGATE_ERROR, ESM_TRANQUIL
INVALID	INVALID_FORMAT, INVALID_FUNCTION

DFHSNUS subroutine, SIGNOFF_ATTACH_HEADER function

The SIGNOFF_ATTACH_HEADER function of the DFHSNUS subroutine is used to reverse the effect of a SIGNON_ATTACH_HEADER function when the transaction initiated by the FMH5 attach header terminates.

Input parameters

TCTTE_PTR is the address of the TCTTE for which the FMH5 sign off is being performed.

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the subroutine's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, ZCUT_FAILURE, CORRUPT_USER_TOKEN
EXCEPTION	INVALID_TERMINAL_TYPE, PRESET_SECURITY_TERMINAL, SURROGATE_TERMINAL, SECURITY_INACTIVE, ESM_INACTIVE, ESM_TRANQUIL, UNKNOWN_ESM_RESPONSE
INVALID	INVALID_FORMAT, INVALID_FUNCTION

Modules

Module	Function
DFHSNAS	Handles the following requests: SIGNON_ATI_SESSION SIGNOFF_ATI_SESSION
DFHSNPU	Handles the following requests: SIGNON_PRESET_USERID SIGNOFF_PRESET_USERID
DFHSNDUF	SN domain offline dump formatting routine
DFHSNSG	Handles the following requests: SIGNOFF_SURROGATE
DFHSNSU	Handles the following requests: SIGNON_SESSION_USERID SIGNOFF_SESSION_USERID
DFHSNTU	Handles the following requests: SIGNON_TERMINAL_USER SIGNOFF_TERMINAL_USER
DFHSNUS	Acts as a router to the other signon modules, and handles the following requests directly: SIGNON_ATTACH_HEADER SIGNOFF_ATTACH_HEADER
DFHSNTRI	Interprets SN domain trace entries

Exits

There are two global user exit points in DFHSNUS: XSNON and XSNOFF.

For further information, see the *CICS Customization Guide*.

Trace

The point IDs for the sign on component are of the form AP xxxx; the corresponding trace levels are AP 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 71. Statistics domain (ST)

The statistics domain controls the collection of resource statistics for a CICS system (the monitoring domain collects task statistics). The statistics domain collects data at user-specified intervals, at system quiesce or logical end of day, and when requested by the user, and writes it to the statistics data sets in SMF format. This can subsequently be used by the statistics offline utility to produce formatted reports.

Statistics domain's specific gate

Table 86 summarizes the statistics domain's specific gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and whether or not the functions are available through the exit programming interface (XPI).

Table 86. Statistics domain's specific gate

Gate	Trace	Function	XPI
STST	ST 0003	INQ_STATISTICS_OPTIONS	NO
	ST 0004	SET_STATISTICS_OPTIONS	NO
		REQUEST_STATISTICS	NO
		RECORD_STATISTICS	NO
		STATISTICS_COLLECTION	NO
		DISABLE_STATISTICS	NO

STST gate, INQ_STATISTICS_OPTIONS function

The INQ_STATISTICS_OPTIONS function of the STST gate is used to return information associated with the statistics domain options.

Input parameters: None.

Output parameters

COLLECT indicates whether interval and unsolicited statistics are being collected (and their counts reset). It can have either of these values:

`YES|NO`

INTERVAL is the interval at which statistics are being collected if COLLECT is YES.

EOD_TIME_OF_DAY is the time of day at which end-of-day statistics are collected.

NEXT_COLLECTION_TIME is the time of the next collection of statistics. If COLLECT is YES, it is the earlier of the next interval collection time and the logical end-of-day time; if COLLECT is NO, it is the logical end-of-day time.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|INVALID|KERNERROR|DISASTER`

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

STST gate, SET_STATISTICS_OPTIONS function

The SET_STATISTICS_OPTIONS function of the STST gate is used to set statistics options.

Input parameters

[COLLECT] indicates whether interval and unsolicited statistics are to be collected (and their counts reset). It can have either of these values:

`YES|NO`

[INTERVAL] is the interval at which statistics are to be collected if COLLECT is YES.

[EOD_TIME_OF_DAY] is the time of day at which end-of-day statistics are to be collected.

[COLLECT_UPDATE_ACTION] is the action to be taken when changing the COLLECT option value from NO to YES, or from YES to NO. It can have any one of these values:

`NOACTION|RESETNOW|RECORDNOW|RECORD_RESETNOW`

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|INVALID|KERNERROR|DISASTER`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	COLL_ACTION_NO_UPDATE
INVALID	INVALID_COLLECT, INVALID_INTERVAL, INVALID_EOD_TIME_OF_DAY, INV_COLL_UPDATE_ACTION

STST gate, REQUEST_STATISTICS function

The REQUEST_STATISTICS function of the STST gate is used to request a collection of statistics.

Input parameters

[DOMAIN_TOKEN] identifies the domain from which the statistics are to be collected.

[RESOURCE_TYPE] indicates the resource in the AP domain on which statistics are to be collected.

REQUEST_TOKEN uniquely identifies the collection of statistics requested by the caller.

RESET indicates whether certain statistics fields are to be reset.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|INVALID|EXCEPTION|PURGED|KERNERROR|DISASTER
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	TYPE_NOT_FOUND, NOT_AVAILABLE, INCOMPLETE_DATA
INVALID	INVALID_RESET

STST gate, RECORD_STATISTICS function

The RECORD_STATISTICS function of the STST gate is used to record statistics.

Input parameters

STATISTICS_DATA specifies the address and length of data requested.

STATISTICS_TYPE indicates the type of statistics collection, either a normal collection or unsolicited. It can have either of these values:

```
COLLECTION|USS
```

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|INVALID|KERNERROR|DISASTER
```

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_DATA_FORMAT

STST gate, STATISTICS_COLLECTION function

The STATISTICS_COLLECTION function of the STST gate is used to initiate a collection of statistics.

Input parameters

RESET indicates whether certain statistics fields are to be reset.

DATA indicates whether the domain being called is requested to return its statistics to the caller.

END_OF_DAY indicates whether all statistics fields are to be reset.

COLLECTION_TYPE indicates whether this is an interval collection or end-of-day collection of statistics. It can have either of these values:

```
INT|EOD
```

[SYSTEM_TERMINATING] indicates whether this is the last collection for the CICS run. It can have either of these values:

```
YES|NO
```

YES is used for the end-of-day collection that is taken when CICS is shut down.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|INVALID|KERNERROR|DISASTER
```

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

STST gate, DISABLE_STATISTICS function

The DISABLE_STATISTICS function of the STST gate is used to disable statistics interval collections.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|INVALID|KERNERROR|DISASTER
```

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

Statistics domain's generic gates

Table 87 summarizes the statistics domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 87. Statistics domain's generic gates

Gate	Trace	Function	Format
DMDM	ST 0001 ST 0002	INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
TISR	ST 0005 ST 0006	NOTIFY	TISR

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—"Domain manager domain's generic formats" on page 195

Format TISR—"Timer domain's generic format" on page 606

In initialization processing, the statistics domain sets the initial statistics options:

- Collecting interval
- Logical end of day
- Collecting status.

For a cold start, the collecting interval defaults to 3 hours, the logical end of day defaults to midnight, and the collecting status defaults to ON; for any other type of start, the information comes from the global catalog.

In quiesce processing, the statistics domain collects and records statistics from all other domains.

In termination processing, the statistics domain collects and records end-of-day statistics.

Statistics domain's generic format

Table 88 summarizes the generic format owned by the statistics domain and shows the functions performed on the calls.

Table 88. Generic format owned by statistics domain

Format	Calling module	Function
STST	DFHSTST DFHEIQMS	COLLECT_STATISTICS COLLECT_RESOURCE_STATS

In the descriptions of the format that follows, the "input" parameters are input not to statistics domain, but to the domain being called by the statistics domain. Similarly, the "output" parameters are output by the domain that was called by the statistics domain, in response to the call.

STST format, COLLECT_STATISTICS function

The COLLECT_STATISTICS function of the STST format is used by the statistics domain to ask a domain to collect its statistics.

Input parameters

DATA indicates whether the domain being called is requested to return its statistics to the caller. It can have either of these values:

YES|NO

END_OF_DAY indicates whether all statistics fields are to be reset. It can have either of these values:

YES|NO

RESET indicates whether certain statistics fields are to be reset. It can have either of these values:

YES|NO

RESET_TIME is the time of day to be used as the time at which the statistics fields were last reset.

[RESOURCE_TYPE] indicates the resource in the AP domain on which statistics are to be collected.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|PURGED|KERNERROR|DISASTER

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	TYPE_NOT_FOUND, NOT_AVAILABLE, INCOMPLETE_DATA

STST format, COLLECT_RESOURCE_STATS function

The COLLECT_RESOURCE_STATS function of the STST format is used by the EXEC API to ask a domain to collect its monitoring data collection information.

Input parameters

[RESOURCE_TYPE] is the type of resource on which statistics are required.

[RESOURCE_ID] specifies the address and length of the resource identifier.

[RESOURCE_ID_2] specifies the address and length of the resource identifier.

[RESOURCE_ID_3] specifies the address and length of the resource identifier.

[LONG_RESOURCE_IDM] specifies the address and length of the resource identifier.

[RESID_TOKEN] a token representing the resource id required.

RESOURCE_STATISTICS_DATA specifies the address and length of the area into which the requested statistics are to be placed.

Output parameters

[LAST_RESET_TIME] indicates the time at which the statistics fields were last reset.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|INVALID|PURGED|KERNERROR|DISASTER

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	TYPE_NOT_FOUND, ID_NOT_FOUND, NOT_AVAILABLE

Modules

Module	Function
DFHSTDM	Handles the following requests: INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHSTDUF	Formats the ST domain control blocks in a CICS system dump
DFHSTST	Handles the following requests: INQ_STATISTICS_OPTIONS RECORD_STATISTICS REQUEST_STATISTICS SET_STATISTICS_OPTIONS STATISTICS_COLLECTION DISABLE_STATISTICS
DFHSTTI	Handles the NOTIFY request
DFHSTTRI	Interprets ST domain trace entries
DFHSTUE	Provides a SET_EXIT_STATUS routine to enable or disable a user exit.

Exits

There is one global user exit point in the statistics domain: XSTOUT. See the *CICS Customization Guide* for further information.

Trace

The point IDs for the statistics domain are of the form ST xxxx; the corresponding trace levels are ST 1, ST 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 72. Statistics utility program (DFHSTUP)

This chapter provides a general overview of the collection of CICS statistics as well as describing the operation of the offline statistics utility program (DFHSTUP). For more information about using the DFHSTUP utility program, see the *CICS Operations and Utilities Guide*.

An operator interface to all online statistics functions is provided by the CEMT transaction. The equivalent programmable interface is provided by the EXEC API.

Statistics may be collected at user-specified intervals from the startup to the shutdown of a CICS system. Statistics may also be requested, resulting in the collection of data for the period between the last time statistics were reset and the time the request was made.

Statistics are also collected at system quiesce or logical end of day; this data is written to the SMF data set as for a normal interval collection.

An option is provided by the statistics domain to allow the user to specify whether interval statistics are to be collected. The statistics domain calls each domain in turn to reset the statistics fields at every interval when statistics are collected. Statistics (particularly interval statistics) can be used for capacity planning and performance tuning. For further information about this aspect, see the *CICS Performance Guide*.

There is a great similarity between CICS statistics data and CICS performance class monitoring data. Statistics data is collected on a resource basis, whereas performance class monitoring collects similar data on a transaction basis. Statistics can therefore be viewed as resource monitoring.

Design overview

CICS statistics support is divided into the following components:

1. The operator interface. This component is responsible for interfacing to the various CICS-supported terminals, analyzing the input string and then invoking the statistics domain to perform the appropriate management operation. This function is provided by the CEMT transaction, and also by the EXEC API.
2. The statistics domain. This component is responsible for managing statistics interfaces, for example, SMF and EXEC API.
3. The statistics update logic. This code is inline in the relevant resource manager. In this way the control function of statistics is centralized, but the management and updating of the statistics fields is given to the resource owner.
4. The statistics data collection and reset. For all collection types except unsolicited (see below), the collection mechanism is the same. The owning domain is invoked by statistics domain to supply a record that contains the domain's statistics. When this record has been formed, the domain then calls statistics domain to place the data on the SMF data set.

   There are five types of collections:

   a. Interval. The collection interval default is 3 hours. This may be changed by the user. The minimum value is 1 minute, the maximum 24 hours. On an interval collection, each called domain collects and resets its statistics counters. No action is taken if the statistics recording status is OFF.

   b. Requested. Statistics may be requested using the PERFORM STATISTICS function provided by the CEMT transaction or the EXEC API. The data recorded is for the period between the last time statistics were reset and the time the request was made. Statistics are reset on an interval, end-of-day, or requested-reset collection; they can also be reset, without a collection, when changing the statistics recording status from ON to OFF, or from OFF to ON.

      This type of collection can obtain statistics from some or all domains, as requested. Each called domain collects, but does not reset, its statistics counters.

      Requested statistics are collected even if the statistics recording status is OFF.

   c. Requested-reset. This collection is similar to requested statistics, except that it always obtains statistics for all domains, and each called domain resets its statistics counters after collection.

      Requested-reset statistics are collected even if the statistics recording status is OFF.

   d. End-of-day. This collection occurs when the system is quiescing. A logical end-of-day time may be specified. The default time is midnight. This is primarily for continually running systems. The collection is then made at this time, and the called domain collects and resets its statistics counters.

      End-of-day statistics are collected even if the statistics recording status is OFF.

      Daily systems that are taken down after midnight should change the logical end of day to a time when the system is not operational.

      If the user wishes to simulate shutdown statistics, the interval can be set to 24 hours. An end-of-day report, which contains total figures for the CICS run up to the end of the day, can then be printed by DFHSTUP.

e. Unsolicited. For dynamically allocated and deallocated resources, the resource records its statistics just before it is deleted; for example, an autoinstall terminal that logs off and is thereby deleted. USS statistics are written to SMF regardless of the statistics recording status (STATRCD).

5. The statistics formatting control. The offline utility DFHSTUP opens the statistics data set, which is an unloaded SMF data set, and the I/O interfaces to that data set. This routine then browses the data set and formats the statistics.

   Reports may be produced for any or all of the five types of statistics collections.

   DFHSTUP also provides the option of producing a summary report for selected CICS applids. The summary report is constructed from all the statistics contained in the interval, requested-reset, end-of-day, and unsolicited collections. Requested statistics are not involved in the production of the summary report.

DFHSTUP operation

DFHSTUP runs as a separate MVS job and extracts all or selected entries from the unloaded SMF data set. The types of entries to be processed by this program are specified in the SYSIN data set. Entries that can be selected for processing include:

- All entries—the default
- Entries written for specified applids
- Entries written for specified resource types
- Entries written for specified collection types, that is, interval, requested, requested-reset, end-of-day, or unsolicited
- Entries written during a specified period of time.

You can also select:

- The page size; the default is 60 lines per page.
- Whether output is to be printed in mixed case or all uppercase; the default is to print in mixed case.
- The summary report option; by default, it is not selected.

Further information about using DFHSTUP is given in the *CICS Operations and Utilities Guide*.

Modules

Module	Function
DFHSTUP1	PRE_INITIALIZE
DFHSTE15	DFSORT interface to E15 user exit
DFHSTE35	DFSORT interface to E35 user exit
DFHSTIN	DFSORT E15 user exit input routine
DFHSTOT	DFSORT E35 user exit output routine
DFHSTRD	Read interface subroutines
DFHSTTQX	Transient data statistics summary formatter
DFHSTWR	Write interface subroutines
DFHSTUDB	DBCTL statistics formatter
DFHSTUDS	Dispatcher domain statistics formatter
DFHSTUDU	Dump domain statistics formatter
DFHSTUD2	CICS DB2 statistics formatter
DFHSTULD	Loader domain statistics formatter
DFHSTUMN	Monitoring domain statistics formatter
DFHSTUPG	Program manager domain statistics formatter
DFHSTURS	User domain statistics formatter
DFHSTUSM	Storage manager domain statistics formatter
DFHSTUST	Statistics domain statistics formatter
DFHSTUTQ	Transient data statistics formatter
DFHSTUUS	Autoinstall terminals unsolicited statistics formatter
DFHSTUXM	Transaction manager domain statistics formatter
DFHSTU03	VTAM statistics formatter
DFHSTU04	Autoinstall terminals statistics formatter
DFHSTU06	Terminal statistics formatter
DFHSTU08	LSRPOOL resource statistics formatter
DFHSTU09	LSRPOOL file statistics formatter
DFHSTU14	ISC/IRC statistics formatter
DFHSTU16	Table manager statistics formatter
DFHSTU17	File control statistics formatter
DFHSTU21	ISC/IRC attach-time statistics formatter
DFHSTU22	FEPI statistics formatter
DFHSTDBX	DBCTL statistics summary formatter
DFHSTDSX	Dispatcher domain statistics summary formatter
DFHSTDUX	Dump domain statistics summary formatter
DFHSTD2X	CICS DB2 statistics summary formatter
DFHSTLDX	Loader domain statistics summary formatter
DFHSTMNX	Monitoring domain statistics summary formatter
DFHSTPGX	Program manager domain statistics summary formatter
DFHSTSMX	Storage manager domain statistics summary formatter
DFHSTSTX	Statistics domain statistics summary formatter
DFHSTURX	User domain statistics summary formatter
DFHSTXMX	Transaction manager domain statistics summary formatter
DFHST03X	VTAM statistics summary formatter
DFHST04X	Autoinstall terminals statistics summary formatter
DFHST05X	Dynamic transaction backout statistics summary formatter
DFHST06X	Terminal statistics summary formatter
DFHST08X	LSRPOOL resource statistics summary formatter
DFHST09X	LSRPOOL file statistics summary formatter
DFHST12X	Temporary-storage statistics summary formatter
DFHST13X	Journal control statistics summary formatter
DFHST14X	ISC/IRC statistics summary formatter
DFHST16X	Table manager statistics summary formatter
DFHST17X	File control statistics summary formatter
DFHST21X	ISC/IRC attach-time statistics summary formatter
DFHST22X	FEPI statistics summary formatter

Chapter 73. Storage control macro-compatibility interface

DFHSMSCP is responsible for handling all requests for storage services that are made by using the routine addressed by CSASCNAC in the CICS common system area (CSA). DFHSMSCP is called by some parts of the CICS AP domain containing DFHSC macros.

DFHSMSCP converts all requests into calls to the storage manager domain, and its main function is to get or free storage.

Design overview

The input to DFHSMSCP, set up by the macro used for the invocation, or directly by the calling program, consists of the following TCA fields:

- TCASCTR—the storage control request byte. This can contain one of the following values:

  X'80' GETMAIN, in conjunction with:

  X'40' Initialize storage
  X'20' Conditional

  Storage class in bits 3 through 7 (the resulting SMMC GETMAIN storage class name is given in parentheses where this differs from the first name):

  X'00' 1WD, treated as SHARED
  X'04' LINE
  X'05' TERMINAL or TERM
  X'0C' USER (becomes CICS24)
  X'0D' TRANSDATA or TD
  X'13' SHARED (becomes SHARED_CICS24)
  X'14' CONTROL

  X'40' FREEMAIN, in conjunction with:

  X'01' TCTTE address supplied.

- TCASCIB—the 1-byte value to which storage is to be initialized.
- TCASCNB—the 2-byte field giving the number of bytes requested on the GETMAIN.
- TCASCSA—the 4-byte address of the storage that was obtained or the storage to be freed.

Modules

DFHSMSCP

Exits

No global user exit points are provided for this function.

Trace

The point IDs for this function are of the form AP F1xx; the corresponding trace levels are SC 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 74. Storage manager domain (SM)

The storage manager domain (also sometimes known simply as "storage manager") manages virtual storage requests.

Storage manager domain's specific gates

Table 89 summarizes the storage manager domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 89. Storage manager domain's specific gates

Gate	Trace	Function	XPI
SMAD	SM 0201	ADD_SUBPOOL	NO
	SM 0202	DELETE_SUBPOOL	NO
SMAR	SM 0F01	ALLOCATE_TRANSACTION_STG	NO
	SM 0F02	RELEASE_TRANSACTION_STG	NO
SMCK	SM 0901	CHECK_STORAGE	NO
	SM 0902	RECOVER_STORAGE	NO
SMGF	SM 0301	GETMAIN	NO
	SM 0302	FREEMAIN	NO
		INQUIRE_ELEMENT_LENGTH	NO
SMMC	SM 0601	INITIALIZE	NO
	SM 0602		
	SM 0C01	GETMAIN	YES
	SM 0C02		
	SM 0D01	FREEMAIN	YES
	SM 0D02		
	SM 0E01	FREEMAIN_ALL_TERMINAL	NO
	SM 0E02		
	SM 0E01	INQUIRE_ELEMENT_LENGTH	YES
	SM 0E02		
		INQUIRE_TASK_STORAGE	YES
SMSR	SM 0401	INQUIRE_DSA_SIZE	NO
	SM 0402	SET_DSA_LIMIT	NO
		INQUIRE_DSA_LIMIT	NO
		SET_STORAGE_RECOVERY	NO
		SET_STORAGE_PROTECT	NO
		INQUIRE_STORAGE_PROTECT	NO
		INQUIRE_ACCESS_TOKEN	NO
		INQUIRE_ACCESS	YES
		SET_REENTRANT_PROGRAM	NO
		SET_TRANSACTION_ISOLATION	NO
		INQUIRE_REENTRANT_PROGRAM	NO
		INQUIRE_TRANSACTION_ISOLATION	NO
		SWITCH_SUBSPACE	YES
		INQUIRE_SHORT_ON_STORAGE	YES
		UPDATE_SUBSPACE_TCB_INFO	NO

SMAD gate, ADD_SUBPOOL function

The ADD_SUBPOOL function of the SMAD gate is used to create a new subpool with given attributes.

Input parameters

USAGE indicates whether the subpool is for task or domain use. It can have either of these values:

`TASK|DOMAIN`

ELEMENT_TYPE indicates whether the subpool elements are of fixed or variable length. It can have either of these values:

`FIXED|VARIABLE`

[FIXED_LENGTH] is the element length for a fixed-length subpool.

ELEMENT_CHAIN indicates whether a chain of the addresses and lengths of the elements is to be kept. It can have either of these values:

`YES|NO`

BOUNDARY is the boundary on which all elements within the subpool must be aligned. The boundary must be a power of two in the range 8 through 4096.

LOCATION specifies whether all elements within the subpool must be allocated below the maximum 24-bit address, or may be allocated anywhere. It can have either of these values:

`BELOW|ANY`

SUBPOOL_NAME is the 8-character name by which the subpool is known.

INITIAL_FREE is the size of the initial free storage area for the subpool.

[STORAGE_CHECK] indicates whether storage zone checking is to be enabled for this subpool. It can have either of these values:

`YES|NO`

Output parameters

SUBPOOL_TOKEN is the token identifying the newly created subpool.

[DSA_NAME] is the name of the CICS dynamic storage area (DSA) in which the subpool resides. It can have any of these values:

`CDSA|UDSA|SDSA|RDSA|ECDSA|EUDSA|ESDSA|ERDSA`

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INSUFFICIENT_STORAGE
INVALID	INVALID_FIXED_LENGTH, INVALID_BOUNDARY, INVALID_SUBPOOL_NAME, INVALID_INITIAL_FREE, DUPLICATE_SUBPOOL_NAME

SMAD gate, DELETE_SUBPOOL function

The DELETE_SUBPOOL function of the SMAD gate is used to delete a subpool.

Input parameters

SUBPOOL_TOKEN is the token identifying the subpool to be deleted.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_SUBPOOL_TOKEN, NOT_SUBPOOL_OWNER, SUBPOOL_NOT_EMPTY

SMAR gate, ALLOCATE_TRANSACTION_STG function

The ALLOCATE_TRANSACTION_STG function of the SMAR gate is used at task initialization to add the four task lifetime storage subpools.

Input parameters

TASK_DATALOC indicates the location of task data for the transaction, as specified by the TASKDATALOC attribute on the associated TRANSACTION resource definition. It can have either of these values:

BELOW|ANY

TASK_DATAKEY indicates the storage key for the task-lifetime storage and program-related storage (for all programs that run under the transaction) for the transaction, as specified by the TASKDATAKEY attribute on the associated TRANSACTION resource definition. It can have either of these values:

CICS|USER

ISOLATE indicates whether CICS is to isolate the transaction's user-key task-lifetime storage to provide application-to-application protection, as specified by the ISOLATE attribute on the associated TRANSACTION resource definition. It can have either of these values:

YES|NO

STORAGE_FREEZE indicates whether or not task-lifetime storage freemains should be delayed until task termination. It can have either of these values:

YES|NO

STORAGE_CLEAR indicates whether task lifetime storage should be cleared to zeros when it is freemained. It can have either of these values:

YES|NO

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, INSUFFICIENT_STORAGE

SMAR gate, RELEASE_TRANSACTION_STG function

The RELEASE_TRANSACTION_STG function of the SMAR gate is used at task termination to freemain all remaining task-lifetime storage and deletes the four task lifetime subpools.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, DEACTIVATE_FAILURE, INSUFFICIENT_STORAGE, STORAGE_VIOLATION

SMCK gate, CHECK_STORAGE function

The CHECK_STORAGE function of the SMCK gate is used to check the storage check zones of task lifetime storage and the storage accounting areas (SAAs) of terminal storage for consistency.

Input parameters

TASK_STORAGE specifies whether the storage check zones of task lifetime storage are to be checked for the current task or all tasks, or is not to be checked. It can have any one of these values:

NO|CURRENT_TASK|ALL_TASKS

TP_STORAGE specifies whether the SAAs of terminal storage are to be checked for the current terminal, or is not to be checked. It can have either of these values:

NO|CURRENT_TERMINAL

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, STORAGE_VIOLATION

SMCK gate, RECOVER_STORAGE function

The RECOVER_STORAGE function of the SMCK gate is used to recover storage.

Input parameters

TASK_STORAGE specifies whether or not the task lifetime storage for the current task is to be recovered. It can have any one of these values:

NO|CURRENT_TASK

TP_STORAGE specifies whether or not the SAAs of terminal storage for the current terminal are to be recovered. It can have either of these values:

NO|CURRENT_TERMINAL

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	STORAGE_NOT_RECOVERED

SMGF gate, GETMAIN function

The GETMAIN function of the SMGF gate is used to allocate an element of storage from a subpool.

Input parameters

Note: Either STORAGE_CLASS or SUBPOOL_TOKEN, but not both, must be specified.

[REMARK] is an optional 8-character field that is used to identify the GETMAIN operation for problem determination. This field is highlighted when the GETMAIN trace is interpreted. Typically, it is the name of the control block whose storage is being obtained.

[STORAGE_CLASS] identifies the class of storage that is being allocated. It can have any one of these values:

CICS|CICS24|USER|USER24|TASK|TASK24

[SUBPOOL_TOKEN] is a token identifying the subpool within which the element is to be allocated.

[GET_LENGTH] is the length of the storage requested.

SUSPEND If there is insufficient storage to satisfy the request, SUSPEND(YES) causes the caller to be suspended until the request can be satisfied, and SUSPEND(NO) causes REASON to be set to INSUFFICIENT_STORAGE. It can have either of these values:

YES|NO

[INITIAL_IMAGE] is an optional byte value to which every byte in the new element is set.

Output parameters

ADDRESS is the address of the new element.

[ELEMENT_LENGTH] is the actual length of the new element (when it has been rounded up to a multiple of the boundary for the subpool).

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, ACTIVATE_FAILURE, LOOP
EXCEPTION	INSUFFICIENT_STORAGE
INVALID	INVALID_SUBPOOL_TOKEN, INVALID_GET_LENGTH, INVALID_STORAGE_CLASS, NO_GET_LENGTH, NOT_SUBPOOL_OWNER INVALID_INITIAL_IMAGE

SMGF gate, FREEMAIN function

The FREEMAIN function of the SMGF gate is used to release an element of storage within a subpool.

Input parameters

Note: Either STORAGE_CLASS or SUBPOOL_TOKEN, but not both, must be specified.

[REMARK] is an optional 8-character field that is used to identify the FREEMAIN operation for problem determination. This field is highlighted when the FREEMAIN trace is interpreted. Typically, it is the name of the control block whose storage is being released.

[STORAGE_CLASS] identifies the class of storage that is being released. It can have any one of these values:

CICS|CICS24|USER|USER24|TASK|TASK24

[SUBPOOL_TOKEN] is a token identifying the subpool within which the element is to be released.

ADDRESS is the address of the element to be released.

[FREE_LENGTH] is the length of the element to be released.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, DEACTIVATE_FAILURE, LOOP
INVALID	INVALID_SUBPOOL_TOKEN, INVALID_ADDRESS, INVALID_FREE_LENGTH, INVALID_STORAGE_CLASS, NO_FREE_LENGTH, NOT_SUBPOOL_OWNER, SUBPOOL_EMPTY

SMGF gate, INQUIRE_ELEMENT_LENGTH function

The INQUIRE_ELEMENT_LENGTH function of the SMGF gate is used to return the length of an element of storage whose address is known.

Input parameters

Note: Either STORAGE_CLASS or SUBPOOL_TOKEN, but not both, must be specified.

[STORAGE_CLASS] identifies the class of storage that is being inquired upon. It can have any one of these values:

CICS|CICS24|USER|USER24|TASK|TASK24

[SUBPOOL_TOKEN] is a token identifying the subpool within which the element has been allocated.

ADDRESS is the address of the element whose length is being inquired on.

Output parameters

ELEMENT_LENGTH is the length of the element.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	ADDRESS_NOT_FOUND
INVALID	INVALID_STORAGE_CLASS, INVALID_SUBPOOL_TOKEN

SMMC gate, INQUIRE_ELEMENT_LENGTH function

The INQUIRE_ELEMENT_LENGTH function of the SMMC gate is used to obtain the start address and length of the storage element that contains the address that was specified on the input to the call. This function only searches the current task's task-lifetime storage for the required storage element.

Input parameters

ADDRESS is the address to be searched for.

Output parameters

ELEMENT_LENGTH is the length of the storage element that contains the input address.

[ELEMENT_ADDRESS] is the start address of the element that contains the input address.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	INVALID_ADDRESS

SMMC gate, INQUIRE_TASK_STORAGE function

The INQUIRE_TASK_STORAGE function of the SMMC gate is used to obtain details of all the task-lifetime storage associated with the current task (if the input parameter TRANSACTION_NUMBER is omitted from the call) or for the specified task.

Input parameters

[TRANSACTION_NUMBER] indicates the transaction that you wish to obtain storage details about. If this parameter is omitted, the current task is assumed.

ELEMENT_BUFFER is a buffer in which the storage manager lists the start addresses of all the specified task's task-lifetime storage.

LENGTH_BUFFER is a buffer in which the storage manager lists the lengths of all the specified task's task-lifetime storage.

Output parameters

NUMBER_OF_ELEMENTS is the number of elements in each buffer.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	INSUFFICIENT_STORAGE, NO_TRANSACTION_ENVIRONMENT

SMMC gate, INITIALIZE function

The INITIALIZE function of the SMMC gate is used to perform macro-compatibility interface initialization.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMMC gate, GETMAIN function

The GETMAIN function of the SMMC gate is used to allocate an element of storage.

Input parameters

[REMARK] is an optional 8-character field that is used to identify the GETMAIN operation for problem determination. This field is highlighted when the GETMAIN trace is interpreted. Typically, it is the name of the control block whose storage is being obtained.

GET_LENGTH is the length of storage requested. For storage classes that have 8-byte SAAs, the requested length excludes the lengths of the initial and duplicate SAAs. However, for storage classes that have only a 4-byte SAA, the requested length must include the length of the SAA.

SUSPEND specifies whether the request is to be suspended if there is insufficient storage to satisfy the request. It can have either of these values:

```
YES|NO
```

[INITIAL_IMAGE] specifies a byte value to which the user's part of the allocated storage element is to be set.

[TCTTE_ADDRESS] is an optional field that must be specified for GETMAIN requests for the TERMINAL storage class.

STORAGE_CLASS is the class of storage to be allocated. It can have any one of these values:

```
TERMINAL24|CICS|SHARED_CICS|LINE|TERMINAL|
TASK|TASK24|CICS24_SAA|SHARED_CICS24_SAA|
CICS24|TRANSDATA|TEMPSTG|USER|USER24|
SHARED_CICS24|CONTROL|TACLE|SHARED_USER24|
SHARED_USER
```

[CALLER] can have any one of these values:

```
EXEC|MACRO|SYSTEM
```

Output parameters

ADDRESS is the address of the allocated storage.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, ACTIVATE_FAILURE, LOOP
EXCEPTION	INSUFFICIENT_STORAGE, INVALID_GET_LENGTH
INVALID	NO_TCTTE_ADDRESS, INVALID_STORAGE_CLASS

SMMC gate, FREEMAIN function

The FREEMAIN function of the SMMC gate is used to release an element of storage.

Input parameters

[REMARK] is an optional 8-character field that is used to identify the FREEMAIN operation for problem determination. This field is highlighted when the FREEMAIN trace is interpreted. Typically, it is the name of the control block whose storage is being released.

ADDRESS is the address of the storage to be freed.

[TCTTE_ADDRESS] is an optional field that must be specified if the FREEMAIN is for storage of a LINE or TERMINAL class.

[STORAGE_CLASS] is an optional field specifying the class of storage that is being freed. It can have any one of these values:

```
TERMINAL24|CICS|SHARED_CICS|LINE|TERMINAL|
TASK|TASK24|CICS24_SAA|SHARED_CICS24_SAA|
CICS24|TRANSDATA|TEMPSTG|USER|USER24|
SHARED_CICS24|CONTROL|TACLE|SHARED_USER24|
SHARED_USER
```

[CALLER] can have any one of these values:

```
EXEC|MACRO|SYSTEM
```

[EXEC_KEY] is the execution key of the program issuing the EXEC FREEMAIN request. It can have either of these values:

CICS|USER

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, DEACTIVATE_FAILURE, LOOP
EXCEPTION	INVALID_EXEC_KEY
INVALID	INVALID_ADDRESS, NO_TCTTE_ADDRESS

SMMC gate, FREEMAIN_ALL_TERMINAL function

The FREEMAIN_ALL_TERMINAL function of the SMMC gate is used to release all terminal storage.

Input parameters

TCTTE_ADDRESS is the address of the TCTTE whose storage is to be freed.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMSR gate, INQUIRE_ISOLATION_TOKEN function

The INQUIRE_ISOLATION_TOKEN function of the SMSR gate is used to return an isolation token which can be used on SWITCH_SUBSPACE calls.

Input parameters: None.

Output parameters

ISOLATION_TOKEN an isolation token which can be used on SWITCH_SUBSPACE calls.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMSR gate, INQUIRE_REENTRANT_PROGRAM function

The INQUIRE_REENTRANT_PROGRAM function of the SMSR gate is used to return whether the read-only DSAs, RDSA and ERDSA, have been allocated from read-only key-0 protected storage or CICS-key storage, as set by the RENTPGM system initialization parameter.

Input parameters: None.

Output parameters

RENTPGM indicates whether CICS has obtained the storage for the read-only DSAs from key-0 non-fetch protected storage (PROTECT) or from CICS-key storage (NOPROTECT). It can have either of these values:

PROTECT|NOPROTECT

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMSR gate, INQUIRE_SHORT_ON_STORAGE function

The INQUIRE_SHORT_ON_STORAGE function of the SMSR gate is used to return whether or not CICS is currently short-on-storage.

Input parameters: None.

Output parameters

SOS_BELOW_THE_LINE indicates whether or not CICS is short-on-storage below the 16MB line. It can have either of these values:

YES|NO

SOS_ABOVE_THE_LINE indicates whether or not CICS is short-on-storage above the 16MB line. It can have either of these values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMSR gate, INQUIRE_DSA_SIZE function

The INQUIRE_DSA_SIZE function of the SMSR gate is used to return the size of the CICS DSAs.

Input parameters

DSA_NAME is the name of the DSA whose size is being inquired on. It can have any of these values:

CDSA|UDSA|SDSA|RDSA|ECDSA|EUDSA|ESDSA|ERDSA

Output parameters

DSA_SIZE is the size of the DSA.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMSR gate, SET_STORAGE_RECOVERY function

The SET_STORAGE_RECOVERY function of the SMSR gate is used to set the storage recovery option.

Input parameters

RECOVERY is the value to which the storage recovery option is to be set. It can have either of these values:

YES|NO

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMSR gate, SET_TRANSACTION_ISOLATION function

The SET_TRANSACTION_ISOLATION function of the SMSR gate is used to set whether or not you want transaction isolation in your CICS region. This value is initially set by the TRANISO system initialization parameter.

Input parameters

TRANSACTION_ISOLATION indicates whether or not transaction isolation is active in your CICS region. It can have either of these values:

ACTIVE|INACTIVE

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMSR gate, SWITCH_SUBSPACE function

The SWITCH_SUBSPACE function of the SMSR gate is used to change a task’s subspace.

Input parameters

SPACE indicates the type of subspace you wish this task to execute in. It can have any of these the values:

BASESPACE|SUBSPACE|RESET_SPACE

[ISOLATION_TOKEN] an isolation token which can be returned from an INQUIRE_ISOLATION_TOKEN call.

[TRANSACTION_TOKEN] a transaction manager token (which can be returned from an XMIQ INQUIRE_TRANSACTION_TOKEN call) that represents the task whose subspace you wish to change.

[WORK_REGISTER] a work register.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMSR gate, INQUIRE_DSA_LIMIT function

The INQUIRE_DSA_LIMIT function of the SMSR gate is used to return the DSA storage limits above (EDSA) and below (DSA) the 16MB line. These limits are the maximum amounts of storage that CICS can use for *all* the DSAs above and below the 16MB line.

Input parameters: None.

Output parameters

[DSA_LIMIT] indicates the DSA storage limit.

[EDSA_LIMIT] indicates the EDSA storage limit.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|DISASTER|INVALID|KERNERROR`

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMSR gate, SET_DSA_LIMIT function

The SET_DSA_LIMIT function of the SMSR gate is used to set the DSA storage limits above (EDSA) and below (DSA) the 16MB line. These limits are the maximum amounts of storage that CICS can use for *all* the DSAs above and below the 16MB line.

Input parameters

[DSA_LIMIT] indicates the DSA storage limit required.

[EDSA_LIMIT] indicates the EDSA storage limit required.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|DISASTER|INVALID|KERNERROR`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	INSUFFICIENT_STORAGE, INVALID_DSA_LIMIT

SMSR gate, SET_STORAGE_PROTECT function

The SET_STORAGE_PROTECT function of the SMSR gate is used to set the storage protection option.

Input parameters

STORAGE_PROTECT can have either of these values:

`YES|NO`

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	NO_HARDWARE_SUPPORT

SMSR gate, INQUIRE_STORAGE_PROTECT function

The INQUIRE_STORAGE_PROTECT function of the SMSR gate is used to return the current value of the storage protection option.

Input parameters: None.

Output parameters

STORAGE_PROTECT is the current storage protection mode. It can have either of these values:

`YES|NO`

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|DISASTER|INVALID|KERNERROR`

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMSR gate, INQUIRE_ACCESS function

The INQUIRE_ACCESS function of the SMSR gate is used to return the access key of an element of storage.

Input parameters

[ACCESS_TOKEN] is the access token for the element of storage (returned by the INQUIRE_ACCESS_TOKEN function).

ELEMENT_ADDRESS is the start address of the storage element.

ELEMENT_LENGTH is the length of the storage element.

Output parameters

ACCESS is the type of access for the storage element. It can have any of these values:

CICS|USER|READ_ONLY

[DSA_NAME] is the name of the DSA in which the storage element resides.

[DSA_EXTENT_START] indicates the start address of the DSA extent that contains the input address.

[DSA_EXTENT_END] indicates the end address of the DSA extent that contains the input address.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	INVALID_ELEMENT

SMSR gate, SET_REENTRANT_PROGRAM function

The SET_REENTRANT_PROGRAM function of the SMSR gate is used to set the reentrant program option for the RDSA and the ERDSA.

Input parameters

REENTRANT_PROGRAM is the reentrant program option for the RDSA and the ERDSA. It can have either of these values:

PROTECT|NOPROTECT

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMSR gate, INQUIRE_ACCESS_TOKEN function

The INQUIRE_ACCESS_TOKEN function of the SMSR gate is used to return the access token for a storage element.

Input parameters: None.

Output parameters

ACCESS_TOKEN is the access token for the storage element.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

SMSR gate, UPDATE_SUBSPACE_TCB_INFO function

The UPDATE_SUBSPACE_TCB_INFO function informs SM of the deletion of open TCBs which are associated with subspaces.

Input parameters

SUBSPACE_TOKEN indicates the subspace which is associated with the deleted TCBs.

OPEN_TCBS_DELETED is a 32-bit string indicating the mode(s) of deleted TCB(s).

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR

Storage manager domain’s generic gates

Table 90 summarizes the storage manager domain’s generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 90. Storage manager domain’s generic gates

Gate	Trace	Function	Format
DMDM	SM 0101 SM 0102	PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
STST	SM 0A01 SM 0A02	COLLECT_STATISTICS COLLECT_RESOURCE_STATS	STST

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—"Domain manager domain's generic formats" on page 195

Format STST—"Statistics domain's generic format" on page 521

In preinitialization processing, the storage manager domain sets the initial storage options:

- The amount of storage to be allocated to the dynamic storage area
- The amount of storage to be allocated to the extended dynamic storage area
- The storage recovery option
- The state of the storage protect, transaction isolation and the reentrant program option.

For a cold start, the information comes from the system initialization parameters; for any other type of start, the information comes from the local catalog, but is then modified by any relevant system initialization parameters.

Storage manager domain also issues console messages during preinitialization to report the amount of storage allocated above and below the line for DSA use.

In initialization, quiesce, and termination processing, the storage manager domain performs only internal routines.

Storage manager domain's generic format

Table 91 shows the generic format owned by the storage manager domain, and shows the function performed on the call.

Table 91. Generic format owned by the storage manager domain

Format	Calling module	Function
SMNT	DFHSMSY	STORAGE_NOTIFY

In the descriptions of the format that follow, the "input" parameters are input not to the storage manager domain, but to the domain being called by the storage manager. Similarly, the "output" parameters are output by the domain that was called by the storage manager domain, in response to the call.

Format SMNT, STORAGE_NOTIFY function

The STORAGE_NOTIFY function of SMNT format is used to notify free storage above and below the 16MB line.

Input parameters

DSAS_CONSTRAINED `YES|NO` indicates whether any DSA is currently constrained due to lack of free storage.

FREE_BYTES_CDSA is the largest free area available (in bytes) in the CICS DSA below the 16MB line (not including the cushion).

FREE_BYTES_UDSA is the largest free area available (in bytes) in the user-key DSA below the 16MB line (not including the cushion).

FREE_BYTES_SDSA is the largest free area available (in bytes) in the shared user-key DSA below the 16MB line (not including the cushion).

FREE_BYTES_RDSA is the largest free area available (in bytes) in the read-only DSA below the 16MB line (not including the cushion).

FREE_BYTES_ECDSA is the largest free area available (in bytes) in the CICS DSA above the 16MB line (not including the cushion).

FREE_BYTES_EUDSA is the largest free area available (in bytes) in the user-key DSA above the 16MB line (not including the cushion).

FREE_BYTES_ESDSA is the largest free area available (in bytes) in the shared user-key DSA above the 16MB line (not including the cushion).

FREE_BYTES_ERDSA is the largest free area available (in bytes) in the read-only DSA above the 16MB line (not including the cushion).

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOOP, ABEND
INVALID	INVALID_FUNCTION

Modules

Module	Function
DFHSMAD	Handles the following requests: ADD_SUBPOOL DELETE_SUBPOOL
DFHSMAR	Handles the following requests: ALLOCATE_TRANSACTION_STG RELEASE_TRANSACTION_STG
DFHSMCK	Handles the following requests: CHECK_STORAGE RECOVER_STORAGE

Module	Function
DFHSMDM	Handles the following requests: PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHSMDUF	SM domain offline dump formatting routine
DFHSMGF	Handles the following requests: GETMAIN FREEMAIN INQUIRE_ELEMENT_LENGTH
DFHSMMCI	SM domain macro-compatibility interface INITIALISE function
DFHSMMC2	SM domain macro-compatibility interface which handles the following requests: FREEMAIN_ALL_TERMINAL INQUIRE_ELEMENT_LENGTH INQUIRE_TASK_STORAGE
DFHSMMF	SM domain macro-compatibility interface FREEMAIN function
DFHSMMG	SM domain macro-compatibility interface GETMAIN function
DFHSMSR	Handles the following requests: INQUIRE_ACCESS INQUIRE_ACCESS_TOKEN INQUIRE_DSA_LIMIT INQUIRE_DSA_SIZE INQUIRE_REENTRANT_PROGRAM INQUIRE_SHORT_ON_STORAGE INQUIRE_STORAGE_PROTECT INQUIRE_TRANSACTION_ISOLATION SET_DSA_LIMIT SET_REENTRANT_PROGRAM SET_STORAGE_RECOVERY SET_STORAGE_PROTECT SWITCH_SUBSPACE
DFHSMST	Handles the following requests: COLLECT_STATISTICS COLLECT_RESOURCE_STATS
DFHSMSVC	Gets DSAs
DFHSMSY	SM domain system task—issues STORAGE_NOTIFY requests
DFHSMTRI	Interprets SM domain trace entries

Exits

No global user exit points are provided in this domain.

Trace

The point IDs for the storage manager domain are of the form SM xxxx; the corresponding trace levels are SM 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 75. Subsystem interface

The subsystem interface is a mechanism by which the MVS operating system communicates with its underlying subsystems at certain critical points in its processing.

CICS is required to be defined as a formal MVS subsystem for the following purposes:

- Multiregion operation (MRO)
- Shared database support
- Console message handling.

Functional overview

An MVS subsystem consists of two control blocks and a set of functional routines, all resident in common memory. The control blocks are:

SSCT The subsystem communication table, which contains the 4-character name of the subsystem and a pointer to the SSVT.

SSVT The subsystem vector table, which contains a list of the subsystem function codes that the subsystem supports, and the addresses of the functional routines that support them.

The subsystem is **active** when the SSCT contains a nonzero pointer to the SSVT, and **inactive** when the pointer is zero.

Subsystem definition

Each subsystem is defined to MVS by an entry in an IEFSSNxx member of SYS1.PARMLIB. (See the *OS/390 MVS Initialization and Tuning Guide*, SC28-1751.) Each subsystem can be defined with an initialization routine and some initialization parameters. The CICS subsystem is defined with an initialization routine of DFHSSIN, and an initialization parameter that specifies the name of an additional member of SYS1.PARMLIB, which contains further CICS-specific subsystem parameters. These parameters specify whether the console message handling facility is required.

Design overview

When the recommended initialization routine DFHSSIN is specified, the CICS subsystem is initialized during the master scheduler initialization phase of the MVS IPL. The CICS-specific subsystem parameters are read from SYS1.PARMLIB, and the subsystem vector table is created. The supporting subsystem function routines are loaded into common memory and their addresses are stored into the subsystem vector table. If everything is successful, the CICS subsystem is made active by storing the address of the subsystem vector table in the subsystem communication table.

Console message handling

At startup, a CICS region that supports console message handling notifies the CICS subsystem of its existence, by using the CICS SVC to issue a subsystem interface call for the ‘generic connect’ function with a CONNECT subfunction. The subsystem notes the creation of the new region and, if this is the first such CICS region to become active, invokes a service of MVS console support called “subsystem console message broadcasting”. The message broadcasting service causes all subsequent console messages to be broadcast to all subsystems that have expressed an interest in receiving them, including the CICS subsystem. This MVS service can also be activated by other products, for example, NetView.

If the message broadcasting service has been activated, either by CICS or by another product, the CICS subsystem examines ***all*** messages issued by WTO macros in any address space, but it intercepts and modifies only the following:

- Messages beginning with “DFH” that are issued under any CICS TCB, including those CICS regions that do not have console message handling support.

  These messages are reformatted to contain the CICS applid for the region in a standard position in the message.

  Because the CICS subsystem receives control after JES has recorded a console message in the job’s message log, messages in the job log do not appear to be reformatted. The messages are only reformatted on the operator consoles and in the MVS system log.

  If the original message is a long one, inserting the CICS applid can cause the message to exceed the maximum length for an MVS console message. In this case, the original message is suppressed (that is, does not appear on the console), and the reformatted message is issued using the MVS multiple-line console message service to split the message text over several lines. Both the original message and perhaps several instances of the reformatted multiple-line message appear in the job log, but only one copy of the reformatted message is displayed on the console.

- Messages that redisplay, on operator consoles or in the MVS system log, MODIFY commands that are directed towards CICS and contain signon passwords for the CESN transaction.

  These messages are reformatted with the passwords replaced by asterisks, so that the original passwords are not exposed.

As each TCB terminates, it issues an ‘end of task’ subsystem call, which is broadcast to all active subsystems. Likewise, as each address space terminates, it issues an ‘end of memory’ subsystem call, which is also broadcast to all active subsystems. When it receives either of these calls, the CICS subsystem first calls the end-of-memory routine in DFHIRP; then, if the terminating address space is known by the subsystem, it invokes the ‘generic connect’ function with a DISCONNECT subfunction.

The DISCONNECT subfunction notes the termination of the CICS address space and, if this is the last CICS containing console message handling support to terminate, notifies the “subsystem console message broadcasting” support that the CICS subsystem is no longer interested in receiving broadcast console messages. Nevertheless, if another product has kept console message broadcasting active, the CICS subsystem continues to reformat messages from CICS regions that do not have console message handling support.

Control Blocks

DSECT	Function
DFHSABDS	The CICS subsystem anchor block (SAB). This is used to contain global subsystem-related information that is common to all CICS regions in the MVS image. It is used to record the options specified in the DFHSSInn member of SYS1.PARMLIB. It contains a pointer to a bit map that records which MVS address spaces contain an active CICS. It also contains the address of the subsystem control table extension (SCTE) used by IRC, and the address of the CEC status tracking information used by XRF.
IEFJSCVT	The subsystem communication table (SSCT). This is an MVS control block. There is one SSCT for each subsystem, including the primary job entry subsystem (JES) as well as CICS.
IEFJSSVT	The subsystem vector table (SSVT). This is an MVS control block. There is one SSVT for each active subsystem. It contains a lookup table for determining which function codes are supported by the subsystem, and a list of the entry points for all the supporting function routines.

Figure 87 shows these control blocks.

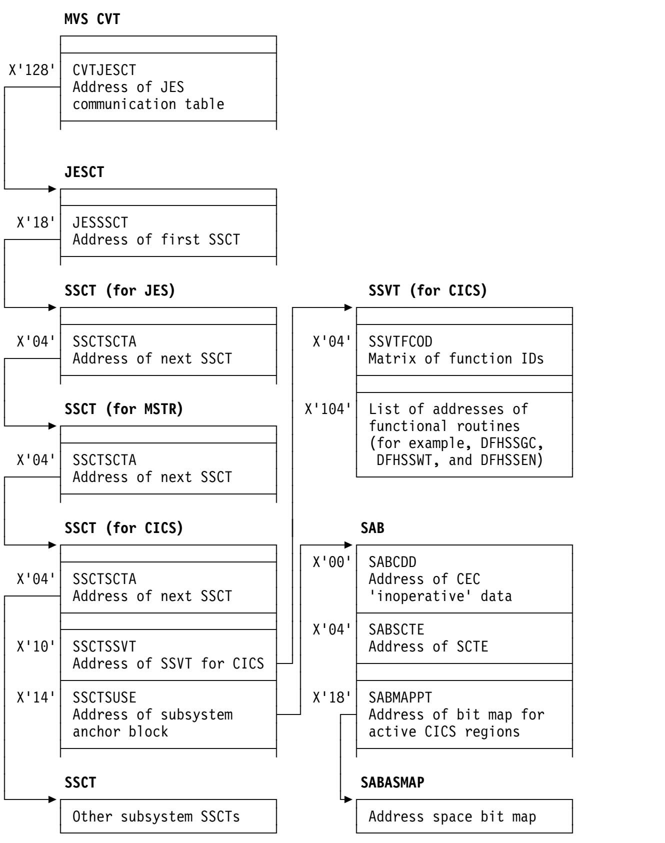


Figure 87. Control blocks associated with the subsystem interface

Modules

Module	Function
DFHSSIN	Subsystem initialization routine for the CICS subsystem. Reads in subsystem parameters from member DFHSSInn of SYS1.PARMLIB, creates SSVT, loads function modules into MVS common storage.
DFHSSEN	End-of-task and end-of-memory functional module. Calls DFHIRP’s EOT/EOM routine. Issues ‘generic connect’ if terminating region or job-step task is in the CICS address space map.
DFHSSGC	The generic connect functional module. CONNECT subfunction sets the bit for the current address space in the address space map. If this is the first CICS region to start, it invokes IEAVG700 to initiate message broadcasting. DISCONNECT subfunction unsets the bit for the current address space in the address space map. If this is the last CICS region to finish, it invokes IEAVG700 to terminate message broadcasting.
DFHSSMGP	Message routine for DFHSSIN.
DFHSSMGT	Message table for DFHSSIN.
DFHSSWT	Router module for the console message handler. Calls DFHSSWTO for messages beginning with DFH. Calls DFHSSWTF for messages that echo MODIFY commands.
DFHSSWTF	Suppresses passwords from the echoed copies of MODIFY CICS commands that contain signon passwords.
DFHSSWTO	Inserts the applid into all DFH messages issued under a TCB with a valid AFCB.

Exits

There are no user exits in the subsystem interface support.

Trace

No tracing is performed by the subsystem interface support.

External interfaces

Module DFHSSIN invokes the MVS module IEEMB878 to read its initialization parameters from SYS1.PARMLIB.

Module DFHSSGC invokes the MVS module IEAVG700 to start and stop console message subsystem broadcasting.

Modules DFHCSVC and DFHSSEN use the IEFSSREQ interface to communicate with the CICS subsystem.

Chapter 76. Subtask control

Subtask control is the interface between a CICS task and a subtask. It avoids suspending CICS execution, and improves the response time.

This function is invoked by the DFHSK macro with the following calls:

- CTYPE=PERFORM activates an exit routine under a new TCB.
- CTYPE=WAIT waits for subtask to complete.
- CTYPE=RETURN returns control to the main CICS TCB.

Design overview

Some synchronous operating system requests issued by CICS modules could cause CICS to be suspended until the requests had completed. To avoid the resulting response-time degradation, certain requests are processed by the general-purpose subtask control program, DFHSKP. A CICS module calls DFHSKP to execute a routine within the module under a subtask of the operating system.

DFHSKP does the following:

- Schedules a subtask to execute a routine (called an SK exit routine)
- Allows an SK exit routine to wait on an event control block (ECB) of the operating system
- Manages subtask creation, execution, and termination
- Handles program checks or abends within the SK exit routine.

DFHSKP consists of the DFHSKM, DFHSKC, and DFHSKE programs.

DFHSKM (subtask manager program)

A DFHSK macro invokes DFHSKM to cause a routine to be executed under a subtask of the operating system. DFHSKM chooses a subtask to execute the request unless the caller has specified a particular subtask.

DFHSKM determines whether the subtask is inoperative, not started, or running. The subtask is called inoperative if it has terminated itself, or could not be attached. If the subtask is inoperative and the user coded SYNC=YES in the DFHSK macro, the request is processed synchronously; that is, DFHSKM executes the request under the CICS task control block (TCB).

If the subtask has not started, DFHSKM attaches a CICS task specifying the entry point of DFHSKC to execute. DFHSKM then waits on an ECB in the subtask control area (SKA) for the subtask and continues when the ECB is posted by DFHSKC, indicating that the subtask has been initialized.

DFHSKM then creates a work queue element (WQE) that represents the work to be performed under a subtask. The WQE is added to the work queue for the subtask. When the work ECB of the subtask is posted, signaling work to do, DFHSKM issues a wait on the work-complete ECB in the WQE. This ECB is posted when the WQE has been processed by the subtask. DFHSKM returns control to the caller, indicating the outcome of the processing.

If the subtask processing the WQE fails before completion, DFHSKM is informed and attempts to execute the request synchronously if the caller so specified.

When CICS terminates, it issues a DFHSK CTYPE=TERMINATE macro to terminate the subtasking mechanism. DFHSKM sets a flag in each subtask control area (in DFHSKP static storage) indicating that the subtask should terminate. DFHSKM then posts the subtask work ECB to signal the subtask to examine this flag.

DFHSKM is also invoked by deferred work element (DWE) processing.

When DFHSKM decides to process a WQE synchronously, control is passed to the routine specified by the caller. This routine may not complete normally and, so that DFHSKM does not lose the WQE because the task abended, it creates a DWE containing the address of the WQE. If the task abends, the DWE processor adds the WQE to the free queue.

DFHSKC (subtask control program)

DFHSKM invokes DFHSKC using the DFHKCP attach logic to start a subtask of the operating system, and wait for its completion. DFHSKM passes the address of the subtask control area in the facility control area address (TCAFCAAA) in the TCA.

DFHSKC issues an EXEC CICS GETMAIN for shared storage to pass to the subtask for use as its automatic storage. The length required is in a field in DFHSKE containing the automatic storage requirements. DFHSKC issues the ATTACH macro with the ECB option to attach the operating system subtask, and passes the address of the subtask control area.

DFHSKC issues the CICS SVC to authorize the TCB of the subtask to use the SVC.

DFHSKC issues a KC wait on the attach ECB. The module is suspended until subtask termination, when the ECB is posted. On termination, the subtask puts a return code in the subtask control area.

When the subtask completes, DFHSKC cleans up the subtask work queue. It then frees the automatic storage and terminates.

DFHSKC writes messages to CSMT from this module if it was unable to attach a subtask of the operating system subtask, or the subtask indicated that its termination was not normal.

DFHSKE (subtask exit program)

When the subtask manager DFHSKM, executing on behalf of a CICS task, decides that a subtask is to be started, it attaches a CICS task using the DFHKC ATTACH macro and specifying the entry point of DFHSKCNA. This CICS task attaches the subtask and waits for subtask completion by means of the ECB parameter coded in the ATTACH macro.

The ATTACH macro specifies an entry point in DFHSIP (known to MVS by an IDENTIFY macro issued in DFHSIP). DFHSIP then branches to the entry point of DFHSKE, whose address is in the subtask control area.

Note: DFHSIP remains in storage after initialization has completed.

The subtask reverses the order of the in-progress queue to service requests on a first-come, first-served basis. It then loops round the in-progress queue and, for each WQE, branches to the program specified in the WQE (the SK exit routine).

The exit routine returns control to DFHSKE, either indicating that the exit routine has completed by issuing a DFHSK CTYPE=RETURN macro or requesting that execution of the SK exit is suspended until an ECB specified by the exit is posted by some component of the operating system.

When a return is requested, the ECB in the WQE is posted, causing the dispatcher domain to resume the CICS task that was waiting for the SK exit to be complete. When a wait is requested, the WQE is added to the waiting queue, which is processed later.

When all WQEs in the in-progress queue have been processed, DFHSKE examines the waiting queue. If any WQEs are on this queue, their ECB addresses are inserted into an operating-system multiple-wait queue. The subtask work ECB (posted when a WQE is added to the work queue) is put at the top of this multiple-wait list. An operating-system multiple-wait is then issued.

When the subtask regains control, an ECB has been posted. This can be because more work has arrived or because an ECB belonging to an exit routine has been posted.

The WQEs on the waiting queue are scanned, and those whose ECB has been posted are moved to the in-progress queue, with a flag on indicating that an SK exit routine is to be resumed.

Control returns to the beginning of this program which examines the work queue and proceeds as described earlier.

DFHSKE handles program checks and operating system abends. If an abend exit is driven when processing a WQE, that WQE is blamed and processing of it terminates. The CICS task requesting the processing is informed of the problem.

If an abend exit is driven when a WQE is not being processed, it is assumed to be a problem in the subtasking program. The abend is handled, and a count of failures is increased. When a threshold is reached, the subtask terminates.

The MVS exits are ESTAE and SPIE.

For normal termination, DFHSKE loops, processing WQEs and waiting when there is no work to do. The subtask checks a flag in the subtask control area to see if it has been requested to terminate. If the flag is set, the subtask terminates, indicating normal termination by setting a response code in the subtask control area for the attacher, DFHSKC.

Abnormal termination may occur when the error threshold has been reached. The subtask terminates, but sets an error return code in the subtask control area for the attacher to see. The attacher, DFHSKC, then cleans up any outstanding WQEs on the subtask queues.

Control blocks

This function has the following control blocks:

- SK static storage contains pointers to free work queue elements (WQEs) and to work queue elements.
- SKRQLIST is the parameter area passed to DFHSKP on a request. It contains the address of the code to be executed, and the address of the ECB.
- DFHSKWPS is the WKE structure containing the address of the next WQE in the chain, the contents of the parameter field from CTYPE=PERFORM, the save area for registers, and the work-complete ECB.
- DFHSKAPS is the subtask control area. Each instance of this control block describes the state of one subtask and contains the address of automatic storage to be used by DFHSKE, pointers to the WQE used by the subtask, the current WQE being processed, and the ECB for work and completion.

See the *CICS Data Areas* manual for a detailed description of these control blocks.

Modules

Module	Function
DFHSKC	The subtask control program is invoked by DFHSKM to start up a subtask of the operating system
DFHSKE	The general-purpose multitask program is executed as a subtask of the operating system
DFHSKM	The subtask manager program causes the routine to execute under a subtask.

Exits

No global user exit points are provided for this function.

Trace

The following point ID is provided for this function:

- AP 00DE, for which the trace level is AP 1.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

External interfaces

The following external calls are made by DFHSKC:

MVS ATTACH	To attach a new TCB
MVS DETACH	To detach a TCB
MVS POST	To post a CICS TCB.

The following external calls are made by DFHSKE:

MVS ESTAE	To establish an error exit
MVS WAIT	To synchronize with the TCB
MVS SETRP	To retry after a failure.

Chapter 77. Syncpoint program

This allows the user to specify logical units of work by means of **syncpoints**. Any processing performed between syncpoints (provided the resources are declared as recoverable) can be reversed in the event of an error; but ***after*** a given syncpoint has been reached, the processing performed ***before*** that syncpoint cannot be reversed.

A syncpoint is also taken automatically at the end of each task.

Design overview

The syncpoint program works in conjunction with the Recovery Manager domain to provide the user with the ability to establish points in application programs at which all recoverable updates are committed. (The user can, at any time, back out any uncommitted changes by means of the rollback function.)

The syncpoint interface is provided by the DFHSPP module. DFHSPP is invoked, via the EXEC Interface module DFHEISP, when an application program issues an EXEC CICS SYNCPOINT or SYNCPOINT ROLLBACK command. It is also called from other CICS modules, such as DFHMIRS.

Further important information about syncpoint processing is given in Chapter 40, “Function shipping” on page 333 and Chapter 63, “Recovery Manager Domain (RM)” on page 457.

DFHSPP implements syncpoint calls by in turn calling the Recovery Manager domain with DFHRMUWM COMMIT_UOW or BACKOUT_UOW requests. RM calls its clients with prepare, commit, start backout etc. calls. One of RM's clients is ’APUS’, serviced by module DFHAPRC. Depending on the call from RM DFHAPRC calls DFHSPP or DFHDBP to process Deferred Work Elements (DWEs). DWEs provide a mechanism whereby resource owners can record their need to perform actions at a syncpoint. Most resource owners provide their own RM client routines, but a few, such as interval control, use DWEs.

Note that the implicit syncpoint or backout performed at task termination is effected by a direct call to the RM domain, not by issuing a DFHSP macro.

Task-related user exit resynchronization

The purpose of task-related user exit resynchronization is to allow a resource manager to ask CICS for the resolution of UOWs about which it is in-doubt. Task related user exit resynchronization is called as a result of an EXEC CICS RESYNC command to restore the CICS end of the thread that was interrupted by the failure of the connection with the resource manager.

DFHRMSY is passed a parameter list by DFHERMRS which consists of the following: rmi entryname (8 bytes) - the name of the TRUE to be called for resync. rmi qualifier (8 bytes) - the qualifier to the name of the TRUE to be called for resync. uowid (8 bytes) - the id of the UOW to be resynchronized resync type (1 byte) - a flag indicating whether this is a resync as a result of an EXEC CICS RESYNC command or due to a Recovery manager domain unshunt.

DFHRMSY's job is to call the named TRUE with a resync call giving the resolution of the named UOW. The resolution can be commit, backout, should not be indoubt or lost to initial start. (Lost to initial start means that a START=INITIAL has been performed subsequent to the indoubt UOW being created. Initial start clears the log and the catalog meaning that Recovery Manager has no knowledge of the UOW.)

In order to find the outcome of the UOW, DFHRMSY issues a INITIATE_RECOVERY call to Recovery manager domain for the named UOW, which returns the UOW status. DFHRMSY then builds the resync plist to pass to the TRUE, and calls the TRUE using a DFHRMCAL macro. On return from the TRUE, if the TRUE returns an OK response indicating that it has successfully resynced with its resource manager, then DFHRMSY issues a TERMINATE_RECOVERY call to RECOVERY manager domain specifying FORGET(YES). This tells RM domain it can remove this TRUE's involvement in the UOW. If no other components or TRUEs are waiting resync for the UOW, then RM domain will delete it's knowledge of the UOW. If the TRUE does not return with an ok response, FORGET(NO) is specified on the TERMINATE_RECOVERY call, and RM domain retains this UOW for this TRUE. A subsequent resync will be required.

Control blocks

This section describes the control blocks used by the syncpoint program:

- Deferred work element (DWE)

See the *CICS Data Areas* manual for a detailed description.

Deferred work element (DWE)

A deferred work element (DWE) is created and placed on a DWE chain to save information about actions that must be taken when the unit of work terminates. These actions may depend upon whether the UOW commits or backs out.

DWEs are created by CICS control modules, and chained off field TCADWLBA in the task’s TCA using DWECHAN as the chain field. The module that creates a DWE inserts the entry address of a DWE processor in field DWESVMNA of that

DWE. Control is passed to this DWE processor by the syncpoint program at the end of the task or UOW.

DWEs can be used for work to be done before or after the syncpoint is logged or in the event of transaction backout.

The layout of DWEs is defined by the DFHDWEPS structure and by the DFHDWEDS assembler DSECT.

Modules

DFHSPP, DFHAPRC, DFHDBP

DFHSPP

DFHSPP can be invoked by the following macros:

DFHSP TYPE=USER
Take a syncpoint

DFHSP TYPE=ROLLBACK
Roll back the current unit of work

DFHSP TYPE=PHASE_1
Do DWE processing for prepare

DFHSP TYPE=PHASE_2
Do DWE processing for commit

When DFHSPP is called by means of a DFHSP TYPE=USER or TYPE=ROLLBACK macro the request is converted into a call to the Recovery Manager domain to commit or backout the current UOW. If the RM request fails SPP calls DFHAPAC to select an abend code corresponding to the failure reported by RM (for example ASP1 for an in-doubt failure) and, in most cases, issues a PC ABEND with this abend code.

In the case of a commit or backout failure, however, no PC ABEND is issued and the transaction continues normally. In these cases CICS has, for the present, been unable to bring all local resources to the committed state for this unit of work. It has recorded any data necessary to re-attempt this at some later time, and has retained any locks necessary to preserve data integrity until then.

When DFHSPP is called by means of a DFHSP TYPE=PHASE_1 or TYPE=PHASE_2 macro SPP processes any DWEs in the DWE chain (TCADWLBA). The TYPE=PHASE_1 call is issued by DFHAPRC in response to an RM prepare or end_backout request. For each DWE in the chain that is not marked as cancelled (DWECNLM ON) or phase_2 only (DWEPHS2 ON) the DWE processor (entry address DWESVMNA) is called. In the prepare case SPP collects 'votes' and may return a YES, NO or READ-ONLY vote to its caller. Also, if necessary, a DL/I TERM call is issued to allow DFHDLI to perform end-of-UOW actions. The TYPE=PHASE_2 call is issued by DFHAPRC in response to an RM commit or shunt request. For each DWE in the chain that is marked phase 2 and not cancelled the DWE processor is called. In the shunt case any DWE that is marked for shunting (DWESHUNT ON) is retained in the DWE chain. All other DWEs are freed.

DFHDBP

DFHDBP is link-edited with DFHAPRC and is called by DFHAPRC in response to an RM start_backout request. For each DWE in the task's DWE chain that is not marked cancelled it marks the DWE as 'backout' (DWEDYNB ON). For any BMS DWE it issues a DFHBMS TYPE=PURGE request to discard the incomplete message, otherwise it calls the DWE processor then marks the DWE as cancelled.

DFHAPRC

DFHAPRC is the module which provides the gate for the 'APUS' Recovery Manager client. It provides keypoint and restart support for user written log records, which is described elsewhere, and syncpoint support where it serves as a receiver for RMRO calls from the RM domain for prepare, commit, etc. which it converts into appropriate calls to SPP or DBP described above.

Exits

No global user exit points are provided for this function.

Trace

The following point IDs are provided for this function:

- AP 00CB, for which the trace level is AP 1.
- AP D8xx, for which the trace level is AP 1.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 78. System dump formatting program

The system dump formatting program is for use on MVS system dump (SYS1.DUMP) data sets that record system dumps requested by CICS via the MVS SDUMP macro.

The program is invoked via the interactive problem control system (IPCS). You can use IPCS either interactively or from an MVS batch job.

The CICS-supplied sample system dump formatting program for use with CICS Transaction Server for OS/390 Release 3 control blocks is called DFHPD510. In earlier CICS releases, the CICS dump formatting program for use under the IPCS is supplied as DFHPDX.

For further information about the system dump formatting programs, about using IPCS to format and analyze CICS dumps, and about the dump exit parameters available, see the *CICS Operations and Utilities Guide*.

Design overview

The system dump formatting program produces a formatted listing of CICS control blocks grouped within functional area. CICS dump exit parameters can be specified on the IPCS VERBEXIT subcommand to indicate whether the control block output is to be produced or suppressed for each functional (component) area. Summary reports are available for certain of the functional areas, and the dump exit parameters can also indicate whether these are to be produced or suppressed.

Modules

Module	Function
DFHAIDUF	Autoinstall terminal model manager formatter
DFHAPTRA	Application domain multiregion operation trace interpreter
DFHAPTRB	Application domain extended recovery facility trace interpreter
DFHAPTRC	Application domain user exit trace interpreter
DFHAPTRD	Application domain trace interpreter
DFHAPTRE	Application domain data tables trace interpreter
DFHAPTRF	Application domain SAA Communications and Resource Recovery interfaces trace interpreter
DFHAPTRG	Application domain ZC exception and VTAM exit trace interpreter
DFHAPTRI	Application domain trace interpretation router
DFHAPTRJ	Application domain ZC VTAM interface trace interpreter
DFHAPTRL	Application domain CICS OS/2 LU2 mirror trace interpreter
DFHAPTRN	Application domain autoinstall terminal model manager trace interpreter
DFHAPTRO	Application domain LU6.2 application request logic trace interpreter
DFHAPTRP	Application domain program control trace interpreter
DFHAPTRR	Application domain partner resource manager trace interpreter
DFHAPTRS	Application domain DFHEISR trace interpreter
DFHAPTRV	Application domain DFHSRP trace interpreter
DFHAPTRW	Front End Programming Interface feature trace interpreter
DFHAPTR0	Application domain old-style trace entry interpreter
DFHAPTR2	Application domain statistics trace interpreter
DFHAPTR4	Application domain transaction manager trace interpreter
DFHAPTR5	Application domain file control trace interpreter
DFHAPTR6	Application domain DBCTL DL/I trace interpreter
DFHAPTR7	Application domain LU6.2 transaction routing trace interpreter
DFHAPTR8	Application domain security trace interpreter
DFHAPTR9	Application domain interval control trace interpreter
DFHCCDUF	CICS catalog formatter
DFHCCTRI	CICS catalog trace interpreter
DFHCPDUF	SAA Communications and Resource Recovery interfaces formatter
DFHCSDUF	CSA and CSA optional features list formatter
DFHDBDUF	DBCTL and remote DL/I dump formatter
DFHDDDUF	Directory manager formatter
DFHDDTRI	Directory manager trace interpreter
DFHDMDUF	Domain manager formatter
DFHDMTRI	Domain manager trace interpreter
DFHDSDUF	Dispatcher domain formatter
DFHDSTRI	Dispatcher domain trace interpreter
DFHDUDUF	Dump domain formatter
DFHDUF	Formatting router
DFHDUFUT	Service functions routine
DFHDUTRI	Dump domain trace interpreter
DFHERDUF	Error message index processor
DFHFCDUF	File control formatter
DFHFRDUF	File control recoverable work elements formatter
DFHICDUF	Interval control formatter
DFHIPCSP	Table of CICS entries for the IPCS exit control table
DFHIPDUF	Kernel stack internal procedure formatter
DFHKEDUF	Kernel domain formatter
DFHKELOC	Routine for locating domain anchors
DFHKETRI	Kernel domain trace interpreter
DFHLDDUF	Loader domain formatter
DFHLDTRI	Loader domain trace interpreter
DFHLMDUF	Lock manager formatter
DFHLMTRI	Lock manager trace interpreter
DFHMEDUF	Message domain formatter
DFHMETRI	Message domain trace interpreter
DFHMNDUF	Monitoring domain formatter
DFHMNTRI	Monitoring domain trace interpreter
DFHMRDUF	Multiregion operation formatter
DFHNXDUF	Control block index processor
DFHPADUF	Parameter manager formatter
DFHPATRI	Parameter manager trace interpreter
DFHPDKW	Input parameter string validation routine
DFHPDX1	Control program
DFHPGDUF	Program manager formatter
DFHPGTRI	Program manager trace interpreter
DFHPRDUF	Partner resource manager formatter
DFHPTDUF	Program control table formatter
DFHRMDUF	Resource recovery manager formatter
DFHSMDUF	Storage manager formatter
DFHSMTRI	Storage manager trace interpreter
DFHSNTRI	Application domain signon trace interpreter
DFHSSDUF	Static storage area formatter
DFHSTDUF	Statistics domain formatter
DFHSTTRI	Statistics domain trace interpreter
DFHSUDUF	Dump domain summary formatter
DFHSUTRI	Subroutine trace interpreter
DFHSZDUF	Front End Programming Interface feature dump formatter
DFHTCDUF	Terminal control formatter
DFHTDDUF	Transient data formatter
DFHTDTRI	Transient data trace interpreter
DFHTIDUF	Timer domain formatter
DFHTITRI	Timer domain trace interpreter
DFHTMDUF	Table manager formatter
DFHTRDUF	Trace domain formatter
DFHTRFFD	Trace entry data field formatter
DFHTRFFE	Trace entry formatter
DFHTRFPB	Routine to process blocks of trace entries

Module	Function
DFHTRFPP	Routine for selecting trace entries to be printed
DFHTRIB	Trace entry interpretation string builder
DFHTRTRI	Trace domain trace interpreter
DFHTSDUF	Temporary-storage formatter
DFHUEDUF	User exit formatter
DFHUSDUF	User domain dump formatter
DFHUSTRI	User domain trace interpreter
DFHXMDUF	Transaction manager domain formatter
DFHXMTRI	Transaction manager domain trace interpreter
DFHXSDUF	Security domain dump formatter
DFHXSTRI	Security domain trace interpreter
DFHXRDUF	Extended recovery facility (XRF) formatter
DFHZXDUF	XRF ZCP queue formatter

Exits

Global user exit points are not applicable to offline utilities.

Trace

Trace points are not applicable to offline utilities. However, the output obtained and any messages issued by the system dump formatting program may provide clues to problems associated with corrupted data.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

External interfaces

The following external calls are used by the system dump formatting program:

- MVS GETMAIN and FREEMAIN for storage management
- OPEN SVC to open DFHSNAP
- CLOSE SVC to close DFHSNAP
- MVS IPCS service routines.

Chapter 79. System recovery program

The system recovery programs, DFHSR1, DFHSRP, and DFHSRLI, together form the default CICS recovery routine for the application (AP) domain. This routine is, in particular, the recovery routine for program checks, operating system abends, and runaway tasks that occur in user application code.

Design overview

The CICS kernel intercepts program checks, runaway tasks, operating system abends and some other internal errors for all CICS domains. The kernel then selects which CICS recovery routine to pass control to. The selected recovery routine can then process the error as appropriate.

The DFHSR1 module is the default recovery routine for the application domain. It receives control if any of the above errors occur in CICS system application programs, user application programs and some CICS nucleus modules. It processes internal errors itself but, when dealing with program checks, operating system abends, and runaway task abends, it calls the DFHSRP module. The DFHSRP module, in turn, converts the error into a transaction abend, if possible; if not possible, it terminates CICS. The DFHSRP module uses subroutines in DFHSRLI.

The transaction abend codes that may be issued are:

AEYD	error detected by command protection
AICA	task runaway
AKEF	domain gate not active
AKEG	kernel stack storage GETMAIN failure.
ASRA	program check
ASRB	operating system abend
ASRD	illegal macro call or attempt to access the CSA or TCA
ASRK	TCA not available
xxxx	as set by issuers of deferred abend

The processing associated with each of these abends is described in "Error handling."

For further information about the abends, see the *CICS Messages and Codes* manual.

System recovery table

Associated with DFHSRP is the system recovery table (SRT). This is a table that the user can provide, containing operating system abend codes. It controls whether CICS recovers from program checks and operating system abends in noncritical code.

You specify the name of the system recovery table by the SRT system initialization parameter, as either SRT=NO or SRT=xx, where xx is the two-character suffix of the SRT:

- If NO is coded, CICS does not recover from program checks or operating system abends, and terminates if one occurs.
- If a suffix is coded, CICS attempts to recover from all types of program check, but can only recover from an operating system abend if the abend code appears in the SRT identified by the suffix (for example, DFHSRT1A where 1A is the suffix). If the abend code is not in the SRT, CICS terminates.

For information about how to create the SRT, see the *CICS Resource Definition Guide*.

Recovery initialization

The DFHSII1 module calls the DFHSR1 module during AP Domain initialization. The DFHSR1 module tells the Kernel that it is the default recovery routine for the AP domain and adds the ABAB gate.

If any error occurs when informing the kernel, CICS is terminated with message DFHSR0605 and a system dump because it is not possible to run CICS without AP domain recovery.

Error handling

The DFHSR1 module gets control from the kernel or from other AP domain modules. It decides whether it is dealing with an internal error or an external error such as a program check. Internal errors are dealt with by exiting from the recovery environment and issuing the appropriate kernel call. If either of the DFHXFP or DFHEMS modules has caused a program check, the DFHSR1 module exits from the recovery environment and passes control to DFHXFP or DFHEMS. All other external errors are passed on to the DFHSRP module. If control returns from the DFHSRP module, DFHSR1 issues a transaction abend. If control returns from the abend call, it is because the XPCTA exit has requested retry; in which case, DFHSR1 restores the registers etc and branches to the resume address.

The DFHSRP module makes an exception trace entry, ensures it is running on the QR TCB and then deals with one of the following:

- Program check (see "Program check" on page 552)
- Operating system abend (see "Operating system abend" on page 552)
- Runaway task (see "Runaway task" on page 553)
- Kernel gate error (see "Kernel gate error" on page 553)

- Deferred abend. (see "Deferred abend" on page 553).

Note: The kernel recovery environment is terminated very soon after DFHSRP receives control. This ensures that DFHSRP gets driven again if a subsequent error occurs in DFHSRP itself (rather than the kernel percolating the error to the next kernel stack entry). DFHSRP is therefore in a position to detect such recursive errors, and can take the appropriate action.

If DFHSRP can abend the transaction, it builds a Transaction Abend Control Block (TACB) to describe the abend. The TACB is a task-lifetime control block that records details of a transaction abend. This TACB may be used by the rest of AP domain that needs information about the abend. DFHSRP builds the TACB, rather than letting Program Control build it as part of DFHPC TYPE=ABEND processing. This enables DFHSRP to include extra information in the TACB that would otherwise be lost, such as GP registers, PSW, and FP registers at the time of the error.

Program check: The following processing takes place for a program check, in the order given:

1. If this program check occurred while DFHSRP was in the middle of processing a previous program check, then CICS is terminated with message DFHSR0602 and a system dump. Otherwise DFHSRP may get caught in a recursive loop.
2. If this program check occurred while DFHSRP was in the middle of processing an operating system abend, then CICS is terminated with message DFHSR0615 and a system dump. This traps program checks in global user exit XSRAB.
3. If DFHEIP hired gun checking caused the program check, create an abend record for abend code AEYD and return to DFHSR1.
4. If the program check was an 0C4 protection exception, DFHSRP diagnoses the 0C4 further in order to establish whether it was caused by an attempt to access or overwrite CICS-managed protected storage.
   Such storage is as follows:
   - The fetch-protected dummy CSA block
   - The CDSA
   - The ECDSA
   - The ERDSA.
   - The EUDSA.
   - The RDSA.
   - The UDSA.

   Of the above, it should be noted that one can only 0C4 on the CDSA or ECDSA if storage protection is active, while 0C4 on the UDSA or EUDSA can only be obtained if transaction isolation is active.

   This diagnosis is accomplished by disassembling the failing instruction, and examining the instruction operands in conjunction with the execution conditions at the time of the 0C4 (such as execution key). If the dummy CSA caused the 0C4 (that is, an attempt was made to access the CSA or TCA, or an illegal macro call was issued), message DFHSR0618 is issued. If a DSA caused the 0C4, message DFHSR0622 is issued.
5. If the SRT=NO system initialization parameter was specified, you have disabled recovery, and CICS terminates with message DFHSR0603 and a system dump.
6. If a CICS system task was in control at the time of the program check, indicated by a non-numeric transaction number, CICS is terminated with message DFHSR0601 and a system dump.
7. Some special processing is performed which applies only to PL/I programs.
8. DFHSRLI is called to determine the following information:
   - The program in which the program check occurred
   - The offset in that program
   - The execution key.
9. The results of the diagnosis (program, offset, execution key, and, if an 0C4 abend, any "hit" DSA) are output in an exception trace.
10. Message DFHAP0001 or DFHSR0001 is issued and a system dump is taken. (See also "System dump suppression" on page 553.)

    Whether message DFHAP0001 or DFHSR0001 is issued is governed by the execution key at the time of the program check. If the program was running in user key, message DFHSR0001 is issued; otherwise, message DFHAP0001 is issued.
11. Finally, DFHSRP creates an abend record and returns to DFHSR1.

Operating system abend: The following processing takes place for an operating system abend, in the order given:

1. If this abend occurred while DFHSRP was in the middle of processing a previous operating system abend, then CICS is terminated with message DFHSR0612 and a system dump. Otherwise, DFHSRP may get caught in a recursive loop.
2. If the SRT=NO system initialization parameter was specified, you have disabled recovery, and CICS terminates with message DFHSR0606. A system dump may be taken, if specified on the operating system abend.
3. If the SRT=xx system initialization parameter was specified, DFHSRP searches the SRT with the suffix xx (that is, DFHSRTxx) for the abend code. If it does not find the abend code, CICS terminates with message DFHSR0606. A system dump may be taken, if specified on the operating system abend.
4. When the abend code has been located, the next check is to see if the operating system abend occurred in a CICS system task, indicated by a non-numeric

transaction number. If so, CICS terminates with message DFHSR0613 and a system dump.

5. Otherwise, the default decision is to abend the transaction with code ASRB. However, you can modify this decision by coding a global user exit program at exit point XSRAB. In addition to performing any processing that might be required for particular operating system abends, the XSRAB exit point allows you to specify whether to:
   - Terminate CICS
   - Abend the transaction ASRB
   - Abend the transaction ASRB, but cancel any active HANDLE ABEND exits.
6. If you choose to terminate CICS, CICS terminates with message DFHSR0606. A system dump may be taken, if specified on the operating system abend.
7. DFHSRLI is called to determine the following information:
   - The program in which the program check occurred
   - The offset in that program
   - The execution key.
8. The results of the diagnosis (program, offset, and execution key) are output in an exception trace.
9. Message DFHAP0001 or DFHSR0001 is issued and a system dump is taken. (See also "System dump suppression.")

   Whether message DFHAP0001 or DFHSR0001 is issued is governed by the execution key at the time of the program check. If the program was running in user key, message DFHSR0001 is issued; otherwise, message DFHAP0001 is issued.
10. Finally, DFHSRP The DFHSRP module creates an abend record with abend code ASRB returns to DFHSR1.

Runaway task: One of the following processing options takes place for a runaway task:

- If this runaway task occurred while DFHSRP was in the middle of processing an operating system abend, CICS terminates with message DFHSR0612 and a system dump. This traps runaway tasks caused by errors in global user exit XSRAB.
- Otherwise, the DFHSRP module creates an abend record with abend code AICA and returns to DFHSR1.

Kernel gate error: One of the following processing options takes place for a kernel gate error:

- If this error occurred while DFHSRP was in the middle of processing an operating system abend, CICS terminates with message DFHSR0612 and a system dump. This traps kernel gate errors from XPI calls in global user exit XSRAB.
- Otherwise, the DFHSRP module issues message DFHAP0001, creates an abend record with abend code AKEF, and returns to DFHSR1.

kernel stack GETMAIN error: The processing that takes place for a kernel stack GETMAIN error is identical to the processing for a kernel gate error, except that the transaction is abended with abend code AKEG.

Deferred abend: The DFHSRP module creates an abend record using the abend code set by the code that issued the deferred abend and returns to DFHSR1.

DFHSRLIM interface

This interface is used to call program DFHSRLI. It provides the following functions for DFHSRP:

INVOKE_XSRAB: This function invokes global user exit XSRAB if active, passing to it structure SRP_ERROR_DATA which contains details of the operating system abend that occurred. The abend recovery option selected by the exit is returned, which is either to terminate CICS, abend the transaction ASRB, or abend the transaction ASRB and cancel any active abend exits.

DIAGNOSE_ABEND: This function diagnoses a program check, operating system abend, or other error, to establish the location of the error. It returns the program in which the error occurred, the offset within that program, and whether the error occurred in CICS or user application code. (A decision based on the execution key; user key implies user application code.)

System dump suppression

When message DFHAP0001 or DFHSR0001 is issued before the transaction is abended with ASRA, ASRB, ASRD, AKEF, or AKEG, the default is to take a system dump with dumpcode AP0001 or SR0001 respectively. Message DFHSR0001 is issued if CICS is running with storage protection active and is running in user key at the time of the error; otherwise, message DFHAP0001 is issued.

Therefore, it is possible to suppress the system dumps taken for errors occurring in code that is being run in user key (user application code), while retaining system dumps for errors occurring in code that is being run in CICS key (CICS code), by adding SR0001 to the dump table specifying that no system dump is to be taken.

Note that the XDUREQ Global User Exit can be used to distinguish between AP0001 situations in application and non-application code. This allows selective dump suppression when storage protection is not active or when it is active but some applications run in CICS key.

Modules

Module	Function
DFHSRP	Called by DFHSR1 to process program checks, operating system abends, runaway tasks, and so on.
DFHSRLI	Provides functions for DFHSRP, via the DFHSRLIM interface.
DFHSR1	The default recovery routine for the AP Domain.

Exits

There is one global user exit point in DFHSR1: XSRAB. This exit can be called if an operating system abend has occurred and the abend code is in the SRT.

For further information about using the XSRAB exit, see the *CICS Customization Guide*.

Trace

The following trace point IDs are provided for DFHSRP and DFHSRLI:

- AP 0701, for which the trace entry level is AP 2
- AP 0702, for which the trace entry level is AP 2
- AP 0780, for which the trace entry level is Exc
- AP 0781, for which the trace entry level is Exc
- AP 0782, for which the trace entry level is Exc
- AP 0783, for which the trace entry level is Exc.
- AP 0790, for which the trace entry level is Exc
- AP 0791, for which the trace entry level is Exc
- AP 0792, for which the trace entry level is Exc
- AP 0793, for which the trace entry level is Exc.
- AP 0794, for which the trace entry level is Exc
- AP 0795, for which the trace entry level is Exc
- AP 0796, for which the trace entry level is Exc
- AP 0797, for which the trace entry level is Exc.
- AP 0798, for which the trace entry level is Exc
- AP 0799, for which the trace entry level is Exc.
- AP 079A, for which the trace entry level is Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 80. System spooler interface

A system programmer can communicate with the local system spooler and, consequently, with other system spoolers via the system spooler network facilities. The system spooler interface single-threads its input, and it is the user’s responsibility to see that all transactions get the chance to run. One high-priority transaction should not use the interface exclusively.

Further information about the system spooler interface is given in the *CICS Application Programming Reference*.

Design overview

The system spooler interface program opens a system spooler file for either input or output, reads or writes a file, and closes a file. These functions are for system programmer use. The input is single-threaded, so only one transaction can use it at a time.

An application can send files to a remote location by specifying the node of the location, and the userid (or external writer name) of the user at that location. To retrieve a file at the remote location, you specify the external writer name, and you can then retrieve reports from that writer. For security reasons, the external writer name must begin with the same four characters as the CICS applid. The remote system to which a file or report is sent, or from which it is received, must have JES under MVS, or VM.

System spooler interface modules

The SPOOLOPEN command dynamically allocates input or output files using the CICS SVC, and an application control block (ACB) is opened to process the file. For an input file, the IEFSSREQ macro is also issued to determine which file to process. The SPOOLREAD or SPOOLWRITE commands cause GETs or PUTs to be issued using the ACB. The SPOOLCLOSE command dynamically deallocates a file, and causes it to be either transmitted or deleted. All processing which could cause CICS to be suspended is performed under an operating system subtask which is initiated by subtask control, DFHSKP.

DFHPSPST runs under CICS, but DFHPSPSS, and modules called as a result, run under the subtask.

Normal flow

When a system spooler interface command is executed, the normal sequence of invocation of modules is:

1. DFHEIP
2. DFHEPS
3. DFHPSP
4. DFHPSPSS
5. DFHPSPST
6. DFHPSSVC.

DFHPSP is called by:

- Application programs via DFHEPS issuing the DFHPS macro.
- Syncpoint program and dynamic transaction backout program to the deferred work element (DWE) module (DFHPSPDW). The entry address of DFHPSPDW is stored in the DWE. DFHPSPDW then calls DFHPSPST via DFHPS.

Abnormal flow

If a user transaction terminates without issuing a SPOOLCLOSE command, DFHPSPDW is invoked to process a DWE that was set up when the SPOOLOPEN command was processed. This closes the file in the usual way.

Modules

Module	Name
DFHEIP	DFHEIP initializes the EXEC interface structure (EIS) and then invokes the application program. Each EXEC CICS command invokes DFHEIP (nucleus) which in turn invokes the appropriate interface processor. DFHEIP also returns information to the application program through EIB (within EIS).
DFHEPS	DFHEPS is the link between DFHEIP and the JES interface program, DFHPSP.
DFHPSP	DFHPSP is the system spooler interface control module.
DFHPSPCK	DFHPSPCK is the JES interface termination processor.
DFHPSPDW	DFHPSPDW is the DWE processor.
DFHPSPSS	The system spooler interface subtask module attaches a subtask to check that a writer name and a token have been supplied. It opens and closes JES data sets, reads a record, and writes a record.
DFHPSPST	DFHPSPST is the JES interface controller.
DFHPSSVC	DFHPSSVC is the system spooler interface module that retrieves a data set name for a given external writer name, dynamically allocates it, and returns its DDNAME.

Exits

No global user exit points are provided for this interface.

Trace

The following point ID is provided for this interface:

- AP 00E3, for which the trace level is AP 1.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 81. Table manager

The table manager controls the locating, adding, deleting, locking, and unlocking of entries in certain CICS tables. These operations can be performed while CICS is running.

Design overview

Locating, adding, deleting, locking, and unlocking entries in tables such as the file control table (FCT), application file control table (AFCT), data set name block table (DSNT), and terminal control table (TCT) are performed by the table manager program, DFHTMP. Entries in these tables are also called "resources". Because the structures of tables vary as entries are added or deleted, and a quick random access is required, a hash table mechanism is used to reference the table entries. In addition because fast access is needed for generic locates and ordered lists of entries, a getnext chain with a range table is used.

Hash table

The hash table is a set of pointers that are the addresses of directory elements of table entries. A directory element is a set of pointers; one of these pointers is the address of the table entry, the remaining pointers are the addresses of the next elements of various chains used in the different operations of the table manager. An example of a hash table is shown in Figure 88 on page 558.

The table manager logically combines the characters of the name of the resource, and transforms the result to give an integer that is evenly distributed over the hash table size.

When an entry is located or added, the table manager places it at the head of its chain. Thus frequently used entries tend to have the minimum search times.

If the hash chains become very long, the table manager creates a larger hash table if storage is available. The hash table is enqueued before and dequeued after the reorganization, so that no references to the table can be made during reorganization.

Note: Certain TMP hash tables are not reorganized because they are also used in VTAM SRB exits.

Range table and getnext chain

Some requests to TMP are not full key locates, but rather generic locates with a partial key. For example, requests to find all terminals whose Termid starts with two specified characters. To enable these requests, a getnext chain is maintained which orders all the directory elements alphabetically by key. There is also a 'range table' which holds pointers to certain elements along the getnext chain and a count of how many intermediate elements there are in each range.

This range table is hunted with a binary search to find the range in which a given key (full or partial) will reside, and then the getnext chain is used to find a match (if one exists) for the search condition.

A range will be split into two equal ranges if the number of intermediate elements rises above a threshold which depends on the number of ranges and the number of elements in the table. So the ranges are dynamic, and do not depend on any particular key distribution.

The number of ranges in the table is determined when the hash table is created, and if all the ranges are full, but a range should be split, a reorganization of the ranges takes place, which increases the range threshold by a factor of 2.

Secondary indexes

A separate hash table, called the secondary index, is created for certain TMP tables, which allows the same entry to be located by another key. In certain secondary indexes, the names do not need to be unique (whereas in the primary index the name is always unique). The secondary index entry is deleted at the same time the entry in the primary index is deleted.

For example, a secondary index is created for DSNAME blocks. This allows table entries to be accessed via secondary keys, using the DSNAME block number in the case of DSNAME blocks.

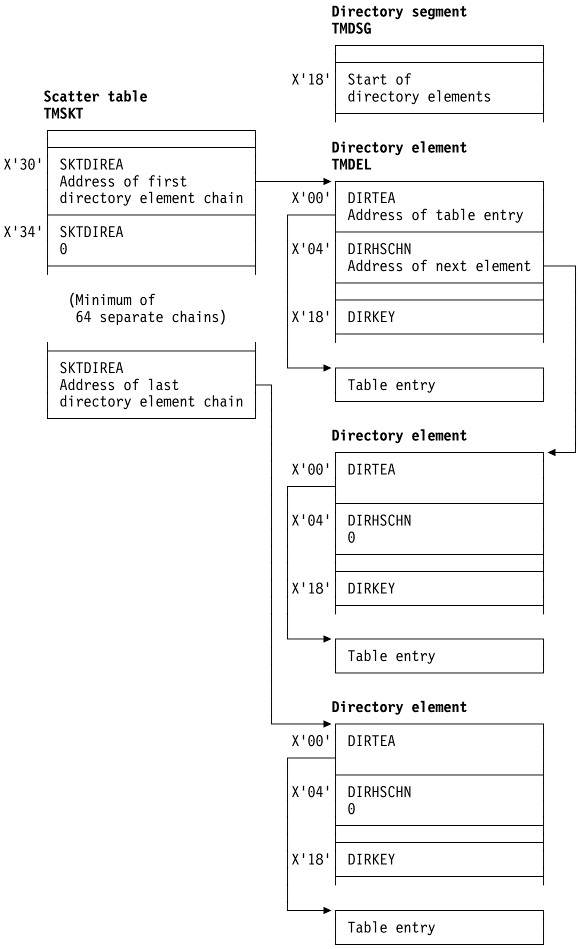


Figure 88. Example of a hash table

Certain tables also have aliases as distinct from secondary indexes. These are alternative names for the table entry, which can be used to locate a table entry. They exist in the same index as the primary name, and are not included in a getnext chain, rather they form an alias chain from the primary entry.

Functions of the table manager

The table manager performs the following functions:

Locate table entry
For a given name, find the address of the table entry.

Get next table entry
For a given name, find the address of the next table entry in collating sequence. This can be used repeatedly to find all entries in a range (or all elements in the whole table).

Add table entry
For a given table entry, add it into the table.

Quiesce a table entry
For a given name, mark its directory segment as busy.

Unquiesce a table entry
For a given name, remove its directory segment from the 'quiesce' state.

Delete a table entry
For a given name, delete it and any associated alias. The entry must have been quiesced first.

Create an index for a table
Create a hash table of a given type.

Add a name into a secondary index
Given a primary name and a secondary name, add the names to the secondary index.

Add an alias name
For a given name, assign an alias name.

Get next alias name
For a given a name, find the next alias name (if any).

Lock a table entry
For a given a name, assign a read lock to it.

Unlock a directory entry
For a given a name, remove the associated read lock.

Reset lock slots
For a given name, reset the lock slots.

Transfer lock to target task
For a given a name and the address of a target TCA, transfer the read lock to the target task.

Process deferred work element
Make the changes made by the logical unit of work (LUW) visible at task syncpoint time.

Read locks

Read locks are used to prevent a table entry being deleted by the table manager.

A read lock is a fullword of storage. When DFHKCP attaches a task, it allocates storage for a number of local read locks; this storage is addressed by TCATMRLP in the TCA. Local read locks are not acquired for table entries that cannot be deleted.

Global read locks are used by the CICS modules that are executed independently of any task. They reside in the table manager static storage area (TMS) that is addressed by SSATMP in the static storage address list (SSA).

These locks are released by:

- an Unlock call,
- a Getnext call,
- a Reset call,
- the termination of the task,
- or a DWE call.

Read locks are always obtained against the primary index entry even if the request is against a secondary index or an alias.

Browse token

For Getnext requests on secondary indexes, a browse token is used to hold the name of the previously found entry. The token consists of the name found in the secondary index (which may not be unique) and the name in the primary index (which is unique).

The address of the directory entry cannot be used instead of this logical name because the entry may be returned unlocked, and so may be deleted when the next getnext request is received.

The getnext consists of locating the entry in the secondary index which has a the correct primary index, if it exists, and then moving forward in the getnext chain. If it does not, an entry with a matching secondary index name, but a higher primary index name is located, if one exists. If that also does not exist, an entry with a higher name in the secondary index is located. This requires that entries on the getnext chain for ordered both by secondary index name and also when identical secondary index names exist, by primary index name.

Quiesce state

A table entry is moved into quiesce state by a quiesce request if no read locks (including ones obtained by the issuing task) exist for the entry. When a table entry moves into quiesced state, it is unable to be located. Locating tasks can choose to ignore or wait for quiesced entries to be unquiesced or deleted.

If the quiesce request is performed with the commit option, the only ways to release the quiesced state are:

- Unquiesce
- Delete

For commit requests, the delete takes place immediately the request completes. Otherwise, if an entry is not deleted or unquiesced by the end of the UOW the TM DWE will unquiesce the entry. In this case, a delete does not take effect until the end of the UOW.

Finding FCT, or TCT entries in a partition dump

Figure 89 on page 560 shows the relationship of the table manager control blocks. A general procedure for finding the required table entries in a partition dump is as follows:

1. Find the CSA.
2. Find the CSA optional features list, CSAOPFL, from its address in field CSAOPFLA (offset X'C8') in the CSA.
3. Find the static storage area address list (SSA) from its address in field CSASSA (offset X'1C0') in the CSAOPFL.
4. Find the table manager static storage area (TMS) from its address in field SSATMP (offset X'14') in the SSA.
5. Look at TMS in the *CICS Data Areas* manual. The fields TMASKT1 through TMASKT24 hold the addresses of the hash tables for various control blocks. Find the hash table for the control block you are interested in:

   ```
   TMASKT1 = reserved
   TMASKT2 = reserved
   TMASKT3 = reserved
   TMASKT4 = addr of profile table (PFT) entries
   TMASKT5 = addr of FCT entries
   TMASKT7 = addr of local terminal (TCTE) entries
   TMASKT8 = addr of remote terminal and connection (TCNT) entries
   TMASKT9 = addr of local connection (TCTS) entries
   TMASKT10 = addr of AFCT entries
   TMASKT11 = addr of DSNAME entries (by name)
   TMASKT12 = addr of DSNAME entries (by block ID)*
   TMASKT13 = addr of partner resource table (PRT)
              entries
   TMASKT14 = reserved
   TMASKT15 = addr of local terminal NETNAME table (TCNT) entries
   TMASKT16 = addr of autoinstall terminal model (AITM)
              table entries
   TMASKT17 = addr of signon table (SNT) entries
   TMASKT18 = addr of session (TCSE) entries
   TMASKT19 = addr of remote connection entries (TCSR)*
   TMASKT20 = addr of indirect connection entries (TCSI)*
   TMASKT21 = addr of connection NETNAME (TCSN) entries*
   TMASKT22 = addr of remote terminal entries (TCTR)*
   TMASKT23 = addr of generic connection NETNAME (TCSM) entries*
   TMASKT24 = addr of remote terminal NETNAME (TCNR) entries*

   * - Secondary index
   ```

   Use the following formula to find the offset of the individual scatter table:

   ```
   Length(TMATTV) * (n-1) + X'08'
   ```

   Where n = position in table (see above - TMASKTn)

   To find Length(TMATTV) (and the value of n) see the *CICS Data Areas* manual.
6. Find the first directory element from its address in field SKTFDEA (offset X'10') in the hash table area.
7. Directory elements are chained together in alphabetic order. The address of the next element is in field DIRGNCHN (offset X'10').
8. Look at each directory element until you find the name of the control block you are looking for. The name is in field DIRKEY (offset X'18'). Field DIRTEA (offset X'0') holds the address of the desired control block.

Control blocks

Figure 89 shows the table manager control blocks.

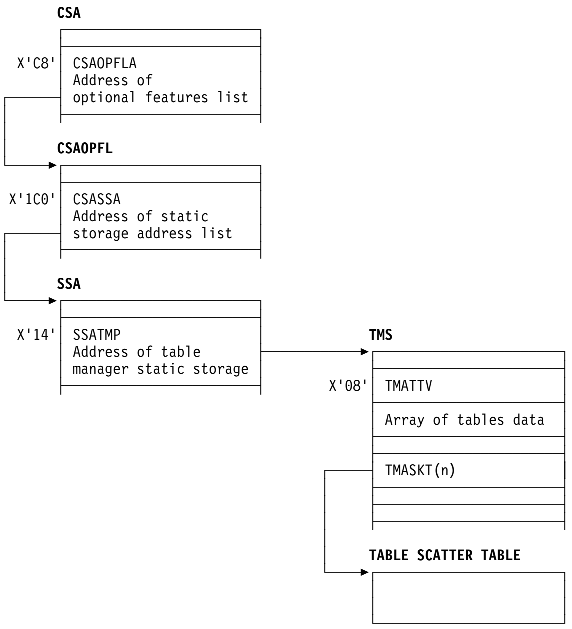


Figure 89. Table manager control blocks

See the *CICS Data Areas* manual for a detailed description of these control blocks.

Modules

DFHTMP

Exits

No global user exit points are provided for this function.

Trace

The following point ID is provided for this function:

- AP 00EA, for which the trace level is AP 1.

See the *CICS Trace Entries* for further information.

Statistics

The statistics utility program, DFHSTUP, provides, for table management, statistics (for each table) on the amount of storage (expressed in bytes) used by the table manager to support each table (excluding storage used for the tables themselves).

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 82. Task-related user exit control

Task-related user exit support in CICS, also known as the resource manager interface (RMI), provides an interface that non-CICS resource managers can use to communicate with CICS applications. The exit program can be enabled or disabled dynamically, and useful information can be transferred to a user work area.

Functional overview

The following operations may be performed on a task-related user exit from application programs:

ENABLE

This is a global operation that names the task-related user exit and causes the task-related user exit to be loaded into storage, if it has not already been loaded. It also causes the exit program control block (EPB), which represents the task-related user exit, and the exit's global storage to be set up by the user exit manager module, DFHUEM. The EPB also holds a TALENGTH argument and a bit-string profile for use in an exit operation. The ENABLE operation does not pass control to the task-related user exit. DFHUEM is used to enable both global user exits and task-related user exits.

The ENABLE operation is performed in two stages:

1. ENABLE
2. START.

An exit is not made available for execution until it has been both enabled and started.

You can use the TASKSTART keyword on the ENABLE command to enable a task-related user exit so that it is invoked at task start for all tasks in the CICS system.

You can also enable a task-related user exit with the FORMATEDF keyword, which means that the task-related user exit can provide formatted screens for EDF to display, whenever a DFHRMCAL request to the task-related user exit takes place.

The task-related user exit is invoked in the addressing mode of its original caller unless the LINKEDITMODE keyword is specified on the ENABLE command, in which case the exit is invoked in its own link-edit AMODE. LINKEDITMODE is only valid on the first ENABLE command for an exit program.

EXTRACT

Information concerning an "enabled and started" task-related user exit is returned to an application when it issues this command.

DISABLE

This is a global operation which in general terms is the reverse of an ENABLE request. The DISABLE operation can be performed in two stages:

1. STOP: This is the reverse of the START keyword on the ENABLE request. It causes the task-related user exit to remain in main storage together with all its associated control blocks; however it is not available for execution until an ENABLE command with the START option is specified.
2. EXITALL: This causes the EXIT and its control blocks to be deleted from main storage. The EPB however is added to a chain of re-usable EPB's anchored in the UETH.

DFHRMCAL

After an exit has been enabled and started, it can be invoked from an application using a DFHRMCAL request directly, or by passing control to a stub which performs the DFHRMCAL request. A register 1 parameter list may be supplied to the task-related user exit from the application.

The task interface element (TIE) control block is created for the task and task-related user exit combination when the task issues its first DFHRMCAL request, unless the TIE has already been created because the task-related user exit was enabled for TASKSTART.

When a DFHRMCAL request is issued, control passes to DFHEIP, to DFHERM (the external resource manager interface program), and then to the task-related user exit. DFHERM manages the TIEs.

ENABLE, DISABLE, and EXTRACT are all EXEC CICS requests. DFHRMCAL is a macro.

A task-related user exit can "express interest" in certain types of events, and be invoked when these events take place. These events are:

- Application invocations (DFHRMCAL mentioned above), associated with which are optionally the EDF screen format invocations
- System Programming interface events i.e. INQUIRE EXITPROGRAM commands
- Syncpoint related events
- Task termination events
- CICS termination.

By default, it is assumed that task-related user exits are interested in application invocations only.

Design overview

The task-related user exit interface is comparable with the EXEC interface. When an application program requests the services of a non-CICS resource manager, it does so by a module called the task-related user exit. The exit receives arguments from the application program, and passes them on to the resource manager in a suitable form.

The advantage of this method is that if the resource manager is changed, the application program that invokes the resource manager should not need to be changed too.

The exit is part of the resource manager programs. The name of the exit, or the name of the entry to the exit, is specified by the resource manager, and each application program that invokes the resource manager has to be link-edited with an application program stub that refers to that name.

The exit is enabled and disabled using the user exit manager (DFHUEM). For enabling, the resource manager can specify the size of a task-related work area that it requires.

The exit, when enabled and subsequently driven, receives arguments in the form specified by the DFHUEXIT TYPE=RM parameter list (see the *CICS Customization Guide* or the manual). Register 1 points to this parameter list. Register 13 points to the address of a save area, rather than the address of the CSA. The save area is 18 words long, with registers 14 through 12 stored in the fourth word onward.

Responses to the request are indicated by values placed in register 15, and also by means that are specific to the architecture of the application interface, for example, by moving data into storage areas passed by the call, or into the caller's register 15.

The main control blocks used by the task-related interface are the task interface element (TIE):

- A TIE is created by DFHERM on the first call by a task to each resource manager, and it is chained to the TCA for that task.

Task-related user exit implementation

The state of an exit is managed by DFHUEM, which is described under Chapter 98, "User exit control" on page 681. For an exit, the TALENGTH argument and a profile in the form of a bit-string are held in the exit program block (EPB). These arguments are not processed until the occurrence of an application program CALL that explicitly names the exit, unless the TASKSTART keyword is used on the ENABLE request.

Entry to the exit is through the task-related user exit interface, which comprises:

- An application stub provided with the exit, but generated using the CICS-provided macro DFHRMCAL. It is this stub which explicitly names the exit, and which is link-edited with each application program that uses the application program interface (API) of the resource manager.
- DFHEIP, which is entered at DFHEIPCN by the application stub, in much the same way as EXEC CICS commands are routed at execution time.
- DFHERM, which receives control when DFHEIP discovers that the call is not for a CICS control function, but for a named exit.

DFHERM receives a set of registers (those of the caller, for example, the application program), and a routing argument which names the exit. This routing argument is constructed by DFHRMCAL, in the application stub, and is not normally visible to the application programmer. DFHERM retrieves the name of the requested exit from the routing argument, and scans any existing task interface elements (TIEs) that are chained from the task's TCA, looking for a TIE associated with the named exit. If such a TIE is not found, it searches the installed exits on a chain of EPBs, looking for the matching name. On finding a match, DFHERM constructs a TIE to represent the connection between that task and the exit. The TIE is initialized from information provided in the EPB; the TALENGTH argument defines the size of a task-local work area which can be thought of as a logical extension of the TIE. The profile string is also copied into the TIE.

DFHERM stacks (stores in a last-in, first-out manner) various parts of the program execution environment—the status of HANDLE commands, file browse cursors, the EXEC interface block (EIB), and so on—and builds a parameter structure which is essentially a superset of that built by DFHUEH. Additional arguments include the task-local work area, the profile referred to above, and an 8-byte UOW identifier supplied by Recovery Manager.

DFHERM then passes control to the exit's entry point using standard CALL conventions, in which register 13 addresses a save area for DFHERM's own registers, register 14 addresses DFHERM's next sequential instruction, and register 1 addresses the passed parameters. This is a vector of addresses which include that of the caller's register save area. Any changes the exit makes to arguments of the application program interface (API), or to the contents of the caller's register save area, are not examined by DFHERM when it regains control, because they are not part of the CICS task-related user exit interface—rather they are the concern of the caller and the exit. However, the exit can request DFHERM to schedule certain actions by means of the profile argument. For example, the exit can request that it be informed (driven) when commitment of resources (syncpointing) is taking place, or the exit can request that DFHERM no longer routes API calls to it from this task.

Finally, on regaining control from the exit, DFHERM unstacks the objects that it had previously stacked, and returns to the caller. The state of the cursors, HANDLE labels, and so on, is apparently unchanged by the actions of DFHERM or the exit. Note that the exit may have used EXEC CICS HANDLE commands; this does not interfere with the caller's HANDLE status.

In the discussion of DFHERM so far, the term "caller" has been used for the application program. However, a caller can be a function such as syncpoint (DFHERMSP), task control (DFHAPXM or DFHERMSP), system programming interface (DFHUEIQ), CICS termination (DFHAPDM or DFHSTP) or EDF (DFHERM). The exit can set appropriate bits in the profile (schedule flag word) so that, if the corresponding function is subsequently invoked, it in turn calls the exit. The exit can determine the identity of the caller from the first argument (called the "function definition"). This argument, passed by DFHERM, always has its first byte equal to X'00'. (If the first byte is other than X'00', the exit has been entered from DFHUEH as a global user exit.) DFHERM sets the second byte of this argument according to the type of caller, thus indicating which interface is addressed by the caller's register save area. The second byte is:

X'01'	For system programming interface
X'02'	For an application program
X'04'	For the syncpoint program
X'08'	For CICS task control
X'0A'	For a CICS termination call
X'0C'	For an EDF call.

Any remaining arguments are specific to each individual caller.

The flow of control for the task-related user exit interface is shown in Figure 90.

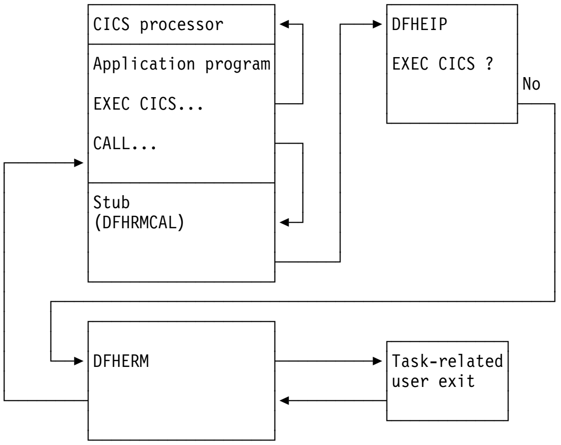


Figure 90. Task-related user exit control flow

Processors

The term "processor" is used to refer to two different types of object:

1. For the EXEC interface, it refers to the function-dependent modules associated with the EXEC interface nucleus, DFHEIP. These processors usually have names such as DFHEPC, DFHETC, DFHETD, and so on, and each of these is invoked by DFHEIP. DFHERM is also a processor of this type.
2. In various contexts, including task-related user exits, it refers to a piece of code that is link-edited with an application program and serves the dual function of:
   - Satisfying the CALL requirement for a target address—its entry resolves a V-type ADCON
   - Finding the entry point of DFHEIP.

Both these types of processor are part of the path between an application call and the functional control module that supports the request. This path appears as follows:

```
Application call
 Application processor (type 2)
  DFHEIP
   EXEC interface processor (type 1)
    Functional control module
```

Examples of the interface are:

```
EXEC CICS SYNCPOINT ... CICS API
 DFHECI     CICS COBOL EIP router
  DFHEIP
   DFHEISP  CICS syncpoint router
    DFHSPP  CICS syncpoint manager
       CICS Recovery manager domain

EXEC DLI TERM ... DLI HLPI
 DFHECI     CICS COBOL EIP router
  DFHEIP
   DFHERM   CICS RMI module
    DFHEDP  DLI HLPI manager
             (implemented as a task-related
                user exit)
```

Control blocks

The control blocks used in task-related user exit control are the exit program control block (DFHEPB), the task interface element (DFHTIEDS).

Figure 91 on page 564 shows the main control blocks associated with task-related user exits.

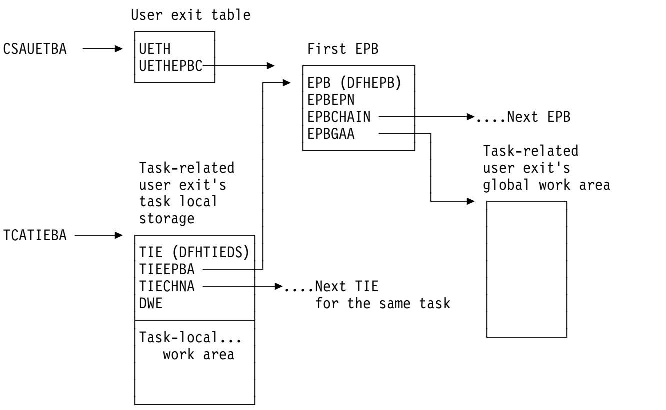


Figure 91. Control blocks associated with task-related user exits

Field CSAUETBA in the CSA points to the user exit table (UET); UETHEPBC in the UET points to the first exit program block (EPB); and EPBCHAIN in each EPB points to the next EPB in the chain.

Each EPB holds:

- The address of the exit's entry point (EPBEPN)
- The address of the global work area
- The halfword length of the global work area
- The halfword length of the task-local work area.

One EPB is associated with each enabled task-related user exit program or entry name.

EPBs used for global user exits and for task-related user exits are held on the same EPB chain.

The task-related user exit's global storage is optional. It is associated with an individual enabled task-related user exit program or entry name. Several task-related user exit programs or entry names can share the same global storage.

For full details of the EPB, see the *CICS Data Areas* manual.

The task interface element (TIE) is associated with each associated pair of CICS task and task-related user exit. The first time a CICS task passes control to a particular task-related user exit, a TIE is created. The TIE lasts until task termination.

Note that all TIEs relating to a single task are chained together (more than one TIE is set up when a single CICS task makes use of more than one task-related user exit). The TIEs corresponding to a single EPB (that is, to a single task-related user exit program or entry name) are not chained together.

A global user exit may only use global storage; a task-related user exit may use both global storage and task-local work area.

Field TCATIEBA in the TCA points to the first TIE, and TIECHNA in each TIE points to the next TIE in the chain.

The TIE holds information relevant to all invocations of the task-related user exit for the task concerned. For example, TIEFLAGS holds information concerning the events for which the task-related user exit should be invoked, for example, API calls, syncpoint, and task start.

Figure 92 gives a closer look at the TIE control block chain that is used during the lifetime of a task-related user exit.

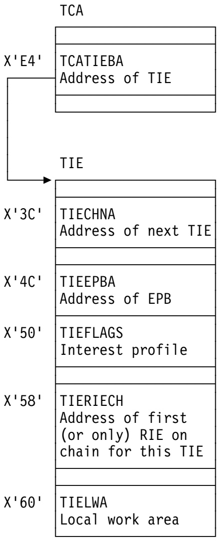


Figure 92. Control blocks used during the lifetime of a task-related user exit

For full details of the TIE control blocks, see the *CICS Data Areas* manual.

Modules

Module	Function
DFHUEM	The EXEC interface processor for the ENABLE, DISABLE, and EXTRACT user exit commands.
DFHERM	Interfaces with task-related user exit.
DFHTIEM	Handles the TIE subpools.

Exits

No global user exit points are provided for this function.

Trace

The following point ID is provided for this function:

- AP 2520) for which the trace level is RI 1.
- AP 2521)

- AP 2522) for which the trace level is RI 2.
- AP 2523)

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

External interfaces

Calls are made to the task-related user exit via DFHEIP and DFHERM from the following modules:

DFHAPXM	Task start
DFHERMSP	Task end
DFHERMSP	Syncpoint and backout
DFHRMSY	For syncpoint resynchronization
DFHAPDM	CICS termination
DFHSTP	CICS termination
DFHUEIQ	System programming interface for inquire exitprogram calls
Applications	Application calls to resource manager
DFHERM	EDF invocations for application calls to resource manager

Chapter 83. Task-related user exit recovery

Task-related user exit recovery, also known as the resource manager interface (RMI) recovery, ensures that changes to recoverable resources performed by an external resource manager in a logical unit of work are either all committed or all backed out.

Design overview

During the execution of a CICS task, the CICS recovery manager communicates with the resource manager task-related user exit to prepare to commit, to commit unconditionally, or to back out. The purpose of these calls is to ensure that changes to recoverable resources performed in a unit of work (UOW) are either all committed or all backed out, if there is a failure anywhere in CICS or in any of the external resource managers.

Each UOW created by Recovery Manager Domain is identified by a UOW_ID and a Local UOW_ID. The LOCAL UOWID is an eight byte value whose format is easy for CICS to identify whether the UOW originated before or after an initial start.

When the resource manager receives the call to commit unconditionally or to back out, it takes the corresponding irreversible step, if possible. If the action is successful, the resource manager sends the appropriate return code. If not, it sends a return code which requests that CICS record the state of the UOW, and tries to resolve the status at a later time.

Recovery manager domain maintains the status of UOWs that require resynchronization, until all participants in the UOW have successfully resynchronized. Recovery manager domain maintains these UOWs across cold, warm and emergency start of CICS. An initial start of CICS however will mean that Recovery manager domain will lose this information and resynchronization will not be possible.

The RMI also supports an optimized syncpoint process to improve performance under certain conditions where a single-phase commit can be used. With single phase commit Recovery manager does not have to maintain resynchronization information for the RMI. This optimized process is described in more detail later in this section.

The two-phase commit process

The RMI supports the two-phase commit process. The following is a brief summary of the two-phase commit process and other related processing as seen from the RMI's point of view.

- When a unit of work is first created, Recovery manager creates local_uow_id which will be used by the RMI.
- When the task syncpoints, a prepare-to-commit request is then issued to each task-related user exit used during the current UOW. For each task-related user exit, issuing the prepare request indicates the start of phase 1 of commit processing from CICS's point of view.
- If all syncpoint participants vote 'YES' to the prepare requests, then Recovery manager will commit the UOW. CICS then invokes each task-related user exit with a commit request. This indicates the start of phase 2 commit processing for the task-related user exit.

  If the task-related user exit is unable to commit the UOW, Recovery manager will maintain a record of the UOW's status so that the task related user exit can resync later.
- If one or more of the task-related user exits votes 'NO' to the prepare-to-commit request, all the task's recoverable resources are backed out.

Resolution of in-doubts: An external resource manager can be left in doubt about the disposition of UOWs, for example, if the resource manager abnormally terminated after receiving a prepare request for an UOW, but before receiving the commit or backout request. The resource manager, at any time while interfacing with CICS, can supply a list of recovery tokens representing the in-doubt UOWs to the task-related user exit. The task-related user exit (or other related code) can then issue an EXEC CICS RESYNC request with the in-doubt list and the name of the task-related user exit as parameters.

As a result of a the EXEC CICS RESYNC command, DFHERMRS initiates a CRSY task (running program DFHRMSY) for each UOW named in the indoubt list passed from the TRUE. DFHRMSY interfaces with Recovery manager to find out the status of the UOW, and calls the task-related user exit with the appropriate resolution, for example 'Commit', 'Backout' and so on. For each successful commit or backout, DFHRMSY informs Recovery manager that it can delete the TRUEs involvement in the UOW. When all interested parties in a UOW complete such processing, Recovery manager deletes its record of the UOW.

If an EXEC CICS RESYNC request is issued without an in-doubt list or with an in-doubt list of length zero, then DFHERMRS informs Recovery manager that it can remove the TRUE (identified by its name and qualifier) from all UOWs in the resynchronization set, i.e. delete all resync information for a TRUE.

A resynchronization set is first established when a TRUE is enabled. The next resynchronization set is identified on completion of an EXEC CICS RESYNC command, and is used for the next RESYNC command. A resynchronization bounds how many UOWs resync information is deleted for because RESUNC commands execute at the same time as new work is processed by a TRUE. A RESYNC command with a zero list should not delete resync information new UOW created since the resync command was issued.

The single-phase commit process

The RMI also supports the single-phase commit process for UOWs that are read-only, and for UOWs where CICS detects that only one external resource manager has been called for update requests. The task-related exit must indicate to the RMI that it is capable of processing single-phase commit requests; otherwise, a two-phase commit is used. Use of single-phase commit improves performance, because CICS does not perform any logging and the task-related user exit is called only once during syncpoint processing.

Single-phase commit for read-only UOWs: To take advantage of single-phase commit for read-only UOWs, the external resource manager must return to the task-related user exit an indicator that the UOW is read-only. This can be done by the resource manager returning a flag indicating the “history” of the UOW so far (that is, whether it is read-only so far), or returning information about the current request. In the latter case, it is the responsibility of the task-related user exit to keep a “history” of the UOW so far. After each request, the task-related user exit must return to CICS with a flag set in the parameter list indicating this history.

At syncpoint time, if CICS detects that the UOW is read-only, it invokes the task-related user exit with an “End-UOW” request instead of the normal prepare and commit requests associated with a two-phase commit. This means that the task-related user exit is invoked only once during syncpoint. The “End-UOW” request is issued during phase 2 syncpoint processing. On receiving an “End-UOW” request, the task-related user exit should invoke the resource manager for single-phase commit. There are no return codes associated with the “End-UOW” request, and CICS does not perform any logging for this type of request.

Single-phase commit for the single updater: To take advantage of single-phase commit for the single-update situation, the task-related user exit must indicate to the RMI that it knows the single-update protocol. It does this by setting a flag in the parameter list at the same time as it expresses an interest in syncpoint.

At syncpoint time, if CICS detects that only resources owned by one external resource manager were updated in the UOW, and if the task-related user exit has indicated that it understands the protocol, CICS invokes the task-related user exit with an ‘Only’ request, instead of the normal prepare and commit requests associated with a two-phase commit. This means that the task-related user exit is invoked only once during syncpoint. The ‘Only’ request is issued during phase 1 syncpoint processing. CICS does not perform any logging for this type of request. When invoked for an ‘Only’ request, the For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in task-related user exit should invoke the resource manager for single-phase commit.

There are two architected responses to the ‘Only’ request: ‘OK’ and ‘Backed-out’. ‘OK’ means that the UOW was committed; ‘Backed-out’ means that the single-phase commit failed and the updates were backed out. It is important to note that, unlike the two-phase commit, there is no equivalent ‘Remember’ response. If a task-related user exit calls a resource manager for single-phase commit and, for example, the resource manager abends while processing this request, the task-related user exit is left in doubt as to the outcome of the request. The task-related user exit cannot return to CICS in this case, but instead must output diagnostic messages as appropriate, and then abend the transaction.

Recovery manager does not keep resynchronization information for UOWs using single phase commit. Because the resource manager is the only updater in the UOW, CICS is ***not*** in doubt about any of its resources. The resource manager has either committed or backed out the updates. The messages output by the task-related user exit, in conjunction with any messages output by the resource manager, can be used to determine the outcome of the UOW.

Modules

Module	Function
DFHERMRS	DFHERMRS is invoked by DFHEISP as a result of a an EXEC CICS RESYNC command. It attaches a CRSY task for each UOW identified in the IDLIST. Calls Recovery manager to delete unwanted resynchronization information.
DFHRMSY	A CRSY task (running program DFHRMSY) is attached for each indoubt UOW appearing in the in-doubt list for an EXEC CICS RESYNC command. This program then issues the appropriate ‘phase 2 of syncpoint’ request, that is, commit or backout, to the external resource manager that issued the EXEC CICS RESYNC.

Exits

No global user exit points are provided for this function.

Trace

The following point IDs are provided for this function:

- AP 2540) For trace level RI Level 1
- AP 2541)

- AP 2548) For trace level RI level 2
- AP 2549)

- AP 2560) For trace level RI level 1
- AP 2561)

problem determination, see the *CICS Problem Determination Guide*.

External interfaces

Calls are made from DFHRMSY, via DFHERM, to the task-related user exit to provide information about the disposition of the UOW, when resynchronization of in-doubts is taking place.

Chapter 84. Temporary storage domain (TS)

The temporary storage domain manages temporary storage requests.

Temporary storage domain's specific gates

Table 92 summarizes the temporary storage domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 92. Temporary storage domain's specific gates

Gate	Trace	Function	XPI
TSQR	TS 0201	WRITE	NO
	TS 0202	REWRITE	NO
		READ_INTO	NO
		READ_SET	NO
		READ_NEXT_INTO	NO
		READ_NEXT_SET	NO
		DELETE	NO
TSPT	TS 0301	PUT	NO
	TS 0302	PUT_REPLACE	NO
		GET	NO
		GET_SET	NO
		GET_RELEASE	NO
		GET_RELEASE_SET	NO
		RELEASE	NO
TSSH	TS 0A01	INITIALIZE	NO
	TS 0A02	INQUIRE_POOL_TOKEN	NO
		WRITE	NO
		REWRITE	NO
		READ_INTO	NO
		READ_SET	NO
		READ_NEXT_INTO	NO
		READ_NEXT_SET	NO
		DELETE	NO
		INQUIRE_SYSID_TABLE_TOKEN	NO
		START_BROWSE	NO
		GET_NEXT	NO
		END_BROWSE	NO
		INQUIRE_QUEUE	NO
TSSR	TS 0601	SET_START_TYPE	NO
	TS 0602	SET_BUFFERS	NO
		SET_STRINGS	NO
TSBR	TS 0701	INQUIRE_QUEUE	NO
	TS 0702	START_BROWSE	NO
		GET_NEXT	NO
		END_BROWSE	NO
		CHECK_PREFIX	NO

TSQR gate, WRITE function

If the queue does not exist, this function creates a queue with the single item provided, and the queue's "read cursor" is set to zero.

If the queue already exists, the item provided is appended to the queue, and the read cursor left unchanged.

Input parameters

QUEUE_NAME is the name of the queue being created or appended to.

ITEM_DATA is the address and length of the item being written.

[BMS] indicates whether or not BMS owns this queue. It can have either of these values:

`YES|NO`

SUSPEND indicates whether or not the request will be suspended if there is insufficient auxiliary storage to satisfy the request. This option is ignored if the queue is in main storage.

STORAGE_TYPE indicates whether the queue is to be created in main or auxiliary storage. Note that this option is ignored if the queue already exists.

[CALLER] indicates whether this request originated from an EXEC or macro call. The default is MACRO. It can have either of these values:

`EXEC|MACRO`

[FMH] indicates whether the data contains an FMH. It can have either of these values:

`YES|NO`

Output parameters

[TOTAL_ITEMS] is the total number of items in the queue on completion of the operation.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	QUEUE_FULL, INSUFFICIENT_STORAGE, INVALID_LENGTH, IO_ERROR, INVALID_QUEUE_TYPE, LOCKED, INVALID_QUEUE_NAME, QUEUE_DELETED, QUEUE_REMOTE

TSQR gate, REWRITE function

This function updates the specified item in an existing queue. The read cursor is unchanged.

Input parameters

QUEUE_NAME is the name of the queue being updated.

ITEM_NUMBER is the number of the item to be updated.

ITEM_DATA is the address and length of the item being written.

SUSPEND indicates whether the request will be suspended if there is insufficient auxiliary storage to satisfy the request. This option is ignored if the queue is in main storage.

[CALLER] indicates whether this request originated from an EXEC or macro call. The default is MACRO. It can have either of these values:

EXEC|MACRO

[FMH] indicates whether the data contains an FMH. It can have either of these values:

YES|NO

Output parameters

[TOTAL_ITEMS] is the total number of items in the queue.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INSUFFICIENT_STORAGE, INVALID_LENGTH, IO_ERROR, INVALID_QUEUE_TYPE, QUEUE_NOT_FOUND, ITEM_NOT_FOUND, LOCKED, INVALID_QUEUE_NAME, QUEUE_DELETED, QUEUE_REMOTE

TSQR gate, READ_INTO function

This function reads the specified queue item into a buffer provided by the caller. The read cursor for the queue is set to the item number provided. The caller provides the address (item_buffer_p) and buffer length (item_buffer_m). The actual length of the record is returned in item_buffer_n. If item_buffer_n is greater than item_buffer_m, the data is truncated (but an OK response is returned).

Input parameters

QUEUE_NAME is the name of the queue being read.

ITEM_NUMBER is the number of the item to be read.

ITEM_BUFFER specifies the address (item_buffer_p) and maximum length (item_buffer_m) of the data area into which the data will be read. The actual data length is returned in item_buffer_n.

[CALLER] indicates whether this request originated from an EXEC or macro call. The default is MACRO. It can have either of these values:

EXEC|MACRO

Output parameters

[TOTAL_ITEMS] returns the total number of items in the queue.

[FMH] indicates whether the data contains an FMH. It can have either of these values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	IO_ERROR, INVALID_QUEUE_TYPE, QUEUE_NOT_FOUND, ITEM_NOT_FOUND, INVALID_QUEUE_NAME

TSQR gate, READ_SET function

This function reads the specified queue item into a storage area obtained by TS. The read cursor for the queue is set to the input item number.

Input parameters

QUEUE_NAME is the name of the queue being read.

ITEM_NUMBER is the number of the item to be read.

[TCTTE_ADDRESS] is the address of the TCTTE - required if SET_STORAGE_CLASS(TERMINAL) is specified.

[SET_STORAGE_CLASS] specifies the class of storage into which the item will be read. This may be either TASK (the default) or TERMINAL. If TERMINAL is specified, the item is read into a TIOA. It can have either of these values:

TASK|TERMINAL

[CALLER] indicates whether this request originated from an EXEC or macro call. The default is MACRO. It can have either of these values:

EXEC|MACRO

Output parameters

ITEM_DATA returns the address and length of the item data.

[TOTAL_ITEMS] returns the total number of items in the queue.

[FMH] indicates whether the data contains an FMH. It can have either of these values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	IO_ERROR, INVALID_QUEUE_TYPE, QUEUE_NOT_FOUND, ITEM_NOT_FOUND, INVALID_QUEUE_NAME

TSQR gate, READ_NEXT_INTO function

This function increments the read cursor by one and reads that item number into the buffer provided by the caller. The caller provides the address (item_buffer_p) and buffer length (item_buffer_m). The actual length of the record is returned in item_buffer_n. If item_buffer_n is greater than item_buffer_m, the data will have been truncated.

Input parameters

QUEUE_NAME is the name of the queue being read.

ITEM_BUFFER specifies the address (item_buffer_p) and maximum length (item_buffer_m) of the data area into which the data will be read. The actual data length is returned in item_buffer_n.

[CALLER] indicates whether this request originated from an EXEC or macro call. The default is MACRO. It can have either of these values:

EXEC|MACRO

ITEM NUMBER returns the number of the item just read.

Output parameters

[TOTAL_ITEMS] returns the total number of items in the queue.

[FMH] indicates whether the data contains an FMH. It can have either of these values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	IO_ERROR, INVALID_QUEUE_TYPE, QUEUE_NOT_FOUND, ITEM_NOT_FOUND, INVALID_QUEUE_NAME

TSQR gate, READ_NEXT_SET function

This function increments the queue's read cursor by one and reads that item number into a storage area obtained by TS.

Input parameters

QUEUE_NAME is the name of the queue being read.

[TCTTE_ADDRESS] is the address of the TCTTE - required if SET_STORAGE_CLASS(TERMINAL) is specified.

[SET_STORAGE_CLASS] specifies the type of storage into which the item will be read. This may be either TASK (the default) or TERMINAL. If TERMINAL is specified, the item is read into a TIOA. It can have either of these values:

TASK|TERMINAL

[CALLER] indicates whether this request originated from an EXEC or macro call. The default is MACRO. It can have either of these values:

EXEC|MACRO

Output parameters

ITEM_DATA returns the address and length of the item data.

[ITEM_NUMBER] returns the number of the item just read.

[TOTAL_ITEMS] returns the total number of items in the queue.

[FMH] indicates whether the data contains an FMH. It can have either of these values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	IO_ERROR, INVALID_QUEUE_TYPE, QUEUE_NOT_FOUND, ITEM_NOT_FOUND, INVALID_QUEUE_NAME

TSQR gate, DELETE function

This function deletes the specified queue.

Input parameters

QUEUE_NAME is the name of the queue to be deleted. the request.

[CALLER] indicates whether this request originated from an EXEC or macro call. The default is MACRO. It can have either of these values:

EXEC|MACRO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_QUEUE_TYPE, QUEUE_NOT_FOUND, LOCKED, INVALID_QUEUE_NAME, QUEUE_DELETED

TSQR gate, ALLOCATE_SET_STORAGE function

This function allocates set storage of the requested length.

Input parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_QUEUE_TYPE, QUEUE_NOT_FOUND, LOCKED, INVALID_QUEUE_NAME, QUEUE_DELETED

TSPT gate, PUT function

If the queue does not already exist, this function creates a queue with the single item provided.

If the queue already exists, and is recoverable, a duplicate_name exception is returned. Otherwise, the item is appended to the queue.

Input parameters

QUEUE_NAME is the name of the queue being created or appended to.

ITEM_DATA is the address and length of the item being written.

[IC_DATA] is the address and length of an optional ICE.

[BMS] this option indicates whether or not BMS owns this queue. If the queue already exists and is a BMS queue then BMS(YES) must be specified on the request. Otherwise an INVALID response is returned. It can have either of these values:

`YES|NO`

[IC] this option indicates whether or not Interval Control owns this queue. If the queue already exists and is an IC queue then IC(YES) must be specified on the request. Otherwise an INVALID response is returned. It can have either of these values:

`YES|NO`

[FMH] indicates whether the data contains an FMH. It can have either of these values:

`YES|NO`

SUSPEND indicates whether the request is to be suspended if there is insufficient auxiliary storage to satisfy the request.

Output parameters

RECOVERABLE returns whether the queue is recoverable or not.

QUEUE_CREATION_TIME returns the store clock time at which the queue was created.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INSUFFICIENT_STORAGE, QUEUE_FULL, DUPLICATE_NAME, INVALID_LENGTH, IO_ERROR, INVALID_QUEUE_TYPE, LOCKED, INVALID_QUEUE_NAME, QUEUE_DELETED, QUEUE_REMOTE

TSPT gate, PUT_REPLACE function

If the queue does not exist, this function creates the queue with the item provided. If the queue does exist, the first item in the queue is replaced by the item provided.

Input parameters

QUEUE_NAME is the name of the queue being created or written to.

ITEM_DATA is the address and length of the data item being written.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_LENGTH, IO_ERROR, INVALID_QUEUE_TYPE, LOCKED, INVALID_QUEUE_NAME, QUEUE_DELETED, QUEUE_REMOTE

TSPT gate, GET function

This function retrieves the first item in a "put" queue.

Input parameters

QUEUE_NAME is the name of the queue being accessed.

ITEM_BUFFER specifies the address (item_buffer_p) and maximum length (item_buffer_m) of the data area into which the data will be read. The actual data length is returned in item_buffer_n.

Output parameters

[FMH] indicates whether the data contains an FMH. It can have either of these values:

`YES|NO`

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	IO_ERROR, INVALID_QUEUE_TYPE, QUEUE_NOT_FOUND, INVALID_QUEUE_NAME

TSPT gate, GET_SET function

This function retrieves the first item in a "put" queue into a set storage area.

Input parameters

QUEUE_NAME is the name of the queue being accessed.

Output parameters

ITEM_DATA returns the address and length of the item in set storage.

[FMH] indicates whether the data contains an FMH. It can have either of these values:

`YES|NO`

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	IO_ERROR, INVALID_QUEUE_TYPE, QUEUE_NOT_FOUND, INVALID_QUEUE_NAME

TSPT gate, GET_RELEASE function

This function retrieves and deletes the first item in a "put" queue. If the queue has one item, the queue is deleted.

Input parameters

QUEUE_NAME is the name of the queue being accessed.

ITEM_BUFFER specifies the address (item_buffer_p) and maximum length (item_buffer_m) of the data area into which the data will be read. The actual data length is returned in item_buffer_n.

Output parameters

[FMH] indicates whether the data contains an FMH. It can have either of these values:

`YES|NO`

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	IO_ERROR, INVALID_QUEUE_TYPE, QUEUE_NOT_FOUND, LOCKED, INVALID_QUEUE_NAME, QUEUE_DELETED

TSPT gate, GET_RELEASE_SET function

This function retrieves the first item in a "put" queue into set storage and then deletes it. If the queue has one item, the queue is deleted.

Input parameters

QUEUE_NAME is the name of the queue being accessed.

Output parameters

ITEM_DATA returns the address and length of the item in set storage.

[FMH] indicates whether the data contains an FMH. It can have either of these values:

`YES|NO`

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	IO_ERROR, INVALID_QUEUE_TYPE, QUEUE_NOT_FOUND, LOCKED, INVALID_QUEUE_NAME, QUEUE_DELETED

TSPT gate, RELEASE function

This function deletes a "put" queue.

Input parameters

QUEUE_NAME is the name of the queue being deleted. the request.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_QUEUE_TYPE, QUEUE_NOT_FOUND, LOCKED, INVALID_QUEUE_NAME, QUEUE_DELETED

TSSH gate, INITIALIZE function

Initialize the Shared TS interface.

Input parameters

TSSH gate, INQUIRE_POOL_TOKEN function

Return token for the pool corresponding to the sysid provided.

Input parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SYSID_NOT_FOUND

TSSH gate, WRITE function

If the queue does not exist, this function creates a queue with the single item provided, and the queue's "read cursor" is set to zero.

If the queue already exists, the item provided is appended to the queue, and the read cursor left unchanged.

Input parameters

[POOL_TOKEN] is a token for the shared TS pool.

QUEUE_NAME is the name of the queue being created or appended to.

ITEM_DATA is the address and length of the item being written.

SUSPEND indicates whether or not the request will be suspended if there is insufficient storage to satisfy the request.

FMH indicates whether the data contains an FMH.

[TRANSID] is the id of the transaction which issued this request.

[TRANSACTION_NUMBER] is the 4-byte transaction number (in packed-decimal format).

Output parameters

TOTAL_ITEMS is the total number of items in the queue on completion of the operation.

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_ERROR, IO_ERROR, QUEUE_FULL, INSUFFICIENT_STORAGE, INVALID_LENGTH, INVALID_QUEUE_NAME, MAXIMUM_QUEUES_REACHED

TSSH gate, REWRITE function

This function updates the specified item in an existing queue. The read cursor is unchanged.

Input parameters

[POOL_TOKEN] is a token for the shared TS pool.

QUEUE_NAME is the name of the queue being updated.

ITEM_NUMBER is the number of the item to be updated.

ITEM_DATA is the address and length of the item being written.

SUSPEND indicates whether the request will be suspended if there is insufficient storage to satisfy the request.

FMH indicates whether the data contains an FMH.

[TRANSACTION_NUMBER] is the 4-byte transaction number (in packed-decimal format).

Output parameters

TOTAL_ITEMS is the total number of items in the queue.

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_ERROR, IO_ERROR, INSUFFICIENT_STORAGE, INVALID_LENGTH, QUEUE_NOT_FOUND, ITEM_NOT_FOUND, INVALID_QUEUE_NAME

TSSH gate, READ_INTO function

This function reads the specified queue item into a buffer provided by the caller. The read cursor for the queue is set to the item number provided. The caller provides the address (item_buffer_p) and buffer length (item_buffer_m). The actual length of the record is returned in item_buffer_n. If item_buffer_n is greater than item_buffer_m, the data is truncated (but an OK response is returned).

Input parameters

[POOL_TOKEN] is a token for the shared TS pool.

QUEUE_NAME is the name of the queue being read.

ITEM_NUMBER is the number of the item to be read.

ITEM_BUFFER specifies the address (item_buffer_p) and maximum length (item_buffer_m) of the data area into which the data will be read. The actual data length is returned in item_buffer_n.

[TRANSACTION_NUMBER] is the 4-byte transaction number (in packed-decimal format).

Output parameters

TOTAL_ITEMS returns the total number of items in the queue.

FMH indicates whether the data contains an FMH.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_ERROR, IO_ERROR, QUEUE_NOT_FOUND, ITEM_NOT_FOUND, INVALID_QUEUE_NAME

TSSH gate, READ_SET function

This function reads the specified queue item into a storage area obtained by TS. The read cursor for the queue is set to the input item number.

Input parameters

[POOL_TOKEN] is a token for the shared TS pool.

QUEUE_NAME is the name of the queue being read.

ITEM_NUMBER is the number of the item to be read.

[TRANSACTION_NUMBER] is the 4-byte transaction number (in packed-decimal format).

Output parameters

ITEM_DATA returns the address and length of the item data.

TOTAL_ITEMS returns the total number of items in the queue.

FMH indicates whether the data contains an FMH.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	IO_ERROR, SERVER_ERROR, QUEUE_NOT_FOUND, ITEM_NOT_FOUND, INVALID_QUEUE_NAME

TSSH gate, READ_NEXT_INTO function

This function increments the read cursor by one and reads that item number into the buffer provided by the caller. The caller provides the address (item_buffer_p) and buffer length (item_buffer_m). The actual length of the record is returned in item_buffer_n. If item_buffer_n is greater than item_buffer_m, the data will have been truncated.

Input parameters

[POOL_TOKEN] is a token for the shared TS pool.

QUEUE_NAME is the name of the queue being read.

ITEM_BUFFER specifies the address (item_buffer_p) and maximum length (item_buffer_m) of the data area into which the data will be read. The actual data length is returned in item_buffer_n.

[TRANSACTION_NUMBER] is the 4-byte transaction number (in packed-decimal format).

ITEM NUMBER returns the number of the item just read.

Output parameters

TOTAL_ITEMS returns the total number of items in the queue.

FMH indicates whether the data contains an FMH.

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_ERROR, IO_ERROR, QUEUE_NOT_FOUND, ITEM_NOT_FOUND, INVALID_QUEUE_NAME

TSSH gate, READ_NEXT_SET function

This function increments the queue's read cursor by one and reads that item number into a storage area obtained by TS.

Input parameters

[POOL_TOKEN] is a token for the shared TS pool.

QUEUE_NAME is the name of the queue being read.

[TRANSACTION_NUMBER] is the 4-byte transaction number (in packed-decimal format).

Output parameters

ITEM_DATA returns the address and length of the item data.

ITEM_NUMBER returns the number of the item just read.

TOTAL_ITEMS returns the total number of items in the queue.

FMH indicates whether the data contains an FMH.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_ERROR, IO_ERROR, QUEUE_NOT_FOUND, ITEM_NOT_FOUND, INVALID_QUEUE_NAME

TSSH gate, DELETE function

This function deletes the specified queue.

Input parameters

[POOL_TOKEN] is a token for the shared TS pool.

QUEUE_NAME is the name of the queue to be deleted. the request.

[TRANSACTION_NUMBER] is the 4-byte transaction number (in packed-decimal format).

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_ERROR, IO_ERROR, QUEUE_NOT_FOUND, INVALID_QUEUE_NAME

TSSH gate, INQUIRE_SYSID_TABLE_TOKEN function

Input parameters

[POOL_TOKEN] is a token for the shared TS pool.

QUEUE_NAME is the name of the queue to be deleted. the request.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SERVER_ERROR, IO_ERROR, QUEUE_NOT_FOUND, INVALID_QUEUE_NAME

TSSB gate, START_BROWSE function

Input parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	QUEUE_NOT_FOUND, BROWSE_END, SERVER_ERROR, IO_ERROR

TSSB gate, GET_NEXT function

Returns information about the next queue in the browse.

Input parameters: None

Output parameters

QUEUE_NAME is the name of the queue.

[LAST_REFERENCED_TIME] is the time at which the queue was last referenced.

[TOTAL_ITEMS] is the total number of items in the queue.

[TOTAL_LENGTH] is the sum of the lengths of all the items in the queue.

[MAXIMUM_ITEM_LENGTH] is the length of the longest item in the queue.

[MINIMUM_ITEM_LENGTH] is the length of the shortest item in the queue.

[TRANSID] is the id of the transaction whcih created the queue.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BROWSE_END, SERVER_ERROR, IO_ERROR

TSSB gate, END_BROWSE function

Ends the browse.

Input parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BROWSE_END, SERVER_ERROR, IO_ERROR

TSSB gate, INQUIRE_QUEUE function

Input parameters

[POOL_TOKEN] is the token for the pool being inquired upon.

QUEUE_NAME is the name of the queue being inquired upon.

[KEY_COMPARISON] specifies the constraints on the inquire. The default is KEY_COMPARISON(EQ). It can have any one of these values:

EQ|GT|GTEQ

[TRANSACTION_NUMBER] is the 4-byte transaction number (in packed-decimal format).

Output parameters

[OUTPUT_QUEUE_NAME] is the name of the queue whose information is returned. Note that this may differ from queue_name unless key_comparison(eq) is specified.

[LAST_REFERENCED_TIME] is the time at which the queue was last referenced.

[TOTAL_ITEMS] is the total number of items in the queue.

[TOTAL_LENGTH] is the sum of the lengths of all the items in the queue.

[MAXIMUM_ITEM_LENGTH] is the length of the longest item in the queue.

[MINIMUM_ITEM_LENGTH] is the length of the shortest item in the queue.

[TRANSID] is the id of the transaction which created the queue.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	QUEUE_NOT_FOUND, SERVER_ERROR, IO_ERROR

TSSR gate, SET_START_TYPE function

Input parameters

START indicates the type of startup requested.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

TSSR gate, SET_BUFFERS function

Sets the number of TS buffers to be used.

Input parameters

BUFFERS the number of buffers required.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

TSSR gate, SET_STRINGS function

This function sets the number of strings to be used.

Input parameters

STRINGS the number of strings to be used.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

TSBR gate, INQUIRE_QUEUE function

Input parameters

QUEUE_NAME is the name of the queue being inquired upon.

Output parameters

[CREATION_TIME] is the time at which the queue was created.

[LAST_REFERENCED_TIME] is the time at which the queue was last referenced.

[TRANSID] is the id of the transaction which created the queue.

[TOTAL_ITEMS] is the total number of items in the queue.

[TOTAL_LENGTH] is the sum of the lengths of all the items in the queue.

[MAXIMUM_ITEM_LENGTH] is the length of the longest item in the queue.

[MINIMUM_ITEM_LENGTH] is the length of the shortest item in the queue.

[STORAGE_TYPE] indicates whether the queue is held in main or auxiliary storage. It can have either of these values:

MAIN|AUXILIARY

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	QUEUE_NOT_FOUND

TSBR gate, START_BROWSE function

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	QUEUE_NOT_FOUND

TSBR gate, GET_NEXT function

Returns information about the next queue in the browse.

Input parameters: None

Output parameters

QUEUE_NAME is the name of the queue.

[CREATION_TIME] is the time at which the queue was created.

[LAST_REFERENCED_TIME] is the time at which the queue was last referenced.

[TRANSID] is the id of the transaction which created the queue.

[TOTAL_ITEMS] is the total number of items in the queue.

[TOTAL_LENGTH] is the sum of the lengths of all the items in the queue.

[MAXIMUM_ITEM_LENGTH] is the length of the longest item in the queue.

[MINIMUM_ITEM_LENGTH] is the length of the shortest item in the queue.

[STORAGE_TYPE] indicates whether the queue is held in main or auxiliary storage. It can have either of these values:

MAIN|AUXILIARY

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BROWSE_END

TSBR gate, END_BROWSE function

Ends the browse.

Input parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BROWSE_END

TSBR gate, CHECK_PREFIX function

Checks whether there are any queues with the prefix provided.

Input parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUPLICATE, NOT_FOUND

TSIC gate, DELIVER_IC_RECOVERY_DATA function

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

TSIC gate, INQUIRE_QUEUE function

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

TSIC gate, SOLICIT_INQUIRES function

This call is made from TS to IC to initiate inquire_queue requests from IC to TS.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

```
OK|DISASTER|INVALID|KERNERROR|PURGED
```

Temporary storage domain’s generic gates

Table 93 summarizes the storage manager domain’s generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 93. Temporary storage domain’s generic gates

Gate	Trace	Function	Format
DMDM	TS 0101 TS 0102	INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
STST	TS 0501 TS 0502	COLLECT_STATISTICS COLLECT_RESOURCE_STATS	STST
APUE	TS 0601 TS 0602	SET_EXIT_STATUS	APUE
RMRO	TS 0401 TS 0402	PERFORM_PREPARE PERFORM_COMMIT PERFORM_SHUNT PERFORM_UNSHUNT START_BACKOUT END_BACKOUT	RMRO
RMDE	TS 0401 TS 0402	START_DELIVERY DELIVER_RECOVERY END_DELIVERY	RMDE
RMKP	TS 0401 TS 0402	TAKE_KEYPOINT	RMKP

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format APUE—Chapter 3, “Application domain (AP)” on page 11

Format DMDM—Chapter 27, “Domain manager domain (DM)” on page 191

Format RMRO—Chapter 63, “Recovery Manager Domain (RM)” on page 457

Format RMDE—Chapter 63, “Recovery Manager Domain (RM)” on page 457

Format RMKP—Chapter 63, “Recovery Manager Domain (RM)” on page 457

Format STST—Chapter 71, “Statistics domain (ST)” on page 519

Modules

Module	Function
DFHTSDM	Handles the following requests: INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHTSQR	Handles the following requests: WRITE REWRITE READ_INTO READ_SET READ_NEXT_INTO READ_NEXT_SET DELETE
DFHTSPT	Handles the following requests: PUT PUT_REPLACE GET GET_SET GET_RELEASE GET_RELEASE_SET RELEASE
DFHTSSH	Handles the following requests: INITIALIZE INQUIRE_POOL_TOKEN INQUIRE_SYSID_TABLE_TOKEN WRITE REWRITE READ_INTO READ_NEXT_INTO READ_SET READ_NEXT_SET DELETE START_BROWSE GET_NEXT END_BROWSE INQUIRE_QUEUE
DFHTSSR	Handles the following requests: SET_START_TYPE SET_BUFFERS SET_STRINGS SET_EXIT_STATUS
DFHTSRM	Handles the following requests: PERFORM_PREPARE PERFORM_COMMIT PERFORM_SHUNT PERFORM_UNSHUNT START_BACKOUT END_BACKOUT START_DELIVERY DELIVER_RECOVERY END_DELIVERY TAKE_KEYPOINT
DFHTSBR	Handles the following requests: INQUIRE_QUEUE START_BROWSE GET_NEXT END_BROWSE CHECK_PREFIX
DFHTSST	Handles the following requests: COLLECT_STATISTICS COLLECT_RESOURCE_STATISTICS
DFHTSDUF DFHTSDUC DFHTSDUS	TS domain offline dump formatting routines

Module	Function
DFHTSITR	Interprets TS domain trace entries

Exits

The temporary storage domain has four global user exit points: XTSQRIN, XTSQROUT, XTSPTIN and XTSPTOUT. For further information about these, see the *CICS Customization Guide*.

Trace

The point IDs for the temporary storage domain are of the form TS xxxx; the corresponding trace levels are TS 1, TS 2 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 85. Terminal abnormal condition program

Terminal error processing for TCAM-supported terminals normally routes any error to the terminal abnormal condition program (DFHTACP). Depending on the type of error, DFHTACP issues messages, sets error flags, and places the terminal or line out of service.

Before default actions are taken, CICS passes control to the terminal error program (DFHTEP) for application-dependent action if necessary. On return from the terminal error program, DFHTACP performs the indicated action as previously set by DFHTACP or as altered by the TEP, a sample version of which is supplied by CICS (DFHXTEP in source code form). See Chapter 87, “Terminal error program” on page 603 for further information about the TEP.

Design overview

The terminal abnormal condition program (DFHTACP) is used by terminal control to analyze any abnormal conditions. Appropriate action is taken with regard to terminal statistics, line statistics, terminal status, and line status; the task (transaction) can be terminated. Messages are logged to the transient data master terminal destination (CSMT) or the terminal log destination (CSTL). DFHTACP links to the user-supplied (or sample) terminal error program, passing a parameter list via a COMMAREA that is mapped by the DFHTEPCA DSECT. This allows the user to attempt recovery from transmission errors and to take appropriate action for the task.

Table 94 lists the various TACP message processing routines, which assemble the text of the messages and write them to one of three destinations depending on the type of error.

The matrix shown in Figure 93 on page 584 defines the selection of message routines based on error code. The sequence in which the routines are executed is indicated by the number in the column corresponding to the error code. For example, for error code X'88', the processing routines are executed in the following order: ME, F, W, X, N, BA, and finally R.

Figure 94 on page 584 gives a generalization of TACP’s default error handling upon completion of the message processing. For each error code, it shows the first routine to be called.

Table 94 (Page 1 of 2). TACP message routines

Routine	Function
A	Establish DFHTC message number 2501 (Msg too long, please resubmit)
D	Establish DFHTC message number 2502 (TCT search error)
F	Establish DFHTC message number 2507 (Input event rejected)
H	Establish DFHTC message number 2506 (Output event rejected)
I	Establish DFHTC message number 2513 (Output length zero)
J	Establish DFHTC message number 2514 (No output area provided)
K	Establish DFHTC message number 2515 (Output area exceeded)
L	Establish DFHTC message number 2517 (Unit check SNS=ss, S.N.O.)
M	Establish DFHTC message number 2519 (Unit exception, S.N.O.)
N	Generate standard message inserts, for example, ‘at term tttt’
O	Generate special inserts for message DFHTC2500
Q	Write to terminal causing the error, after retrieving the message text from ME domain using an MEME RETRIEVE_MESSAGE call
R	Write to destination (CSMT or CSTL) using an MEME SEND_MESSAGE call to ME domain
T	Obtain terminal main storage area (message build area)
V	Establish DFHTC message number 2511 (Incorrect write request)
W	Establish ‘return code xx’ message insert
X	Convert hexadecimal byte into 2 printable characters
AB	Establish DFHTC message number 2534 (Incorrect destination)
AE	Establish DFHTC message number 2500 (Line|CU|Terminal out of service)
AF	Obtain terminal statistics
BA	Obtain line statistics
BB	Establish DFHTC message number 2516 (Unit check SNS=ss)
BC	Establish DFHTC message number 2518 (Unit exception)
BF	Establish DFHTC message number 2521 (Undetermined unit error)
CA	Establish DFHTC message number 2522 (Intercept required)

Table 94 (Page 2 of 2). TACP message routines

Routine	Function
DB	Establish DFHTC message number 2529 (Unsolicited input)
ME	Initialize parameter list for calling ME domain

	ERROR CODES																
PROCESSING ROUTINES	81	82	84	85	87	88	8C	8D	8E	8F	94	95	96	97	99	9A	9F
A	3																
D			2														
F						2											
H							2										
I								2									
J									2								
K										2							
L												2					
M														2			
N			3	3	3	5	5	3	3	3	4	4	3	3	3	3	3
O		3															
Q	5																
R		4	5	4	4	7	7	4	4	4	5	5	4	4	4	4	4
T	2																
V				2													
W						3	3										
X						4	4				3	3					
AB																	2
AE		2															
AF	4																
BA			4			6	6										
BB											2						
BC													2				
BF															2		
CA																2	
DB					2												
ME	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Figure 93. TACP message construction matrix

ERROR CODES	
81	1
82	-
84	2
85	1
87	5
88	3
8C	3
8D	1
8E	1
8F	1
94	4
95	4
96	4
97	4
99	3
9A	6
9F	1

```
ROUTINE DESCRIPTION

1. Abend transaction

2. Put line in/out of service,
   as required

3. Put line (or terminal) out
   of service

4. I/O error test

5. Unsolicited input message

6. Test line for next operation.
```

Figure 94. TACP default error handling

Modules

DFHTACP

Exits

No global user exit points are provided for this function.

Trace

The following point ID is provided for the terminal abnormal condition program:

- AP 00E6, for which the trace level is TC 1.

DFHTACP provides trace entries immediately before and after calling DFHTEP.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 86. Terminal control

Terminal control allows communication between terminals and application programs. VTAM/NCP and TCAM are used for most terminal data control and line control services.

Terminal control supports automatic task initiation to process transactions that use a terminal but which are not directly initiated by the terminal operator (for example, printers).

Terminal control can also provide a simulation of terminals, using sequential devices, in order to help test new applications.

Design overview

The user can specify that concurrent terminal support is to be provided by any combination of the following access methods:

- VTAM
- TCAM
- Basic sequential access method (BSAM)
- Interregion communication (IRC)
- Console.

The primary function of terminal control is to take an input/output (I/O) request for a terminal and convert it to a format acceptable to the access method (VTAM, TCAM, or BSAM).

Terminal control uses data that describes the communication lines and terminals, kept in the terminal control table (TCT). The TCT is generated by the user as part of CICS system definition, or dynamically as needed. The TCT entries contain terminal request indicators, status, statistics, identification, and addresses of I/O and related areas.

When CICS terminal control is used with VTAM, VTAM itself resides in a separate address space, having a higher priority than CICS. VTAM-related control blocks and support programming comprise the CICS terminal control component. The application programs that run under CICS control communicate with terminals through the CICS terminal control interface with VTAM.

VTAM network functions allow terminals to be connected to any compatible control subsystem that is online. This enables a terminal operator to switch from one CICS system to another, or to another subsystem.

VTAM manages the flow of data between devices in the network and VTAM application programs such as CICS.

VTAM is responsible for:

- Connecting, controlling, and terminating communication between the VTAM applications and terminal logical units
- Transferring data between VTAM applications and logical units
- Allowing VTAM applications to share communication lines, communication controllers, and terminals
- Controlling locally attached devices, that is, those not connected through a communication controller
- Providing tools to monitor network operations and make dynamic changes to the network configuration.

In a VTAM environment, the functions of CICS terminal control include:

- Establishing communication with terminal logical units (LUs) by issuing logon requests, communicated through the access method
- Handling terminal input and passing user program requests for communication to VTAM
- Returning terminal LUs to the access method by accepting logoff requests
- Taking measures to ensure the integrity of messages flowing to and from VTAM
- Performing logical error recovery processing for VTAM devices.

Terminal control issues VTAM macros to receive incoming messages, and routes them to the appropriate CICS application program for processing. Likewise, it sends messages destined for various devices in the network to VTAM, which then routes them to the appropriate location.

When TCAM controls communication lines, those lines are not dedicated to the CICS region. Thus a single terminal can access programs in separate regions supported by TCAM. TCAM facilities available within the region supported by TCAM include message switching, broadcasting, disk queuing, checkpoint and restart of the communication network, and TCAM terminal support.

Terminal control services

The following services are performed by, or in conjunction with, terminal control:

- Service request facilities
- System control services
- Transmission facilities.

Service request facilities

Write request
Sets up and issues or queues access method macros; performs journaling and journal synchronization.

Read request
Sets up and issues access method macros; performs journaling if required.

Wait request
Causes a dispatcher to suspend.

Dispatch analysis
Determines the type of access method and terminal used, and executes the appropriate area of terminal control.

System control services

Automatic task initiation
Services requests for automatic task (transaction) initiation caused by events internal to the processing of CICS.

Task initiation
Requests the initiation of a task to process a transaction from a terminal. When an initial input message is accepted, a task is created to do the processing.

Terminal storage
Performs allocation and deallocation of terminal storage.

Transmission facilities—VTAM

Connection services
Accepts logon requests, requests connection of terminals for automatic task initiation, and returns terminals to VTAM, as specified by the user. If the terminal has not been defined, CICS uses the VTAM logon information to autoinstall the terminal.

Transmission facilities—VTAM/non-VTAM

Access method selection
Passes control to the appropriate access method routine based on the access method specified in the terminal control table.

Wait
Synchronizes the terminal control task with all other tasks in the system. When all possible read and write operations have been initiated, terminal control processing is complete and control is returned to the transaction manager to allow dispatching of other tasks.

Transmission facilities—TCAM

TCAM message control program facilities
Performs the following functions:

- Invites and selects terminals to transmit or receive data
- Manages dynamic buffers
- Handles messages and directs the flow of data through the system on a priority basis
- Maintains queues in main storage and on direct-access devices for terminals and application programs
- Handles error checking, operator control, and checkpoint and restart.

Terminal error recovery

The resolution of certain conditions (for example, permanent transmission errors) involves both CICS and additional user coding. CICS cannot arbitrarily take all action with regard to these errors. User application logic is sometimes necessary to resolve the problem.

For the VTAM part of the network, terminal error handling is carried out by the node abnormal condition program (NACP) and a sample node error program (NEP), provided by CICS, or a user-written node error program. For further information about these, see Chapter 55, "Node abnormal condition program" on page 421 and Chapter 56, "Node error program" on page 425.

For the portion of the telecommunication network connected to TCAM or BSAM, these error-handling services are provided by the terminal abnormal condition program (TACP) and by the user-written or sample terminal error program (TEP). For further information about these, see Chapter 85, "Terminal abnormal condition program" on page 583 and Chapter 87, "Terminal error program" on page 603.

The following sequence of events takes place when a permanent error occurs for a terminal:

1. The terminal is "locked" against use.
2. The node or terminal abnormal condition program is attached to the system to run as a separate CICS task.
3. The node or terminal abnormal condition program writes the error data to a destination in transient data control if the user has defined one. This destination is defined by the user and can be intrapartition or extrapartition.
4. The node or terminal abnormal condition program then links to the appropriate node/terminal error program to allow terminal- or transaction-oriented analysis of the error. In the node or terminal error program, the user may decide, for example, to have the terminal placed out of service, have the line placed in or out of service, or

have the transaction in process on the terminal abnormally terminated.

5. The terminal is "unlocked" for use.
6. The node or terminal abnormal condition program is detached from the system if no other terminals are to be processed.

Testing facility—BSAM

To allow the user to test programs, BSAM can be used to control sequential devices, such as card readers, printers, magnetic tape, and direct-access storage devices. These sequential devices can then be used to supply input/output to CICS before actual terminals are available or during testing of new applications.

Terminal control modules (DFHZCP, DFHTCP)

Terminal control consists of two CICS resource managers:

ZCP DFHZCP, DFHZCX, and DFHZCXR provide both the common (VTAM and non-VTAM) interface, and DFHZCA, DFHZCB, DFHZCC, DFHZCW, DFHZCY, and DFHZCZ provide the VTAM-only support.

TCP DFHTCP provides the non-VTAM support (not MVS console support).

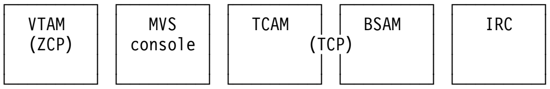
Terminal control communicates with application programs, CICS system control functions (transaction manager, storage control), CICS application services (basic mapping support and data interchange program), system reliability functions (abnormal condition handling), and operating system access methods (VTAM, TCAM, or BSAM).

Requests for terminal control functions made by application programs, BMS, or the transaction manager, are processed through the common interface of DFHZCP. Generally, terminal control requests for other CICS or operating system functions are issued by either ZCP or TCP, depending upon the terminal being serviced.

The ZCP and TCP suites of programs are loaded at CICS system initialization according to specified system initialization parameters, as follows:

- DFHTCP is loaded only if TCP=YES is specified.
- DFHZCP, DFHZCX, and DFHZCXR are always loaded.
- DFHZCA, DFHZCB, DFHZCY, and DFHZCZ are loaded only if VTAM=YES is specified.
- DFHZCC and DFHZCW are loaded only if ISC=YES is specified.

Figure 95 gives an overview of the terminal control resource managers.



Modules:

DFHTCP	TCAM, BSAM only	DFHZCW	VTAM only (ISC)
DFHZCA	VTAM only	DFHZCX	All
DFHZCB	VTAM only	DFHZCXR	All
DFHZCC	VTAM only (ISC)	DFHZCY	VTAM only
DFHZCP	All	DFHZCZ	VTAM only

Figure 95. Terminal control resource managers

Figure 96 shows the relationships between the components of terminal control.

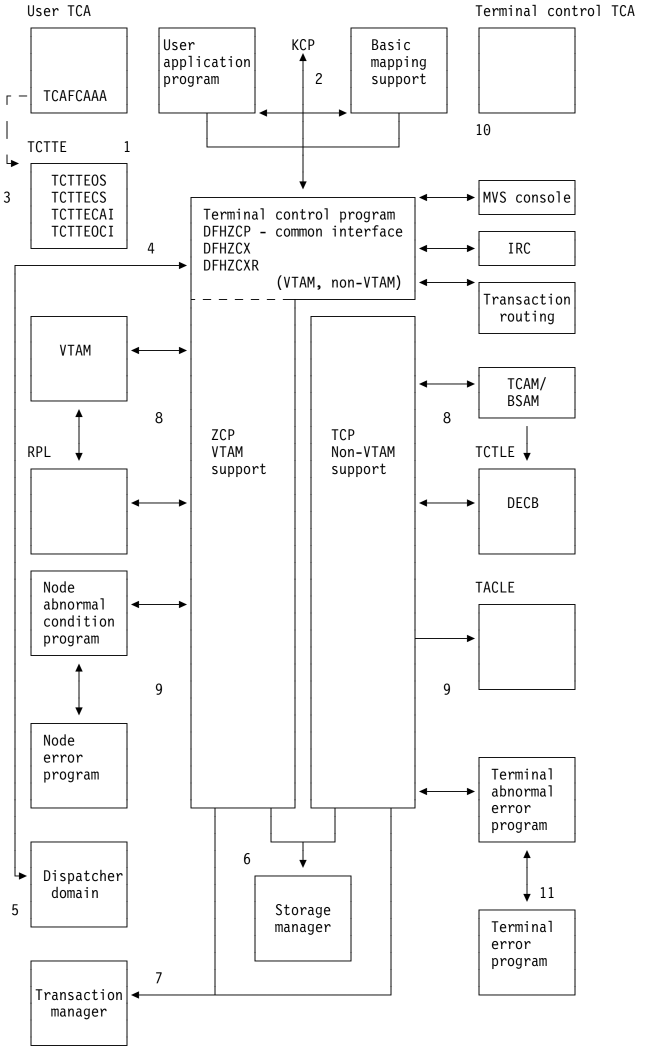


Figure 96. Terminal control interfaces

Notes for Figure 96 on page 587:

Common interface

1. When a terminal control request is issued by an application program, or internally by the basic mapping support (BMS) routines using the DFHTC macro, request bits are set in the user's task control area (TCA) and control is passed to the common interface (VTAM, non-VTAM) routines of DFHZCP.
2. If the request includes WAIT and the IMMED option is not in effect, control is passed to the transaction manager to place the requesting program (task) in a suspended state. If WAIT is not included, control is returned to the requesting task.
3. The task's TCA contains the TCTTE address either in a field named TCAFCAAA (facility control area associated address) or in a field named TCATPTA when passing TCATPTA to terminal control.
4. The dispatcher dispatches terminal control through the common interface (DFHZDSP in DFHZCP) for one of the following reasons:
   - The system address space exit time interval (specified by the ICV system initialization parameter) has elapsed since the last terminal control dispatch.
   - The specified terminal scan delay (specified by the ICVTSD system initialization parameter) has elapsed.
   - There is high-performance option (HPO) work to process.
   - The terminal control event has been posted complete (for example, an exit scheduled in the case of VTAM, or an event control block (ECB) posted in the case of non-VTAM), and CICS is about to go into a wait condition.
5. Terminal control, through its common interface (DFHZDSP) requests the dispatcher to perform a CICS WAIT when the terminal control task has processed through the terminal network and has no further work that it can do.

Access method dependent interface

6. Terminal control communicates with storage manager to obtain and release storage as follows:

   VTAM
   ZCP modules issue domain calls for terminal storage (TIOAs), receive-any input area (RAIA) storage, and request parameter list (RPL) storage.

   Non-VTAM
   DFHTCP issues DFHSC macros to obtain and release terminal and line storage.
7. Terminal control communicates with the transaction manager by means of the DFHKC macro. The macro can be issued by certain CICS control modules, depending upon the terminal being serviced. Terminal control may request the transaction manager to perform one of the following:
   - Attach a task upon receipt of a transaction identifier from a terminal.
   - Respond to a DFHKC TYPE=AVAIL request (a task control macro documented only for system programming) when a terminal is required by or for a task and that facility is available.
8. Terminal control communicates with operating system access methods in either of the following ways, depending upon the terminal being serviced:

   VTAM
   ZCP (referring here to the resource manager) builds VTAM request information in the RPL which is then passed to VTAM for servicing. VTAM notifies terminal control of completion by placing completion information in the RPL. ZCP analyzes the contents of the RPL upon completion to determine the type of completion and the presence of error information. Communication with VTAM also occurs by VTAM scheduling exits, for example, LOGON or LOSTERM. VTAM passes parameter lists and does not always use an RPL.

   When authorized-path VTAM has been requested (HPO), communication with VTAM also occurs in service request block (SRB) mode (using DFHZHPRX); ZCP uses the RPL with an extension to communicate with its SRB mode code. When an SRB mode RPL request is complete, ZCP calls the relevant exit or posts the ECB, as indicated by the RPL extension.

   Non-VTAM
   DFHTCP builds access method requests in the data event control block (DECB), which is part of the terminal control table line entry (TCTLE). The DECB portion of the TCTLE is passed to the access method by terminal control to request a service of that access method. The access method notifies terminal control of the completion of the service through the DECB. Terminal control analyzes the contents of the DECB upon completion to determine the type of completion and to check for error information.
9. Terminal control communicates with the CICS abnormal condition functions in either of the following ways, depending upon the terminal being serviced:

   VTAM
   The activate scan routine (DFHZACT, in the DFHZCA load module) attaches the CSNE transaction to run the node abnormal condition program (DFHZNAC); this is done during CICS initialization. DFHZNAC does some preliminary processing and then passes control to the node error program (DFHZNEP). (The node error program can be either your own version or the

default CICS-supplied version.) Upon the completion of the user's error processing, control is returned to DFHZNAC. (For further information about DFHZNAC, see Chapter 55, "Node abnormal condition program" on page 421.)

Non-VTAM
DFHTCP attaches the CSTE transaction to run the terminal abnormal condition program (TACP) and passes a terminal abnormal condition line entry (TACLE) when an error occurs. The TACLE is a copy of the DECB portion of the TCTLE and contains all information necessary for proper evaluation of the error, together with special action indicators that can be manipulated to alter the error correction procedure. After analyzing the DECB, DFHTACP calls the terminal error program (DFHTEP) with a COMMAREA containing the TACLE address. (The terminal error program can be either your own version or the default CICS-supplied version.) For further information about DFHTACP, see Chapter 85, "Terminal abnormal condition program" on page 583.

10. Terminal control is executed under either the user's TCA or its own TCA as follows:
    User's TCA
    a. During the application program interface
    b. During the interface with basic mapping support
    c. While performing direct VTAM terminal SEND requests.

    Terminal control's TCA
    a. When the dispatcher dispatches terminal control
    b. When terminal control issues a request to the transaction manager to attach a task
    c. When terminal control issues a request to storage control
    d. While performing non-VTAM terminal I/O or queued VTAM terminal I/O
    e. For session-control functions when no task is attached.

Because many devices are supported by CICS terminal control, a large number of modules are required to provide this support.

Figure 97 on page 590 gives an overview of the relationships between the functions within terminal control and the rest of CICS and Figure 98 on page 590 through Figure 100 on page 592 show some of the flows through the terminal control modules.

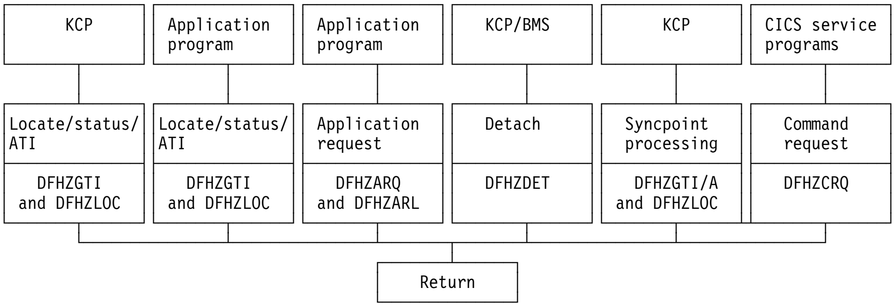


Figure 97. Terminal control functions and modules

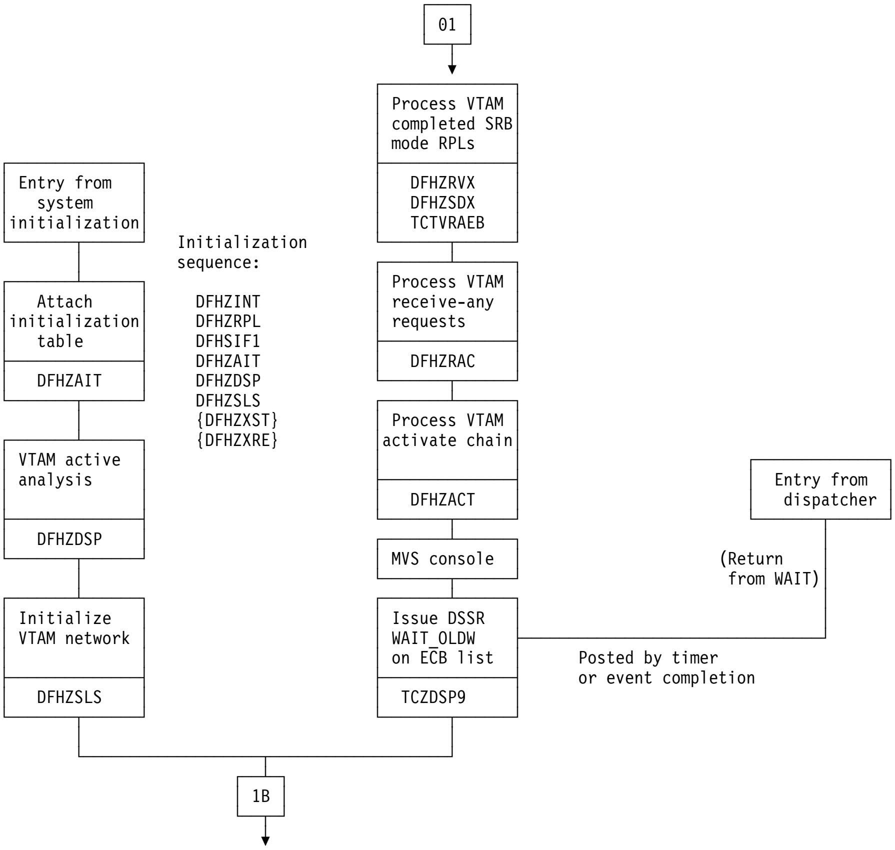


Figure 98. Terminal control ZCP and TCP common control routines

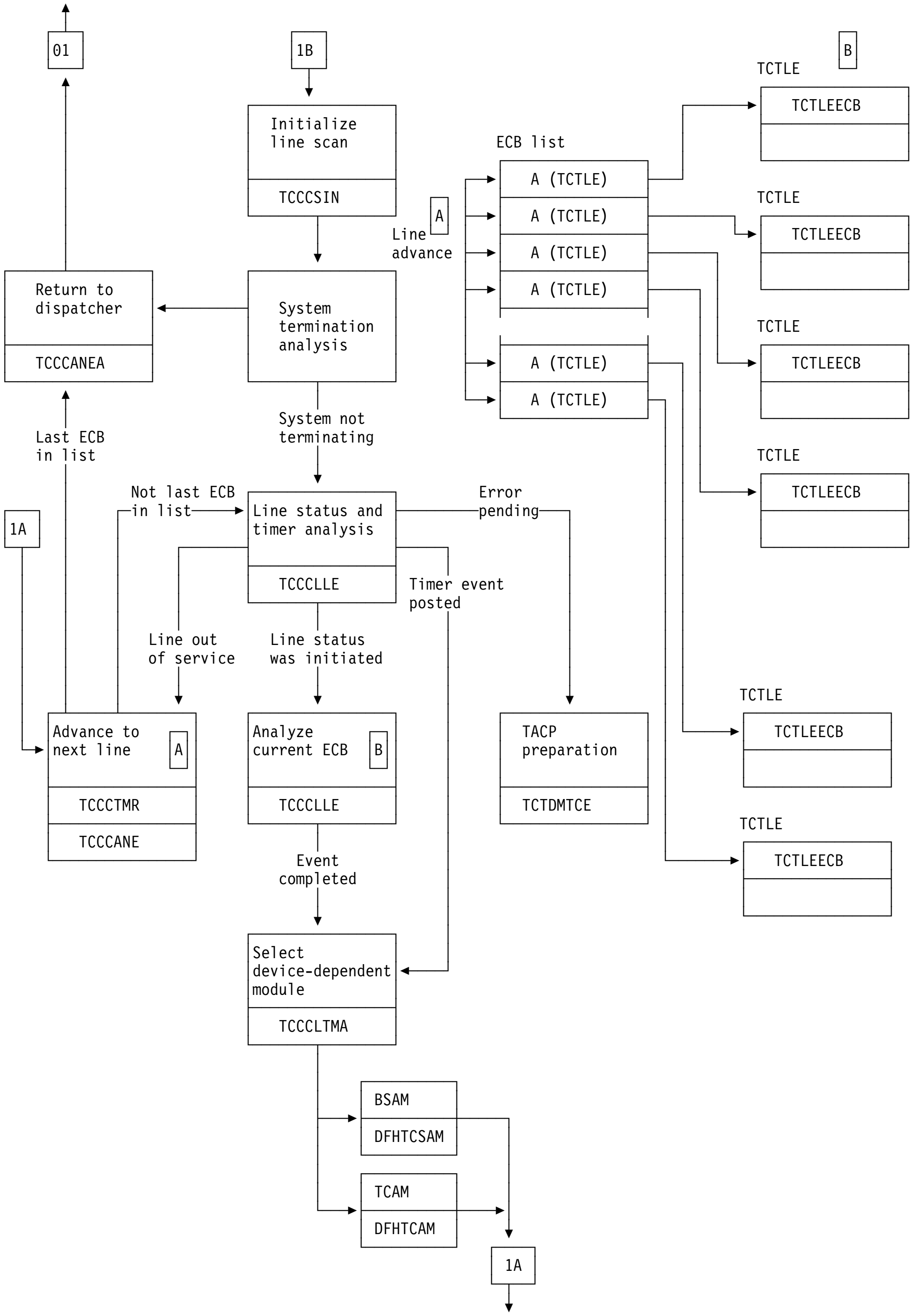
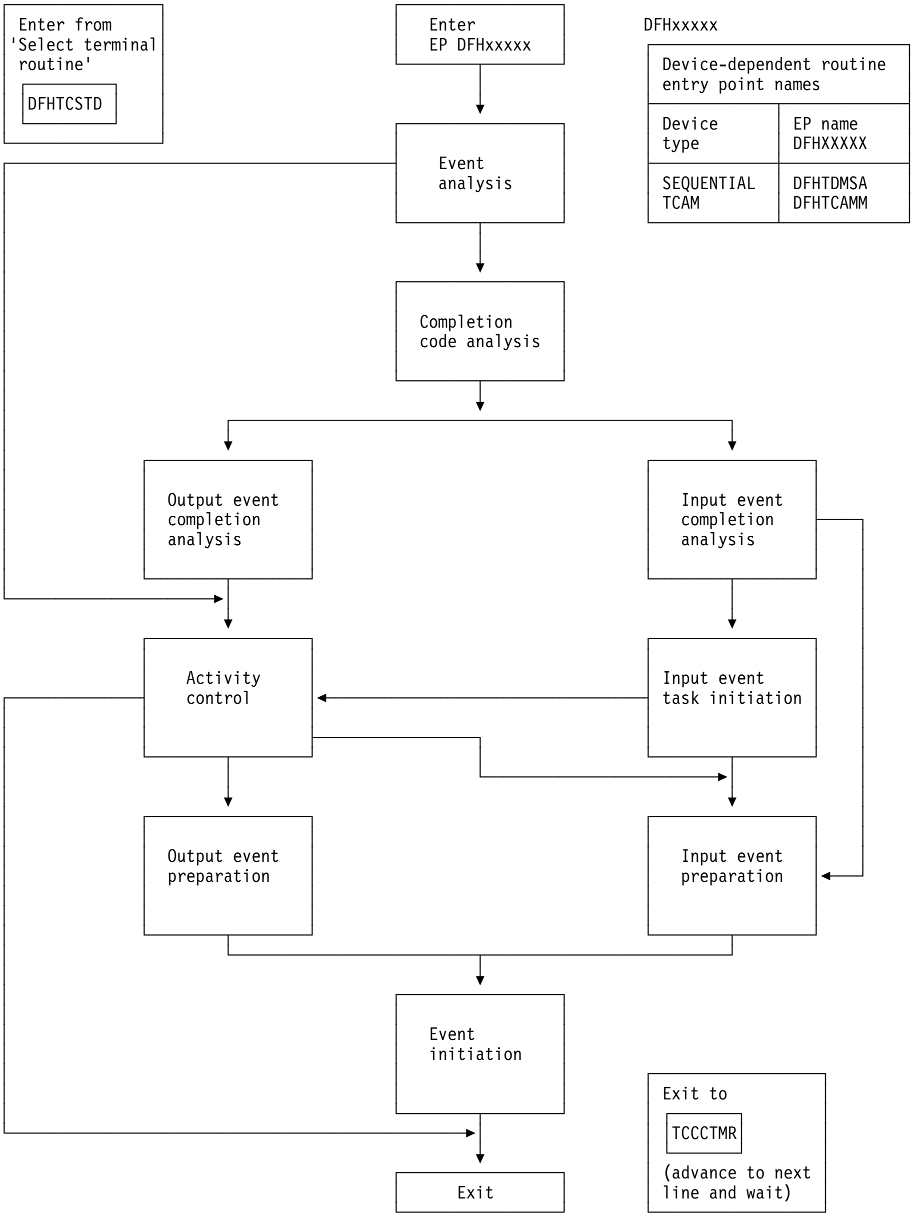


Figure 99. Terminal control TCP control routines (TCAM, BSAM)



DFHxxxxx

Device-dependent routine entry point names	
Device type	EP name DFHXXXXX
SEQUENTIAL TCAM	DFHTDMSA DFHTCAMM

Figure 100. Terminal control general flow through device-dependent modules (TCP only)

High-performance option: When running CICS under MVS, the high-performance option (HPO) can be used. HPO uses VTAM with CICS as an authorized program so that the VTAM path length is reduced. This is achieved by dispatching SRBs to issue the send and receive requests for data to and from the terminals. The SRB code is executed in the DFHZHPRX module.

System console support: One or more MVS system consoles can be used as CICS terminals. This includes any MVS extended console introduced from MVS/ESA SP 4.1 onward; for example, a TSO user issuing the TSO CONSOLE command.

Each console has a unique number (releases prior to MVS/ESA SP 4.1) or a unique name (MVS/ESA SP 4.1 onwards). This matches the console number or name defined in the MVS system generation. Consoles are defined to CICS using CEDA DEFINE TERMINAL (see Chapter 66, “Resource definition online (RDO)” on page 485). The console number or name is specified using the CONSOLE or CONSNAME keyword respectively, depending on the level of MVS.

The console operator communicates with CICS using the MVS MODIFY command to start transactions. CICS communicates with the console using either the WTO macro or the WTOR macro.

A system console is modeled by CICS as a TCTTE that has an associated control block, the console control element (CCE). The CCE holds the event control block (ECB) for the console, and both the console ID and the console name.

The interface between a system console and CICS is the command input buffer (CIB), which is created in MVS-protected storage for each MODIFY command. A CIB contains the data for a MODIFY command. CICS addresses the first CIB using the EXTRACT macro and the CIBs are chained together.

The MVS communication ECB is in MVS-protected storage; it is posted complete for each MODIFY command and reset when there are no CIBs to be processed. The CICS system wait list holds pointers to the MVS communication ECB and the ECB for each system console.

When CICS is initialized, an EXTRACT macro is executed to obtain the job name and point to the MVS communication ECB and the first CIB; all these are stored in the TCT prefix.

DFHZCP contains two modules, DFHZCNA and DFHZCNR, which perform system console support.

DFHZCNA is used to:

- Resume a task on completion of a terminal event for the task
- Attach a task to satisfy a request for transaction initiation by a MODIFY command
- Attach a task (AVAIL) requested by automatic transaction initiation (ATI)
- Detach a terminal from a task when the task has completed
- Shut down console support when CICS is quiescing.

DFHZCNR is used to:

- Issue WTO macros for application program WRITE requests
- Issue WTO and WTOR macros for application program CONVERSE or (WRITE,READ) requests
- Issue a WTOR macro with message DFH4200 for application program READ requests.

Console support control modules: DFHZDSP calls DFHZCNA to scan the consoles for any activity.

DFHZCNA checks whether any task is suspended because it is waiting for a terminal event, for example, a READ, and, if the event is completed, resumes that task before starting any new task. This is done by scanning the CCE chain for ECBs that have been posted by MVS.

When a MODIFY command is executed, the communication ECB is posted complete and a CIB for the command is added to the end of the CIB chain. DFHZCNA processes the CIB chain in first-in, first-out order. For each CIB, DFHZCNA searches the CCE chain for the console. With MVS/ESA SP 4.1 (or later), the search is on console name; otherwise, the search is on console ID.

The task is then attached if the ‘task pending’ flag in the CCE is not set by a preceding CIB in the chain. In the course of scanning the CIB chain, DFHZCNA may find a MODIFY command that requires a task to be attached, but cannot attach the task immediately because there is already a task active, or there is an outstanding error condition to clear. DFHZCNA therefore sets the ‘task pending’ flag in the CCE to remember the existence of the CIB. During the CIB chain scan, the condition preventing the task attach might clear, and a subsequent CIB might be selected for attach. However, the ‘task pending’ flag prevents this, and ensures that CIBs are processed in order. All ‘task pending’ flags are reset before each CIB chain scan.

If the task is to be attached, DFHZCNA obtains a TIOA and moves the data from the CIB to the TIOA. DFHZATT is then called to attach the task. If the attach fails, the TIOA is freed. A QEDIT macro frees the CIB if the attach is successful, and the scan continues.

When a transaction is automatically initiated and DFHKCP schedules the transaction for a terminal which is a console, a flag is set in the CCE by DFHZLOC. After DFHZCNA has completed scanning the CIB chain, it checks that the console does not have a task already attached and there is not a CIB on the chain for the console; if both these conditions are satisfied, the task is attached.

DFHZCNA issues a QEDIT macro to prevent any more MODIFY commands being accepted when CICS is shutting down. Any MODIFY commands on the CIB chain after shutdown has been started are processed. When other access methods have been quiesced, and there are no tasks attached for a console, console support is shut down.

If a console not defined to CICS is used to enter a MODIFY command, DFHZCNA sets up an error code and links to DFHACP to issue the error message. This is done using the TCTTE for the error console, CERR.

DFHZCNR sends terminal control requests from an application program to a specific system console by issuing WTO and WTOR macros. It is called by DFHZARQ.

For a WRITE request, DFHZCNR executes either a single WTO macro, or one or more multiline WTO macros, depending on the amount of data specified for the request.

For a READ request, DFHZCNR acquires a TIOA for the reply area and executes a WTOR macro with a CICS-supplied message, DFH4200. This message requests the operator to reply, and the transaction waits for this reply.

For a CONVERSE or (WRITE,READ) request, DFHZCNR acquires a TIOA for the reply area and executes a WTOR macro with the data specified for the WRITE. If there is any data remaining, DFHZCNR then executes either a single WTO macro, or one or more multiline WTO macros, depending on the amount of data. The transaction then waits until the operator replies to this request.

Defining terminals to CICS

Terminal definitions are created as CSD records or DFHTCT macros (non-VTAM only) and then installed in (added to) the terminal control table (TCT) as TCT terminal entries (TCTTEs).

When a cold start is performed, CICS obtains its TCT entries from DFHTCT macros or from groups of resource definitions in the CSD file, which are named in the GRPLIST system initialization parameter. These are recorded in the CICS catalog.

When a warm start is performed, CICS obtains the definitions from the DFHTCT macros and from the CICS catalog; the GRPLIST is ignored.

On emergency restart, CICS obtains the definitions from the DFHTCT macros and from the CICS catalog; the GRPLIST is ignored. Then CICS re-applies any in-flight TCT updates using information from the system log.

During CICS execution, TCT entries can be added as follows:

- By using the CEDA INSTALL command
- By the autoinstall process when an unknown terminal logs on
- By the transaction routing component when a TCT entry is shipped from a terminal-owning to an application-owning region.
- By using the EXEC CICS CREATE command

During CICS execution, TCT entries can be deleted as follows:

- By using the EXEC CICS DISCARD command
- By the autoinstall process when an autoinstalled terminal logs off or has been logged for a period.
- By the transaction routing component when a TCT entry has been unused for a period.
- Using the CEDA INSTALL, EXEC CICS CREATE, transaction routing, or autoinstall processes to replace the old entry.

Figure 101 on page 595 shows the terminal control table (TCT).

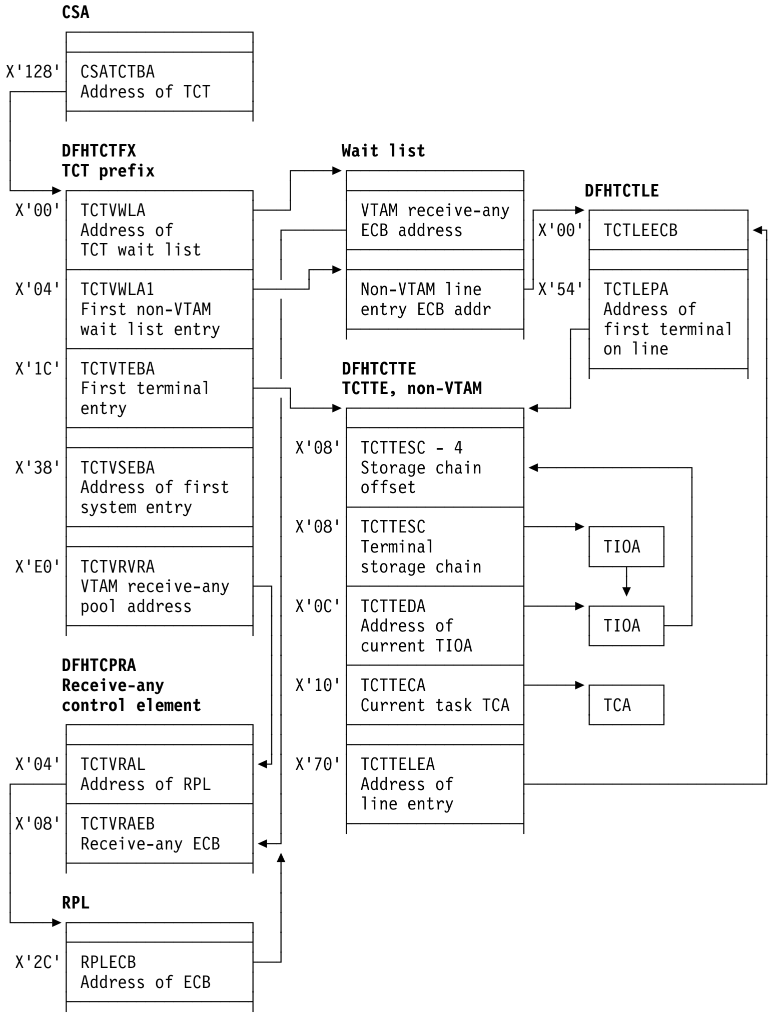


Figure 101. Terminal control table (TCT)

DFHZCQ: DFHZCQ installs, deletes, catalogs, uncatalogs, recovers, and inquires on terminals. Entries are installed in and deleted from the terminal control table by DFHZCQ. DFHZCQ is called by the following modules:

DFHAMTP For the CEDA transaction and EXEC CICS CREATE, to install TCT entries

DFHEIQSC For EXEC CICS DISCARD CONNECTION, to discard a connection.

DFHEIQST For EXEC CICS DISCARD TERMINAL, to discard a terminal.

DFHTBSS During CICS initialization, to restore terminal definitions at warm or emergency restart

DFHZATA The autoinstall program

DFHZATD The autoinstall delete program

DFHZATS When a TCT entry is shipped, installed, or deleted for transaction routing

DFHZTSP When a transaction route request is received to recatalog the connection if certain characteristics have changed.

DFHQRY When the QUERY function is used to discover the actual characteristics of a device, complete the TCT entry, and recatalog the resulting TCTTE

DFHWKP The warm keypoint program, to record information for RDO-eligible terminals in the CICS catalog, and to uncatalog autoinstalled entries.

DFHZCQ calls the table builder services (TBS) modules which in turn, call the appropriate DFHBSxxx modules to build the TCTTE for the input parameters. DFHZCQ is heavily dependent on the module that calls it to supply the complete set of parameters to be used to create the TCTTE; DFHZCQ itself is not responsible for determining parameters for the TCTTE.

DFHBS* builder programs: DFHZCQ calls the builder programs, whose names all begin DFHBS. These **builders** are responsible for creating TCTTEs. The parameters given to DFHZCQ are passed on to the builders, which extract the parameters and set the relevant fields in the TCTTE.

For further information about builders, see Chapter 10, "Builders" on page 79.

Contents of the TCT: The TCT describes the logical units (LUs) known to CICS. Each active LU is represented by a terminal control table terminal entry (TCTTE). The TCT does not describe the network configuration; it describes the CICS logical viewpoint of the network.

The TCT contains pointers to these VTAM-related control blocks:

- Access method control block (ACB)— Link an application program, such as CICS, to VTAM
- Receive-any control blocks (RA-RPL, RA-ECB, RACE)— Process initial transaction input
- Node initialization block (NIB) descriptors and bind-area models— Used during logon processing
- TCTTEs— Describe the logical units known to CICS
- ACB and RPL exit lists— Point to the VTAM exit routines.

TCT indexing(DFHZGTI and DFHZLOC): There are two types of requests that can be used in CICS to locate terminal entries:

1. DFHZGTI calls
2. and DFHTC CTYPE=LOCATE calls

Both these modules use DFHTM calls to a variety of indexes and chains to locate terminal entries in the TCT with efficiency.

The DFHZGTI module has the following call types:

Locate	Find a TCT entry in the given 'domain' which matches the name
GetStart	Obtain a browse token for Getnexts.
GetFirst	Find the first entry that matches the name in the given domain.
GetNext	Find the next entry that matches the name in the given domain.
GetEnd	Release the browse token
Release	Unlock an entry

Callers can decide to have an entry returned as locked or unlocked.

In DFHZGTI the total TCT is carved up into 'domains' A TCT entry can reside in several domains depending on its type. Callers to DFHZGTI specify one domain on a call and are returned one entry that fits the name (or partial name) that is supplied. DFHZGTI calls can be for the following domains:

Terminal by termid	All terminals (local, remote, non-vtam) by the terminal id (4-char).
Session by termid	All sessions (VTAM, MRO, remote) by the terminal id (4-char).
Global by termid	All terminal and all sessions by the terminal id (4-char).
System by sysid	All connections (local, remote) by the sysid (4-char)
MRO system by sysid	MRO connections by sysid (4-char).
LU61 system by sysid	LU61 connections by sysid(4-char).
REMDEL system by sysid	Systems that need REMDEL sent to them (because they do not support timeout) when a local entry is deleted by sysid (4-char).
Terminal by netname	VTAM local terminals by the netname (8-char).
System by netname	All connections (local, remote) by the netname (8-char).
Remote terminal by netname	Remote terminals by the netname (8-char).
Global by netname	Terminals, remote terminals and sessions by the netname (8-char).
Remote by Unique	All remote terminals and remote connections by the unique name that is Terminal-Owning-Region (TOR) netname, followed by a period, followed by the termid or sysid in the TOR. (13-char).
Remote terminal by Rsysid	Remote terminals by the value of REMOTESYSTEM (4-char).
Remote system by Rsysid	Remote connections by the value of REMOTESYSTEM (4-char).

Indirect system by Rsysid	Indirect connections by the value of REMOTESYSTEM (4-char).
Generic system by mbrname	Generic connections by the member-name of the connection in the generic VTAM resource (8-char).

DFHTC CTYPE=LOCATE calls are processed by DFHZLOC. DFHZLOC does not have access to as wide a range of domains as DFHZGTI, but it provides extra facilities such as finding particular types of sessions for a connection. Both DFHZGTI and DFHZLOC can lock TCT entries.

Locks: The table manager program (DFHTMP) is used to locate TCT entries by both DFHZGTI and DFHZLOC. When DFHTMP gives the address of an entry, it notes the address of the calling task, and this has the effect of a shared lock unless the caller asked for the entry not to be locked. All locks are released implicitly at the end of the task.

When a TCT entry is deleted, it must not be in use by another task. This is achieved by issuing the DFHTM QUIESCE macro. Other tasks that issue DFHTM LOCATE for that entry are suspended when they acquire a shared lock. These tasks are resumed when the original task issues a delete (if the commit option is used), or at syncpoint if not.

In addition to TMP read locks, DFHZLOC and DFHZGTI, use update locks which are obtained and released by DFHZGTA. DFHZGTA's involvement in TCT updates is discussed in Chapter 10, "Builders" on page 79. For efficiency, two flags in each TCT entry (one for delete and one for update) are examined before a TCT entry is returned. If either is set, and the request does not ask to see all updates, DFHZGTA is called to determine if the inquiring task holds the lock on the termid or sysid name. If it does, the entry is returned, otherwise the entry is ignored. This hides entries that are being installed or replaced from other parts of CICS until they are ready to be used, without requiring a lock search for each inquiry. The Builders, see Chapter 10, "Builders" on page 79, are responsible for setting and resetting the flags in the TCT entry.

The following sections describe some of the callers of DFHZCQ.

System initialization (DFHTCRP, DFHAPRDR and DFHTBSS): The DFHTCRP program is responsible for reestablishing TCTTEs that were in existence in the previous CICS run. There are three stages of processing in DFHTCRP:

1. Initialize DFHZCQ and DFHAPRDR, then exit if START=COLD
2. Reestablish TCTTEs recorded in the CICS catalog calling DFHZCQ for each one.
3. Call DFHAPRDR to allow it to proceed and forward-recover in-flight updates to TCTTEs recorded in the system log at emergency restart or XRF takeover.

The DFHAPRDR program is called by DFHTCRP in two phases:

1. To initialize its control blocks.
2. To wait until Recovery Manager has delivered any inflight log records and DFHAPRDR (running on another task) has called DFHTBSS to recover them.

DFHAPRDR is called by Recovery Manager (RM) for each log record that are for UOWs that did not write a Forget record to the system log when CICS failed. It is then called again to denote the end of any such records. On this call DFHAPRDR waits until DFHTCRP has rebuilt the TCT from the catalog, and then calls DFHTBSS to recover each log record (which will update the TCT and catalog). Then it posts DFHTCRP to show that the TCT has recovered and returns to Recovery Manager.

The DFHTBSS program is called by DFHAPRDR with log records for TCT updates that were being written to the catalog when CICS failed. It then calls DFHZCQ to re-install or re-delete the entries that the log records represent.

CEDA INSTALL and EXEC CICS CREATE (DFHAMTP): When the CEDA INSTALL command is used to install a group of TERMINAL definitions, the flow of control is as follows:

1. DFHAMP processes CEDA and EXEC CICS CREATE commands.
2. DFHAMPIL processes the INSTALL and CREATE commands.
3. DFHAMTP calls DFHTOR and then DFHZCQ.
4. DFHTOR receives as input a partial definition (TERMINAL, TYPETERM, CONNECTION, or SESSIONS), calling one of the DFHTOAxx modules, depending on the type of resource definition:
   - DFHTOAxx adds a partial definition to a BPS. For a terminal device, a complete BPS is built from information from one TYPETERM and one TERMINAL definition; for an ISC or MRO link, a complete BPSes are built from information from one CONNECTION and one (or more) SESSIONS definition(s).
   - DFHTOBPS builds the BPS, calling one of the DFHTRZxP modules to translate the parameter list into BPS format.
5. When DFHTOR has built a complete BPS, it returns it to DFHAMTP, ready to be passed to DFHZCQ.

For additional information about this process, see Chapter 66, "Resource definition online (RDO)" on page 485.

Autoinstall

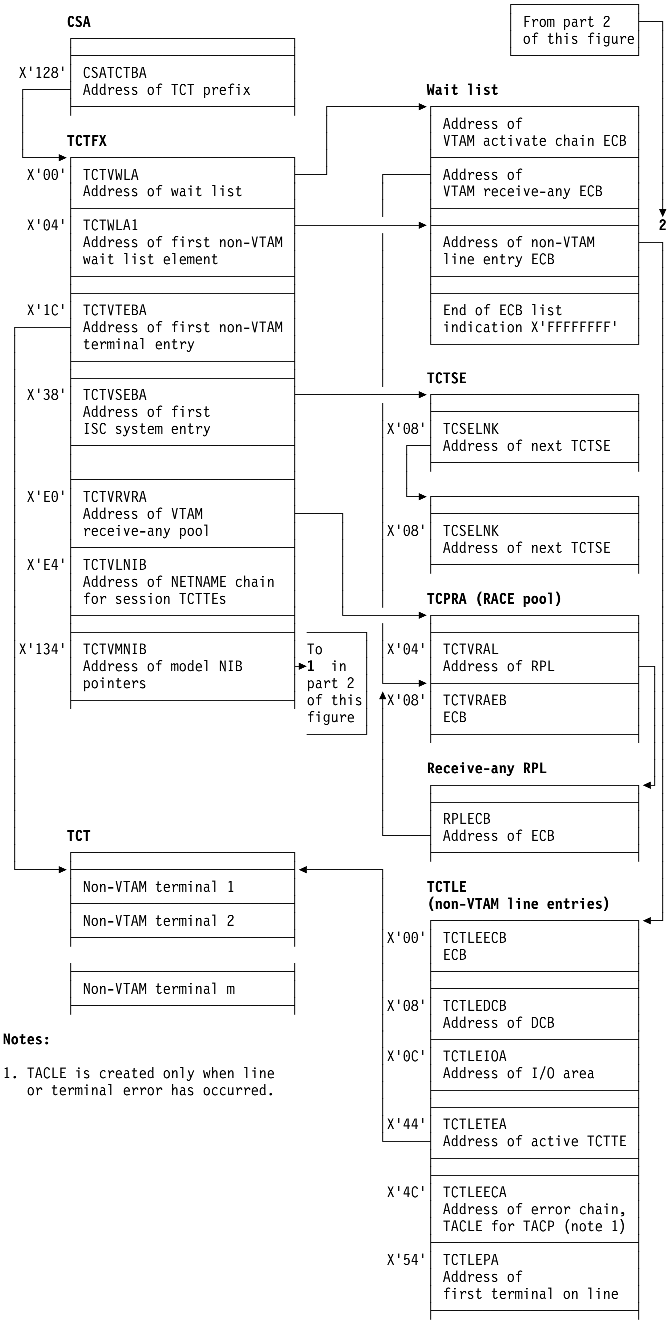
For information about this process, see Chapter 7, "Autoinstall for terminals, consoles and APPC connections" on page 51.

QUERY function (DFHQRY)

The QUERY function (DFHQRY) is used to determine the characteristics of IBM 3270 Information Display System devices, and complete the information about a device in the TCTTE. DFHQRY sends a read partition query structured field to the device, and analyzes the response. The TCTTE fields mainly affected are those used by basic mapping support (BMS), such as extended attributes. If QUERY(ALL) or QUERY(COLD) is specified in the terminal definition, DFHQRY is executed before any other transaction is initiated at a terminal. If QUERY(ALL) is specified, this is done after each logon. If QUERY(COLD) is specified, it is only done following the first logon after a cold start. After completing the TCTTE fields, DFHQRY calls DFHZCQ to recatalog the TCTTE.

Control blocks

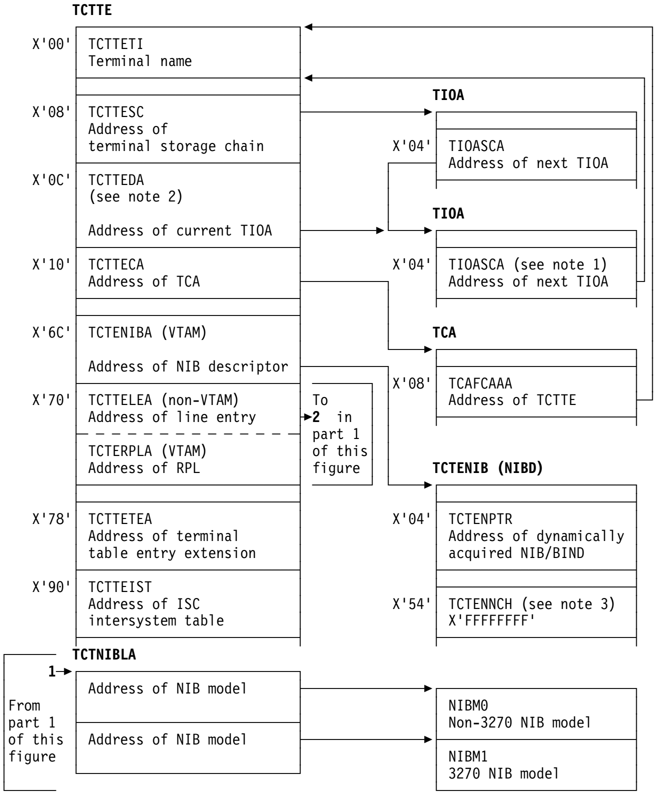
Figure 102 on page 599 shows the control blocks associated with terminal control.



Notes:

1. TACLE is created only when line or terminal error has occurred.

Figure 102 (Part 1 of 2). Control blocks associated with terminal control



Notes:

1. Chain field TIOASCA of the last TIOA in the chain addresses TCTTESC-4. The offset between TCTTESC-4 and TCTTESC is the same as the offset of TIOASCA in the TIOA.

2. TCTTEDA addresses the TIOA being used for the current I/O operation. This TIOA can be anywhere in the TIOA chain.

3. For session TCTTEs, TCTENNCH addresses the next NIBD on the NETNAME chain. Otherwise, TCTENNCH has the value X'FFFFFFFF', indicating that the NETNAME is in the TCNT (NETNAME table) managed by DFHTMP.

Figure 102 (Part 2 of 2). Control blocks associated with terminal control

Figure 103 shows the TCTLE and Figure 104 on page 600 shows the TACLE.

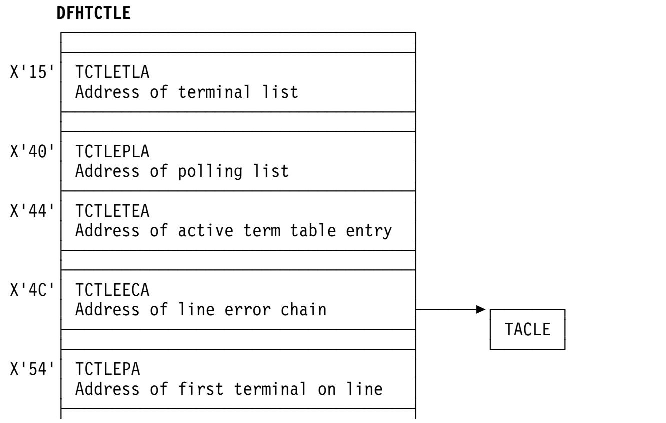


Figure 103. Terminal control table line entry (TCTLE)

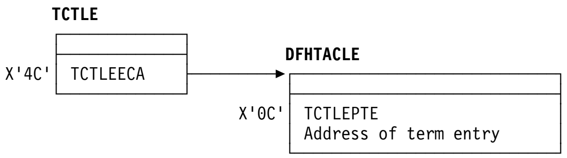


Figure 104. Terminal abnormal condition line entry (TACLE)

Terminal input/output areas (TIOAs) are set up by storage control and chained to the terminal control table terminal entry (TCTTE) as needed for terminal input/output operations. The TCTTE contains the address of the first terminal-type storage area obtained for a task (the beginning of the chain), and the address of the active TIOA.

See the *CICS Data Areas* manual for a detailed description of these control blocks.

Modules

The DFHZCx modules contain CSECTs that issue VTAM macros to perform specific communication functions, and exit routines that are driven by VTAM when network events occur that are related to CICS.

The following is a list of the DFHZCx load modules concerned with terminal control and VTAM management in CICS, together with brief descriptions of their component object modules (CSECTs):

Module	CSECT	Description
DFHZCA	DFHZACT	Activate scan
	DFHZFRE	Freemain
	DFHZGET	Getmain
	DFHZQUE	Queue manager
	DFHZRST	RESETSR request
DFHZCB	DFHZATI	Automatic task initiation
	DFHZDET	Task detach
	DFHZHPSR	Authorized path SRB requests
	DFHZLRP	Logical record presentation
	DFHZRAC	Receive-any completion
	DFHZRAS	Receive-any slowdown processing
	DFHZRVS	Receive specific
	DFHZRVX	Receive specific exit
	DFHZSDR	Send response
	DFHZSDS	Send DFSYN
	DFHZSDX	Send synchronous data exit
	DFHZSSX	Send DFSYN command exit
	DFHZUIX	User input exit
DFHZCC	DFHZARER	Protocol error and exception handler
	DFHZARL	APPC application request logic
	DFHZARM	APPC migration logic
	DFHZARR	Application receive request logic
	DFHZARRA	Application receive buffer support
	DFHZARRC	Classify what next to receive
	DFHZARRF	Receive FMH7 and ER1
	DFHZBKT	Bracket state machine
	DFHZCHS	Chain state machine
	DFHZCNT	Contention state machine
	DFHZCRT	RPL_B state machine
	DFHZRLP	GDS post-VTAM receive logic
	DFHZRLX	GDS receive exit logic
	DFHZRVL	GDS pre-VTAM receive logic
	DFHZSDL	GDS send logic
	DFHZSLX	GDS send exit logic
	DFHZSTAP	Conversation state determination
	DFHZUSR	Conversation state machine
DFHZCP	DFHZARQ	Application request handler
	DFHZATT	Attach routine
	DFHZCNA	MVS console
	DFHZDSP	Dispatcher
	DFHZISP	Allocate/free/point
	DFHZSUP	Startup task
	DFHZUCT	3270 uppercase translate
DFHZCW	DFHZERH	APPC ERP logic
	DFHZEV1	APPC bind security (part 1)
	DFHZEV2	APPC bind security (part 2)
DFHZCX	DFHSNAS	Create signon/sign-off ATI sessions
	DFHSNPU	Preset userid signon/sign-off
	DFHSNSU	Session userid signon/sign-off
	DFHSNTU	Terminal userid signon/sign-off
	DFHSNUS	US domain - local and remote signon
	DFHSNXR	XRF reflecting signon state
	DFHZABD	Abend routine for incorrect requests
	DFHZAND	Build TACB before issuing PC abends
	DFHZCNR	MVS console request
	DFHZIS1	ISC/IRC syncpoint
	DFHZIS2	IRC internal requests
	DFHZLOC	Locate TCTTE and ATI requests
	DFHZSTU	Status changing TCTTEs/LCDs and TCTSEs
DFHZCXR	DFHBSXGS	APPC session name generation
	DFHZTSP	Terminal sharing functions
	DFHZXRL	APPC command routing
	DFHZXRT	Routed APPC command handling
DFHZCY	DFHZASX	DFASY exit
	DFHZDST	SNA-ASCII translation
	DFHZLEX	LERAD exit
	DFHZLGX	LOGON exit
	DFHZLTX	LOSTERM exit
	DFHZNSP	Network services exit
	DFHZOPA	Open VTAM ACB
	DFHZRRX	Release request exit
	DFHZRSY1	Resynchronization part 1
	DFHZRSY2	Resynchronization part 2
	DFHZRSY3	Resynchronization part 3
	DFHZRSY4	Resynchronization part 4
	DFHZRSY5	Resynchronization part 5
	DFHZRSY6	Resynchronization part 6
	DFHZSAX	Send command exit
	DFHZSCX	SESSION control input exit
	DFHZSDA	Send command
	DFHZSES	SESSIONC
	DFHZSEX	SESSIONC exit
	DFHZSHU	Shutdown VTAM
	DFHZSIM	SIMLOGON
	DFHZSIX	SIMLOGON exit
	DFHZSKR	Send response to command
	DFHZSLS	SETLOGON start
	DFHZSYN	Handle CTYPE=syncpoint/recover request
	DFHZSYX	SYNAD exit
	DFHZTPX	TPEND exit
	DFHZTRA	Create ZCP/VIO trace requests
	DFHZXPS	APPC persistent session recovery
	DFHZXRC	XRF and persistent sessions state data analysis
DFHZCZ	DFHZCLS	CLSDST
	DFHZCLX	CLSDST exit
	DFHZCRQ	CTYPE command request
	DFHZEMW	Error message writer
	DFHZOPN	OPNDST
	DFHZOPX	OPNDST exit
	DFHZRAQ	Read ahead queuing
	DFHZRAR	Read ahead retrieval
	DFHZTAX	Turnaround exit

Exits

DFHZCB has three global user exit points: XZCIN, XZCOUT, and XZCOUT1.

DFHZCP has one global user exit point: XZCATT.

DFHTCP has the following global user exit points: XTCIN, XTCOUT, XTCATT, XTCTIN, and XTCTOUT.

For further information about these, see the *CICS Customization Guide*.

Trace

The following point IDs are provided for terminal control:

- AP 00E6 (DFHTCP), for which the trace level is TC 2
- AP 00FC (DFHZCP), for which the trace level is TC 1
- AP FBxx, for which the trace levels are TC 1, TC 2 and Exc
- AP FCxx, for which the trace levels are TC 1, TC 2, and Exc
- AP FDxx, for which the trace level is TC 1
- AP FExx (APPC application receive requests), for which the trace levels are TC 2 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 87. Terminal error program

The terminal error program (DFHTEP) is invoked by the terminal abnormal condition program (DFHTACP) when an abnormal condition associated with a terminal or line occurs. The terminal error program (TEP) can be either of the following:

- The CICS-supplied sample TEP (DFHXTEP in source code form)
- A user-supplied TEP.

Design overview

The TEP analyzes the cause of the terminal or line error that has been detected by the terminal control program. The CICS-supplied version is designed to attempt basic and generalized recovery actions.

A user-supplied TEP can be used to enable processing to be performed whenever a communication system error is reported to CICS; for example, to analyze the error and accept or override the default actions set by DFHTACP.

When TEP processing is complete, control goes back to DFHTACP.

Note: Communication system errors (non-VTAM) are passed only to DFHTEP—not to the application programs.

Guidance information about TEP coding is given in the *CICS Recovery and Restart Guide*. Reference information about TEP coding is given in the *CICS Customization Guide*.

Modules

DFHTEP

Exits

No global user exit points are provided for this function.

Trace

No trace points are provided specifically for this function; however, DFHTACP provides trace entries immediately before and after calling the terminal error program (see Chapter 85, "Terminal abnormal condition program" on page 583 for further details).

Chapter 88. Timer domain (TI)

The timer domain provides interval timing and alarm clock services for CICS domains. These are processes that cause an action to occur at some predetermined future time. This service (called "notifying") can be performed after a specific interval, at periodic intervals, at a specified time of day, or at a specific time of day every day.

The timer domain also provides date and time provision and conversion functions. This includes the facility to synchronize the CICS local time with the operating clock when the system operator has adjusted the time zone.

Timer domain's specific gate

Table 95 summarizes the timer domain's specific gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and whether or not the functions are available through the exit programming interface (XPI).

Table 95. Timer domain's specific gate

Gate	Trace	Function	XPI
TISR	TI 0100	REQUEST_NOTIFY_INTERVAL	NO
	TI 0101	REQUEST_NOTIFY_TIME_OF_DAY	NO
		CANCEL	NO
		INQUIRE_EXPIRATION_TOKEN	NO

TISR gate, REQUEST_NOTIFY_INTERVAL function

The REQUEST_NOTIFY_INTERVAL function of the TISR gate is used to request the timer domain to notify the calling domain after a specified real interval of time. The calling domain can request a NOTIFY on a one-off basis or periodically, and can specify the type of NOTIFY to be expected.

Input parameters

DOMAIN_TOKEN is a token that is to be passed as a parameter on the NOTIFY call.

STCK_INTERVAL specifies an interval as a doubleword binary interval in stored clock (STCK) format, where bit 51 of the doubleword represents 1 microsecond.

PERIODIC_NOTIFY specifies whether the requested NOTIFY is to be repeated at the specified interval until canceled (YES), or is to be just a one-off NOTIFY (NO). It can have either of these values:

YES|NO

NOTIFY_TYPE specifies whether the attached task or the timer task is to be used to notify the calling domain after the specified interval of time. It can have either of these values:

ATTACHED_TASK|TIMER_TASK

[ATTACH_PRIORITY] defines the priority, in the range 0 through 255, at which the requested NOTIFY task is to be attached.

[ATTACH_TASK_TIMEOUT] defines the value, in seconds, of a wait in the attached task after which the dispatcher causes a time-out.

[ATTACH_MODE] is the optional TCB mode in which the attached NOTIFY task is to run.

[ORIGIN_DATE] defines the date from which the timer domain is to start the interval timing for this request. This parameter is mandatory if ORIGIN_TIME has been specified. It holds the origin date as MMDDYYYY.

[ORIGIN_TIME] defines the local time of day from which the timer domain is to start the interval timing for this request. The value in decimal digits is specified in the form HHMMSS:

HH	Hours in the range 00 through 23
MM	Minutes in the range 00 through 59
SS	Seconds in the range 00 through 59.

ORIGIN_TIME defaults to the current time.

Output parameters

TIMER_TOKEN is the token that is returned by the timer domain. The timer token may be used to cancel the NOTIFY request.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|INVALID|EXCEPTION|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. It has this value:

INVALID_INTERVAL

TISR gate, REQUEST_NOTIFY_TIME_OF_DAY function

The REQUEST_NOTIFY_TIME_OF_DAY function of the TISR gate is used to inform the timer domain that an alarm call is required from the timer domain (that is, a NOTIFY) at the specified time of day. The calling domain can request a NOTIFY on a one-off basis or daily, and the type of NOTIFY to be expected.

Input parameters

DOMAIN_TOKEN is the token that is to be passed as a parameter on the NOTIFY call.

REQUESTED_TIME is the time of day at which the NOTIFY function is to be invoked. The value is specified in the form HHMMSS.

PERIODIC_NOTIFY specifies whether the requested NOTIFY is to be repeated every day at the requested time (YES), or is to be just a one-off NOTIFY (NO). It can have either of these values:

YES|NO

NOTIFY_TYPE specifies whether the attached task or the timer task is to be used to notify the calling domain after the specified interval of time. It can have either of these values:

ATTACHED_TASK|TIMER_TASK

[ATTACH_PRIORITY] defines the priority, in the range 0 through 255, at which the requested NOTIFY task is to be attached.

[ATTACH_TASK_TIMEOUT] defines the value, in seconds, of a wait in the attached task after which the dispatcher causes a time-out.

[ATTACH_MODE] is the optional TCB mode in which the attached NOTIFY task is to run.

Output parameters

TIMER_TOKEN is the token that is returned by the timer domain.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|INVALID|EXCEPTION|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. It has this value:

TOO_LATE

TISR gate, CANCEL function

The CANCEL function of the TISR gate is used to cancel a timer request that has already been initiated by one of these functions:

REQUEST_NOTIFY_INTERVAL
REQUEST_NOTIFY_TIME_OF_DAY

Input parameters

TIMER_TOKEN is the token that was returned when the timer request was made.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|INVALID|EXCEPTION|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	REQUEST_NOT_FOUND, TOO_LATE

TISR gate, INQUIRE_EXPIRATION_TOKEN function

The INQUIRE_EXPIRATION_TOKEN function of the TISR gate is used by the dispatcher domain during its initialization.

Input parameters: None.

Output parameters

EXPIRATION_TOKEN is a token used during initialization of the dispatcher domain.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|INVALID|EXCEPTION|DISASTER|KERNERROR|PURGED

Timer domain's generic gate

Table 96 summarizes the timer domain's generic gate. It shows the level-1 trace point IDs of the modules providing the functions for the gate, the functions provided by the gate, and the generic format for calls to the gate.

Table 96. Timer domain's generic gate

Gate	Trace	Function	Format
DMDM	TI 0001 TI 0002	INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM

You can find descriptions of these functions and their input and output parameters in the section dealing with the corresponding generic format, in format DMDM under "Domain manager domain's generic formats" on page 195.

In initialization and quiesce processing, the timer domain performs only internal routines.

The timer domain does no termination processing.

Timer domain's generic format

Table 97 describes the generic format owned by the timer domain and shows the function performed on the calls.

Table 97. Generic format owned by the timer domain

Format	Calling module	Function
TISR	DFHTISR	NOTIFY

In the descriptions of the formats that follow, the "input" parameters are input not to timer domain, but to the domain being called by the timer. Similarly, the “output” parameters are output by the domain that was called by timer domain, in response to the call.

TISR format, NOTIFY function

The NOTIFY function of the TISR format is used by the timer domain itself to notify a domain after its requested interval or time has expired.

Input parameters

DOMAIN_TOKEN is a token that is to be passed as a parameter on the NOTIFY call.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|INVALID|EXCEPTION|DISASTER|KERNERROR|PURGED`

Modules

Module	Function
DFHTIDM	Handles the following requests: INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHTIDUF	Formats the timer domain’s control blocks
DFHTISR	Handles the following requests: REQUEST_NOTIFY_INTERVAL REQUEST_NOTIFY_TIME_OF_DAY CANCEL INQUIRE_EXPIRATION_TOKEN
DFHTITRI	Interprets timer domain trace entries

Exits

No global user exit points are provided in this domain.

Trace

The point IDs for the timer domain are of the form TI xxxx; the corresponding trace levels are TI 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 89. Trace control macro-compatibility interface

DFHTRP is responsible for handling all requests for trace services that are made by using the routine addressed by CSATRNAC in the CICS common system area (CSA).

Some parts of the CICS AP domain invoke DFHTRP to record trace information. This is achieved by use of the DFHTR, DFHTRACE, or DFHLFM macro.

DFHTRP converts all requests for recording trace entries into TRACE_PUT calls to the trace domain. All requests for changing the various trace flags that control tracing are converted into KEDD format calls to the kernel domain.

Design overview

The input to DFHTRP, set up by the macro used for the invocation or by the calling program directly, consists of the following TCA fields:

TCATRTR The trace request byte. The bottom half byte has one of the following values:

2	User trace entry
3	An entry requested via DFHLFM on entry to a LIFO module
4	A system entry requested via DFHTR or DFHTRACE
5	An entry requested via DFHLFM on exit from a LIFO module.

TCATRID The trace ID of the entry to be made. This is one byte X'nn'. The resulting trace point ID is AP 00nn.

TCATRF1/TCATRF2
Two 4-byte fields to appear as FIELD A and FIELD B in the trace entry.

TCATRRSN
An 8-character field used by some entries to specify a resource name.

The following flags in the TCA and CSA are tested by DFHTRP before making the call to the trace domain (TRACE_PUT function):

CSATRMAS (X'80' bit in CSATRMF1)
The trace master flag. This is off unless at least one of internal, auxiliary, or GTF trace is active.

TCANOTRC (X'40' bit in TCAFLAGS)
This is set according to the TRACE (YES|NO) specification on the TRANSACTION definition for the transaction ID used to start this task. It allows suppression of all trace activity for specified transaction IDs.

X'80' bit in TCATRMF
This is the user entry 'single' flag. It allows suppression of user trace entries for the associated task.

The process flow is as follows:

1. Test appropriate flags and exit if trace not required.
2. Execute data collection routine specific to trace ID in TCATRID to set up fields in trace entry.
3. Call TR domain with TRACE_PUT call to write the entry to the active destinations.
4. Invoke the storage violation trap (if this has been activated) by using the CSFE DEBUG transaction, or by using the CHKSTSK or CHKSTRM startup override. See the *CICS Problem Determination Guide* for information about the detection of storage violations.

Modules

DFHTRP

Exits

No global user exit points are provided for this function.

Trace

The following point IDs are provided for trace entries recording "trace on" and "trace off" calls to DFHTRP:

- AP 00FE, for trace turned on
- AP 00FF, for trace turned off.

There are no corresponding trace levels for these point IDs; that is, the trace entries are always produced.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 90. Trace domain (TR)

The trace domain is used by CICS system code and user application programs to record details of the sequence of events occurring in the system. The basic unit of information created for this purpose is called a **trace entry**. The trace domain can put trace entries to any combination of three possible destinations:

INTERNAL trace
a wraparound table in main storage in the CICS address space

AUXILIARY trace
a pair of CICS-controlled BSAM data sets used alternately

Generalized trace facility (GTF) trace
the user-defined destination for MVS GTF records.

Design overview

The trace domain consists of a set of modules that are used to record and manage trace information about internal, auxiliary, and GTF trace. The services of the trace domain are requested by making domain calls, described in "Domain calls." The modules that handle these domain calls are DFHTRDM, DFHTRPT, and DFHTRSR.

Certain sub-functions of the trace domain are required by more than one of these modules. These sub-functions are packaged together in the DFHTRSU module, and are invoked by domain subroutine calls, described in "Subroutine calls" on page 614.

All processing directly related to the auxiliary trace data sets is carried out by the DFHTRAO module. DFHTRAO is loaded below the 16MB line so that it can run in 24-bit mode when calling BSAM and referencing the auxiliary trace data set data control block (DCB). The DFHTRAO functions are described in "DFHTRAO functions" on page 614.

TRACE_PUT handling

For performance reasons, it is important to minimize the path length of a request to write a trace entry. This is achieved for most TRACE_PUT requests by handling them in module DFHTRPX, which runs as a subroutine of the domain that is requesting the trace.

DFHTRPX runs in a very restricted environment. It has no working storage and can make no calls out. Nevertheless, it can still handle the majority of TRACE_PUT requests. When DFHTRPX cannot handle a request, it passes control to the TRPT gate of the trace domain for module DFHTRPT to process the request.

DFHTRPX passes control to DFHTRPT in the following situations:

- CICS tracing to GTF is active.
- Transaction dump processing currently holds the trace lock while copying parts of the trace table to a local buffer.
- DFHTRSR currently holds the trace lock while processing the SET_INTERNAL_TABLE_SIZE function.
- CICS auxiliary trace is active and the requested entry does not fit in the current block, that is, a block write is required.
- The amount of data passed for tracing is larger than the trace domain limit (overlength entry).
- DFHTRPX's recovery routine has been driven, probably because of a program check while moving data into the internal trace table.
- The FE global trap/trace exit (DFHTRAP) is active.

Locking

The trace domain handles TRACE_PUT requests from many MVS task control blocks (TCBs), and so requires a locking mechanism to prevent overlapping or simultaneous access to its control blocks. This is an MVS TCB lock and is provided by the LOCK and UNLOCK functions of the DFHKERN macro.

DFHTRPX does not acquire the trace lock. It uses "compare double and swap" (CDS) logic to serialize the allocation of space for trace entries in the internal trace table.

Selectivity

The overall trace master flag is logically a combination of the flags controlling internal, auxiliary, and GTF trace. It is owned by the trace domain, and both the kernel and the common system area (CSA) have their own copies that are kept up-to-date by calls from the trace domain.

The user trace master flag is owned by the AP domain. The system trace master flag and the standard and special component trace flags are owned by the kernel. None of these flags is referenced by the trace domain.

Domain calls

This section lists the process flows for the domain calls used for the trace domain services.

DMDM gate, PRE_INITIALIZE function

1. Issue an MVS GETMAIN for the trace domain anchor block (TRA) and initialize it.
2. Acquire startup information from the parameter manager (PA) domain and set it in the TRA. The relevant startup parameters are INTTR, TRTABSZ, AUXTR, AUXTRSW, and GTFTR.
3. Call TRSU SET_UP_INTERNAL_TABLE to get and initialize the internal trace table.
4. Call TRSU GET_GTF_BUFFER to initialize CICS tracing to GTF.
5. Issue the KEDD ADD_GATE call for the DFHTRPT gate to inform the kernel that the trace domain is available.
6. If internal trace or GTF trace is started, turn on the trace master flags in the TRA, the kernel, and the CSA.

DMDM gate, INITIALIZE_DOMAIN function

1. If required, call TRSR ACTIVATE_TRAP to active the FE global trap/trace exit, DFHTRAP.
2. If required, call TRSR START_AUXILIARY_TRACE to start auxiliary trace on DFHAUXT.

DMDM gate, QUIESCE_DOMAIN function: Do nothing.

DMDM gate, TERMINATE_DOMAIN function: If auxiliary trace is active, call TRSR STOP_AUXILIARY_TRACE.

KETI gate, NOTIFY_RESET function: Call KETI CONVERT_TO_STCK_FORMAT to get the new STCK value for the last local midnight, and store this in the TRA.

TRPT gate, TRACE_PUT function

1. Acquire the trace lock.
2. Calculate the length of the required entry.
3. If the entry does not fit in the current trace block (TRBL) and auxiliary trace is active, call TRSU WRITE_AUX_BUFFER.
4. Use "compare double and swap" (CDS) to update pointer and available length for next entry in the TRA.
5. Build the entry in allocated space.
6. If GTF trace is required, issue the GTRACE macro to write an entry to GTF, and if the entry is more than 256 bytes, split it into multiple entries.
7. If the FE global trap/trace exit, DFHTRAP, has been activated as a result of using the CSFE DEBUG transaction, or specifying the TRAP=ON system initialization parameter, invoke the exit. See the *CICS Problem Determination Guide* for details of DFHTRAP.
8. Release the trace lock.

TRSR gate, SET_INTERNAL_TABLE_SIZE function

1. If the call is from the parameter manager (during initialization), set the required size in the TRA and return.
2. Acquire the trace lock.
3. If auxiliary trace is active, call TRSU WRITE_AUX_BUFFER to write the current TRBL.
4. If the new table size is smaller, free part of the old table and reset chaining and pointers.
5. If a larger table is required, free all but 16KB (KB equals 1024 bytes) of the old table. Call TRSU SET_UP_INTERNAL_TABLE. If this completes correctly, free the 16KB that was kept back. If it does not work, make the 16KB piece the new table.
6. Release the trace lock.

TRSR gate, START_INTERNAL_TRACE function

1. Set the required status in the TRA.
2. If the call is from the parameter manager (during initialization), return.
3. If required, change the kernel and CSA copies of the trace master flag.

TRSR gate, STOP_INTERNAL_TRACE function

1. Set the required status in the TRA.
2. If the call is from the parameter manager (during initialization), return.
3. If required, change the kernel and CSA copies of the trace master flag.

TRSR gate, INQUIRE_INTERNAL_TRACE function: Get the internal status and internal table size from the TRA.

TRSR gate, START_AUXILIARY_TRACE function

1. If the call is from the parameter manager (during initialization), set the status in the TRA and return.
2. If already started, return immediately.
3. If auxiliary trace is currently stopped (rather than paused):
   a. Issue an MVS GETMAIN for an auxiliary trace buffer, DCB, and DECB storage.
   b. Issue LDLD ACQUIRE_PROGRAM for DFHTRAO.
   c. Call DFHTRAO to OPEN the auxiliary trace data set.
4. Acquire the trace lock.
5. Skip the current TRBL pointer in the TRA to the next TRBL to avoid entries from before start appearing in the auxiliary trace.
6. Release the trace lock.
7. Set the auxiliary trace status in the TRA to started.

8. If required, change the kernel and CSA copies of the trace master flag.

TRSR gate, STOP_AUXILIARY_TRACE function

1. If the call is from the parameter manager (during initialization), set the status in the TRA and return.
2. If already stopped, return immediately.
3. Acquire the trace lock.
4. If auxiliary trace is started (rather than paused), call TRSU WRITE_AUX_BUFFER to output the current TRBL to the auxiliary trace data set, and move the current TRBL pointer in the TRA to the next TRBL.
5. Call TRSU WRITE_AUX_BUFFER to write an end-of-file indication on the auxiliary trace data set.
6. Call DFHTRAO to ensure (CHECK) that output is complete.
7. Call DFHTRAO to CLOSE the auxiliary trace data set.
8. Call TRSU TERMINATE_AUXILIARY_TRACE.
9. Release the trace lock.
10. Issue LDLD RELEASE_PROGRAM for DFHTRAO.

TRSR gate, PAUSE_AUXILIARY_TRACE function

1. If auxiliary trace is stopped, return with error.
2. If auxiliary trace is paused, return 'OK'.
3. Acquire the trace lock.
4. Call TRSU WRITE_AUX_BUFFER to output the current TRBL to the auxiliary trace data set, and move the current TRBL pointer in the TRA to the next TRBL.
5. Release the trace lock.
6. Change the kernel and CSA copies of the trace master flag if required.

TRSR gate, SET_AUX_TRACE_AUTOSWITCH function: Set the new autoswitch status in the TRA.

TRSR gate, SWITCH_AUXILIARY_EXTENTS function

1. If auxiliary trace is started or paused:
   a. Acquire the trace lock.
   b. Call TRSU WRITE_AUX_BUFFER to write an end-of-file indication on the auxiliary trace data set.
   c. Call DFHTRAO to ensure (CHECK) that output is complete.
   d. Call DFHTRAO to close the auxiliary trace data set.
2. Change the name of the current extent in the TRA from DFHAUXT to DFHBUXT or from DFHBUXT to DFHAUXT.
3. If auxiliary trace is started or paused:
   a. Call DFHTRAO to OPEN the auxiliary trace data set.
   b. Release the trace lock.

TRSR gate, INQUIRE_AUXILIARY_TRACE function: Get the auxiliary trace status, current extent name, and autoswitch status from the TRA.

TRSR gate, START_GTF_TRACE function

1. If the call is from the parameter manager (during initialization), set the required status in the TRA and return.
2. If already started, return immediately.
3. Call TRSU GET_GTF_BUFFER.
4. Set the status in the TRA to started.
5. If required, change the kernel and CSA copies of the trace master flag.

TRSR gate, STOP_GTF_TRACE function

1. Set the status in the TRA to stopped.
2. If the call is from the parameter manager (during initialization), return.
3. If required, change the kernel and CSA copies of the trace master flag.
4. If the GTF buffer is present:
   a. Acquire the trace lock.
   b. Issue an MVS FREEMAIN for the GTF buffer.
   c. Release the trace lock.

TRSR gate, INQUIRE_GTF_TRACE function: Get the GTF status from the TRA.

TRSR gate, ACTIVATE_TRAP function

1. If the call is from the parameter manager (during initialization), set the required status in the TRA and return.
2. If the trap is already active, check whether it is marked unusable because a program check occurred while the trap was in control:
   a. If the trap is unusable, return with error.
   b. If the trap is usable, set the required status in the TRA and return.
3. Issue LDLD ACQUIRE_PROGRAM for DFHTRAP.
4. Issue an MVS GETMAIN for the DFHTRAP work area (TRGTW).
5. Acquire the trace lock.
6. Check whether another task has activated the trap:
   a. If the trap is not active, update the trap status in the TRA, release the trace lock, and return.

b. If the trap has been activated by another task, release the trace lock, issue LDLD RELEASE_PROGRAM for DFHTRAP, issue an MVS FREEMAIN for the DFHTRAP work area, and return.

TRSR gate, DEACTIVATE_TRAP function

1. If the call is from the parameter manager (during initialization), set the required status in the TRA and return.
2. If the trap is not active, return.
3. Acquire the trace lock.
4. Update the trap status in the TRA.
5. Release the trace lock.
6. Issue LDLD RELEASE_PROGRAM for DFHTRAP.
7. Issue an MVS FREEMAIN for the DFHTRAP work area.

Subroutine calls

This section lists the process flows for the domain subroutine calls used for the trace domain sub-functions.

TRSU format, WRITE_AUX_BUFFER function

1. If output to the auxiliary trace data set is pending, call DFHTRAO with a CHECK request to allow output to complete.
2. If there was no output pending or the output completed successfully, call DFHTRAO to write the current TRBL, and return.

If an 'end of extent' was encountered on the BSAM CHECK:

3. Call DFHTRAO to close the auxiliary trace data set.
4. If autoswitch is not required:
    a. Issue an MVS FREEMAIN for the auxiliary trace buffer, DCB, and DECB.
    b. Set auxiliary trace status in the TRA to stopped.
    c. Change the kernel and CSA copies of the trace master flag if required.
    d. Return.
5. If autoswitch next is specified, change to autoswitch off.
6. Change the name of the current extent in the TRA from DFHAUXT to DFHBUXT or from DFHBUXT to DFHAUXT.
7. Call DFHTRAO to OPEN the auxiliary trace data set.
8. Call DFHTRAO with a WRITE request to rewrite the block that caused the end-of-extent.
9. Go back to the top of this function's processing to issue the write that was originally requested in this call.

TRSU format, TERMINATE_AUXILIARY_TRACE function

1. Issue an MVS FREEMAIN for the auxiliary trace buffer, DCB, and DECB.
2. Set the auxiliary trace status in the TRA to stopped.
3. If required, change the kernel and CSA copies of the trace master flag.

TRSU format, GET_GTF_BUFFER function

1. Issue an MVS GETMAIN for the GTF buffer.
2. Save the address in the TRA.

TRSU format, SET_UP_INTERNAL_TABLE function

1. Issue an MVS V-type GETMAIN for the required size.
2. Initialize all TRBL headers within the acquired area.

DFHTRAO functions

This section lists the process flows for the DFHTRAO functions for auxiliary trace data sets.

DFHTRAO, OPEN function

1. If the DCB indicates already open, return 'OK'.
2. Issue the BSAM OPEN macro.

DFHTRAO, CLOSE function

1. If the DCB indicates already closed, return 'OK'.
2. Issue the BSAM CLOSE macro.

DFHTRAO, CHECK function

1. Issue the BSAM CHECK macro.
2. If an end-of-extent is caused by the write for which this CHECK is issued, the DCB ABEND exit is driven and causes DFHTRAO to return an end-of-extent indication to the caller.
3. Clear output pending status in TRA.

DFHTRAO, WRITE function

1. Move the specified TRBL to the auxiliary trace buffer.
2. Issue the BSAM WRITE macro.
3. Set output pending status in the TRA.

Trace domain's specific gates

Table 98 summarizes the trace domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 98. Trace domain's specific gates

Gate	Trace	Function	XPI
TRPT	None	TRACE_PUT	YES
TRSR	TR 0201	SET_INTERNAL_TABLE_SIZE	NO
	TR 0202	START_INTERNAL_TRACE	NO
		STOP_INTERNAL_TRACE	NO
		INQUIRE_INTERNAL_TRACE	NO
		START_AUXILIARY_TRACE	NO
		STOP_AUXILIARY_TRACE	NO
		PAUSE_AUXILIARY_TRACE	NO
		SET_AUX_TRACE_AUTOSWITCH	NO
		SWITCH_AUXILIARY_EXTENTS	NO
		INQUIRE_AUXILIARY_TRACE	NO
		START_GTF_TRACE	NO
		STOP_GTF_TRACE	NO
		INQUIRE_GTF_TRACE	NO
		ACTIVATE_TRAP	NO
		DEACTIVATE_TRAP	NO

TRPT gate, TRACE_PUT function

This function is invoked to write a trace entry to the active trace destinations.

Input parameters

POINT_ID is a number, unique within the calling domain, that identifies the trace entries made from this call.

[DATA1] through [DATA7] are BLOCK descriptions of up to seven areas to be included in the data section of the trace entry. They appear in numerical order in the entry, each preceded by a 2-byte length field.

The maximum total length of data that can be traced in one call is as described below:

```
Length of trace table block              4096
less length of trace table block header  -   24
less length of trace entry header        -   32
                                         ------
Maximum space for data + length fields    4040
For each DATA field specified, 2 bytes must be
subtracted to allow for the length field.
Maximum space for actual data  =  4040 - (2 * n)
where 'n' is the number of DATA fields specified.
```

[RETURN_ADDR] is used by DFHTRP to give a return address in the trace entry from the calling module rather than in DFHTRP.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

Note: No response is returned when the TRACE_PUT request is handled by module DFHTRPX without involving the trace domain.

TRSR gate, SET_INTERNAL_TABLE_SIZE function

The SET_INTERNAL_TABLE_SIZE function of the TRSR gate is used to change the size of the internal trace table during a CICS run.

Input parameters

TABLE_SIZE is the required table size, specified as a number of KB (KB equals 1024 bytes). This is rounded up to the nearest multiple of 4KB. The lower limit is 16KB. The upper limit is set only by the amount of storage available. If the table is being made larger, the existing table is freed and a variable MVS GETMAIN issued for the required size. The actual length of the new table can be determined by issuing an INQUIRE_INTERNAL_TRACE command. If the table is being made smaller, part of the existing table is freed.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_TABLE_SIZE, NO_SPACE

Note: INVALID_TABLE_SIZE indicates that the value of TABLE_SIZE is less than 16KB.

NO_SPACE indicates that the variable GETMAIN for the new trace table failed to obtain even the minimum trace table size. In this situation, the trace domain retains an amount equal to the minimum table size from the old table to use.

TRSR gate, START_INTERNAL_TRACE function

The START_INTERNAL_TRACE function of the TRSR gate is used to activate tracing to the internal trace table.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

TRSR gate, STOP_INTERNAL_TRACE function

The STOP_INTERNAL_TRACE function of the TRSR gate is used to deactivate tracing to the internal trace table.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

TRSR gate, INQUIRE_INTERNAL_TRACE function

The INQUIRE_INTERNAL_TRACE function of the TRSR gate is used to return the status of the internal trace and the current size of the internal trace table.

Input parameters: None.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

TABLE_SIZE is the size of the current internal trace table in KB (KB equals 1024 bytes).

INTERNAL_STATUS indicates whether internal trace is active (STARTED) or inactive (STOPPED).

TRSR gate, START_AUXILIARY_TRACE function

The START_AUXILIARY_TRACE function of the TRSR gate is used to open the current auxiliary trace extent (if it is closed) and start tracing to it.

Input parameters: None.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	CANT_GET_AUX_BUFFER, DFHTRAO_NOT_AVAILABLE, OPEN_FAILED

Note: CANT_GET_AUX_BUFFER indicates that MVS had insufficient free storage to satisfy the request for a buffer below the 16MB line.

DFHTRAO_NOT_AVAILABLE indicates that the request to the CICS loader to acquire the auxiliary trace output program, DFHTRAO, has failed.

OPEN_FAILED indicates that the MVS open of the auxiliary trace data set has failed.

TRSR gate, STOP_AUXILIARY_TRACE function

The STOP_AUXILIARY_TRACE function of the TRSR gate is used to stop auxiliary tracing and close the currently active auxiliary trace extent.

Input parameters: None.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

TRSR gate, PAUSE_AUXILIARY_TRACE function

The PAUSE_AUXILIARY_TRACE function of the TRSR gate is used to stop auxiliary tracing without closing the currently active extent.

Input parameters: None.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

`AUX_TRACE_STOPPED`

meaning that the pause is allowed only if auxiliary trace is not stopped.

TRSR gate, SET_AUX_TRACE_AUTOSWITCH function

The SET_AUX_TRACE_AUTOSWITCH function of the TRSR gate is used to allow the autoswitch facility for the CICS auxiliary trace data set to be enabled or disabled.

Input parameters

AUTOSWITCH_STATUS Indicates whether or not an automatic switch to the inactive CICS auxiliary extent is to occur once only when the current extent fills up, or that such automatic switching should occur “continuously” whenever the current extent fills up. It can have any one of these values:

`OFF|ONCE|CONTINUOUS`

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

`INVALID_AUTOSWITCH_STATUS`

meaning that an incorrect value was passed for AUTOSWITCH_STATUS.

TRSR gate, SWITCH_AUXILIARY_EXTENTS function

The SWITCH_AUXILIARY_EXTENTS function of the TRSR gate allows switching from one auxiliary trace extent to the other.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

OPEN_FAILED

meaning that the attempt to open the new auxiliary extent failed.

TRSR gate, INQUIRE_AUXILIARY_TRACE function

The INQUIRE_AUXILIARY_TRACE function of the TRSR gate is used to return the current state of the auxiliary trace.

Input parameters: None.

Output parameters

AUXILIARY_STATUS Indicates the current status of auxiliary trace. It can have any one of these values:

STARTED|STOPPED|PAUSED

EXTENT indicates the currently active CICS auxiliary trace extent; that is, the extent that is already in use or is used if CICS auxiliary tracing is started. It can have either of these values:

DFHAUXT|DFHBUXT

AUTOSWITCH_STATUS Indicates whether or not an automatic switch to the inactive CICS auxiliary extent is to occur once only when the current extent fills up, or that such automatic switching should occur "continuously" whenever the current extent fills up. It can have any one of these values:

OFF|ONCE|CONTINUOUS

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

TRSR gate, START_GTF_TRACE function

The START_GTF_TRACE function of the TRSR gate is used to start the tracing of CICS activity to GTF. It is the responsibility of the user to ensure that GTF has been started in MVS with at least TRACE=USR. If it has not, CICS issues the GTF calls but they are ignored by GTF.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. It has this value:

CANT_GET_GTF_BUFFER

meaning that there was insufficient storage for a buffer to be used in constructing continuation records when an individual entry is longer than 256 bytes.

TRSR gate, STOP_GTF_TRACE function

The STOP_GTF_TRACE function of the TRSR gate is used to stop tracing of CICS activity to GTF.

Input parameters: None.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

TRSR gate, INQUIRE_GTF_TRACE function

The INQUIRE_GTF_TRACE function of the TRSR gate is used to return the current state of the GTF trace.

Input parameters: None.

Output parameters

GTF_STATUS indicates whether CICS tracing to GTF is active (STARTED) or inactive (STOPPED).

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

TRSR gate, ACTIVATE_TRAP function

The ACTIVATE_TRAP function of the TRSR gate is used to activate the FE global trap/trace exit (DFHTRAP).

Input parameters: None.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DFHTRAP_NOT_FOUND, DFHTRAP_UNUSABLE

Note: DFHTRAP_NOT_FOUND indicates that the request to the CICS loader to acquire the FE global trap/trace exit program, DFHTRAP, has failed.

DFHTRAP_UNUSABLE indicates that the trap was already active, but marked as unusable because a program check had previously occurred when DFHTRAP was in control.

TRSR gate, DEACTIVATE_TRAP function

The DEACTIVATE_TRAP function of the TRSR gate is used to deactivate the FE global trap/trace exit (DFHTRAP).

Input parameters: None.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

Trace domain’s generic gates

Table 99 summarizes the trace domain’s generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 99. Trace domain’s generic gates

Gate	Trace	Function	Format
DMDM	TR 0001 TR 0002	PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
KETI	TR 0201 TR 0202	NOTIFY_RESET	KETI

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—“Domain manager domain’s generic formats” on page 195

Format KETI—“Kernel domain’s generic formats” on page 368

In preinitialization processing, the trace domain establishes the initial tracing status:

- A suitably sized internal trace table is created.
- If internal tracing or GTF tracing is required, set on the trace master flag.
- If required, start internal tracing and CICS GTF tracing.
- As required, set the auxiliary tracing switch status to ‘started’ or ‘stopped’.

The information always comes from the system initialization parameters—trace domain is always cold started.

In initialization processing, the trace domain starts auxiliary tracing if it is required.

The trace domain does no quiesce processing.

In termination processing, the trace domain stops auxiliary tracing if it is active.

Control blocks

Figure 105 shows the control blocks associated with the trace domain.

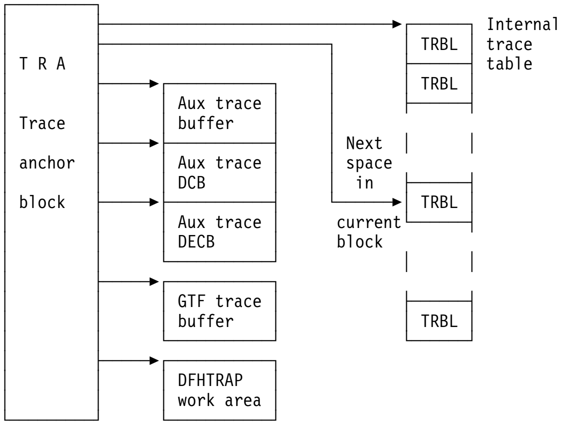


Figure 105. Control blocks associated with the trace domain

TR domain anchor block (TRA). There is one TRA in the system. It contains all status information relating to the trace domain and also pointers to the other trace domain control blocks.

Internal trace table. An area of virtual storage above the 16MB line used for recording trace entries.

TR block (TRBL). The internal trace table consists of a number of TRBLs chained in a loop. They are each 4096 bytes long. Each block contains a standard header and a sequence of variable-length trace entries.

Trace entry (TREN). All trace entries consist of a header together with any data specified on the call. The length of each trace entry is in the range 32 through 4072 bytes.

TR auxiliary trace data set DCB, DECB, and buffer. During the auxiliary trace start process, an MVS GETMAIN is issued to acquire storage below the 16MB line for these areas. Their addresses are kept in the TRA. The storage is released when auxiliary trace is stopped.

GTF buffer. During the GTF trace start process, an MVS GETMAIN is issued to acquire storage above the 16MB line for this area. It is 256 bytes long, and its address is kept in the TRA. The storage is released when GTF trace is stopped. The buffer is used when splitting large entries (more than 256 bytes) into 256-byte pieces to be written to GTF. This is done because GTF has a length restriction of 256 bytes.

Global trap/trace exit work area (TRGTW). When the FE global trap/trace exit (DFHTRAP) is activated, an MVS GETMAIN is issued to acquire storage above the 16MB line for the TRGTW. This area contains a register save area and all working storage associated with DFHTRAP, including the parameter list passed to the exit program. Its address is kept in the TRA. The storage is released when the trap is deactivated.

See the *CICS Data Areas* manual for a detailed description of these control blocks.

Modules

Module	Function
DFHTRDM	Processes requests to the DMDM gate of the trace domain. Part of the DFHSIP load module.
DFHTRPT	Processes requests to the TRPT gate of the trace domain. Part of the DFHSIP load module.
DFHTRPX	Processes, within the calling domain, all TRACE_PUT requests that do not require special handling. Part of the DFHSIP load module.
DFHTRSR	Processes requests to the TRSR and KETI gates of the trace domain. Part of the DFHSIP load module.
DFHTRSU	Processes domain subroutine requests of format TRSU. Part of the DFHSIP load module.
DFHTRAO	Auxiliary trace output subroutines for interfacing with BSAM. Loaded separately below the 16MB line when auxiliary trace is started.
DFHTRAP	FE global trap/trace exit program. Loaded separately above the 16MB line when the trap is activated.

Copy books

Copy book	Function
DFHTRADS	Contains the definition of the parameter list passed to DFHTRAP.
DFHTRDS	Contains the definitions of the TRA and TRBL.
DFHTREN	Contains the definition of the trace entry (TREN) format.

Exits

No global user exit points are provided in this domain.

Trace

The point IDs for the trace domain are of the form TR xxxx; the corresponding trace levels are TR 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Dumps

A formatted system dump contains (depending on the options specified on the TR keyword):

- TR anchor block with interpretation
- Auxiliary trace data set DCB if data set open
- Auxiliary trace data set DECB if data set open
- Auxiliary trace buffer if data set open
- Internal trace table in abbreviated format
- Internal trace table in full format.

System dumps requested by the trace domain fall into two categories:

Dump code TRnnnn
These dump codes are preceded by a console message, DFHTRnnnn. See the *CICS Messages and Codes* manual for details.

Dump code KERNDUMP
At many points in its processing, the trace domain cannot issue domain calls because they would lead to further trace calls and possible recursion of the error. In these circumstances, the trace domain uses MVS WTO to write a console message and the kernel dump function to take a system dump. All such dumps have dump code KERNDUMP. The message numbers for which this occurs are DFHTR0105, DFHTR0114, DFHTR0115, and DFHTR0116. See the *CICS Messages and Codes* manual for more details.

Chapter 91. Trace formatting

There are three possible destinations for CICS trace entries:

Internal To main storage in the CICS region

Auxiliary To a BSAM data set managed by CICS

GTF To the MVS-defined destination for generalized trace facility (GTF) records.

This section describes the code used to interpret and format CICS trace entries from all of these destinations when they are processed offline.

For more information about using traces in problem determination, see the *CICS Trace Entries*.

In this context, "formatting" is used to mean the overall process of producing a report, suitable for viewing or printing, from trace data in a dump or trace data set. "Interpretation" is the process of taking just the point ID and the data fields from a trace entry and producing a character string describing what the entry represents.

There are four environments for trace formatting:

- Internal trace in transaction dump
- Internal trace in system dump
- Printing auxiliary trace data set
- Printing GTF trace data set or processing GTF records in an SDUMP.

Table 100. CICS trace formatting summary

	Transaction dump printout	System dump printout	Auxiliary trace printout	GTF trace printout
CICS trace type	Internal	Internal	Auxiliary	GTF
Data set	DFHDMPx	SYS1.DUMPnn	DFHxUXT	SYS1.DUMPnn or SYS1.TRACE
Controlling program	DFHDU530	DFHTRDUF	DFHTRPRA	DFHTRPRG
Load module name	DFHDU530	DFHPD530	DFHTU530	AMDUSREF (alias DFHTR530)

Design overview

The controlling program (DFHDU530, DFHTRDUF, DFHTRPRA, or DFHTRPRG) is responsible for acquiring the trace formatting control area (TRFCA), which is used for communication between the different routines.

As far as possible, the necessary code is constructed of routines that can run in all four environments. Subroutines required by the common code that cannot themselves be common (such as the line print subroutine) have their addresses placed in the TRFCA by the controlling program.

The controlling routines are:

DFHDU530
The dump utility program used to print transaction dumps. Invokes DFHTRFPB for each internal table block.

DFHTRDUF
The system dump formatting routine for the trace domain. Invokes DFHTRFPB for each internal table block.

DFHTRPRA
The main routine of the trace utility program DFHTU530 used to print an auxiliary trace data set. Invokes DFHTRFPP to encode selective print parameters. Invokes DFHTRFPB for each auxiliary trace block.

DFHTRPRG
The main routine of the GTF format appendage for CICS entries (format ID X'EF') AMDUSREF (alias DFHTR530). Invokes DFHTRFPP to encode selective print parameters. Invokes DFHTRFFE for each trace entry.

A noncommon subroutine required in all four environments is:

TRFPRL Print a specified character buffer. This is contained in the controlling program.

The common routines required in more than one environment are:

DFHTRFPP Process parameters. Passed a character string, encodes the string as selective print parameters into the TRFCA (for DFHTRPRA and DFHTRPRG only). See the *CICS Operations and Utilities Guide* for details of the selective print parameters.

DFHTRFPB Process block. Processes a trace block from a dump or auxiliary trace data set, calling DFHTRFFE for each entry in the block.

DFHTRFFE Format entry. Passed a trace entry, it calls DFHxxTRI, TRFPRL, and DFHTRFFD to produce the formatted entry.

DFHTRFFD Format data. To format and print the trace data fields of a particular entry in hex and character form. Calls TRFPRL to print each line.

DFHxxTRI The interpretation routine for the *xx* domain. Builds the interpretation string for a particular entry given the trace point ID and the data fields from the entry. The AP domain routine DFHAPTRI calls one of the interpretation routines DFHAPTRx. Each of these is responsible for a functional component of the AP domain.

DFHTRIB The interpretation build program. Adds printable data to the interpretation buffer in the TRFCA as requested by the interpretation routine.

DFHCDCON The interpretation of some trace entries requires analysis of domain call parameter lists. Converts a hexadecimal parameter list into a printable list of keywords. If the resulting interpretation string would have been more than 1024 bytes long if all keywords were included, the warning '<<INTERPRETATION OVERFLOWED>>' is printed with the string.

DFHxxyyT The data file for an *xxyy* format parameter list that is used by DFHCDCON to translate the hexadecimal parameter list into a printable list of keywords.

The components of the trace formatting function are shown in Figure 106.

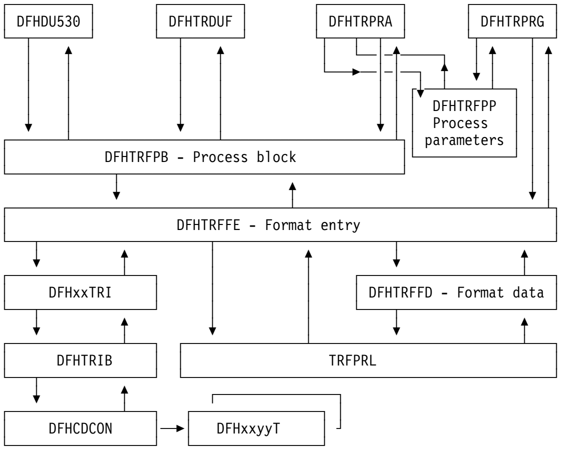


Figure 106. Trace formatting components

Segmented entries on GTF

GTF entries with the CICS format ID X'EF' are written from parts of CICS that run asynchronously with the mainline code, as well as from the trace domain itself. The source of the entry is identified by the type byte in TREN_TYPE in the entry header. See DFHTREN in the *CICS Data Areas* manual for a full description of the trace entry header.

Type	Source of entry
00	TR domain
01	not used
02	DFHMNSVC
03	'normal' CICS VTAM exit
04	CICS VTAM LERAD/SYNAD exit
05	CICS VTAM TPEND exit
06	CICS VTAM HPO exit
07	CICS VTAM HPO LERAD/SYNAD exit

For trace formatting, the different types run on different MVS threads. Because CICS entries can be split into several GTF entries due to the 256-byte restriction on GTF entry length, it is possible that header and continuation entries of the different types may be interleaved on the GTF data set. DFHTRPRG allows for this by having 4KB buffers for each type in which it can reconstruct segmented entries. This is made all the more relevant when it is recognized that there could be several CICS regions writing to the GTF data set at the same time. Not only may different types become interleaved, but also records of the same type but from different CICS regions. For each type there can be up to five 4KB buffers for reconstructing the segmented entries to ensure that all the entries for any region are formatted completely and correctly. This makes the segmenting of the entries transparent in a formatted GTF trace, although they appear in order of completion and so may be out of time sequence.

Control blocks

The trace formatting control area (TRFCA) is used as a communication area between the routines that go to make up each of the four trace formatting load modules. See the *CICS Data Areas* manual for details of DFHTRFCA.

Modules

Module	Function
Controlling programs	
DFHDU530	Internal trace in transaction dump
DFHTRDUF	Internal trace in system dump
DFHTRPRA	Auxiliary trace
DFHTRPRG	GTF trace
Common routines	
DFHTRFPB	Process trace block
DFHTRFPP	Process selective print parameters
DFHTRFFE	Format trace entry
DFHTRFFD	Format data from entry
DFHTRIB	Interpretation build routine
DFHCDCON	Parameter list decode routine
Trace interpretation routines	
DFHAPTRA	MRO entries
DFHAPTRB	XRF entries
DFHAPTRC	User exit management entries
DFHAPTRD	DFHAPDM/DFHAPAP entries
DFHAPTRE	Data tables entries
DFHAPTRF	SAA communications and resource recovery entries
DFHAPTRG	ZC exception and VTAM exit entries
DFHAPTRI	Application domain entries (router)
DFHAPTRJ	ZC VTAM interface entries
DFHAPTRL	CICS OS/2 LU2 mirror entries
DFHAPTRN	Autoinstall terminal model manager entries
DFHAPTRO	LU6.2 application request logic entries
DFHAPTRP	Program control entries
DFHAPTRR	Partner resource manager entries
DFHAPTRS	DFHEISR trace entries
DFHAPTRV	DFHSRP trace entires
DFHAPTRW	Front End Programming Interface feature entries
DFHAPTR0	Old-style entries
DFHAPTR2	Statistics entries
DFHAPTR4	Transaction manager entries
DFHAPTR5	File control entries
DFHAPTR6	DBCTL entries
DFHAPTR7	Transaction routing entries
DFHAPTR8	Security entries
DFHAPTR9	Interval control entries
DFHCCTRI	Local and global catalog domain entries

Module	Function
DFHDDTRI	Directory manager entries
DFHDMTRI	Domain manager domain entries
DFHDSTRI	Dispatcher domain entries
DFHDUTRI	Dump domain entries
DFHKETRI	Kernel domain entries
DFHLDTRI	Loader domain entries
DFHLGTRI	Log Manager domain entries
DFHL2TRI	Log Manager domain entries
DFHLMTRI	Lock manager domain entries
DFHMETRI	Message domain entries
DFHMNTRI	Monitoring domain entries
DFHNQTRI	Enqueue domain entries
DFHPATRI	Parameter manager domain entries
DFHPGTRI	Program manager domain entries
DFHRMTRI	Recovery Manager domain entries
DFHSMTRI	Storage manager domain entries
DFHSNTRI	Signon entries
DFHSTTRI	Statistics domain entries
DFHTITRI	Timer domain entries
DFHTRTRI	Trace domain entries
DFHTSITR	Temporary Storage domain entries
DFHUSTRI	User domain entries
DFHXMTRI	Transaction manager domain entries
DFHXSTRI	Security domain entries

Exits

Global user exit points are not applicable to offline utilities.

Chapter 92. Transaction Failure program

The abnormal condition program has been divided into two new programs according to function.

1. **DFHTFP** which is a new program that is invoked after transaction initialization on abnormal termination.
2. **DFHACP** which is invoked by transaction manager whenever an incorrect transaction is detected.

The transaction failure program (DFHTFP) is invoked during transaction abend processing. Its purpose is to reset the status of a terminal attached to the transaction, and to send a message informing the terminal operator that the transaction has abended. It also calls the user-written (or default) program error program (DFHPEP), and writes a message to the CSMT transient data destination.

DFHTFP resolves any abnormal conditions other than those associated with a terminal, or those handled directly by the operating system.

Design overview

Errors can be classified as belonging in either of two broad categories:

1. **DFHTFP**. Task abnormal conditions, which are detected by CICS control programs and are often due to an application program destroying system control information. When this happens, the task is terminated, the program error program (DFHPEP) is called, the terminal operator is, if possible, informed of the error, and the error is logged at destination CSMT. If the transaction has entered syncpoint processing, then DFHPEP is **NOT** called.
2. **DFHACP**. Operator errors, such as incorrect transaction identifiers, security key violations, or failure of an operator to sign on to the system before attempting to communicate with CICS. When any of these happens, the program error program is **NOT** called, the terminal operator is notified, and the error is logged at destination CSMT.

Figure 107 and Figure 108 show the interfaces between the abnormal condition programs, DFHTFP and DFHACP, and other components when an error has been detected.

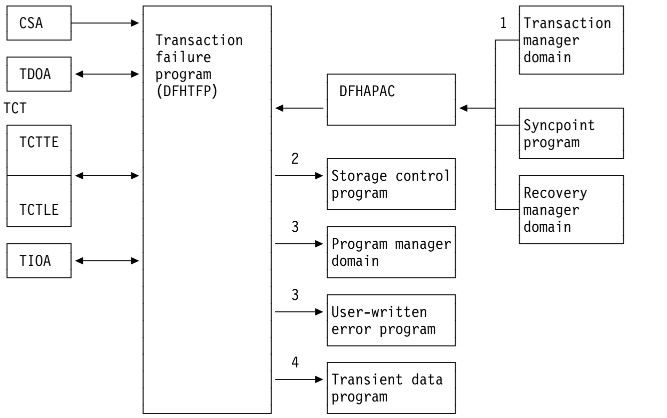


Figure 107. DFHTFP abnormal condition program interfaces

Notes:

1. DFHTFP is invoked by transaction manager whenever a task is abnormally terminated. The operator ID for error messages is in the terminal control table terminal entry (TCTTE) at TCTTEOI. DFHTFP returns to transaction manager after the error message has been issued. When a task is abnormally terminated because of a stall purge condition, the stall purge count is increased by one and the transaction identifier (from the installed resource definition) is included in the error message.
2. DFHTFP communicates with storage control to obtain and release terminal input/output areas (TIOAs).
3. DFHTFP links to the user-supplied (or default) program error program by issuing a DFHPGLU LINK_URM domain call, which passes a parameter list via a COMMAREA (mapped in this case by DFHPCOM TYPE=DSECT). Any abend within a DFHPEP program results in control returning to DFHTFP unless there is an active HANDLE ABEND for this program. See Chapter 60, "Program error program" on page 435 for further information about the DFHPEP program.
4. DFHTFP and DFHACP both write error messages to the transient data destination, CSMT, by calling the message domain.

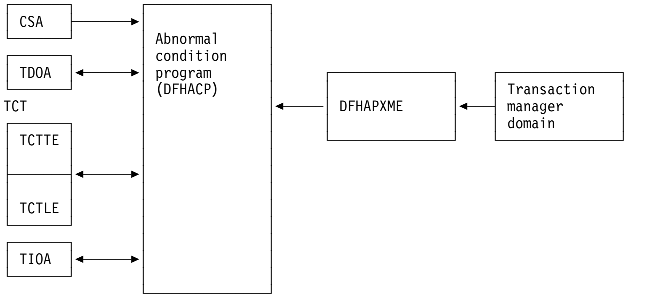

CSA
TDOA
TCT
TCTTE
TCTLE
TIOA
Abnormal condition program (DFHACP)
DFHAPXME
Transaction manager domain

Figure 108. DFHACP abnormal condition program interfaces

Notes:

1. DFHACP is invoked by transaction manager whenever an incorrect transaction code is detected.
2. DFHTFP and DFHACP both write error messages to the transient data destination, CSMT, by calling the message domain.

Modules

DFHTFP, DFHACP, DFHAPAC, and DFHAPXME

Exits

No global user exit points are provided for this function.

Trace

The following point ID is provided for the abnormal condition program:

- AP 00DC, for which the trace level is AP 1.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 93. Transaction manager domain (XM)

The transaction manager domain (also sometimes known simply as "transaction manager") provides transaction-related services to:

- Create tasks
- Terminates tasks
- Purge tasks
- Inquire on tasks
- Manage transaction definitions
- Manage tranclass definitions.

The transaction manager domain also provides a transaction environment to enable other CICS components to implement transaction-related services.

Transaction manager domain's specific gates

Table 101 summarizes the transaction manager domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 101. Transaction manager domain's specific gates

Gate	Trace	Function	XPI
XMAT	XM 1101	ATTACH	NO
	XM 1102		
XMBD	XM 0501	START_BROWSE_TRANDEF	NO
	XM 0502	GET_NEXT_TRANDEF	NO
		END_BROWSE_TRANDEF	NO
XMCL	XM 0A01	ADD_REPLACE_TCLASS	NO
	XM 0A02	ADD_TCLASS	NO
		INQUIRE_TCLASS	YES
		INQUIRE_ALL_TCLASSES	NO
		SET_TCLASS	NO
		DELETE_TCLASS	NO
		START_BROWSE_TCLASS	NO
		GET_NEXT_TCLASS	NO
		END_BROWSE_TCLASS	NO
		REGISTER_TCLASS_USAGE	NO
		DEREGISTER_TCLASS_USAGE	NO
		LOCATE_AND_LOCK_TCLASS	NO
		UNLOCK_TCLASS	NO
XMDD	XM 0601	DELETE_TRANDEF	NO
	XM 0602		
XMER	XM 1204	SET_DEFERRED_MESSAGE	NO
	XM 1205	INQUIRE_DEFERRED_MESSAGE	NO
		SET_DEFERRED_ABEND	NO
		INQUIRE_DEFERRED_ABEND	NO
		REPORT_MESSAGE	NO
		ABEND_TRANSACTION	NO
XMFD	XM 0701	FIND_PROFILE	NO
	XM 0702		
XMIQ	XM 1001	INQUIRE_TRANSACTION	YES
	XM 1002	SET_TRANSACTION	YES
		START_BROWSE_TRANSACTION	NO
		GET_NEXT_TRANSACTION	NO
		END_BROWSE_TRANSACTION	NO
		START_BROWSE_TXN_TOKEN	NO
		GET_NEXT_TXN_TOKEN	NO
		END_BROWSE_TXN_TOKEN	NO
		INQUIRE_TRANSACTION_TOKEN	
		SET_TRANSACTION_TOKEN	
		PURGE_TRANSACTION	
XMLD	XM 0401	LOCATE_AND_LOCK_TRANDEF	NO
	XM 0402	UNLOCK_TRANDEF	NO
XMSR	XM 0801	INQUIRE_MXT	YES
	XM 0802	SET_MXT	NO
		INQUIRE_DTRTRAN	YES
		SET_DTRTRAN	NO
XMXD	XM 0201	ADD_REPLACE_TRANDEF	NO
	XM 0202	SET_TRANDEF	NO
		INQUIRE_TRANDEF	YES
		INQUIRE_REMOTE_TRANDEF	NO
XMXE	XM 1401	GET_TXN_ENVIRONMENT	NO
	XM 1402	FREE_TXN_ENVIRONMENT	NO

XMAT gate, ATTACH function

The ATTACH function of the XMAT gate is used to attach a new transaction.

Input parameters

TRANSACTION_ID The transaction identifier to attach.

TPNAME Alternative means of specifying the transaction identifier to attach.

[ATTACH_PARMS] Parameters to be passed to the attached transaction.

[PRIORITY] Combined user and terminal priority to be added to that of the transaction definition to determine the total priority of the attached transaction.

[TOTAL_PRIORITY] The overriding priority to be associated with the attached transaction.

FACILITY_TYPE The type of principal facility to be associated with the attached transaction. It can have any of these values:

`NONE|TERMINAL|TD|START`

START_CODE Indicates the reason for the attach It can have any of these values:

`C|T|TT|QD|S|SD|SZ|DF`

[TF_TOKEN] Token identifying a terminal to be associated with the transaction.

[IC_TOKEN] Token identifying a START request to be associated with the transaction.

[TD_TOKEN] Token identifying a TDQ to be associated with the transaction.

[US_TOKEN] Token identifying a user to be associated with the transaction.

[SYSTEM_ATTACH] Indicates whether the transaction should be attached as a system transaction. It can have either of these values:

YES|NO

[SUSPEND] Indicates whether the attacher is willing to suspend during the attach. It can have either of these values:

YES|NO

RETURN_NOT_FOUND Indicates whether the attacher wishes to receive the NOT_FOUND exception. Default is to attach CSAC in place of the requested transaction. It can have either of these values:

YES|NO

[RESTART_COUNT] If the attach is for a restarted transaction then this count indicates the number of this restart attempt.

Output parameters

[TRANSACTION_TOKEN] Is the token identifying the newly attached transaction.

[TRANNUM] Is the transaction number assigned to the newly attached transaction.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	NOT_FOUND, DISABLED, INSUFFICIENT_STORAGE, NOT_ENABLED_FOR_SHUTDOWN
INVALID	INVALID_FUNCTION

XMBD gate, START_BROWSE_TRANDEF function

The START_BROWSE_TRANDEF function of the XMBD gate is used to initiate a browse of installed transaction definitions.

Input parameters

[START_AT] Identifies a transaction identifier that the browse is to start at.

Output parameters

BROWSE_TOKEN Token identifying this transaction definition browse.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_FUNCTION

XMBD gate, GET_NEXT_TRANDEF function

The GET_NEXT_TRANDEF function of the XMBD gate is used to return information about the next transaction definition in the browse.

Input parameters

BROWSE_TOKEN Token identifying this browse of the transaction definitions.

Output parameters

[TRANSACTION_ID] Transaction identifier

[INITIAL_PROGRAM] Initial program of transaction.

[PROFILE_NAME] Profile of transaction.

[TWASIZE] Size of Transaction Work Area.

[TRAN_PRIORITY] Transaction priority

[STATUS] The status of the transaction. It can have either of these values:

ENABLED|DISABLED

[PARTITIONSET] The partitionset defined for the transaction. It can have any of these values:

NONE|NAMED|KEEP|OWN

[PARTITIONSET_NAME] The name of the user defined partitionset used by the transaction.

[TASKDATAKEY] The storage key that task-lifetime storage is allocated in. It can have either of these values:

CICS|USER

[TASKDATALOC] The location of task-lifetime storage. It can have either of these values:

BELOW|ANY

[STORAGE_CLEAR] Whether task-lifetime storage is to be cleared before it is freemained. It can have either of these values:

YES|NO

[SYSTEM_RUNAWAY] Whether the transaction uses the default system runaway limit. It can have either of these values:

YES|NO

[RUNAWAY_LIMIT] The runaway limit associated with the transaction.

[DYNAMIC] Whether the transaction is defined to be dynamic. It can have either of these values:

YES|NO

[LOCAL_QUEUING] Whether the transaction is eligible to queue locally when it is started on the remote system. It can have either of these values:

YES|NO

[REMOTE] Whether the transaction is remote. It can have either of these values:

YES|NO

[REMOTE_SYSTEM] The system that a remote transaction is to be routed to.

[REMOTE_NAME] The name of a remote transaction on the remote system.

[TRAN_ROUTING_PROFILE] Profile to be used to route a remote transaction to a remote system.

[TCLASS] Whether the transaction belongs to a tclass. It can have either of these values:

YES|NO

[TCLASS_NAME] The name of the tclass that the transaction belongs to.

[INDOUBT] The action to take if work performed by the transaction becomes indoubt. It can have any of these values:

BACKOUT|COMMIT|WAIT

[RESTART] Whether the transaction is restartable. It can have either of these values:

YES|NO

[SPURGE] Whether the transaction is system-purgeable. It can have either of these values:

YES|NO

[DTIMEOUT] The deadlock timeout value for the transaction.

[TPURGE] Whether the transaction can be purged after a terminal error. It can have either of these values:

YES|NO

[DUMP] Whether transaction dumps are to be taken. It can have either of these values:

YES|NO

[TRACE] The level of tracing associated with the transaction. It can have any of these values:

STANDARD|SPECIAL|SUPPRESSED

[SHUTDOWN] Whether the transaction can be run during shutdown. It can have either of these values:

ENABLED|DISABLED

[RESSEC] Whether resource security checking is active. It can have either of these values:

YES|NO

[CMDSEC] Whether command security checking is active. It can have either of these values:

YES|NO

[STORAGE_FREEZE] Whether storage freeze is on for the transaction. It can have either of these values:

YES|NO

[ISOLATE] Whether the transaction runs in its own subspace. It can have either of these values:

YES|NO

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
EXCEPTION	BROWSE_END_TRANDEF
INVALID	INVALID_BROWSE_TOKEN, INVALID_FUNCTION

XMBD gate, END_BROWSE_TRANDEF function

The END_BROWSE_TRANDEF function of the XMBD gate is used to terminate a browse of installed transaction definitions.

Input parameters

BROWSE_TOKEN Token identifying this transaction definition browse.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_BROWSE_TOKEN, INVALID_FUNCTION

XMCL gate, ADD_REPLACE_TCLASS function

The ADD_REPLACE_TCLASS function of the XMCL gate is used to install a tclass definition.

Input parameters

TCLASS_NAME The name of the tclass.

MAX_ACTIVE The max-active limit of the tclass.

[PURGE_THRESHOLD] The purge-threshold limit of the tclass.

Output parameters

[TCLASS_TOKEN] Token identifying the tclass.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
EXCEPTION	INVALID_TCLASS_NAME, INVALID_MAX_ACTIVE, INVALID_PURGE_THRESHOLD
INVALID	INVALID_FUNCTION

XMCL gate, ADD_TCLASS function

The ADD_TCLASS function of the XMCL gate is used to add an internal tclass definition.

Input parameters

[TCLASS_NAME] The name of the tclass.

MAX_ACTIVE The max-active limit of the tclass.

[PURGE_THRESHOLD] The purge-threshold limit of the tclass.

Output parameters

TCLASS_TOKEN Token identifying the tclass.

RESPONSE is the domain’s response to the call. Possible values are:

```
OK|EXCEPTION|DISASTER|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. It can have any of these values:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
EXCEPTION	DUPLICATE_TCLASS_NAME, INVALID_TCLASS_NAME, INVALID_MAX_ACTIVE, INVALID_PURGE_THRESHOLD
INVALID	INVALID_FUNCTION

XMCL gate, INQUIRE_TCLASS function

The INQUIRE_TCLASS function of the XMCL gate is used to inquire upon a tclass.

Input parameters

INQ_TCLASS_NAME The name of the tclass being inquired upon.

TCLASS_TOKEN Token identifying tclass being inquired upon.

Output parameters

[TCLASS_NAME] The name of the tclass.

[MAX_ACTIVE] The max-active limit of the tclass.

[PURGE_THRESHOLD] The purge-threshold limit of the tclass.

[CURRENT_ACTIVE] The number of active transactions in the tclass.

[CURRENT_QUEUED] The number of queuing transactions in the tclass.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
EXCEPTION	UNKNOWN_TCLASS
INVALID	INVALID_TCLASS_TOKEN, INVALID_FUNCTION

XMCL gate, INQUIRE_ALL_TCLASSES function

The INQUIRE_ALL_TCLASSES function of the XMCL gate is used to inquire about the current state of all the tclasses in the system.

Input parameters: None.

Output parameters

[TOTAL_ACTIVE] The number of transactions active in a tclass.

[TOTAL_QUEUED] The number of transactions queueing for a tclass.

RESPONSE is the domain’s response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
EXCEPTION	UNKNOWN_TCLASS
LOGIC_ERROR	INVALID_FUNCTION

XMCL gate, SET_TCLASS function

The SET_TCLASS function of the XMCL gate is used to modify a tclass definition.

Input parameters

TCLASS_NAME The name of the tclass to be changed.

TCLASS_TOKEN Token identifying tclass to be changed.

[MAX_ACTIVE] The max-active limit of the tclass.

[PURGE_THRESHOLD] The purge-threshold limit of the tclass.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
EXCEPTION	UNKNOWN_TCLASS, INVALID_MAX_ACTIVE, INVALID_PURGE_THRESHOLD
INVALID	INVALID_TCLASS_TOKEN, INVALID_FUNCTION

XMCL gate, DELETE_TCLASS function

The DELETE_TCLASS function of the XMCL gate is used to discard an installed tclass definition.

Input parameters

TCLASS_NAME The name of the tclass to be deleted.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
EXCEPTION	UNKNOWN_TCLASS, TCLASS_BUSY
INVALID	INVALID_FUNCTION

XMCL gate, START_BROWSE_TCLASS function

The START_BROWSE_TCLASS function of the XMCL gate is used to initiate a browse of installed tclass definitions.

Input parameters

[START_AT] Identifies a tclass that the browse is to start at.

Output parameters

BROWSE_TOKEN Token identifying this tclass browse.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_FUNCTION

XMCL gate, GET_NEXT_TCLASS function

The GET_NEXT_TCLASS function of the XMCL gate is used to return information about the next tclass definition in the browse.

Input parameters

BROWSE_TOKEN Token identifying this browse of the tclass definitions.

Output parameters

[TCLASS_NAME] The name of the tclass.

[MAX_ACTIVE] The max-active limit of the tclass.

[PURGE_THRESHOLD] The purge-threshold limit of the tclass.

[CURRENT_ACTIVE] The number of active transactions in the tclass.

[CURRENT_QUEUED] The number of queuing transactions in the tclass.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
EXCEPTION	BROWSE_END_TCLASS
INVALID	INVALID_BROWSE_TOKEN, INVALID_FUNCTION

XMCL gate, END_BROWSE_TCLASS function

The END_BROWSE_TCLASS function of the XMCL gate is used to terminate a browse of installed tclass definitions.

Input parameters

BROWSE_TOKEN Token identifying this tclass browse.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_BROWSE_TOKEN, INVALID_FUNCTION

XMCL gate, REGISTER_TCLASS_USAGE function

The REGISTER_TCLASS_USAGE function of the XMCL gate is used to register usage of a tclass by a transaction definition.

Input parameters

TCLASS_NAME The name of the tclass that is being used.

UNKNOWN_ACTION Specifies the action to perform if the tclass hasn't been installed by the user: It can have either of these values:

`CREATE|ERROR`

Output parameters

TCLASS_TOKEN Token identifying tclass.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
EXCEPTION	UNKNOWN_TCLASS
INVALID	INVALID_FUNCTION

XMCL gate, DEREGISTER_TCLASS_USAGE function

The DEREGISTER_TCLASS_USAGE function of the XMCL gate is used to deregister usage of a tclass by a transaction definition.

Input parameters

TCLASS_TOKEN Token identifying tclass that is no longer being used.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
INVALID	INVALID_TCLASS_TOKEN, NOT_IN_USE, INVALID_FUNCTION
DISASTER	LOGIC_ERROR, ABEND, LOOP

XMCL gate, LOCATE_AND_LOCK_TCLASS function

The LOCATE_AND_LOCK_TCLASS function of the XMCL gate is used to locate a named tclass and lock it against delete.

Input parameters

TCLASS_NAME Name of tclass to be located.

Output parameters

TCLASS_TOKEN Token identifying tclass.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
EXCEPTION	UNKNOWN_TCLASS
INVALID	INVALID_FUNCTION

XMCL gate, UNLOCK_TCLASS function

The UNLOCK_TCLASS function of the XMCL gate is used to unlock a previously locked tclass.

Input parameters

TCLASS_TOKEN Token identifying tclass to be unlocked.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_TCLASS_TOKEN, NOT_LOCKED, INVALID_FUNCTION

XMDD gate, DELETE_TRANDEF function

The DELETE_TRANDEF function of the XMDD gate is used to discard an installed transaction definition.

Input parameters

TRANSACTION_ID The name of the transaction to be deleted.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND LOOP
EXCEPTION	UNKNOWN_TRANSACTION_ID, ICE_PENDING, AID_PENDING, SIT_PARAMETER
INVALID	INVALID_FUNCTION

XMER gate, SET_DEFERRED_MESSAGE function

The SET_DEFERRED_MESSAGE function of the XMER gate is used to store a message to be issued if the attach of a transaction fails.

Input parameters

MESSAGE The message that is to be issued.

[TRANSACTION_TOKEN] Optional token to identify the transaction that the message is to be sent to. Defaults to the current transaction.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	MESSAGE_ALREADY_SET, DEFERRED_ABEND_ALREADY_SET, INVALID_TRANSACTION_TOKEN
INVALID	INVALID_FUNCTION

XMER gate, INQUIRE_DEFERRED_MESSAGE function

The INQUIRE_DEFERRED_MESSAGE function of the XMER gate is used to retrieve the message that is to be issued which will indicate the cause of a transaction attach failure.

Output parameters

MESSAGE The message that is to be issued.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	MESSAGE_NOT_FOUND
INVALID	INVALID_FUNCTION

XMER gate, SET_DEFERRED_ABEND function

The SET_DEFERRED_ABEND function of the XMER gate is used to schedule an abend to be issued if the attach of a transaction fails.

Input parameters

DEFERRED_ABEND_CODE The abend code that is to be used.

[TRANSACTION_DUMP] Indicates whether a transaction dump is to be taken for the abend. It can have either of these values:

YES|NO

[TRANSACTION_TOKEN] Optional token to identify the transaction that is to be abended. Defaults to the current transaction.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	MESSAGE_ALREADY_SET, DEFERRED_ABEND_ALREADY_SET, INVALID_TRANSACTION_TOKEN
INVALID	INVALID_ABEND_CODE, INVALID_FUNCTION

XMER gate, INQUIRE_DEFERRED_ABEND function

The INQUIRE_DEFERRED_ABEND function of the XMER gate is used to retrieve the abend that is to be issued for the transaction whose attach has failed.

Output parameters

DEFERRED_ABEND_CODE The abend code.

[TRANSACTION_DUMP] Indicates whether a transaction dump is to be taken for the abend. It can have either of these values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	DEFERRED_ABEND_NOT_FOUND
INVALID	INVALID_FUNCTION

XMER gate, REPORT_MESSAGE function

The REPORT_MESSAGE function of the XMER gate is used send a deferred message if the attach of a transaction has failed.

Input parameters

MESSAGE The message that is to be sent.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	TRANSACTION_ABEND
INVALID	INVALID_FUNCTION

XMER gate, ABEND_TRANSACTION function

The ABEND_TRANSACTION function of the XMER gate is used abend a transaction whose attach has failed.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION

XMFD gate, FIND_PROFILE function

The FIND_PROFILE function of the XMFD gate is used to check whether the given profile is in use by a transaction definition.

Input parameters

PROFILE_NAME The profile that is to be found.

Output parameters

[TRANSACTION_ID] The name of a transaction definition that is using the profile.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
EXCEPTION	PROFILE_NOT_FOUND,
INVALID	INVALID_FUNCTION

XMIQ gate, INQUIRE_TRANSACTION function

The INQUIRE_TRANSACTION function of the XMIQ gate is used to inquire upon a particular transaction.

Input parameters

[TRANSACTION_NUMBER] The number of the transaction being inquired upon.

[TRANSACTION_TOKEN] Or the token representing the transaction being inquired upon.

If neither TRANSACTION_NUMBER or TRANSACTION_TOKEN are specified the current transaction is assumed.

[ATTACH_PARMS] Specified if the parameter area passed on the transaction. attach are to be returned.

Output parameters

[ABEND_CODE] The abend code if the transaction is terminating abnormally.

[ABEND_IN_PROGRESS] Indicates whether the transaction is in the process of terminating abnormally. It can have either of these values:

YES|NO

[CICS_UOW_ID] The CICS Unit Of Work Identifier associated with the transaction.

[CMDSEC] Whether command security checking is active. It can have either of these values:

YES|NO

[DTIMEOUT] The deadlock timeout value for the transaction.

[DUMP] Whether transaction dumps are to be taken for the transaction. It can have either of these values:

YES|NO

[DYNAMIC] Whether the transaction is dynamic. It can have either of these values:

YES|NO

[FACILITY_NAME] The name of the principal facility associated with the transaction.

[FACILITY_TYPE] The type of the principal facility associated with the transaction. It can have either of these values:

NONE|TERMINAL|TD|START

[INDOUBT] The action to take if work performed by the transaction becomes indoubt. It can have any of these values:

BACKOUT|COMMIT|WAIT

[INITIAL_PROGRAM] The initial program to linked to when the transaction started.

[ISOLATE] Whether the transaction runs in its own subspace. It can have either of these values:

YES|NO

[LOCAL_QUEUING] Whether the transaction is eligible to queue locally if it is started on the remote system. It can have either of these values:

YES|NO

[NETNAME] The network name of a terminal principal facility.

[ORIGINAL_TRANSACTION_ID] The transid that was used to attach the transaction.

[OUT_TRANSACTION_TOKEN] The token that represents this transaction.

[PROFILE_NAME] The profile of the transaction.

[REMOTE] Whether the transaction is remote. It can have either of these values:

YES|NO

[REMOTE_NAME] The name of a remote transaction on the remote system.

[REMOTE_SYSTEM] The system that a remote transaction is to be routed to.

[RESOURCE_NAME] The name of a resource that a suspended transaction is waiting for.

[RESOURCE_TYPE] The type of resource that a suspended transaction is waiting for.

[RESSEC] Whether resource security checking is active for the transaction. It can have either of these values:

YES|NO

[RESTART] Whether the transaction is restartable. It can have either of these values:

YES|NO

[RESTART_COUNT] Contains the number of times this transaction instance has been restarted.

[RUNAWAY_LIMIT] The runaway limit associated with the transaction.

[SPURGE] Whether the transaction is system-purgeable. It can have either of these values:

YES|NO

START_CODE Indicates the reason for the attach of the transaction. It can have any of these values:

C|T|TT|QD|S|SD|SZ|DF

[STATUS] The status of the transaction. It can have either of these values:

ENABLED|DISABLED

[STORAGE_CLEAR] Whether task-lifetime storage will be cleared before it is freemained. It can have either of these values:

YES|NO

[SUSPEND_TIME] Contains the length of time that the transaction has currently been suspended for.

[SYSTEM_TRANSACTION] Whether the transaction has been attached by CICS. It can have either of these values:

YES|NO

[TASK_PRIORITY] The combined priority of the transaction.

[TASKDATAKEY] The storage key that task-lifetime storage is allocated in. It can have either of these values:

CICS|USER

[TASKDATALOC] The location of task-lifetime storage. It can have either of these values:

BELOW|ANY

[TCLASS] Whether the transaction belongs to a tclass. It can have either of these values:

YES|NO

[TCLASS_NAME] The name of the tclass that the transaction belongs to.

[TPURGE] Whether the transaction can be purged after a terminal error. It can have either of these values:

YES|NO

[TRACE] The level of tracing associated with the transaction. It can have any of these values:

STANDARD|SPECIAL|SUPPRESSED

[TRAN_PRIORITY] The priority of the transaction definition used to attach the transaction.

[TRAN_ROUTING_PROFILE] Profile used to route the transaction to a remote system.

[TRANNUM] The transaction number of the transaction.

[TRANSACTION_ID] The transaction identifier associated with the transaction.

[TWASIZE] Size of Transaction Work Area associated with the transaction.

[USERID] The userid of the user associated with the transaction.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	NO_TRANSACTION_ENVIRONMENT, BUFFER_TOO_SMALL, UNKNOWN_TRANSACTION_NUMBER, INVALID_TRANSACTION_TOKEN
INVALID	INVALID_FUNCTION

XMIQ gate, SET_TRANSACTION function

The SET_TRANSACTION function of the XMIQ gate is used to change some attributes associated with a particular transaction.

Input parameters

[TRANSACTION_NUMBER] The number of the transaction being inquired upon.

[TRANSACTION_TOKEN] Or the token representing the transaction being inquired upon.

If neither TRANSACTION_NUMBER or TRANSACTION_TOKEN are specified the current transaction is assumed.

[ABEND_CODE] The abend code if the transaction is terminating abnormally.

[ABEND_IN_PROGRESS] Whether the transaction is in the process of terminating abnormally. It can have either of these values:

YES|NO

[FACILITY_TYPE] The type of the principal facility associated with the transaction. It can have either of these values:

NONE|TERMINAL|TD|START

START_CODE The reason for the attach of the transaction. It can have any of these values:

C|T|TT|QD|S|SD|SZ|DF

[STORAGE_VIOLATIONS] Set to indicate that the transaction has suffered a storage violation.

[TASK_PRIORITY] The combined priority of the transaction.

[TCLASS_NAME] The name of the tclass that the transaction belongs to.

Reserved name DFHTCL00 is used to change a transaction so that it no longer belongs to a tclass.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	NO_TRANSACTION_ENVIRONMENT, UNKNOWN_TCLASS, UNKNOWN_TRANSACTION_NUMBER, INVALID_TRANSACTION_TOKEN
INVALID	INVALID_FUNCTION

XMIQ gate, START_BROWSE_TRANSACTION function

The START_BROWSE_TRANSACTION function of the XMIQ gate is used to initiate a browse of all transactions in the system.

Output parameters

BROWSE_TOKEN Token identifying this transaction browse.

RESPONSE is the domain's response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is INVALID or DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION

XMIQ gate, GET_NEXT_TRANSACTION function

The GET_NEXT_TRANSACTION function of the XMIQ gate is used to inquire upon the next transaction in a transaction browse.

Input parameters

BROWSE_TOKEN The token identifying this transaction browse.

[ATTACH_PARMS] Specified if the parameter area passed on the transaction. attach is to be returned.

Output parameters

[ABEND_CODE] The abend code if the transaction is terminating abnormally.

[ABEND_IN_PROGRESS] Indicates whether the transaction is in the process of terminating abnormally. It can have either of these values:

`YES|NO`

[CICS_UOW_ID] The CICS Unit Of Work Identifier associated with the transaction.

[CMDSEC] Whether command security checking is active. It can have either of these values:

`YES|NO`

[DTIMEOUT] The deadlock timeout value for the transaction.

[DUMP] Whether transaction dumps are to be taken for the transaction. It can have either of these values:

`YES|NO`

[DYNAMIC] Whether the transaction is dynamic. It can have either of these values:

`YES|NO`

[FACILITY_NAME] The name of the principal facility associated with the transaction.

[FACILITY_TYPE] The type of the principal facility associated with the transaction. It can have either of these values:

`NONE|TERMINAL|TD|START`

[INDOUBT] The action to take if work performed by the transaction becomes indoubt. It can have any of these values:

`BACKOUT|COMMIT|WAIT`

[INITIAL_PROGRAM] The initial program to linked to when the transaction started.

[ISOLATE] Whether the transaction runs in its own subspace. It can have either of these values:

`YES|NO`

[LOCAL_QUEUING] Whether the transaction is eligible to queue locally if it is started on the remote system. It can have either of these values:

`YES|NO`

[NETNAME] The network name of a terminal principal facility.

[ORIGINAL_TRANSACTION_ID] The transid that was used to attach the transaction.

[OUT_TRANSACTION_TOKEN] The token that represents this transaction.

[PROFILE_NAME] The profile of the transaction.

[REMOTE] Whether the transaction is remote. It can have either of these values:

`YES|NO`

[REMOTE_NAME] The name of a remote transaction on the remote system.

[REMOTE_SYSTEM] The system that a remote transaction is to be routed to.

[RESOURCE_NAME] The name of a resource that a suspended transaction is waiting for.

[RESOURCE_TYPE] The type of resource that a suspended transaction is waiting for.

[RESSEC] Whether resource security checking is active for the transaction. It can have either of these values:

YES|NO

[RESTART] Whether the transaction is restartable. It can have either of these values:

YES|NO

[RESTART_COUNT] Contains the number of times this transaction instance has been restarted.

[RUNAWAY_LIMIT] The runaway limit associated with the transaction.

[SPURGE] Whether the transaction is system-purgeable. It can have either of these values:

YES|NO

START_CODE Indicates the reason for the attach of the transaction. It can have any of these values:

C|T|TT|QD|S|SD|SZ|DF

[STATUS] The status of the transaction. It can have either of these values:

ENABLED|DISABLED

[STORAGE_CLEAR] Whether task-lifetime storage will be cleared before it is freemained. It can have either of these values:

YES|NO

[SUSPEND_TIME] Contains the length of time that the transaction has currently been suspended for.

[SYSTEM_TRANSACTION] Whether the transaction has been attached by CICS. It can have either of these values:

YES|NO

[TASK_PRIORITY] The combined priority of the transaction.

[TASKDATAKEY] The storage key that task-lifetime storage is allocated in. It can have either of these values:

CICS|USER

[TASKDATALOC] The location of task-lifetime storage. It can have either of these values:

BELOW|ANY

[TCLASS] Whether the transaction belongs to a tclass. It can have either of these values:

YES|NO

[TCLASS_NAME] The name of the tclass that the transaction belongs to.

[TPURGE] Whether the transaction can be purged after a terminal error. It can have either of these values:

YES|NO

[TRACE] The level of tracing associated with the transaction. It can have any of these values:

STANDARD|SPECIAL|SUPPRESSED

[TRAN_PRIORITY] The priority of the transaction definition used to attach the transaction.

[TRAN_ROUTING_PROFILE] Profile used to route the transaction to a remote system.

[TRANNUM] The transaction number of the transaction.

[TRANSACTION_ID] The transaction identifier associated with the transaction.

[TWASIZE] Size of Transaction Work Area associated with the transaction.

[USERID] The userid of the user associated with the transaction.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BROWSE_END
DISASTER	ABEND, LOOP
INVALID	INVALID_BROWSE_TOKEN, INVALID_FUNCTION

XMIQ gate, END_BROWSE_TRANSACTION function

The END_BROWSE_TRANSACTION function of the XMIQ gate is used to terminate a browse of all transactions in the system.

Input parameters

BROWSE_TOKEN Token identifying the transaction browse to be terminated.

Output parameters

RESPONSE is the domain's response to the call. It can have any of these values:

OK||DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_BROWSE_TOKEN, INVALID_FUNCTION

XMIQ gate, START_BROWSE_TXN_TOKEN function

The START_BROWSE_TXN_TOKEN function of the XMIQ gate is used to initiate a browse of a particular components transaction token in all transactions in the system.

Input parameters

TOKEN_OWNER Identifies the particular transaction token that is to be browsed in the transactions. It can have any of these values:

`AP|SM|TD|MN|PG|IC|XS|US|RM|TF`

Output parameters

BROWSE_TOKEN Token identifying this transaction token browse.

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION

XMIQ gate, GET_NEXT_TXN_TOKEN function

The GET_NEXT_TXN_TOKEN function of the XMIQ gate is used to return the transaction token associated with the next transaction in the system.

Input parameters

BROWSE_TOKEN Identifies this browse of the transaction tokens.

Output parameters

OWNERS_TOKEN The transaction token associated with the current transaction.

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	BROWSE_END
DISASTER	ABEND, LOOP
INVALID	INVALID_BROWSE_TOKEN, INVALID_FUNCTION

XMIQ gate, END_BROWSE_TXN_TOKEN function

The END_BROWSE_TXN_TOKEN function of the XMIQ gate is used to terminate a browse of transaction tokens.

Input parameters

BROWSE_TOKEN Token identifying the transaction token browse to be terminated.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK||DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_BROWSE_TOKEN, INVALID_FUNCTION

XMIQ gate, INQUIRE_TRANSACTION_TOKEN function

The INQUIRE_TRANSACTION_TOKEN function of the XMIQ gate is used to return a particular transaction token associated with a particular transaction.

Input parameters

[TRANSACTION_TOKEN] Token identifying the transaction being inquired upon.

If omitted defaults to the current transaction.

TOKEN_OWNER Identifies the particular transaction token that is to be returned. It can have any of these values:

`AP|SM|TD|MN|PG|IC|XS|US|RM|TF`

Output parameters

OWNERS_TOKEN The transaction token associated with the transaction.

RESPONSE is the domain’s response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_TRANSACTION_ENVIRONMENT
DISASTER	ABEND, LOOP
INVALID	INVALID_BROWSE_TOKEN, INVALID_FUNCTION

XMIQ gate, SET_TRANSACTION_TOKEN function

The SET_TRANSACTION_TOKEN function of the XMIQ gate is used to modify a particular transaction token associated with a particular transaction.

Input parameters

[TRANSACTION_TOKEN] Token identifying the transaction in which the token is to be modified.

If omitted defaults to the current transaction.

TOKEN_OWNER Identifies the particular transaction token that is to be changed. It can have any of these values:

AP|SM|TD|MN|PG|IC|XS|US|RM|TF

OWNERS_TOKEN The new value for the transaction token.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_TRANSACTION_ENVIRONMENT
DISASTER	ABEND, LOOP
INVALID	INVALID_BROWSE_TOKEN, INVALID_FUNCTION

XMIQ gate, PURGE_TRANSACTION function

The PURGE_TRANSACTION function of the XMIQ gate is used to purge a particular transaction in the system.

Input parameters

TRANSACTION_NUMBER The number of the transaction to be purged.

TRANSACTION_TOKEN Or the token representing the transaction to be purged.

PURGE_TYPE The type of purge that is to be attempted. It can have either of these values:

NORMAL|FORCE

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_TRANSACTION_NUMBER, INVALID_TRANSACTION_TOKEN, PURGE_DEFERRED, TRANSACTION_INITIALIZING, TRANSACTION_TERMINATING, PURGE_SYSTEM_TRANSACTION, PURGE_ABENDING_TRANSACTION, SPURGE_PROTECTED, PURGE_INHIBITED, INVALID_STATE
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION

XMLD gate, LOCATE_AND_LOCK_TRANDEF function

The LOCATE_AND_LOCK_TRANDEF function of the XMLD gate is used to locate a particular transaction definition instance.

Input parameters

TRANSACTION_ID Transaction identifier to locate.

TPNAME Or alternatively a tpname alias of the transaction definition to locate.

[USE_DTRTRAN] If the named transaction-id or tpname cannot be found then indicates whether the DTRTRAN, if installed, should be used instead. It can have either of these values:

YES|NO

Output parameters

TRANDEF_TOKEN The token representing the returned transaction definition.

[PRIMARY_TRANSACTION_ID] The primary transaction identifier of the returned transaction. definition.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NOT_FOUND
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_TPNAME, INVALID_FUNCTION

XMLD gate, UNLOCK_TRANDEF function

The UNLOCK_TRANDEF function of the XMLD gate is used to unlock a previously located transaction definition instance.

Input parameters

TRANDEF_TOKEN Transaction definition instance to unlock.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP

RESPONSE	Possible REASON values
INVALID	NOT_LOCKED, INVALID_TOKEN, INVALID_FUNCTION

XMSR gate, INQUIRE_MXT function

The INQUIRE_MXT function of the XMSR gate is used to inquire upon the state of MXT in the system.

Output parameters

[MXT_QUEUED] The number of user transactions queued for MXT.

[TCLASS_QUEUED] The number of transactions queued for tclass membership.

[CURRENT_ACTIVE] The number of active user transactions.

[CURRENT_ACTIVE] The number of user transactions queued on MXT.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_FUNCTION

XMSR gate, SET_MXT function

The SET_MXT function of the XMSR gate is used to change MXT in the system.

Input parameters

MXT_LIMIT The requested setting for MXT.

Output parameters

MXT_LIMIT_SET The MXT limit that could be set.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_MXT_LIMIT, LIMIT_TOO_HIGH
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_FUNCTION

XMSR gate, INQUIRE_DTRTRAN function

The INQUIRE_DTRTRAN function of the XMSR gate returns the name of the dynamic transaction routing transaction.

Output parameters

DTRTRAN The name of the dynamic transaction routing transaction definition.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_FUNCTION

XMSR gate, SET_DTRTRAN function

The SET_DTRTRAN function of the XMSR gate changes the dynamic transaction routing transaction definition.

Input parameters

DTRTRAN The name of the dynamic transaction routing transaction definition.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_FUNCTION

XMXD gate, ADD_REPLACE_TRANDEF function

The ADD_REPLACE_TRANDEF function of the XMXD gate is used to install a transaction definition.

Input parameters

TRANSACTION_ID Name of transaction definition to install.

PROFILE_NAME Profile of transaction.

TRAN_PRIORITY Transaction priority

[INITIAL_PROGRAM] Initial program of transaction.

[TWASIZE] Size of Transaction Work Area.

[STATUS] The status of the transaction. It can have either of these values:

ENABLED|DISABLED

[PARTITIONSET] The partitionset defined for the transaction. It can have any of these values:

NONE|NAMED|KEEP|OWN

[PARTITIONSET_NAME] The name of the user defined partitionset used by the transaction.

[TASKDATAKEY] The storage key that task-lifetime storage is allocated in. It can have either of these values:

CICS|USER

[TASKDATALOC] The location of task-lifetime storage. It can have either of these values:

BELOW|ANY

[STORAGE_CLEAR] Whether task-lifetime storage is to be cleared before it is freemained. It can have either of these values:

YES|NO

[SYSTEM_RUNAWAY] Whether the transaction uses the default system runaway limit. It can have either of these values:

YES|NO

[RUNAWAY_LIMIT] The runaway limit associated with the transaction.

[DYNAMIC] Whether the transaction is defined to be dynamic. It can have either of these values:

YES|NO

[LOCAL_QUEUING] Whether the transaction is eligible to queue locally when it is started on the remote system. It can have either of these values:

YES|NO

[REMOTE_SYSTEM] The system that a remote transaction is to be routed to.

[REMOTE_NAME] The name of a remote transaction on the remote system.

[TRAN_ROUTING_PROFILE] Profile to be used to route a remote transaction to a remote system.

[TCLASS] Whether the transaction belongs to a tclass. It can have either of these values:

YES|NO

[TCLASS_NAME] The name of the tclass that the transaction belongs to.

[INDOUBT] The action to take if work performed by the transaction becomes indoubt. It can have any of these values:

BACKOUT|COMMIT|WAIT

[RESTART] Whether the transaction is restartable. It can have either of these values:

YES|NO

[SPURGE] Whether the transaction is system-purgeable. It can have either of these values:

YES|NO

[DTIMEOUT] The deadlock timeout value for the transaction.

[TPURGE] Whether the transaction can be purged after a terminal error. It can have either of these values:

YES|NO

[DUMP] Whether transaction dumps are to be taken. It can have either of these values:

YES|NO

[TRACE] The level of tracing associated with the transaction. It can have any of these values:

STANDARD|SPECIAL|SUPPRESSED

[SHUTDOWN] Whether the transaction can be run during shutdown. It can have either of these values:

ENABLED|DISABLED

[RESSEC] Whether resource security checking is active. It can have either of these values:

YES|NO

[CMDSEC] Whether command security checking is active. It can have either of these values:

YES|NO

[STORAGE_FREEZE] Whether storage freeze is on for the transaction. It can have either of these values:

YES|NO

[ISOLATE] Whether the transaction runs in its own subspace. It can have either of these values:

YES|NO

[CATALOGUED_EXTERNALS] Block of data specified as an alternative to the above parameters when a transaction definition is being installed from the catalog.

[ALIAS] Alternative name for transaction definition.

[TASKREQ] Alternative name for transaction definition so that it can be invoked by PF/PA key, light pen, etc.

[XTRANID] Alternative name for transaction definition originally specified in hexadecimal notation.

[TPNAME] Alternative name of transaction definition in form of a sixty four character transaction program name.

[SYSTEN_DEFINITION] Whether the definition is being added on behalf of CICS or not. It can have either of these values:

YES|NO

Output parameters

[TRANDEF_TOKEN] Token returned to represent the installed transaction. definition.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	TWASIZE_INVALID, RUNAWAY_LIMIT_INVALID, TRANSACTION_ID_INVALID, ALIAS_INVALID, XTRANID_INVALID, TASKREQ_INVALID, TPNAME_INVALID, RECOVERY_NOT_COMPLETE
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INITIAL_PROGRAM_EXPECTED, REMOTE_SYSTEM_EXPECTED, REMOTE_NAME_EXPECTED, RUNAWAY_LIMIT_EXPECTED, TRAN_ROUTING_PROF_EXPECTED, TCLASS_NAME_EXPECTED, PARTITIONSET_NAME_EXPECTED, INVALID_FUNCTION

XMXD gate, SET_TRANDEF function

The SET_TRANDEF function of the XMXD gate is used to modify transaction definition creating a new transaction. definition instance.

Input parameters

TRANSACTION_ID Name of transaction definition to change.

[TRAN_PRIORITY] Transaction priority.

[STATUS] The status of the transaction. It can have either of these values:

ENABLED|DISABLED

[SYSTEM_RUNAWAY] Whether the transaction uses the default system runaway limit. It can have either of these values:

YES|NO

[RUNAWAY_LIMIT] The runaway limit associated with the transaction.

[TCLASS] Whether the transaction belongs to a tclass. It can have either of these values:

YES|NO

[TCLASS_NAME] The name of the tclass that the transaction belongs to.

[SPURGE] Whether the transaction is system-purgeable. It can have either of these values:

YES|NO

[DUMP] Whether transaction dumps are to be taken. It can have either of these values:

YES|NO

[TRACE] The level of tracing associated with the transaction. It can have any of these values:

STANDARD|SPECIAL|SUPPRESSED

[SHUTDOWN] Whether the transaction can be run during shutdown. It can have either of these values:

ENABLED|DISABLED

[STORAGE_FREEZE] Whether storage freeze is on for the transaction. It can have either of these values:

YES|NO

[SHUTDOWN_DISABLEOVERRIDE] Whether to override a SHUTDOWN setting of DISABLED for the transaction definition. It can have either of these values:

YES|NO

Output parameters

[TRANDEF_TOKEN] Token returned to represent the new transaction. definition instance.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_TRANSACTION_ID, RUNAWAY_LIMIT_INVALID, UNKNOWN_TCLASS
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	RUNAWAY_LIMIT_EXPECTED, TCLASS_NAME_EXPECTED, INVALID_FUNCTION

XMXD gate, INQUIRE_TRANDEF function

The INQUIRE_TRANDEF function of the XMXD gate is used to inquire upon a named transaction definition.

Input parameters

INQ_TRANSACTION_ID Transaction-id to inquire upon.

TRANDEF_TOKEN Or alternatively token representing transaction definition to inquire upon.

[USE_DTRTRAN] If the INQ_TRANSACTION_ID cannot be found then indicates whether the DTRTRAN, if installed, should be used for the inquire instead. It can have either of these values:

YES|NO

Output parameters

[TRANSACTION_ID] Transaction identifier.

[INITIAL_PROGRAM] Initial program of transaction.

[PROFILE_NAME] Profile of transaction.

[TWASIZE] Size of Transaction Work Area.

[TRAN_PRIORITY] Transaction priority.

[STATUS] The status of the transaction. It can have either of these values:

ENABLED|DISABLED

[PARTITIONSET] The partitionset defined for the transaction. It can have any of these values:

NONE|NAMED|KEEP|OWN

[PARTITIONSET_NAME] The name of the user defined partitionset used by the transaction.

[TASKDATAKEY] The storage key that task-lifetime storage is allocated in. It can have either of these values:

CICS|USER

[TASKDATALOC] The location of task-lifetime storage. It can have either of these values:

BELOW|ANY

[STORAGE_CLEAR] Whether task-lifetime storage is to be cleared before it is freemained. It can have either of these values:

YES|NO

[SYSTEM_RUNAWAY] Whether the transaction uses the default system runaway limit. It can have either of these values:

YES|NO

[RUNAWAY_LIMIT] The runaway limit associated with the transaction.

[DYNAMIC] Whether the transaction is defined to be dynamic. It can have either of these values:

YES|NO

[LOCAL_QUEUING] Whether the transaction is eligible to queue locally when it is started on the remote system. It can have either of these values:

YES|NO

[REMOTE] Whether the transaction is remote. It can have either of these values:

YES|NO

[REMOTE_SYSTEM] The system that a remote transaction is to be routed to.

[REMOTE_NAME] The name of a remote transaction on the remote system.

[TRAN_ROUTING_PROFILE] Profile to be used to route a remote transaction to a remote system.

[TCLASS] Whether the transaction belongs to a tclass. It can have either of these values:

YES|NO

[TCLASS_NAME] The name of the tclass that the transaction belongs to.

[INDOUBT] The action to take if work performed by the transaction becomes indoubt. It can have any of these values:

BACKOUT|COMMIT|WAIT

[RESTART] Whether the transaction is restartable. It can have either of these values:

YES|NO

[SPURGE] Whether the transaction is system-purgeable. It can have either of these values:

YES|NO

[DTIMEOUT] The deadlock timeout value for the transaction.

[TPURGE] Whether the transaction can be purged after a terminal error. It can have either of these values:

YES|NO

[DUMP] Whether transaction dumps are to be taken. It can have either of these values:

YES|NO

[TRACE] The level of tracing associated with the transaction. It can have any of these values:

STANDARD|SPECIAL|SUPPRESSED

[SHUTDOWN] Whether the transaction can be run during shutdown. It can have either of these values:

ENABLED|DISABLED

[RESSEC] Whether resource security checking is active. It can have either of these values:

YES|NO

[CMDSEC] Whether command security checking is active. It can have either of these values:

YES|NO

[STORAGE_FREEZE] Whether storage freeze is on for the transaction. It can have either of these values:

YES|NO

[ISOLATE] Whether the transaction runs in its own subspace. It can have either of these values:

YES|NO

[SYSTEM_ATTACH] Whether a system task will be attached using this transaction definition It can have either of these values:

YES|NO

[DTRTRAN] Indicates whether the returned transaction definition is the dynamic transaction routing transaction definition or not. It can have either of these values:

YES|NO

TCB_HISTORY returns historical data indicating the frequency of usage of ic each subspace-inheriting open TCB mode by tasks with the caller's these transaction id.

RESPONSE is the domain's response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	UNKNOWN_TRANSACTION_ID
INVALID	INVALID_TOKEN, INVALID_FUNCTION
DISASTER	LOGIC_ERROR, ABEND, LOOP

XMXD gate, INQUIRE_REMOTE_TRANDEF function

The INQUIRE_REMOTE_TRANDEF function of the XMXD gate is used to inquire upon a remote transaction definition.

Input parameters

REMOTESYSTEM_KEY Remote system of remote transaction definition to be found.

REMOTENAME_KEY Remote name of remote transaction definition to be found.

Output parameters

[TRANSACTION_ID] Transaction identifier.

[INITIAL_PROGRAM] Initial program of transaction.

[PROFILE_NAME] Profile of transaction.

[TWASIZE] Size of Transaction Work Area.

[TRAN_PRIORITY] Transaction priority.

[STATUS] The status of the transaction. It can have either of these values:

ENABLED|DISABLED

[PARTITIONSET] The partitionset defined for the transaction. It can have any of these values:

NONE|NAMED|KEEP|OWN

[PARTITIONSET_NAME] The name of the user defined partitionset used by the transaction.

[TASKDATAKEY] The storage key that task-lifetime storage is allocated in. It can have either of these values:

CICS|USER

[TASKDATALOC] The location of task-lifetime storage. It can have either of these values:

BELOW|ANY

[STORAGE_CLEAR] Whether task-lifetime storage is to be cleared before it is freemained. It can have either of these values:

YES|NO

[SYSTEM_RUNAWAY] Whether the transaction uses the default system runaway limit. It can have either of these values:

YES|NO

[RUNAWAY_LIMIT] The runaway limit associated with the transaction.

[DYNAMIC] Whether the transaction is defined to be dynamic. It can have either of these values:

YES|NO

[LOCAL_QUEUING] Whether the transaction is eligible to queue locally when it is started on the remote system. It can have either of these values:

YES|NO

[REMOTE] Whether the transaction is remote. It can have either of these values:

YES|NO

[REMOTE_SYSTEM] The system that a remote transaction is to be routed to.

[REMOTE_NAME] The name of a remote transaction on the remote system.

[TRAN_ROUTING_PROFILE] Profile to be used to route a remote transaction to a remote system.

[TCLASS] Whether the transaction belongs to a tclass. It can have either of these values:

YES|NO

[TCLASS_NAME] The name of the tclass that the transaction belongs to.

[INDOUBT] The action to take if work performed by the transaction becomes indoubt. It can have any of these values:

BACKOUT|COMMIT|WAIT

[RESTART] Whether the transaction is restartable. It can have either of these values:

YES|NO

[SPURGE] Whether the transaction is system-purgeable. It can have either of these values:

YES|NO

[DTIMEOUT] The deadlock timeout value for the transaction.

[TPURGE] Whether the transaction can be purged after a terminal error. It can have either of these values:

YES|NO

[DUMP] Whether transaction dumps are to be taken. It can have either of these values:

YES|NO

[TRACE] The level of tracing associated with the transaction. It can have any of these values:

STANDARD|SPECIAL|SUPPRESSED

[SHUTDOWN] Whether the transaction can be run during shutdown. It can have either of these values:

ENABLED|DISABLED

[RESSEC] Whether resource security checking is active. It can have either of these values:

YES|NO

[CMDSEC] Whether command security checking is active. It can have either of these values:

YES|NO

[STORAGE_FREEZE] Whether storage freeze is on for the transaction. It can have either of these values:

YES|NO

[ISOLATE] Whether the transaction runs in its own subspace. It can have either of these values:

YES|NO

[SYSTEM_ATTACH] Whether a system task will be attached using this transaction definition It can have either of these values:

YES|NO

[DTRTRAN] Indicates whether the returned transaction definition is the dynamic transaction routing transaction definition or not. It can have either of these values:

YES|NO

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	REMOTE_NOT_FOUND
INVALID	INVALID_FUNCTION
DISASTER	LOGIC_ERROR, ABEND, LOOP

XMXE gate, GET_TXN_ENVIRONMENT function

The GET_TXN_ENVIRONMENT function of the XMXE gate is used to acquire a transaction environment for a task that was DS instead XM attached.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	DUPLICATE_ENVIRONMENT, ATTACHED_TRANSACTION
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION

XMXE gate, FREE_TXN_ENVIRONMENT function

The FREE_TXN_ENVIRONMENT function of the XMXE gate is used to release a transaction environment for a task that was DS instead XM attached.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	NO_ENVIRONMENT, ATTACHED_TRANSACTION
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION

Transaction manager domain’s generic gates

Table 102 summarizes the transaction manager domain’s generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 102. Transaction manager domain’s generic gates

Gate	Trace	Function	Format
XMDM	XM 0101 XM 0102	PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
XMST	XM 0C01 XM 0C02	COLLECT_STATISTICS COLLECT_RESOURCE_STATS	STST

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—“Domain manager domain’s generic formats” on page 195

Format STST—“Statistics domain’s generic format” on page 521

Transaction manager domain’s generic format

Table 103 shows the generic format owned by the transaction manager domain, and shows the function performed on the call.

Table 103. Generic format owned by the transaction manager domain

Format	Calling module	Function
XMNT	DFHXMSR DFHXMAT DFHXMTA DFHXMCL	MXT_NOTIFY MXT_CHANGE_NOTIFY
XMDN	DFHXMXD DFHXMQD DFHXMDD	TRANDEF_NOTIFY TRANDEF_DELETE_QUERY
XMPP	DFHXMIQ	FORCE_PURGE_INHIBIT_QUERY

In the descriptions of the format that follow, the “input” parameters are input not to the transaction manager domain, but to the domain being called by the transaction manager. Similarly, the “output” parameters are output by the domain that was called by the transaction manager domain, in response to the call.

Format XMNT, MXT_NOTIFY function

The MXT_NOTIFY function of XMNT format is used to notify other domains when CICS is at, or no longer at, the maximum task limit for user tasks.

Input parameters

MXTQUEUING Indicates whether queuing for MXT has just started or just stopped. It can have either of these values:

STARTED|STOPPED

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

Format XMNT, MXT_CHANGE_NOTIFY function

The MXT_CHANGE_NOTIFY function of XMNT format is used to notify other domains of a change to the MXT limit. The called domains indicate whether they can cope with the new limit.

Input parameters

REQUESTED_MXT The new limit requested for MXT.

Output parameters

ALLOCATED_MXT Indicates the limit that the called domain can cope with when the LIMIT_TOO_HIGH exception is returned.

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	LIMIT_TOO_HIGH
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_FUNCTION

Format XMDN, TRANDEF_NOTIFY function

The TRANDEF_NOTIFY function of the XMDN format is used to notify other domains that a transaction definition has been installed, changed, or deleted. The called domain's can then modify any transaction definition related data they are keeping for that definition.

Input parameters

EVENT Indicates the event that has caused the notify to be sent. It can have any of the following values:

INSTALL|CHANGE|DELETE

TRANDEF_TOKEN Token identifying the transaction definition instance subject to the above event.

Output parameters

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_FUNCTION

Format XMDN, TRANDEF_DELETE_QUERY function

The TRANDEF_DELETE_QUERY function of the XMDN format allows other domains to object to the deletion of the named transaction. definition.

Input parameters

TRANSACTION_ID The transaction definition subject to the delete request.

Output parameters

INHIBIT_DELETE Indicates whether the called domain wants to inhibit the deletion of the named transaction definition. It can either of the following values:

YES|NO

INHIBIT_REASON Indicates the reason why the called domain wants to inhibit the deletion of the named transaction definition. It can have any of the following values:

AID_PENDING|ICE_PENDING|SIT_PARAMETER

RESPONSE is the domain’s response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	LOGIC_ERROR, ABEND, LOOP
INVALID	INVALID_FUNCTION

Format XMPP, FORCE_PURGE_INHIBIT_QUERY function

The FORCE_PURGE_INHIBIT_QUERY function of the XMPP format allows other domains to object to the force purge request for the specified transaction.

Input parameters

TRANSACTION_TOKEN Token identifying the transaction that is subject to the force purge request.

Output parameters

INHIBIT_PURGE Indicates whether the called domain wants to inhibit the force purge of the transaction. It can have either of the following values:

YES|NO

RESPONSE is the domain's response to the call. It can have any of these values:

OK|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FUNCTION

Modules

Module	Function
DFHXMAB	XM domain abend program
DFHXMAT	Handles the following requests: ATTACH
DFHXMBD	Handles the following requests: START_BROWSE_TRANDEF GET_NEXT_TRANDEF END_BROWSE_TRANDEF
DFHXMCL	Handles the following requests: ADD_REPLACE_TCLASS ADD_TCLASS INQUIRE_TCLASS SET_TCLASS DELETE_TCLASS START_BROWSE_TCLASS GET_NEXT_TCLASS END_BROWSE_TCLASS REGISTER_TCLASS_USAGE DEREGISTER_TCLASS_USAGE LOCATE_AND_LOCK_TCLASS UNLOCK_TCLASS
DFHXMDD	Handles the following requests: DELETE_TRANDEF
DFHXMDM	Handles the following requests: PRE_INITIALIZE INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHXMDUF	XM domain offline dump formatting routine
DFHXMER	Handles the following requests: SET_DEFERRED_MESSAGE INQUIRE_DEFERRED_MESSAGE SET_DEFERRED_ABEND INQUIRE_DEFERRED_ABEND REPORT_MESSAGE ABEND_TRANSACTION
DFHXMFD	Handles the following requests: FIND_PROFILE
DFHXMIQ	Handles the following requests: INQUIRE_TRANSACTION SET_TRANSACTION START_BROWSE_TRANSACTION GET_NEXT_TRANSACTION END_BROWSE_TRANSACTION START_BROWSE_TXN_TOKEN GET_NEXT_TXN_TOKEN END_BROWSE_TXN_TOKEN INQUIRE_TRANSACTION_TOKEN SET_TRANSACTION_TOKEN PURGE_TRANSACTION
DFHXMLD	Handles the following requests: LOCATE_AND_LOCK_TRANDEF UNLOCK_TRANDEF
DFHXMQC	Is an internal module which handles the following requests: TCLASS_ACQUIRE TCLASS_RELEASE TCLASS_LIMIT_CHANGE TCLASS_QUEUE_CHANGE
DFHXMQD	Is an internal module which handles the following requests: QUIESCE_TRANDEF DELETE_INSTANCE
DFHXMRP	Is an internal module which handles the following requests: DEFINITION_RECOVERY
DFHXMSR	Handles the following requests: INQUIRE_MXT SET_MXT INQUIRE_DTRTRAN SET_DTRTRAN
DFHXMST	Handles the following requests: COLLECT_STATISTICS COLLECT_RESOURCE_STATS
DFHXMTRI	Interprets XM domain trace entries

Module	Function
DFHXMXD	Handles the following requests: ADD_REPLACE_TRANDEF SET_TRANDEF INQUIRE_TRANDEF INQUIRE_REMOTE_TRANDEF
DFHXMXE	Handles the following requests: GET_TXN_ENVIRONMENT FREE_TXN_ENVIRONMENT

Exits

There is one specific global user exit point in the transaction manager, XXMATT, which is called during Attach processing.

Note also that the general resource install/discard exit, XRSINDI, is also called by transaction manager to log installs and discards of transaction and tclass definitions.

For further information about both these exit points see the *CICS Customization Guide*.

Trace

The point IDs for the storage manager domain are of the form XMxxxx; the corresponding trace levels are XM 1, XM 2 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 94. Transaction restart program

The transaction restart program, DFHREST, is a user-replaceable module that helps you to determine whether or not a transaction is restarted. The default DFHREST module requests a transaction restart under certain conditions; for example, if a program isolation deadlock occurs (that is, when two tasks each wait for the other to release a particular DL/I database segment), one of the tasks is backed out and automatically restarted, and the other is allowed to complete its update.

For further information about the transaction restart program, see the *CICS Recovery and Restart Guide*. For information about how to provide your own code for the DFHREST module, see the *CICS Customization Guide*.

Design overview

In the creation of the program control table (PCT), the system programmer can designate selected transactions as **restartable**.

During the execution of any transaction, certain temporary-storage data, intrapartition destinations, and files are protected for dynamic backout. In addition, for a restartable transaction, the following actions take place:

- Any terminal input/output area (TIOA), command-level communication area, or terminal user area existing at task initiation is copied to the dynamic log.
- Interval control automatic initiate descriptors (AIDs) used in the task are preserved by means of deferred work elements (DWEs) until the next syncpoint.
- Data is maintained to show:
  - What terminal traffic has occurred during the task
  - Whether a syncpoint has been passed
  - Whether or not the current activation of the task is the result of a restart.

If a transaction abends, but before backout has been attempted, the DFHREST module may be invoked to decide whether or not the task is to be restarted. Even if the DFHREST module decides that the transaction can be restarted, CICS may overrule the restart, for example because of a transaction backout failure.

DFHREST is invoked by DFHXMTA passing a parameter list via a COMMAREA that is mapped by the DFHXMRSD DSECT. DFHREST should return to DFHXMTA, indicating whether or not the transaction should be restarted. If the DFHREST module requests a restart, and CICS does not overrule this decision, the principal facility is not released and the principal facility owner reattaches a new task to restart the transaction.

Notes:

1. The DFHREST module can invoke CICS facilities such as file control and transient data, via the command-level interface.
2. If an error occurs while linking to, or in, the transaction restart program, the restart is not attempted for this task.
3. The DFHREST module runs before backout.

Control blocks

CICS supplies a description of the transaction restart program commarea, in Assembler-language, COBOL, PL/I, and C, which maps the layout of the parameter list passed between DFHXMTA and DFHREST. The parameter list contains information that helps you code the DFHREST module to determine whether a restart should be requested for a task.

For a detailed description of this control block, see the *CICS Data Areas*.

Modules

DFHREST is a skeleton user-replaceable module that you can modify.

Exits

Global user exit points are not relevant for this function.

Trace

Trace point IDs are not relevant for this function.

Statistics

CICS keeps a count of the number of times that each transaction has been restarted.

Chapter 95. Transaction routing

Transaction routing allows one CICS system to run a transaction in another CICS system. The transaction routing facility enables a terminal operator to enter a CICS transaction code into a terminal attached to one CICS system, and thereby start a transaction on another CICS system in a different address space in the same processing system or in another system.

There are two cases of transaction routing:

- Advanced program-to-program communications (APPC); that is, LU6.2
- Non-APPC (for example, LU2).

APPC transaction routing makes use of much of the non-APPC function, and there is often considerable overlap between the function provided by modules for each of the two cases.

The *CICS Intercommunication Guide* gives a detailed description of transaction routing.

Design overview

Figure 109 shows the overall design of this component.

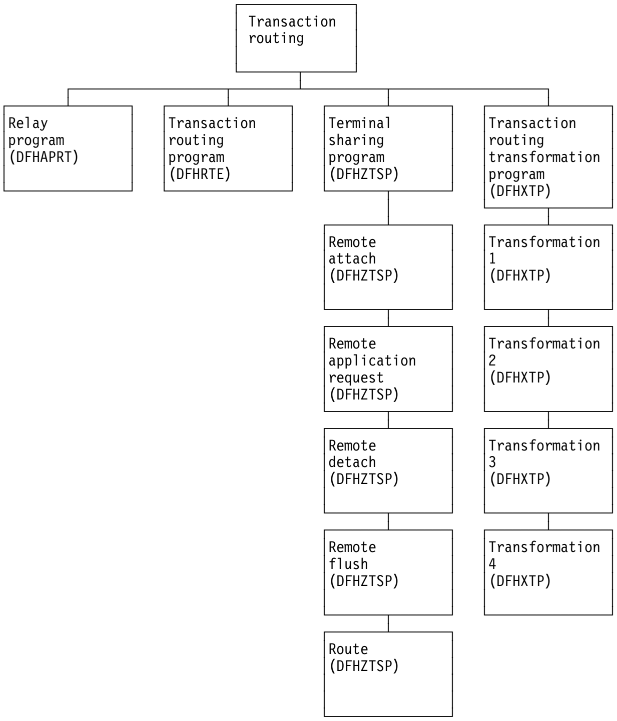

Transaction routing
Relay program (DFHAPRT)
Transaction routing program (DFHRTE)
Terminal sharing program (DFHZTSP)
Transaction routing transformation program (DFHXTP)
Remote attach (DFHZTSP)
Remote application request (DFHZTSP)
Remote detach (DFHZTSP)
Remote flush (DFHZTSP)
Route (DFHZTSP)
Transformation 1 (DFHXTP)
Transformation 2 (DFHXTP)
Transformation 3 (DFHXTP)
Transformation 4 (DFHXTP)

Figure 109. Transaction routing

CICS executes the CICS relay program DFHAPRT (which invokes the user-replaceable dynamic transaction routing program) as follows:

- When a transaction defined with the value DYNAMIC(YES) is initiated.
- When a transaction definition is not found and CICS uses the special transaction defined on the DTRTRAN system initialization parameter. (For more information about DTRTRAN, see the *CICS System Definition Guide*.)
- Before routing a remote, terminal-oriented, transaction initiated by ATI.
- If an error occurs in route selection.
- At the end of a routed transaction, if the initial invocation requests re-invocation at termination.

If CICS has been generated with the appropriate options for intercommunication, the initialization of CICS with the ISC=YES system initialization parameter specified causes the following modules to be loaded:

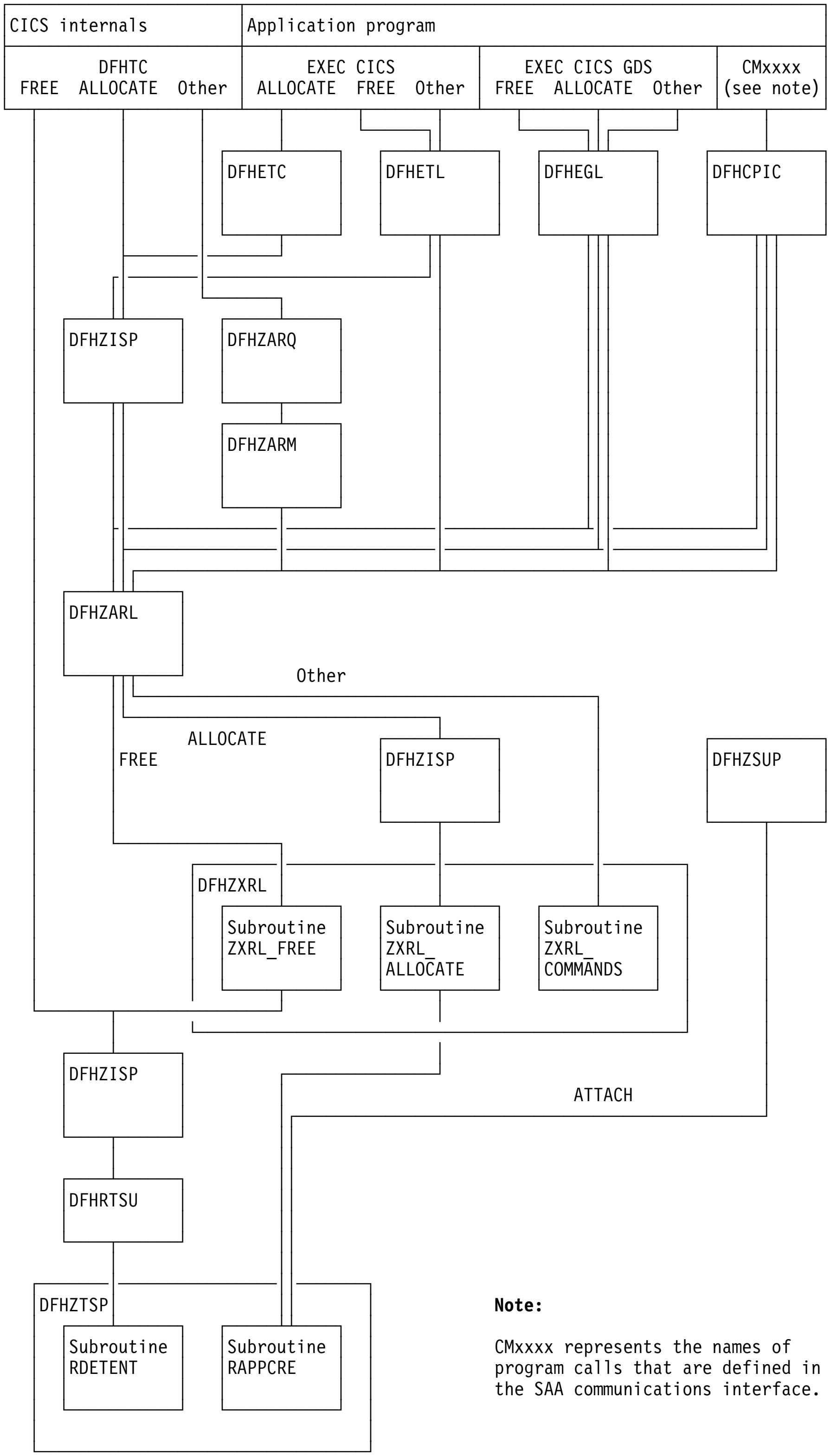
- DFHXTP (transaction routing data transformation program)
- DFHZCXR (which includes the DFHZTSP CSECT, the terminal sharing program).

The entry point addresses of these modules are contained in the optional features list that is addressed by CSAOPFLA in the CSA.

The rest of this section is mainly concerned with APPC transaction routing, which occurs when an APPC device is linked through an LU6.2 session to a transaction that is defined as remote.

Overview of operation in the application-owning region for APPC transaction routing

Figure 110 on page 654 shows the modules in the application-owning region for transaction routing for APPC devices.



Note:

CMxxxx represents the names of program calls that are defined in the SAA communications interface.

Figure 110. Transaction routing for APPC devices. Modules in the application-owning region.

APPC control blocks: A remote APPC device is defined in the application-owning region with a remote terminal control table system entry (or remote system entry). There are no TCT mode entries or session TCTTE entries associated with the remote system entry when it is defined.

A session with the remote APPC device is represented by a surrogate session TCTTE (or surrogate session entry). The surrogate is built dynamically when the conversation between the systems is initiated, and is deleted when the conversation terminates.

Figure 111 shows the way in which the TCT entries are related.

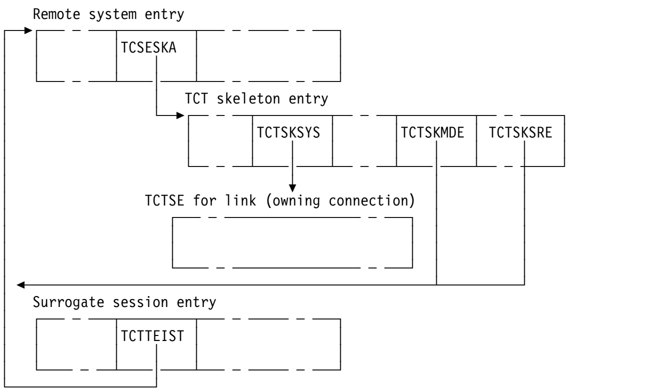


Figure 111. Transaction routing for APPC devices. TCT control-block structure in the application-owning region.

Remote system entry: The remote system entry is similar to a normal system entry and, together with the TCT skeleton entry, also includes the following information:

- SYSIDNT of the terminal-owning region (TCTSKSYS)
- SYSIDNT of remote APPC device (local name) (TCTSKID)
- REMOTENAME of APPC device (SYSIDNT on terminal-owning region) (TCTSKHID)
- NETNAME of remote APPC device (TCSESID).

The remote system entry may be defined explicitly with CEDA DEFINE and INSTALL commands.

Alternatively, it is installed dynamically when the first transaction is routed from the remote APPC device. In this case, all data required to build the system entry is included in the initial ATTACH data stream from the application-owning region. No INQUIRE or INSTALL data is sent.

The remote system entry is recorded on the catalog and recovered after warm start and restart. It is located by TMP in the REMOTE domain and SYSTEM domain.

Surrogate session entry: The session between the terminal-owning region and the APPC device is represented in the application-owning region by a surrogate session entry. The surrogate session entry is used to support the routing of commands to the APPC device, and to record security and status information for the conversation.

A surrogate session entry cannot be defined by the user; instead it is created when the conversation is initiated (by an ATTACH request from the APPC device, or an ALLOCATE request from the application-owning region), and is deleted when the conversation ends.

The surrogate session entry is not recorded on the catalog, is not accessible via TC LOCATE, and does not have an entry in the TMP index. It is not recovered after warm start or restart.

CEMT and EXEC CICS INQUIRE or SET commands cannot be used to modify a remote system entry.

DFHZXRL: This module forms a principal part of the transaction routing component for APPC devices. It passes DFHLUC macro requests issued in an application-owning region to the terminal-owning region.

All DFHLUC macro requests cause DFHZARL to be invoked. DFHZARL passes a request to DFHZXRL if the TCTTE address passed is for a surrogate session, and the request is one that DFHZXRL is known to handle (apart from ALLOCATE). ALLOCATE requests are always routed from DFHZARL to DFHZISP. DFHZISP is then responsible for calling DFHZXRL if the system from which a session is to be allocated is found to be remote. Table 104 summarizes this and shows which of the three main routines in DFHZXRL is called. ZXRL_ALLOCATE, ZXRL_COMMANDS, and ZXRL_FREE are described in “ALLOCATE processing in the application-owning region” on page 657, “Other LU6.2 command processing in the application-owning region” on page 658, and “FREE processing in the application-owning region” on page 658 respectively.

Table 104. DFHZXRL’s processing of DFHLUC requests

DFHLUC request	DFHZXRL’s caller	DFHZXRL routine called
ALLOCATE	DFHZISP	ZXRL_ALLOCATE
ISSUE-ABEND ISSUE-ATTACH ISSUE-CONFIRMATION ISSUE-ERROR ISSUE-SIGNAL RECEIVE SEND WAIT EXTRACT-PROCESS	DFHZARL	ZXRL_COMMANDS
FREE	DFHZARL	ZXRL_FREE

The input and output for DFHZXRL is provided by means of the LUC parameter list, that is, the parameter list which is built by the DFHLUC macro. DFHZARL passes the LUC parameter list to DFHZXRL unaltered. If the LUC parameter list previously contained only the SYSID name, DFHZISP adds the address of the remote system entry to the LUC parameter list before passing it to DFHZXRL.

DFHZXRL calls routine RAPPCRE of DFHZTSP to build the surrogate TCTTE representing the session with the APPC device, and DFHZISP calls routine RDETENT to free it.

ATTACH processing in the application-owning region: The following describes how a transaction is attached in the application-owning region when the attach request has been routed from the terminal-owning region.

DFHZSUP module

1. Issues DFHSEC TYPE=CHECK,RESTYPE=TRAN to validate transaction security against the security values associated with the intersystem link at bind time.
2. Processes the incoming attach FMH5.

   For an LU6.2 ISC connection:

   - Sets the TCTTE to indicate a mapped or unmapped conversation.
   - Validates synclevel requested in FMH5 against the value negotiated at bind time.
   - Moves the TPN from the FMH5 to the TCA extension.
   - Performs attach-time security processing, as defined by the ATTACHSEC parameter in the resource definition for the LUC CONNECTION to the terminal-owning region. This may change the security values associated with the link from the bind-time established values that were checked in step 1) to user-level values, obtained from the SNT for a userid specified in the FMH5.

   For an MRO connection:

   - Issues DFHZIRCT FN=ZSUP to extract the USERID and UOW-ID from the LU6.2 style FMH5.
   - Performs attach-time security processing, as defined by the ATTACHSEC parameter in the resource definition for the LUC CONNECTION to the terminal-owning region. This can change the security values associated with the link from the bind-time established values that were checked in step 1) to user-level values, obtained from the SNT for a userid specified in the FMH5.
   - Deletes the LU6.2-style FMH5 from the front of the data stream.
3. Issues DFHZUSRM TYPE=SET,REQUEST=ATTACH_INBOUND and DFHLUC TYPE=INIT-CALL macros to move input data into a buffer bypassing the FMH5 ATTACH header.
4. PIP processing is bypassed because PIP is never present on an attach from a terminal-owning region when transaction routing.
5. Puts the remaining data into a TIOA with a DFHTC TYPE=(READ,WAIT),NOATNI=YES.
6. Issues a DFHIS TYPE=RATT, to call DFHZTSP to build a surrogate session entry to represent the session TCTTE in the terminal-owning region.
7. Assign the security values established for the link to the surrogate, as preset security values are shipped from the terminal-owning region, and cannot be defined on the application-owning region.

   ATTACH security processing in DFHZSUP has established two SNTTEs associated with the link session:

   a. The SNTTE pointed to by TCTELSNT in the LU6.2 extension or TCTEIRSN for MRO represents link-level security values established at bind time.
   b. The SNTTE pointed to by TCTTESNT represents user-level security values established during ATTACH security processing.

   TCTTESNT is copied to the surrogate TCTTE. No provision is made for preset user security values to override the TCTTESNT value.

   Preset security values defined for the terminal session on the terminal-owning region are processed only on that system, during local attach processing. The SNTTE then associated with the local TCTTE is used to build the routed attach FMH5.

   At transaction end, no SNTTEs addressed by the surrogate are deleted when the surrogate is deleted. This is done, if necessary, as part of the termination of the LINK SESSION.

   Each system in a "daisy chain" imposes its own link security requirements. An intermediate system with a lower level of security would route the ATTACH with lower security (that is, no USERID or verified bit) which could cause it to be rejected by the next system in the chain.
8. Passes control to the requested application program.

DFHZTSP module

1. Performs initialization housekeeping, checks the link TCTTE and TIOA.
2. Locates remote system entry from the TMP REMOTE domain. If not found, attaches the CITS transaction (DFHZATS) to install it.
3. Builds surrogate session TCTTE.
4. Gets a TIOA and chains it to the surrogate.
5. Issues DFHIS TYPE=XTP,XFNUM=2 to call DFHXTP.
6. Chains surrogate to TCA and Link TCTTE.
7. Copies link operator dispatching priority from the link and establishes dispatching priority for the surrogate.

DETACH processing in the application-owning region: At transaction end, routine RDETENT of DFHZTSP is called to delete the surrogate session entry. The remote system entry is not deleted, and can be used by a subsequent transaction routing request, by an ATI request, or by an ALLOCATE request issued in the application-owning region.

ALLOCATE processing in the application-owning region: A session can be allocated as a result of either of the following macro calls:

- DFHLUC TYPE=ALLOCATE
- DFHTC TYPE=ALLOCATE

The DFHLUC call invokes DFHZARL, which passes control to DFHZISP, the module that handles allocation and freeing of sessions. The DFHTC call invokes DFHZISP directly.

DFHZISP locates the TCTSE for the system identified on the ALLOCATE request.

The request is routed to DFHZXRL if the following conditions hold:

- The system is LU6.2
- The system is remote
- DFHZISP was called as a result of a DFHTC TYPE=ALLOCATE request (which is the case when DFHZISP is called from DFHZARL).

The address of the remote TCTSE is inserted in the parameter list passed to DFHZXRL.

If a Privileged Allocate request is made, the transaction abends, because the request is not permitted for a remote system.

DFHZXRL module: For an ALLOCATE request, control passes to subroutine ZXRL_ALLOCATE which establishes a session between the application-owning region and the alternate facility, and builds a surrogate session TCTTE.

Subroutine ZXRL_ALLOCATE:

1. Checks that the parameter list contains the TCTSE address for the remote LU6.2 system.
2. Obtains the address of the TCTSE of the system to which the LU6.2 commands are to be routed.
3. Allocates a session to the terminal-owning region.

   The connection between the terminal-owning region and application-owning region which supports remote alternate facilities may be an LU6.2 ISC connection or an MRO connection. Subroutine ZXRL_ALLOCATE allocates the session using a DFHTC TYPE=ALLOCATE macro call that can allocate a session on either type of connection.

   The default profile DFHCICSR is used; this may specify the modename for an LU6.2 connection. The modename specified on the EXEC CICS ALLOCATE is not used here, but is shipped to the terminal-owning region where it is used to allocate an LU6.2 session between the terminal-owning region and the APPC device.

   The queuing option (NOQUEUE|NOSUSPEND) specified on the ALLOCATE request by the caller is used when the DFHTC TYPE=ALLOCATE macro call is issued for the connection. If NOQUEUE is not specified, the request may also be queued when it is issued in the terminal-owning region. If a session failure occurs during this period, the transaction in the application-owning region and the relay transaction in the terminal-owning region abend.

   If a session between the application-owning region and terminal-owning region cannot be allocated:

   - When the failure is due to CICS logic, corruption of CICS storage, or incorrect resource definition by the user, the transaction abends.
   - When the failure is due to other conditions (such as session failure or 'SYSBUSY'), an appropriate return code is passed to the caller.

     The return code is handled so as to minimize the differences between local and remote APPC devices as seen by the user of the DFHLUC interface. The actions available are:

     – Where the condition could be encountered with a local terminal, reflect the return code to the caller in LUCRCOD2 and LUCRCOD3 with LUCESYSI (X'01') in LUCRCOD1.

     – Where the condition would not occur with a local terminal, reflect a different return code to the caller.
4. Issues a DFHIS TYPE=XTP,XFNUM=3 macro call that invokes a stream that is passed to the terminal-owning region.
5. Issues a DFHTC TYPE=(WRITE,WAIT,READ),FMH=YES macro call to send the request to the terminal-owning region and receive the response.
6. Issues a DFHIS TYPE=RALL that invokes DFHZTSP to build a surrogate session TCTTE, then chains the link session TCTTE and the surrogate session TCTTE together.
7. Issues a DFHIS TYPE=XTP,XFNUM=2 macro call that invokes DFHXTP to unwrap the response from the terminal-owning region and update the surrogate session TCTTE and the parameter list created by the DFHLUC macro.
8. Examines the return codes in the response:

   - If the request has been successful, returns the surrogate session TCTTE address to the caller.

- If the request has not been successful, issues a DFHIS TYPE=RDET macro call to free the surrogate session TCTTE.

FREE processing in the application-owning region: One of the following macro calls is made in the application-owning region to request that a surrogate session TCTTE should be freed:

- DFHLUC TYPE=FREE
- DFHTC TYPE=FREE

The DFHLUC TYPE=FREE call invokes DFHZARL, which passes control to DFHZXRL; and subroutine ZXRL_FREE in DFHZXRL is then called to issue a DFHTC TYPE=FREE request against the surrogate. The DFHTC TYPE=FREE call invokes DFHZISP.

DFHZISP:

1. Bypasses security processing (sign-off) for a surrogate session entry, because the sign-off is performed for the link.
2. Issues the DFHIS TYPE=RDET macro that calls DFHZTSP to free the surrogate and link TCTTEs.

Other LU6.2 command processing in the application-owning region: Most SAA communications calls, EXEC CICS GDS commands, and EXEC CICS commands relating to LU6.2 sessions cause a call to DFHZARL using the DFHLUC macro.

The EXEC CICS SYNCPOINT, EXEC CICS SYNCPOINT ROLLBACK, and EXEC CICS (GDS) ISSUE PREPARE commands are handled under the control of the syncpoint program, which uses DFHLUC macro requests to send syncpoint flows on LU6.2 sessions, and DFHTC macro calls to end any dangling conversations.

DFHTC macro requests: DFHTC macro requests may be issued against surrogate session TCTTEs. Unlike requests for other surrogate TCTTEs, which are passed to DFHZTSP, DFHZARQ handles these requests in the same way as other requests against LU6.2 sessions: they are passed to DFHZARM which in turn calls DFHZARL. Within DFHZARL, requests are handled in a similar way to those initiated by the DFHLUC macro.

DFHLUC requests: DFHLUC requests are passed to DFHZARL: when the session is a surrogate, the request is passed to DFHZXRL (routine ZXRL_COMMANDS).

DFHZXRL module: Input to routine ZXRL_COMMANDS in DFHZXRL is the application command in the form of a DFHLUC macro call parameter list.

1. ZXRL_COMMANDS normally wraps up the command to be shipped and relevant TCTTE fields by calling a transformer routine in DFHXTP.

   However, if the first syncpoint flow has been received, then:

   - Application requests ISSUE-ERROR and ISSUE-ABEND are sent unwrapped on the link session.
   - All other requests are rejected with a state error.
2. ZXRL_COMMANDS tests the state of its link with the terminal-owning region (this may not be the same as the state of the application):

   If it finds that it is in 'RECEIVE' state, it issues a DFHTC TYPE=(READ,WAIT) in order to receive the change direction (CD) indicator from the terminal-owning region. Except during syncpoint processing, however, the session is normally in 'SEND' state when a command is issued.
3. ZXRL_COMMANDS then sends the wrapped-up request to the remote system using the DFHTC macro. To reduce the number of flows when the command may result in the termination of the conversation, the following rules are applied for both MRO and ISC links:

   - If the application command is SEND LAST WAIT and the application program is in 'SEND' state, the command is sent using a DFHTC TYPE=(WRITE,LAST) macro.
   - If the application command is WAIT and the application program is in 'FREE PENDING AFTER SEND LAST' state, the command is sent using a DFHTC TYPE=(WRITE,LAST) macro.
   - If the end bracket (EB) indicator has been sent to the terminal-owning region all other commands result in a state error return code.

   In other cases and when the link between the terminal-owning region and application-owning region is MRO, ZXRL_COMMANDS issues a DFHTC TYPE=(WRITE,WAIT,READ).

   However, when the link is LU6.2, the following additional rules are applied in order to exploit the buffering provided by LU6.2:

   - When the application's command is a SEND and the application is in 'SEND' state ZXRL_COMMANDS, issues a DFHTC TYPE=(WRITE,WAIT) macro to send the request without waiting for a response.
   - When the application's command is a SEND and the application is not in 'SEND' state ZXRL_COMMANDS, issues a DFHTC TYPE=(WRITE,WAIT,READ) so that it can get the state error back from the remote system immediately.
   - For all other commands, including SEND INVITE and so on, ZXRL_COMMANDS issues a DFHTC TYPE=(WRITE,WAIT,READ).
4. ZXRL_COMMANDS receives the response to its DFHTC macro call. This may be:

- An ATNI or ATND abend. ZXRL_COMMANDS frees the link session and returns 'TERMERR' to the application.
- 'SIGNAL', which is used by the terminal-owning region when it is in 'RECEIVE' state to indicate to the application-owning region that there is an abnormal response pending.

  ZXRL_COMMANDS issues a DFHTC TYPE=(WRITE,WAIT,READ) to send the change direction indicator and get the abnormal response from the terminal-owning region.

5. When the DFHTC macro included a READ, and the request was succesfully processed, ZXRL_COMMANDS checks for a wrapped reply from the terminal-owning region, and calls DFHXTP to unwrap the reply. When the resulting DFHLUC parameter list indicates SYNCPOINT or SYNCPOINT ROLLBACK, and the link is an MRO connection, ZXRL_COMMANDS issues a DFHTC TYPE=READ, because there is a SYNCPOINT or ROLLBACK flow pending.

   When there is no wrapped reply, ZXRL_COMMANDS checks for SYNCPOINT ROLLBACK received (the only possibility under these circumstances).

LU6.2 daisy-chaining considerations: There is no special-case code to distinguish between the terminal-owning region and an intermediate system. When DFHZXRT has interpreted a request received from the application-owning region, it issues the LU6.2 service request (DFHLUC) macro call with the parameter list that was created in the application-owning region. The macro generates a call to DFHZARL. If the TCTTE is a surrogate, which is the case in an intermediate system, control passes to DFHZXRL as described above.

Overview of operation in the terminal-owning region for APPC transaction routing

Figure 112 shows the modules in the terminal-owning region for transaction routing for APPC devices.

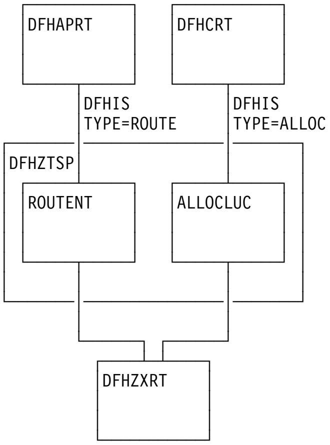


Figure 112. Transaction routing for APPC devices. Modules in the terminal-owning region.

In the terminal-owning region, operation is under the control of a relay program. When transaction routing is initiated from the APPC device, the relay program is DFHAPRT (which is also used for non-APPC devices). When transaction routing is initiated by an ALLOCATE request in the application-owning region, the relay program is DFHCRT. Both relay programs call DFHZTSP, which calls DFHZXRT.

When an APPC device initiates a conversation with an application in the application-owning region, relay program DFHAPRT is started in the terminal-owning region. It calls the ROUTENT routine of DFHZTSP, which allocates a session to the application-owning region and starts the requested transaction there (see "ATTACH processing in the terminal-owning region").

When an application running in the application-owning region initiates a conversation with a remote APPC device by issuing an ALLOCATE request, the DFHCRT relay program is started in the terminal-owning region. It calls the ALLOCLUC routine of DFHZTSP which allocates a session to the APPC device (see Chapter 60, "Program error program" on page 435).

After a conversation has been started by either method, the LU6.2 commands passed from the application-owning region are processed by DFHZXRT, which issues the LU6.2 service request (DFHLUC) macro with an appropriate parameter list against the APPC device.

ATTACH processing in the terminal-owning region: The following flow describes the steps involved in routing a transaction from an APPC device across an LU6.2 intersystem link.

DFHZSUP module

1. Processes the incoming FMH5 from the terminal. This:
   - Sets TCTTE to indicate mapped or unmapped conversation.

- Validates synclevel requested in FMH5 against the value negotiated at bind time.
- Moves the TPN from the FMH5 to the TCA extension.
- Performs attach-time security processing, as defined by the ATTACHSEC parameter in the resource definition for the APPC device (or CONNECTION). This may change the security values associated with the terminal from the default link-level values to user-level values, obtained from the SNT for a user who is signed on.

2. Checks transaction security code against new security levels developed during ATTACH security processing above.
3. Issues DFHSEC TYPE=CHECK,RESTYPE=TRAN to validate transaction security against the security values associated with the terminal (and with the user, if signed on).
4. Issues DFHZUSRM TYPE=SET,REQUEST=ATTACH_INBOUND and DFHLUC TYPE=INIT-CALL macros to move input data into a buffer bypassing the FMH5 ATTACH header.
5. If PIP is present, builds a new TCA extension and moves the PIP data into it by issuing a DFHLUC TYPE=RECEIVE (which also causes the PIP data to be deleted from the buffer).
6. Puts remaining mapped data into a TIOA with a DFHTC TYPE=(READ,WAIT),NOATNI=YES.
7. Issues DFHPC TYPE=XCTL to the relay program DFHAPRT.

DFHAPRT module

1. Drives the dynamic routing exit if the transaction has been defined as dynamic.
2. Sets up the DFHISCRQ parameter list with remote sysid and tranid.
3. Recognizes that the principal facility is an APPC device.
4. Issues DFHIS macro to invoke DFHZTSP.

DFHZTSP module

1. If the transaction has been defined with an associated TRPROF, the profile named is located with a DFHKC CTYPE=PROFLOC; otherwise the default DFHCICSS profile is used.
2. Issues DFHTC TYPE=ALLOCATE,REQUID=CSRR to allocate a session to the remote system using the profile identified in step 1.
3. Flags the returned TCTTE as a relay link and puts the remote sysid into TCTESYID in the terminal TCTTE. If the LINK TCTTE status is 'COLD', issues DFHTC CTYPE=CATALOG.
4. Sets up the transformer parameter list (DFHXTSTG) to indicate ATTACH FMH5 required, COLD or not COLD, and transaction routing for an APPC device, passing the tranid, user TCTTE, and link TCTTE.
5. Issues DFHIS TYPE=XTP,XFNUM=1 to call the transformer program, DFHXTP, to build the data. (See "Transformer program (DFHXTP)" on page 662.)
6. Issues DFHTC TYPE=(WRITE,WAIT,READ) against the link to route the ATTACH request to the application-owning region. This causes DFHZARM (when the link is ISC) or DFHZIS2 (when the link is MRO) to add an LU6.2 FMH5 preceding the LU6.1 FHM5 built by XTP. This contains security data required to validate the request at the application-owning region.

ALLOCATE processing in the terminal-owning region

DFHCRT module: Transaction CXRT (program DFHCRT) is started in the terminal-owning region when the attach FMH5 is received from the application-owning region

Program DFHCRT:

1. Checks that the principal facility of the task is an ISC or MRO session.

   If not, and if it is a terminal, a message is written to the facility, and the transaction terminates.
2. Issues DFHIS TYPE=ALLOC macro which calls DFHZTSP.

DFHZTSP module: The ALLOCLUC routine of DFHZTSP is invoked when the DFHIS TYPE=ALLOC macro is issued. This routine is called with input from the application-owning region in a TIOA.

Routine ALLOCLUC:

1. Issues DFHIS TYPE=XTP,XFNUM=4 which updates the TCTTE and builds a parameter list of the type created by the DFHLUC macro.
2. Verifies that the parameter list contains an ALLOCATE request (the only valid request at this stage). If it does not, the transaction abends.
3. Issues a DFHLUC MF=E macro with the supplied parameter list.
4. If the request is successful, DFHZTSP:
   a. Issues DFHIS TYPE=XTP,XFNUM=1 which wraps the updated TCTTE and DFHLUC parameter list ready for transmission to the application-owning region.
   b. Issues a DFHTC TYPE=(WRITE,WAIT,READ) against the session with the application-owning region.
   c. Passes control to DFHZXRT. The TIOA received with the preceding DFHTC request should contain data for one of the requests that DFHZXRT handles.
5. If the request is unsuccessful, DFHZTSP:

- Issues DFHIS TYPE=XTP,XFNUM=1 which wraps the updated TCTTE and DFHLUC parameter list ready for transmission to the application-owning region.
- Issues DFHTC TYPE=(WRITE,LAST) to send the response to the application-owning region.
- Frees the session with the application-owning region.

FREE processing in the terminal-owning region: When an end-bracket has flowed from the application-owning region to the terminal-owning region as a result of an application command (for example, EXEC CICS SEND LAST), and the corresponding command has been issued in the terminal-owning region against the terminal, DFHZXRT issues a DFHLUC TYPE=FREE macro against the terminal, and a DFHTC TYPE=FREE macro against the link to the application-owning region.

Other LU6.2 command processing in the terminal-owning region: DFHZXRT is called by DFHZTSP following a DFHTC TYPE=(WRITE,WAIT,READ) macro. The reply received from the application-owning region is processed as follows:

1. If an application request has been received, DFHZXRT:
   - Calls DFHXTP to unwrap the application program's request
   - Issues the DFHLUC macro call with the parameter list created in the application-owning region
   - Calls DFHXTP to wrap the response to the DFHLUC macro
   - Sends the response to the application-owning region.

     Normally the wrapped terminal response is sent to the application-owning region with a DFHTC TYPE=(WRITE,WAIT,READ) macro. However, there are exceptions:

     – If the response to the DFHLUC macro call is a request for SYNCPOINT ROLLBACK, DFHZXRT sends the wrapped terminal response with a DFHTC TYPE=WRITE macro and then issues a DFHSP TYPE=ROLLBACK command.

     – If the response to the DFHLUC macro call is a request for SYNCPOINT, DFHZXRT sends the wrapped terminal response with a DFHTC TYPE=WRITE macro and then issues a DFHSP TYPE=PREPARE against the link.

       The response to the macro is processed in the same way as when a SYNCPOINT request is received from the application, and issued to the terminal, except that the roles of the terminal and link are reversed.

     – If the session to the terminal has been freed by an application command, DFHZXRT sends the wrapped terminal response with a DFHTC TYPE=(WRITE,LAST) macro.

     – When the session to the application-owning region is in 'RECEIVE' state, normally DFHZXRT issues a DFHTC TYPE=READ to get the next request from the application.

       However, if the link between the terminal-owning and application-owning regions is LU6.2, and the response to the DFHLUC macro issued to the terminal indicates that the terminal has issued one of ISSUE_SIGNAL, ISSUE_ERROR, ISSUE_ABEND, or SYNCPOINT_ROLLBACK, DFHZXRT issues an ISSUE_SIGNAL against the link with the application-owning region to notify the application-owning region that the terminal-owning region wants to send. It then issues a series of DFHTC TYPE=READ macros until it receives the change of direction indicator.

       The data is processed in the normal way when 'SIGNAL' is received from the terminal. In the other cases, that is, if a negative response is received from the terminal, the data from the application-owning region is purged.

       After the change direction indicator is received, DFHZXRT sends the response to the application-owning region, ISSUE_SIGNAL and ISSUE_ERROR are sent using a DFHTC TYPE=(WRITE,WAIT,READ) macro, ISSUE_ABEND is sent using a DFHTC TYPE=(WRITE,LAST) macro, and SYNCPOINT_ROLLBACK is sent using a DFHTC TYPE=WRITE macro.

     – If the response from the terminal was 'ROLLBACK', by a DFHSP TYPE=ROLLBACK macro is issued.
2. If a syncpoint request has been received, DFHZXRT:
   - Issues a DFHLUC TYPE=ISSUE-PREPARE macro against the terminal TCTTE.
   - Checks the terminal's response:

     If the terminal response indicates that a SYNCPOINT or BACKOUT request was issued, DFHSPP is called.

     If the terminal response indicates that the terminal issued a SEND_ERROR request, DFHZXRT issues a DFHTC CTYPE=ISSUE_ERROR macro followed by a DFHTC TYPE=(WRITE,WAIT,READ) macro against the link session.

     If the terminal response indicates that the terminal issued DEALLOCATE(ABEND), DFHZXRT issues a

DFHTC CTYPE=ISSUE_ABEND macro against the link session. It then frees the link with the application-owning region and returns.

3. If a syncpoint rollback request has been received, DFHZXRT issues a SYNCPOINT ROLLBACK request.

When DFHZXRT detects that EB has flowed on both the session with the terminal and the session with the application-owning region, it issues DFHTC TYPE=FREE on both and returns.

Transformer program (DFHXTP)

The terminal-sharing data-transformation program, DFHXTP, constructs and interprets the data streams flowing between terminal-owning and application-owning regions, for both APPC and non-APPC transaction routing environments.

It does this by using four transformers. These either wrap this data from the surrogate TCTTE (in the AOR) or the real TCTTE (in the TOR) into the link TCTTE's TIOA, or they unwrap this data from the link TCTTE's TIOA into the surrogate or real TCTTE.

The transformers work in matching wrap and unwrap pairs. Transformer 1 wraps any data to be sent from a TOR to an AOR, which is then unwrapped in the AOR by transformer 2. Transformer 3 wraps any data to be sent from an AOR to a TOR, which is then unwrapped in the TOR by transformer 4. Figure 113 shows this process.

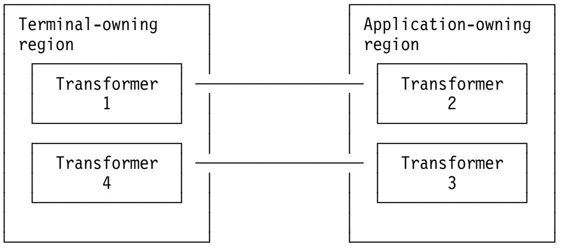


Figure 113. DFHXTP transformer operations

The transformer program is capable of shipping data from the TCTTE and the following control blocks that are chained off the TCTTE:

- The TCTTE extension, chained off TCTTETEA in the TCTTE.
- The terminal partition extension, chained off TCTTETPA in the TCTTE BMS extension.
- The TCTTE user extension, chained off TCTTECIA in the TCTTE.
- The SNTTE, chained off TCTTESNT in the TCTTE.
- The DFHLUC parameter list, and fields chained off it.

  Note that because this field is not chained off the TCTTE but is in LIFO, its address is passed as a parameter to the transformer program.
- The TCA extension for LU6.2 communication.
- Fields from the terminal control table system entry (TCTSE), chained off TCTTEIST in the TCTTE.
- Fields from the terminal control table mode entry (TCTME), chained off TCTTEMOD in the TCTTE.
- The data interchange block (DIB), chained off TCTEDIBA in the TCTTE.

The fields to be shipped are defined in tables in the transformer program.

There is special-case code to deal with fields that cannot be processed by the table-driven code.

For the transaction routing of LU6.2 commands, DFHXTP must ensure that the data stream built for transmission contains all the information relevant to support the issuing of a DFHLUC macro request on the remote system. This information consists primarily of:

- The DFHLUC parameter list
- Any data addressed by the parameter list
- The conversation state machine (TCTEUSRS in DFHTCTZE) in the TCTTE
- TCTTE fields required to build the surrogate TCTTE, in particular:
  - The synclevel supported by the terminal
  - The information returned to the application by the EXTRACT PROCESS command.

Data streams for transaction routing: Figure 114 shows the types of transaction-routing data streams.

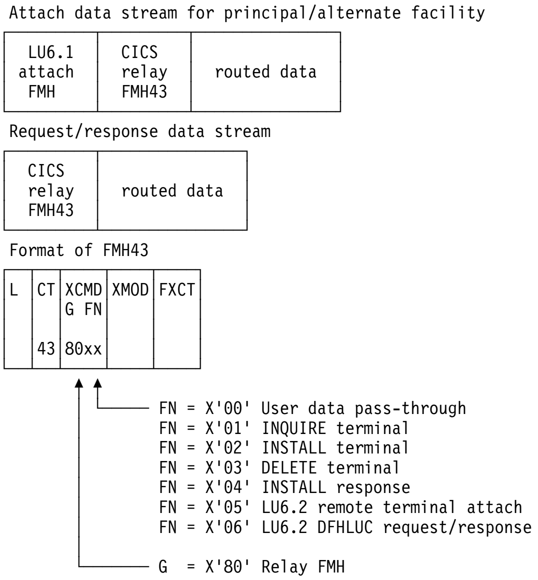

Attach data stream for principal/alternate facility
LU6.1 attach FMH
CICS relay FMH43
routed data
Request/response data stream
CICS relay FMH43
routed data
Format of FMH43
L
CT 43
XCMD G FN 80xx
XMOD
FXCT
FN = X'00' User data pass-through
FN = X'01' INQUIRE terminal
FN = X'02' INSTALL terminal
FN = X'03' DELETE terminal
FN = X'04' INSTALL response
FN = X'05' LU6.2 remote terminal attach
FN = X'06' LU6.2 DFHLUC request/response
G = X'80' Relay FMH

Figure 114. Transaction-routing data streams

The transformer builds four types of data stream for transaction routing:

1. Attach data stream for principal facility
   - Built by transformer 1
   - Shipped from TOR to AOR
   - Unwrapped by transformer 2
   - Contains an LU6.1 attach FMH (FMH5)
   - For LU6.2, the routed data does not contain a DFHLUC parameter list.
2. Attach data stream for alternate facility
   - Built by transformer 3
   - Shipped from AOR to TOR
   - Unwrapped by transformer 4
   - Contains an LU6.1 attach FMH (FMH5)
   - For LU6.2, the routed data contains a DFHLUC parameter list.
3. DFHLUC request data stream
   - Built by transformer 3
   - Shipped from AOR to TOR
   - Unwrapped by transformer 4
   - For LU6.2, the routed data contains a DFHLUC parameter list.
4. DFHLUC response data stream
   - Built by transformer 1
   - Shipped from TOR to AOR
   - Unwrapped by transformer 2
   - For LU6.2, the routed data contains a DFHLUC parameter list.

Note: The first transformer request for remote alternate facilities is to transformer 3, and not to transformer 1. This is because the same transformers are used whether transaction routing is initiated in the terminal-owning region or in the application-owning region.

An LU6.1 attach FMH5 is used when a transaction is to be started in the system to which the request is sent. CSRR is specified as the return process to indicate the use of transaction routing. In the case of routing to the application-owning region, the transaction is the user transaction; in the case of routing to the terminal-owning region, the transaction is the CXRT relay transaction.

Transaction-routed data format: Figure 115 shows the format of the data stream passed between a TOR and an AOR to provide transaction routing from any supported device.

The fields that are shipped depend principally on the type of terminal and on other parameters, as follows:

code	length	data	code	length	data	code	length	data	

Figure 115. Routed data format

The length field in Figure 115 depends upon whether the field type is described in the table that follows as being V (Variable), F (Fixed), or U (Undefined). A V field is 2 bytes in length, an F field is 1 byte, and U indicates a variable that is no longer wrapped or unwrapped if it is encountered.

Table 105 on page 664 shows the various data fields that may appear in a transaction routing data stream, together with their codes and field types.

Table 105 (Page 1 of 2). Transaction routing data stream. Built by the terminal sharing transformer (DFHXTP).

Code	Hex	Type	DSECT	Field	Description
1	01	V		XTPCDTC1	TC request bytes or attach start code
2	02	V		XTPCDOPC	Operator class
3	03	V		XTPCDTUA	TCTTE user area
4	04	V		XTPCDTIA	Terminal I/O area
5	05	V		XTPCDCMA	COMMAREA
6	06	V		XTPCDLPS	Terminal partition set
7	07	V		XTPCDPLM	Page LDC mnemonic
8	08	V		XTPCDPGD	Page data
9	09	V		XTPCDRQI	Request ID
10	0A	V		XTPCDETI	Error terminal ID
11	0B	V		XTPCDETL	Error terminal LDC
12	0C	V		XTPCDMCF	Message control flags
13	0D	V		XTPCDTTL	Message title
14	0E	V		XTPCDRTT	Route target ID: netname.termid.ldc.opid
15	0F	V		XTPCDCPS	Application partition set
16	10	F	DFHTCTTE	TCTTEAID	Automatic initiate descriptor
17	11	F	DFHTCTTE	TCTTECAD	Cursor address
18	12	F	DFHTCTTE	TCTESIDO	Outbound signal data
19	13	F	DFHTCTTE	TCTESIDI	Inbound signal data
20	14	F	DFHTCTTE	TCTE32SF	Screen size attributes
21	15	F	DFHTCTTE	TCTTEFX	Transparency attributes
22	16	F	DFHTCTTE	TCTTEBMN	Map set name
23	17	F	DFHTCTTE	TCTTECRE	Request completion extension
24	18	F	DFHTCTTE	TCTTECR	Request completion analysis
25	19	F	DFHTCTTE	TCTTEDES	TCAM destination name
26	1A	F	DFHTCTTE	TCTTETM	Terminal model number
27	1B	F	DFHTCTTE	TCTTETID	Teller identification for 2980
28	1C	F	DFHTCTTE	TCTTEOI	Operator identification
29	1D	F	DFHTCTTE	TCTTEEDF	EDF mode
30	1E	F	DFHTCTTE	TCTTETC	Nominated transaction
31	1F	F	DFHTCTTE	TCTTETS	Terminal status
32	20	U	DFHSNTTE	SNTESSF	Userid
33	21	F	DFHTCTTE	TCTEASCZ TCTEASCL TCTEASCC	Alternate screen size attributes
34	22	F	DFHTCTTE	TCTE32EF TCTE32E2	3270 extended feature flags
35	23	F	DFHTCTTE	TCTETXTF	3270 text feature flag
36	24	F	TCTTETTE	TCTEAPGL TCTEAPGC	Alternate page size
37	25	F	DFHTCTTE	TCTECSG1 TCTECSG2	Coded graphic character set identifiers
38	26	F	DFHTCTTE	TCTEUSRS	LU6.2 conversation state machine
39	27	F	TCTTELUC	TCTECVT	LU6.2 conversation type (mapped or unmapped)
40	28	F	TCTTELUC	TCTESPL	LU6.2 syncpoint level
41	29	F	DFHTCTTE	TCTESPSA	Additional syncpoint flags
42	2A	F	TCTTELUC	TCTEIAHB	Attach FMH indicator
43	2B	F	DFHTCTSE	TCSESID	NETNAME of APPC device
44	2C	U	DFHSNTTE	SNTENLS	User's national language
45	2D	F	DFHTCTTE	TCTENLS	National Language Support Code
46	2E	F	DFHTCTTE	TCTESCFL	Security flag
47	2F	F	DFHTCTTE	TCTEITRS	Trace flags
48	30	F	DFHTCTME	TCMEMODE	Mode group name
49	31	F	DFHTCTTE	TCTTENLI	National language in use
50	32	F	TCTTELUC	TCTELUC1	LUC flag byte 1
51	33	F	DFHTCTTE	TCTESSPL	Synclevel of link
53	35	F	DFHTCTTE	TCTEVTP	Send mode/receive mode
54	36	F	DFHTCTTE	TCTTEIO	Task to be initiated
55	37	F	DFHLFS	PRESETC	Preset userid
56	38	F	TCTTETTE	TCTTEFMB	Outbound formatting status
57	39	F	DFHTCTTE	TCTEUCTB	UCTRAN = YES
58	3A	F	DFHTCTTE	TCTETSU3	UCTRAN = TRANID
63	3F	F	DFHTCTTE	TCTTETT	Terminal type code
64	40	F	DFHLUCDS	LUCOPN0 LUCOPN1 LUCOPN2 LUCOPN3	LUC request codes
65	41	F	DFHLUCDS	LUCRCODE	LUC request error feedback
66	42	F	DFHLUCDS	LUCSDBLK	LUC conversation feedback
67	43	F	DFHLUCDS	LUCNSYS	System name for LUC Allocate
68	44	F	DFHLUCDS	LUCMODNM	Modename for LUC Allocate
69	45	F	DFHLUCDS	LUCMSGNO	Message number for LUC Abend and Error
70	46	F	DFHLUCDS	LUCSENSE	Sense code for LUC Abend and Error
71	47	F	DFHLUCDS	LUCRQCON	Conversation type for LUC Issue Attach
72	48	F	DFHLUCDS	LUCRQSYN	Syncpoint level for LUC Issue Attach
73	49	F	DFHLUCDS	LUCFTPNL LUCFTPN	TPN for LUC Issue Attach

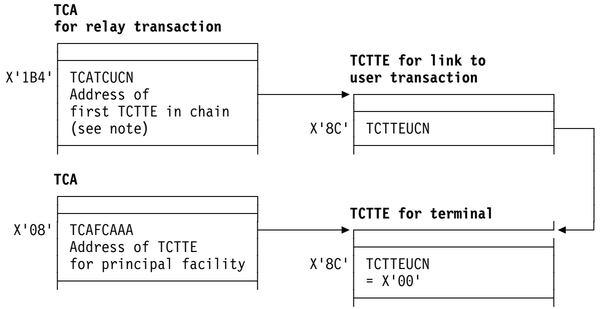
Table 105 (Page 2 of 2). Transaction routing data stream. Built by the terminal sharing transformer (DFHXTP).

Code	Hex	Type	DSECT	Field	Description
74	4A	F	DFHLUCDS	LUCPIP	PIP indicator for LUC Issue Attach
75	4B	F	DFHLUCDS	LUCTAREL	Maximum receivable length for LUC Receive
76	4C	F	DFHLUCDS	LUCMGAL	Mode group name of allocated session
90	5A	F	DFHDIBDS	DIBSENSE	DIB system/user sense data
128	80	V		XTPCDZIR	ZC install response
129	81	V		XTPCDZBP	ZC builder parameter set
130	82	V		XTPCDZIM	ZC install message set
131	83	V		XTPCOPCL	Opclass in routed message
132	84	V		XTPCDPNM	Program name for ISSUE LOAD
133	85	V		XTPLUCSD	Message text for LUC Send
134	86	V		XTPLUCRD	Message text for LUC Receive
135	87	V		XTPLUTCX	TCA extension for LU6.2
136	88	V		XTPLUMSG	Message text for LUC Issue Abend or Issue Error
137	89	V		XTPIPASS	Issue Pass
138	8A	V		XTPLDATA	Logon Data
139	8B	V		XTPRETC	Issue Pass Return Code
140	8C	V		XTPLMOD	Issue Pass Logmode

Control blocks

Relay transaction control blocks

To support transaction routing, the relay transaction owns two TCTTEs; see Figure 116. One TCTTE is for the terminal, the other is for the link to the user transaction. The link TCTTE has bit TCTERLT in field TCTETSU set on, to indicate that it is being used by the relay transaction.



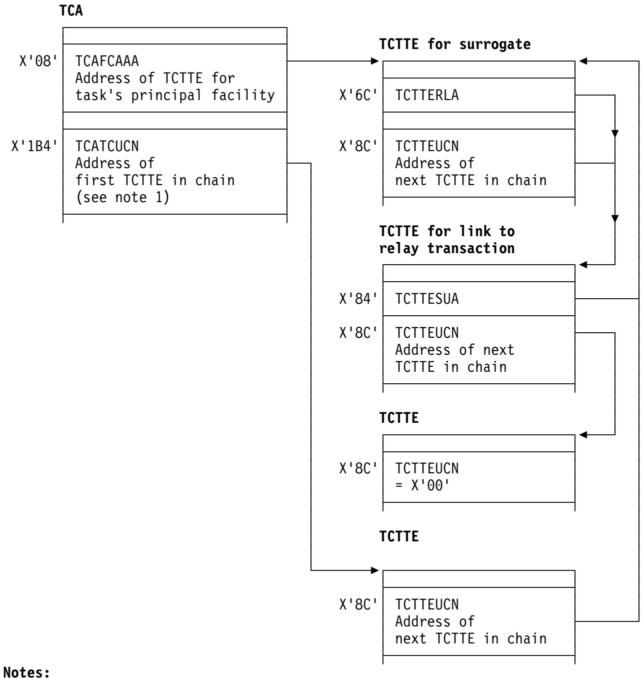
Note:
The first TCTTE in the chain is not necessarily the TCTTE for the task's principal facility.

Figure 116. Control blocks associated with the relay transaction

User transaction control blocks

The user transaction owns two or more TCTTEs; see Figure 117. One TCTTE is always present for the link to the relay transaction, and another TCTTE, called the surrogate TCTTE, represents the terminal TCTTE in the relay transaction address space. Field TCTTERLA in the surrogate TCTTE contains the address of the TCTTE for the link to the relay transaction. Bit TCTESUR (in field TCTETSU) set on indicates that the TCTTE is for a surrogate terminal. The link TCTTE has bit TCTERLX in field TCTETSU set on, to indicate that it is being used as a relay link.

If the user transaction executes CICS functions that are shipped to another address space or processing system, one TCTTE is chained off from the TCA for each different address space or processing system.



Notes:
1. The first TCTTE in the chain is not necessarily the TCTTE for the task's principal facility.
2. Apart from the surrogate and the link to the relay transaction, other TCTTEs can be in use for function shipping or DTP.

Figure 117. Control blocks for the user transaction (non-APPC device)

See the *CICS Data Areas* manual for a detailed description of these control blocks.

Modules

The principal modules associated with transaction routing are as follows:

DFHAPRT is the relay program for non-APPC devices, and for APPC devices when the device initiates a transaction by sending an attach FMH5 to CICS.

DFHCRT is the relay program for APPC devices when CICS sends an attach FMH5 to the device.

DFHRTSU is the program which maintains the state of a surrogate APPC session during syncpoint

DFHXTP is the data transformation program for terminal sharing. It constructs and interprets data streams flowing between terminal-owning and application-owning regions, for both APPC and non-APPC transaction routing environments.

DFHZTSP is the terminal sharing program. It is used by transaction routing for devices of all types, exclusively so for non-APPC devices.

DFHZXRL runs in the application-owning region to route APPC requests to the terminal-owning region.

DFHZXRT runs in the terminal-owning region to receive APPC requests from the application-owning region, and issue them to the APPC device.

Exits

No global user exit points are provided for this function.

Trace

The following point IDs are provided for this function:

- AP DBxx (DFHXTP), for which the trace level is IS 1
- AP 08xx (DFHCRT, DFHZXRL, and DFHZXRT), for which the trace levels are IS 1, IS 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 96. Transient data control

Transient data control provides an optional queuing facility for managing data being transmitted between user-defined destinations (I/O devices or CICS tasks). This function facilitates data collection.

Design overview

The transient data program provides a generalized queuing facility enabling data to be queued (stored) for subsequent internal or offline processing. Selected units of information can be routed to or from predefined symbolic queues. The queues are classified as either **intrapartition** or **extrapartition**.

Intrapartition queues

Intrapartition queues are queues of data, held in a direct-access data set, for eventual input to one or more CICS transactions. Intrapartition queues are accessible only by CICS transactions within the CICS address space. Data directed to or from these internal queues is called intrapartition data. It can consist of variable-length records only.

An intrapartition queue is mapped onto one or more control intervals in the intrapartition data set. The control intervals are allocated to a queue as records are written and freed automatically as they are read or as the queue is deleted.

Examples of the data queued for intrapartition processing are:

- Transactions that require processes to be performed serially, not concurrently. An example of this type of process is one in which pending order numbers are to be assigned.
- Data to be used in a data set (file) update that could pass through the queue to allow the data to be applied in sequence.

Recovery of intrapartition transient data queues: Following abnormal system termination, intrapartition queues defined as recoverable by the user can be restored. Recovery is accomplished by reconstructing the queues from catalog data and from log records written automatically by CICS during normal execution. Two types of recovery are possible: **physical** and **logical**.

Physical recovery of intrapartition transient data queues: Physically recoverable transient data queues are restored to the state they were in when the system terminated abnormally. A physically recoverable transient data queue is not backed out if it has been updated by a unit of work (UOW) that has subsequently failed. Data written to such a queue is always committed and is restored during warm and emergency restarts.

When a UOW reads, writes, or deletes a physically recoverable queue, a log record is written to the system log. When the system is brought up after an abnormal termination, CICS can recreate a queue by retrieving definition information associated with the queue from the catalog, and state data from the log. .

Note: There is an exception to the rule that states that a physically recoverable queue is restored to the state it was in when CICS abnormally terminated. If a UOW reads a physically recoverable queue and CICS then terminates abnormally, the read operation will be backed out when CICS is subsequently brought back up.

Logical recovery of intrapartition transient data queues: Logically recoverable transient data queues are restored to the state they were in at the time they were last syncpointed. All inflight UOWs are backed out. If a UOW updates a logically recoverable queue and subsequently fails, all updates to the queue are backed out. Logically recoverable queues are restored during warm and emergency restarts.

Logically recoverable queues are logged as part of the first phase of syncpoint processing. When CICS is brought up after an abnormal termination, it can recreate logically recoverable queues by retrieving definition information associated with the queue from the catalog, and state data from the log.

Logically recoverable transient data queues can suffer from indoubt failures. If a UOW is indoubt and CICS abnormally terminates, the indoubt UOW environment is recreated when CICS is next brought up. When the indoubt failure is resolved, the UOW is committed or backed out.

Extrapartition queues

Extrapartition queues are sequential data sets on tape or direct-access devices. Data directed to or from these external queues is called extrapartition data and can consist of sequential records that are fixed- or variable-length, blocked or unblocked.

Data can be placed on an extrapartition data set by CICS for subsequent input to CICS or for offline processing. Sequentially organized data created by other than CICS programs can be entered into CICS as an extrapartition data set. Examples of data that might be placed on extrapartition data sets are:

- System statistics
- Transaction error messages

- Customer data, such as cash payments that can be applied offline.

Indirect queues

Intrapartition and extrapartition queues can be referenced through indirect destinations. This provides flexibility in program maintenance. Queue definitions can be changed, using the CEDA transaction, without having to recompile existing programs.

Automatic transaction initiation

When data is sent to an intrapartition queue and the number of entries (WRITEQs from one or more programs) in the queue reaches a predefined level (trigger level), the user can optionally specify that a transaction be automatically initiated to process the data in that queue.

The automatic transaction initiation (ATI) facility allows a user transaction to be initiated either immediately, or, if a terminal is required, when that terminal has no task associated with it. The terminal processing status must be such that messages can be sent to it automatically. Through the trigger level and automatic transaction initiation facility, an application program can switch messages to terminals. After a task has been initiated, a command in the application program is executed to retrieve the queued data. All data in the queue is retrieved sequentially for the application program.

Trigger transactions may only execute sequentially against their associated queue. When a trigger transaction has been attached, another transaction will not be attached until the first transaction has completed. If a trigger transaction suffers an indoubt failure, (the transaction must be associated with a logically recoverable queue) another trigger transaction cannot be attached until the indoubt failure has been resolved.

Transient data services

The following services are performed by the transient data program in response to transient data commands issued in application programs:

Intrapartition data disposition
Controls and queues data for serially reusable or re-enterable facilities (programs, terminals) related to this partition or region.

Intrapartition data acquisition
Retrieves data that has been placed in a queue for subsequent internal processing.

Extrapartition data acquisition
Enters a sequentially organized data set into the system.

Extrapartition data disposition
Writes fixed- or variable-length data in a blocked or unblocked format on sequential devices, usually for subsequent offline processing.

Automatic transaction initiation
Initiates a transaction to process previously queued transient data when a predefined trigger level is reached.

Dynamic open/close
Logically opens or closes specified extrapartition data sets (queues) during the real-time execution of CICS.

Dynamic allocation and deallocation of extrapartition queues
Extrapartition transient data queues do not have to be predefined in your JCL. They can be created dynamically.

Transient data

This section describes transient data's interfaces.

Intrapartition queues: Figure 118 shows transient data's interfaces for intrapartition queues.

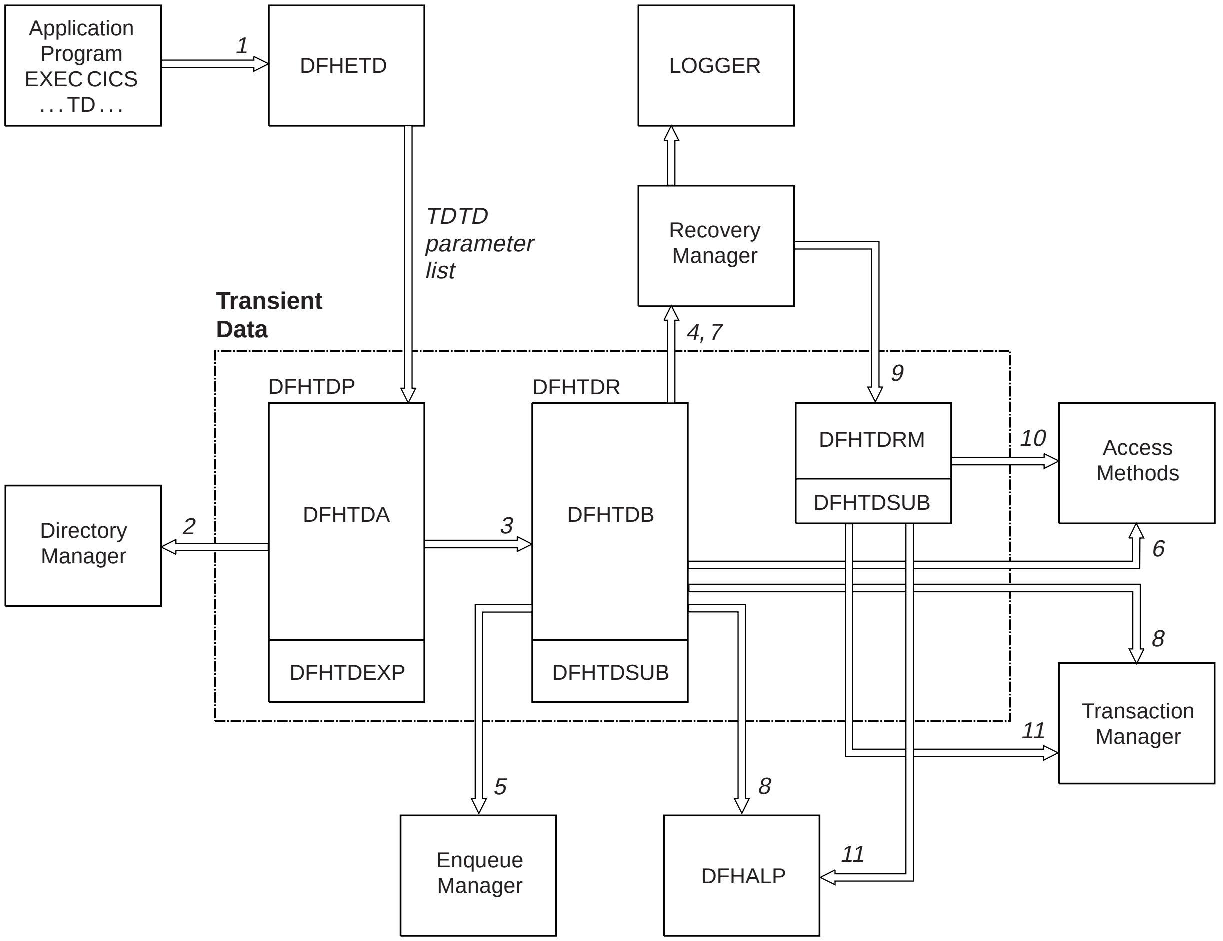


Figure 118. Transient data interfaces for intrapartition queues

Notes:

1. An application program invokes a Transient Data request (WRITEQ TD, READQ TD, or DELETEQ TD). The EXEC interface module, DFHETD is invoked and calls Transient Data using the TDTD CDURUN parameter list.
2. Transient Data locates the target queue using a Directory Manager locate.
3. Assuming that the required queue has been found, the call is passed to the module that handles intrapartition queue requests, DFHTDQ.
4. If the target queue is logically recoverable, Transient Data must tell Recovery Manager it is interested in this UOW by setting its work token in the Recovery Manager’s table.
5. If the target queue is logically recoverable, Transient Data must obtain an enqueue on the appropriate end of the queue by invoking the Enqueue Manager.
6. Data is read from (or written to) the target queue using the appropriate access method. In the case of physically recoverable queues only, the buffers are always flushed and the data set hardened.
7. After the request has completed, Transient Data must log the state of the queue, if the queue is physically recoverable.
8. If the request was a WRITEQ TD request and the target queue was physically recoverable or non-recoverable, the trigger level may have been exceeded. If the trigger transaction is to be associated with a terminal DFHALP is invoked so that the required AID can be scheduled. If the trigger transaction is to be associated with a file, Transaction Manager is invoked to attach the trigger transaction.
9. If a UOW has updated a logically recoverable queue, Recovery Manager invokes Transient Data when the UOW begins syncpoint processing DFHTDRM.
10. Transient Data invokes the appropriate access methods to harden the data set. Finally, Recovery Manager invokes Transient Data once more, detailing whether Transient Data should commit or back out its updates.
11. If the UOW commits the updates. Transient Data attaches a trigger transaction or schedules an AID if the trigger level has been exceeded. DFHALP is invoked if the trigger transaction is associated with a terminal. Transaction Manager is invoked if the trigger transaction is associated with a file.

Extrapartition queues

Figure 119 shows the transient data interfaces for extrapartition queues.

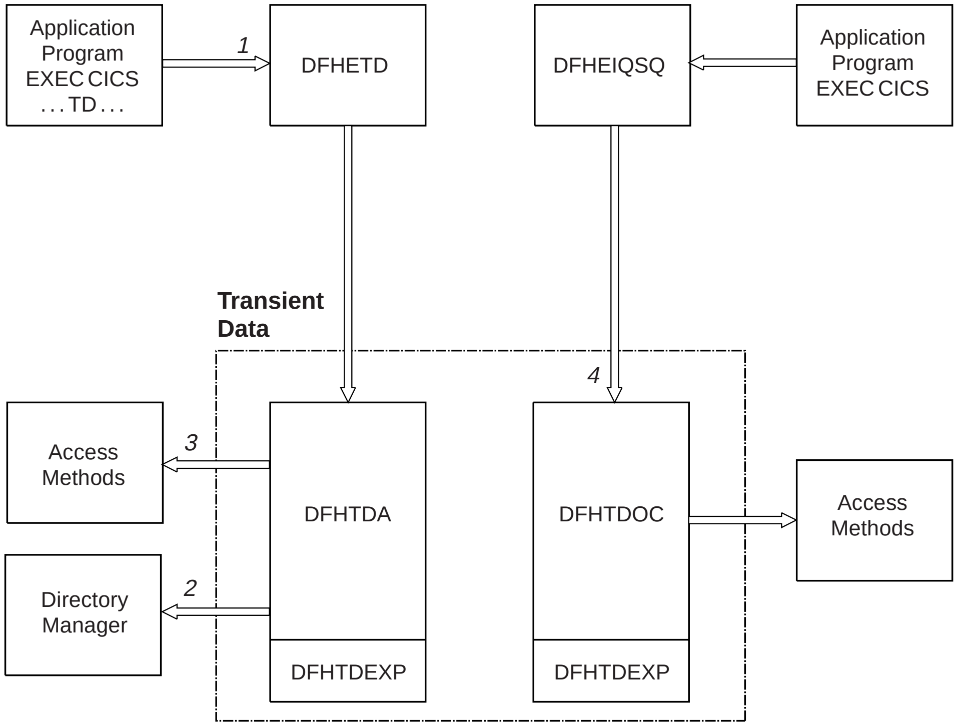


Figure 119. Transient data interfaces for extrapartition queues

Notes:

1. An application program invokes Transient Data services (WRITEQ TD, READQ TD or DELETEQ TD). The EXEC interface module, DFHETD is invoked. DFHETD invokes Transient Data using the TDTD CDURUN parameter list.
2. Transient Data locates the target queue using Directory Manager.
3. The request is passed to the appropriate QSAM routine for processing. QSAM PUT with LOCATE mode is used.
4. If an application program requests that an intrapartition queue be opened or closed, module DFHTDOC is invoked using the TDOC CDURUN parameter list.

Modules

Module	Function
DFHTDP	Provides request analysis and extrapartition processing, RMODE(24)
DFHTDA	Included in load module DFHTDP. Provides request analysis and processing for extrapartition queues
DFHTDEXC	Included in load module DFHTDP. Contains subroutines associated with the processing of extrapartition queues
DFHTDOC	Included in load module DFHTDP. Manages the opening and closing of extrapartition queues
DFHETD	Processes EXEC CICS commands and maps them to the TDTD CDURUN parameter list
DFHTDB	Included in load module DFHTDQ. Processes intrapartition queue requests
DFHTDSUC	Included in load module DFHTDQ. Contains subroutines associated with the processing of intrapartition transient data queues
DFHTDRM	Undertakes syncpoint processing on behalf of Transient Data
DFHTDTM	Manages requests to install, discard, set and inquire on transient data queues

Exits

The following global user exit points are provided for this function: XTDREQ, XTDEREQ, XTDEREQC, XTDIN, and XTDOUT.

See the *CICS Customization Guide* for further information.

Trace

The following point ID is provided for transient data control:

- AP F6xx, for which the trace levels are TD 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 97. User domain

The user domain provides an optional facility for checking user authority to sign on to a terminal.

User domain's specific gates

Table 106 summarizes the user domain's specific gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and whether or not the functions are available through the exit programming interface (XPI).

Table 106. User domain's specific gates

Gate	Trace	Function	XPI
USAD	US 0201	ADD_USER_WITH_PASSWORD	NO
	US 0202	ADD_USER_WITHOUT_PASSWORD	NO
	US 0203	DELETE_USER	NO
	US 0204	INQUIRE_USER	NO
	US 0205	INQUIRE_DEFAULT_USER	NO
		VALIDATE_USER	NO
USFL	US 0501	FLATTEN_USER	NO
	US 0502	UNFLATTEN_USER	NO
	US 0503	TAKEOVER	NO
	US 0504		
	US 0505		
	US 0509		
	US 050A		
	US 050B		
	US 050C		
	US 050D		
	US 050E		
	US 050F		
	US 0510		
	US 0511		
	US 0512		
	US 0513		
USIS	US 0201	SET_USER_DOMAIN_PARMS	NO
	US 0202		
	US 0203		
	US 0204		
	US 0205		
	US 0206		
	US 0207		
	US 0208		
	US 0209		
	US 020A		
USXM	US 0401	ADD_TRANSACTION_USER	NO
	US 0402	DELETE_TRANSACTION_USER	NO
	US 0403	END_TRANSACTION	NO
	US 0404	FLATTEN_TRANSACTION_USER	NO
	US 0405	INIT_TRANSACTION_USER	NO
	US 0406	INQUIRE_TRANSACTION_USER	
	US 0407	TERM_TRANSACTION_USER	
	US 0408	UNFLATTEN_TRANSACTION_USER	
	US 0409		
	US 040B		
	US 040C		
	US 040D		
	US 040E		
	US 040F		

USAD gate, ADD_USER_WITH_PASSWORD function

The ADD_USER_WITH_PASSWORD function of the USAD gate is used to add a user to the CICS region and verify the associated password or oidcard.

Input parameters

USERID is the identifier of the user (a userid of 1 through 10 alphanumeric characters) to be added to the security domain.

USERID_LENGTH is the length of the USERID value.

[PASSWORD] is the current password, 1 through 10 alphanumeric characters, for the userid specified by the USERID value.

[PASSWORD_LENGTH] is the 8-bit length of the PASSWORD value. This parameter is only valid if PASSWORD is also specified.

[NEW_PASSWORD] is a new password, 1 through 10 alphanumeric characters, to be assigned to the userid (specified by the USERID value). This parameter is only valid if PASSWORD is also specified.

[NEW_PASSWORD_LENGTH] is the 8-bit length of the NEW_PASSWORD value. This parameter is only valid if NEW_PASSWORD is also specified.

[OIDCARD] is an optional oidcard (operator identification card); a 65-byte field containing further security data from a magnetic strip reader (MSR) on 32xx devices.

[GROUPID] is an optional identifier, 1 through 10 alphanumeric characters, of a RACF user group to which the userid (specified by the USERID value) is to be assigned.

[GROUPID_LENGTH] is the 8-bit length of the GROUPID value. This parameter is only valid if GROUPID is also specified.

[ENTRY_PORT_NAME] is an optional name of an entry port, 1 through 8 alphanumeric characters, to be assigned to the userid (specified by the USERID value).

[ENTRY_PORT_TYPE] is the type of the optional entry port to be assigned to the userid (specified by the USERID value). It can have either of these values:

```
TERMINAL|CONSOLE
```

This parameter is only valid if ENTRY_PORT_NAME is also specified.

[SCOPE_CHECK] indicates whether or not scope checking is to be performed for this function call. It can have either of these values:

```
YES|NO
```

SIGNON_TYPE is the type of signon for the userid (specified by the USERID value). It can have any of these values:

```
ATTACH_SIGN_ON|DEFAULT_SIGN_ON|IRC_SIGN_ON|
LU61_SIGN_ON|LU62_SIGN_ON|NON_TERMINAL_SIGN_ON|
PRESET_SIGN_ON|USER_SIGN_ON|XRF_SIGN_ON
```

Output parameters

USER_TOKEN is the token identifying the userid in the user domain.

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DEL_TIMEOUT_ENTRY_FAILED, EXTRACT_FAILED, GETMAIN_FAILED
EXCEPTION	ALREADY_SIGNED_ON, PASSWORD_REQUIRED, NEW_PASSWORD_REQUIRED, OIDCARD_REQUIRED, INVALID_USERID, INVALID_PASSWORD, INVALID_NEW_PASSWORD, INVALID_OIDCARD, INVALID_GROUPID, INQUIRE_PW_DATA_FAILED, USERID_NOT_IN_GROUP, UNKNOWN_ESM_RESPONSE, SECURITY_INACTIVE, ESM_INACTIVE, ENTRY_PORT_NOTAUTH, APPLICATION_NOTAUTH, USERID_REVOKED, GROUP_ACCESS_REVOKED, SECLABEL_CHECK_FAILED, ESM_TRANQUIL

USAD gate, ADD_USER_WITHOUT_PASSWORD function

The ADD_USER_WITHOUT_PASSWORD function of the USAD gate is used to add a user to the CICS region *without* verifying any password or oidcard.

Input parameters

USERID is the identifier of the user (a userid of 1 through 10 alphanumeric characters) to be added to the security domain.

USERID_LENGTH is the 8-bit length of the USERID value.

[APPLID] is the application identifier for the CICS region.

[ENTRY_PORT_NAME] is an optional name of an entry port, 1 through 8 alphanumeric characters, to be assigned to the userid (specified by the USERID value).

[ENTRY_PORT_TYPE] is the type of the optional entry port to be assigned to the userid (specified by the USERID value). It can have either of these values:

`TERMINAL|CONSOLE`

This parameter is only valid if ENTRY_PORT_NAME is also specified.

[GROUPID] is an optional identifier, 1 through 10 alphanumeric characters, of a RACF user group to which the userid (specified by the USERID value) is to be assigned.

[GROUPID] is the RACF user group to which the userid (specified by the USERID value) is to be assigned.

[GROUPID_LENGTH] is the 8-bit length of the GROUPID value. This parameter is only valid if GROUPID is also specified.

[LOGIN_CONTEXT] is a token identifying the context of the user's login attempt (for example, whether the user was already logged in).

[SCOPE_CHECK] indicates whether or not scope checking is to be performed for this function call. It can have either of these values:

`YES|NO`

SIGNON_TYPE is the type of signon for the userid (specified by the USERID value). It can have any of these values:

```
ATTACH_SIGN_ON|DEFAULT_SIGN_ON|IRC_SIGN_ON|
LU61_SIGN_ON|LU62_SIGN_ON|NON_TERMINAL_SIGN_ON|
PRESET_SIGN_ON|USER_SIGN_ON|XRF_SIGN_ON
```

[SUSPEND] indicates whether a wait during add user processing is acceptable. It can have either of these values:

`YES|NO`

[UUID] is the unique universal ID (UUID) for the user.

Output parameters

USER_TOKEN is the token identifying the userid in the user domain.

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

`OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED`

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	DEL_TIMEOUT_ENTRY_FAILED, EXTRACT_FAILED, GETMAIN_FAILED
EXCEPTION	ALREADY_SIGNED_ON, APPLICATION_NOTAUTH, ENTRY_PORT_NOTAUTH, ESM_INACTIVE, ESM_TRANQUIL, GROUP_ACCESS_REVOKED, INVALID_GROUPID, INVALID_USERID, SECLABEL_CHECK_FAILED, SECURITY_INACTIVE, UNKNOWN_ESM_RESPONSE, USER_NOT_LOCATED, USERID_NOT_IN_GROUP, USERID_REVOKED
INVALID	INVALID_FORMAT, INVALID_FUNCTION, INVALID_PARAMETERS

USAD gate, DELETE_USER function

The DELETE_USER function of the USAD gate is used to delete the user from the CICS region.

Input parameters

USER_TOKEN is the token identifying the userid in the user domain.

SIGNOFF_TYPE is the type of signoff for the userid identified by the SECURITY_TOKEN value. It can have any of these values:

```
ABNORMAL_SIGN_OFF|ATTACH_SIGN_OFF|DEFERRED_SIGN_OFF|
DELETE_SIGN_OFF|LINK_SIGN_OFF|NON_TERMINAL_SIGN_OFF|
PRESET_SIGN_OFF|UNFLATTEN_USER_SIGN_OFF|
USER_SIGN_OFF|XRF_SIGN_OFF
```

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ADD_TIMEOUT_ENTRY_FAILED, FREEMAIN_FAILED
EXCEPTION	INVALID_USER_TOKEN, DEFAULT_USER_TOKEN, SECURITY_INACTIVE, ESM_TRANQUIL, ESM_INACTIVE, UNKNOWN_ESM_RESPONSE

USAD gate, INQUIRE_USER function

The INQUIRE_USER function of the USAD gate is used to inquire about the attributes of the user represented by the user token.

Input parameters

USER_TOKEN is the token identifying the userid to the user domain.

[USERNAME] is an optional buffer into which the attributes of the user are placed.

Output parameters

[USERID] is the identifier of the user (a userid of 1 through 10 alphanumeric characters).

USERID_LENGTH is the length of the USERID value.

[CURRENT_GROUPID] is the identifier, 1 through 10 alphanumeric characters, of the current RACF user group to which the userid (specified by the SECURITY_TOKEN value) is assigned.

[CURRENT_GROUPID_LENGTH] is the 8-bit length of the GROUPID value.

[NATIONAL_LANGUAGE] is a three-character code identifying the national language for the userid. It can have any of the values in Table 83 on page 500.

[OPERATOR_CLASSES] identifies the operator classes to which the user belongs. This is a 24-bit value, with each bit determining whether or not the user is a member of that class.

[OPERATOR_IDENT] is the operator identification code, 1 through 3 alphanumeric characters, for the userid.

[OPERATOR_PRIORITY] is the operator priority value, in the range 0 through 255 (where 255 is the highest priority), for the userid.

[TIMEOUT] is the number of minutes, in the range 0 through 60, that must elapse since the user last used the terminal before CICS "times-out" the terminal.

Notes:

1. CICS rounds values up to the nearest multiple of 5.
2. A TIMEOUT value of 0 means that the terminal is not timed out.

[XRF_REFLECTABLE] indicates whether or not you want CICS to sign off the userid following an XRF takeover. It can have either of these values:

YES|NO

[ACEE_PTR] is a pointer to the access control environment element, the control block that is generated by an external user (ESM) when the user signs on. If the user is not signed on, the address of the CICS DFLTUSER's ACEEis returned. If an ACEE does not exist, CICS sets the pointer reference to the null value, X'FF000000'.

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	INVALID_USER_TOKEN

USAD gate, INQUIRE_DEFAULT_USER function

The INQUIRE_DEFAULT_USER function of the USAD gate is used to inquire about the attributes of the default user (specified on the DFLTUSER system initialization parameter).

Input parameters

[USERNAME] is an optional buffer into which the attributes of the default user are placed.

Output parameters

[USERID] is the identifier of the user (a userid of 1 through 10 alphanumeric characters).

USERID_LENGTH is the length of the USERID value.

[CURRENT_GROUPID] is the identifier, 1 through 10 alphanumeric characters, of the current RACF user group to which the userid (specified by the SECURITY_TOKEN value) is assigned.

[CURRENT_GROUPID_LENGTH] is the 8-bit length of the GROUPID value.

[NATIONAL_LANGUAGE] is a three-character code identifying the national language for the userid. It can have any of the values in Table 83 on page 500.

[OPERATOR_CLASSES] identifies the operator classes to which the user belongs. This is a 24-bit value, with each bit determining whether or not the user is a member of that class.

[OPERATOR_IDENT] is the operator identification code, 1 through 3 alphanumeric characters, for the userid.

[OPERATOR_PRIORITY] is the operator priority value, in the range 0 through 255 (where 255 is the highest priority), for the userid.

[TIMEOUT] is the number of minutes, in the range 0 through 60, that must elapse since the user last used the terminal before CICS "times-out" the terminal.

Notes:

1. CICS rounds values up to the nearest multiple of 5.
2. A TIMEOUT value of 0 means that the terminal is not timed out.

[XRF_REFLECTABLE] indicates whether or not you want CICS to sign off the userid following an XRF takeover. It can have either of these values:

YES|NO

[ACEE_PTR] is a pointer to the access control environment element, the control block that is generated by an external user (ESM) when the default user signs on. If an ACEE does not exist, CICS sets the pointer reference to the null value, X'FF000000'.

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

USAD gate, VALIDATE_USERID function

The VALIDATE_USERID function of the USAD gate is used to verify that the specified userid is a valid userid.

Input parameters

[USERID] is the userid to be validated.

[USERID_LENGTH] is the length of the userid to be validated.

Output parameters

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
EXCEPTION	SECURITY_INACTIVE, USERID_NOT_DEFINED, USERID_NOT_DETERMINED

USFL gate, FLATTEN_USER function

The FLATTEN_USER function of the USFL gate is used to flatten the user's security state and place into the FLATTENED_USER buffer provided.

Input parameters

SECURITY_TOKEN is the token identifying the userid.

FLATTENED_USER is the buffer into which the flattened security state is placed.

Output parameters

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, DIR_MANAGER_LOCATE_FAILED, SEC_DOM_FLATTEN_FAILED
EXCEPTION	INVALID_USER_TOKEN, SECURITY_INACTIVE, ESM_INACTIVE, ESM_TRANQUIL, UNKNOWN_ESM_RESPONSE
INVALID	INVALID_FORMAT, INVALID_FUNCTION, INVALID_FLATTENED_BUFFER

USFL gate, TAKEOVER function

The TAKEOVER function of the USFL gate is used, when an XRF takeover occurs, to obtain the SNSCOPE ENQ resources for those users who could not obtain it during tracking, because the resources were already held by the active region.

Input parameters: None.

Output parameters

RESPONSE is the domains response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FORMAT, INVALID_FUNCTION

USFL gate, UNFLATTEN_USER function

The UNFLATTEN_USER function of the USFL gate is used to unflatten the user security state data in the FLATTENED_SECURITY buffer, and add the userid to the user domain.

Input parameters

FLATTENED_SECURITY is a buffer containing flattened security state data for a userid.

Output parameters

USER_TOKEN is the token identifying the userid in the user domain.

RESPONSE is the domains response to the call. It can have any of these values:

```
OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED
```

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP, DEL_TIMEOUT_ENTRY_FAILED, DIR_MANAGER_ADD_FAILED, DIR_MANAGER_DELETE_FAILED, FREEMAIN_FAILED, GETMAIN_FAILED, SEC_DOMAIN_DELETE_FAILED, SEC_DOM_UNFLATTEN_FAILED
EXCEPTION	ALREADY_SIGNED_ON, APPLICATION_NOTAUTH, ENTRY_PORT_NOTAUTH, ESM_INACTIVE, ESM_TRANQUIL, GROUP_ACCESS_REVOKED, SECLABEL_CHECK_FAILED, SECURITY_INACTIVE, UNKNOWN_ESM_RESPONSE, USERID_NOT_IN_GROUP, USERID_REVOKED, USERID_UNDEFINED
INVALID	INVALID_FLATTENED_BUFFER, INVALID_FORMAT, INVALID_FUNCTION

USIS gate, SET_USER_DOMAIN_PARMS function

At CICS startup, loads information for the user domain from the system initialization table (SIT) into the user state data.

Input parameters

DEFAULT_USERID is the default userid, as 1 through 10 alphanumeric characters.

SIGNON_SCOPE is the scope for which the default userid can be signed on. It can have any of these values:

NONE|CICS|MVSIMAGE|SYSPLEX

DIRECTORY_TIMEOUT_VALUE is the intersystem refresh delay, in the range 0 through 10080 minutes (up to 7 days), for the default userid.

Output parameters

RESPONSE is the domains response to the call. It can have any of these values:

OK|DISASTER

[REASON] is returned when RESPONSE is DISASTER. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP

USXM gate, ADD_TRANSACTION_USER function

The ADD_TRANSACTION_USER function of the USXM gate sets the user characteristics (as security tokens) for a transaction.

Input parameters

[PRINCIPAL_USER_TOKEN] is the optional principal user token representing the characteristics of the principal user of the transaction.

[SESSION_USER_TOKEN] is the optional session user token representing the characteristics of the session user of the transaction.

[EDF_USER_TOKEN] is the optional EDF user token representing the characteristics of the EDF user of the transaction.

Output parameters

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	ALREADY_SIGNED_ON, DUPLICATE_USER, INVALID_USER_TOKEN, NO_INPUT_PARAMETER
INVALID	INVALID_FORMAT, INVALID_FUNCTION

USXM gate, DELETE_TRANSACTION_USER function

The DELETE_TRANSACTION_USER function of the USXM gate deletes the user token of the specified token type for the transaction.

Input parameters

TOKEN_TYPE is the type of user token for the transaction. It can have any of these values:

PRINCIPAL|SESSION|EDF

Output parameters

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	NO_USER_TOKEN
INVALID	INVALID_FORMAT, INVALID_FUNCTION

USXM gate, END_TRANSACTION function

The END_TRANSACTION function of the USXM gate deletes all the user token to security token maps for the transaction.

Input parameters: None.

Output parameters

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, FREEMAIN_FAILED, LOOP
INVALID	INVALID_FORMAT, INVALID_FUNCTION

USXM gate, FLATTEN_TRANSACTION_USER function

The FLATTEN_TRANSACTION_USER function of the USXM gate creates the contents of a FLAT_TRANSUSER buffer from the principal user of the current transaction.

Input parameters

FLAT_TRANUSER is the buffer to be created.

Output parameters

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
INVALID	INVALID_FLAT_TRANSUSER

USXM gate, INIT_TRANSACTION_USER function

The INIT_TRANSACTION_USER function of the USXM gate initializes the transaction for the user characteristics identified by the PRINCIPAL_USER_TOKEN value.

Input parameters

PRINCIPAL_USER_TOKEN is the principal user token representing the characteristics of the principal user of the transaction.

Output parameters

USDOM_TRANSACTION_TOKEN is the user token to be used for reference to user characteristics only. It is treated as the principal user token until the next ADD_TRANSACTION_USER call for the transaction.

PRIORITY is the priority value, in the range 0 through 255 (where 255 is the highest priority), for the user with the token identified by the PRINCIPAL_USER_TOKEN value.

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER, EXCEPTION, or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, GETMAIN_FAILED, LOOP
EXCEPTION	INVALID_USER_TOKEN
INVALID	INVALID_FORMAT, INVALID_FUNCTION

USXM gate, INQUIRE_TRANSACTION_USER function

The INQUIRE_TRANSACTION_USER function of the USXM gate inquires about the user characteristics associated with the transaction identified by the USDOM_TRANSACTION_TOKEN value.

Input parameters

USDOM_TRANSACTION_TOKEN is the user token to be used for reference to user characteristics only.

Output parameters

[USERID] is the identifier of the user (a userid of 1 through 10 alphanumeric characters).

USERID_LENGTH is the length of the USERID value.

[USERNAME] is an optional buffer that contains the attributes of the user.

[CURRENT_GROUPID] is the identifier, 1 through 10 alphanumeric characters, of the current RACF user group to which the user is assigned.

[CURRENT_GROUPID_LENGTH] is the 8-bit length of the GROUPID value.

[NATIONAL_LANGUAGE] is a three-character code identifying the national language for the user. It can have any of the values in Table 83 on page 500.

[OPERATOR_CLASSES] identifies the operator classes to which the user belongs. This is a 24-bit value, with each bit determining whether or not the user is a member of that class.

[OPERATOR_IDENT] is the operator identification code, 1 through 3 alphanumeric characters, for the user.

[OPERATOR_PRIORITY] is the operator priority value, in the range 0 through 255 (where 255 is the highest priority), for the user.

[TIMEOUT] is the number of minutes, in the range 0 through 60, that must elapse since the user last used the terminal before CICS "times-out" the terminal.

Notes:

1. CICS rounds values up to the nearest multiple of 5.
2. A TIMEOUT value of 0 means that the terminal is not timed out.

[XRF_SOFF] indicates whether or not you want CICS to sign off the user following an XRF takeover. It can have either of these values:

YES|NO

[ACEE_PTR] is a pointer to the access control environment element, the control block that is generated by an external user (ESM) when the user signs on. If the user is not signed on, the address of the CICS DFLTUSER's ACEEis returned. If an ACEE does not exist, CICS sets the pointer reference to the null value, X'FF000000'.

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND LOOP
INVALID	INVALID_FORMAT, INVALID_FUNCTION

USXM gate, TERM_TRANSACTION_USER function

The TERM_TRANSACTION_USER function of the USXM gate removes the state information created by an INIT_TRANSACTION_USER function.

Input parameters

USDOM_TRANSACTION_TOKEN is the token that identifies the state data to be removed.

Output parameters

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or INVALID. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, FREEMAIN_FAILED, LOOP
INVALID	INVALID_FORMAT, INVALID_FUNCTION

USXM gate, UNFLATTEN_TRANSACTION_USER function

The UNFLATTEN_TRANSACTION_USER function of the USXM gate adds (by the ADD_USER_WITHOUT_PASSWORD function of the USAD gate) the user defined by the contents of the supplied FLAT_TRANSUSER buffer.

Input parameters

FLAT_TRANUSER is the buffer containing data that defines the user to be added.

[SUSPEND] indicates whether a wait during add user processing is acceptable. It can have either of these values:

YES|NO

Output parameters

PRINCIPAL_USER_TOKEN is the token identifying the userid in the user domain.

[SAF_RESPONSE] is the optional 32-bit SAF response code to the call.

[SAF_REASON] is the optional 32-bit SAF reason returned with SAF_RESPONSE.

[ESM_RESPONSE] is the optional 32-bit ESM response code to the call.

[ESM_REASON] is the optional 32-bit ESM reason returned with ESM_RESPONSE.

RESPONSE is the domains response to the call. It can have any of these values:

OK|EXCEPTION|DISASTER|INVALID|KERNERROR|PURGED

[REASON] is returned when RESPONSE is DISASTER or EXCEPTION. Possible values are:

RESPONSE	Possible REASON values
DISASTER	ABEND, LOOP
EXCEPTION	APPLICATION_NOTAUTH, ENTRY_PORT_NOTAUTH, ESM_INACTIVE, ESM_TRANQUIL, GROUP_ACCESS_REVOKED, INVALID_GROUPID, INVALID_USERID, SECLABEL_CHECK_FAILED, SECURITY_INACTIVE, UNKNOWN_ESM_RESPONSE, USER_NOT_LOCATED, USERID_NOT_IN_GROUP, USERID_REVOKED

User domain's generic gates

Table 107 summarizes the user domain's generic gates. It shows the level-1 trace point IDs of the modules providing the functions for the gates, the functions provided by the gates, and the generic formats for calls to the gates.

Table 107. User domain's generic gates

Gate	Trace	Function	Format
DMDM	US 0101 US 0102 US 0103 US 0104 US 0105 US 0106 US 0107 US 0108	INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN	DMDM
STST	US 0601 US 0602 US 0603 US 0604 US 0605 US 0606 US 0607 US 0608	COLLECT_STATISTICS COLLECT_RESOURCE_STATS	STST

For descriptions of these functions and their input and output parameters, refer to the sections dealing with the corresponding generic formats:

Functions and parameters

Format DMDM—“Domain manager domain’s generic formats” on page 195

Format STST—“Statistics domain’s generic format” on page 521

In initialization processing, performs internal routines to set up the user domain, and gets the initial user options, as for “USIS gate, SET_USER_DOMAIN_PARMS function” on page 675.

For a cold start, the user options come from the system initialization parameters; for any other type of start, the information comes from the local catalog, but is then modified by any relevant system initialization parameters.

User domain also issues console messages during initialization to report whether or not security is active.

In quiesce and termination processing, the user domain performs only internal routines.

Modules

Module	Function
DFHUSAD	Handles the following requests: ADD_USER_WITH_PASSWORD ADD_USER_WITHOUT_PASSWORD DELETE_USER INQUIRE_USER INQUIRE_DEFAULT_USER
DFHUSDM	Handles the following requests: INITIALIZE_DOMAIN QUIESCE_DOMAIN TERMINATE_DOMAIN
DFHUSDUF	US domain offline dump formatting routine
DFHUSFL	Handles the following requests: FLATTEN_USER UNFLATTEN_USER
DFHUSIS	Handles the following requests: SET_USER_DOMAIN_PARMS
DFHUSST	Handles the following requests: COLLECT_STATISTICS COLLECT_RESOURCE_STATS
DFHUSTI	Handles user timeout processing.
DFHUSTRI	Interprets US domain trace entries
DFHUSXM	Handles the following requests: ADD_TRANSACTION_USER DELETE_TRANSACTION_USER END_TRANSACTION INIT_TRANSACTION_USER INQUIRE_TRANSACTION_USER

Exits

No global user exit points are provided in this domain.

Trace

The point IDs for the user domain are of the form US xxxx; the corresponding trace levels are US 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 98. User exit control

User exit control enables the user to run exit programs at selected points in CICS modules in the application domain and in other domains. The exit program can be enabled or disabled dynamically, and useful information can be transferred to a user work area.

This function:

- Controls which exit programs are to run at which exit points. This is generally specified using EXEC CICS commands and can be changed during a CICS run.
- Invokes the specified exit programs when control reaches an exit point in a CICS module, and handles any change in flow indicated by a return code from the user exit program.

Design overview

User exit control provides an interface that allows the user to run exit programs at selected points (known as exit points) in CICS control modules. The exit programs are separate from the control modules and are associated with them dynamically by means of the EXEC CICS ENABLE command. (See the *CICS Customization Guide* for a description of how to use exit programs.)

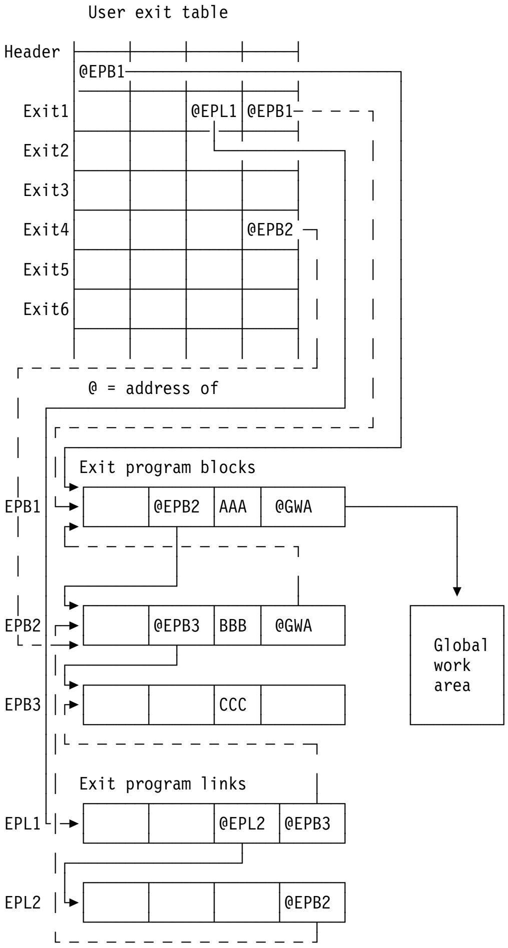
An exit point can have more than one exit program, and an exit program can be shared by more than one exit point. Work areas can be set up for the exit programs, and several exit programs can share a work area. For some exit points, the continuation of the control module can be controlled by a return code.

Each exit point is identified internally by an exit number. The user exit table (UET) contains a UET header and an entry for each exit point, in exit-number order. The UET is addressed from CSAUETBA in the CSA and exists throughout the life of CICS.

Each enabled exit program is represented by an exit program block (EPB). This exists only while an exit program is enabled or while any other exit program is using the work area owned by this exit program. The EPBs are chained together in order of enablement. The UET header points to the first EPB.

Each activation of an exit program for a particular exit point is represented by an exit program link (EPL) which points to the EPB for the exit program. The first EPL for each exit point is contained in the UET entry. If an exit point has more than one exit program, additional EPLs are obtained to represent each subsequent activation. These additional EPLs are chained off the UET entry in order of activation. Thus, for each exit, its EPL chain defines the exit programs that are to be executed at that exit point, and the order of execution.

The user exit interface (UEI) control blocks are illustrated in Figure 120.



Notes:

1. There are three enabled programs: AAA, BBB, and CCC.
2. Program AAA owns a global work area, which is shared by program BBB. The global work area pointer (@GWA) in BBB's EPB points to the EPB of the program owning the shared area, namely AAA's EPB.
3. Exits 1 and 4 are associated with these exit programs.
4. For Exit 1, exit programs AAA, CCC, and BBB have been activated, in that order, as indicated by the EPL chain.
5. Exit program BBB has been activated for exit 4.

Figure 120. UEI control blocks

All user exit programs are executed in the AP domain. When exit programs are activated for exit points in other domains, control is passed from the domain to the AP domain's user exit service module, which creates the necessary environment to invoke the exit programs via the user exit subroutine.

User exit control modules

This section describes the function of the user exit control modules.

DFHUEM (user exit manager): The user exit manager (DFHUEM) processes EXEC commands that are entered by an application program or the command interpreter to control user exit activity. DFHUEM contains three routines, corresponding to the three commands, as follows:

ENABLE

Checks whether an EPB already exists for the exit program specified in the PROGRAM operand.

- If an EPB is not found and the ENTRY operand is not specified, the exit program is loaded, and:
  1. A new EPB is obtained and added to the chain.
  2. The name and entry address of the exit program are placed in the EPB.
  3. If the GALENGTH operand is specified, a work area is obtained, and its address and length are placed in the EPB.
  4. If the GAPROGRAM operand is specified, the address of the EPB for the exit program specified in the GAPROGRAM operand is placed in the new EPB, thus allowing exit programs to share a global work area.
- If the EXIT operand is specified, the EPL chain for the specified exit point is found.
  1. A new EPL is obtained, if necessary, and added to the chain.
  2. The address of the EPB for the exit program specified in the PROGRAM operand is placed in the EPB.
  3. The activation count in the EPB is increased by 1.
  4. If the exit point is not in the AP domain, the domain is notified that the exit point is active.
- If the START operand is specified, the start flag in the EPB is set on.

DISABLE

Finds the EPB for the exit program specified in the PROGRAM operand.

- If the STOP or EXITALL operand is specified, the start-flag in the EPB is set off.
- If the EXIT operand is specified, the EPL chain for the specified exit point is found. The EPL pointing to the EPB for the exit program specified in the PROGRAM operand is removed from the chain and the activation count is reduced by 1.
- If the EXITALL operand is specified:
  1. All EPL chains are scanned.
  2. All EPLs pointing to the EPB for the exit program specified in the PROGRAM operand are removed from its chain.
  3. If the ENTRY operand was not specified when the exit program was enabled, the exit program is deleted.
  4. The EPB is removed from the chain.
  5. If a work area used by the exit program is not still being used by another exit program, it is released.
  6. Any EPB or EPL that is no longer required is moved to a free-chain anchored in the UETH.
- When EXIT or EXITALL is specified for exit points not in the AP domain, the domain is notified when there are no exit programs active.

EXTRACT-EXIT

Finds the EPB for the exit program specified in the PROGRAM operand. The work area's address and length are extracted from this EPB (or from the EPB that owns the work area) and placed in the user's fields specified in the GASET and GALENGTH operands.

DFHUEH (user exit handler): The user exit handler module, DFHUEH, is used to process exit points in the AP domain.

At each exit in a control module, there is a branch to the DFHUEH program. This module scans the EPL chain for that exit and invokes each started exit program in the chain, passing it a parameter list and a register save area. On return from each exit program, the return code is checked and a current return code (maintained by DFHUEH for return to the control module) is set as appropriate.

DFHAPEX (user exit service module): The user exit service module, DFHAPEX, is used to process exit points in domains other than the AP domain.

When an exit point is reached in a non-AP domain, control is passed to the user exit service module (DFHAPEX) in the AP domain, if the domain has previously been notified that there is an exit program activated for the exit point.

The user exit service module constructs the user exit parameter list, using special parameters from the domain, and invokes the user exit subroutine (DFHSUEX).

The return code from DFHSUEX is passed back to the calling domain.

DFHSUEX (user exit subroutine): The DFHSUEX module invokes all started user exit programs for an exit point in a domain (other than the AP domain) by scanning the EPL chain, using the same processing as the user exit handler (DFHUEH). The parameter list defined by DFHAPEX is passed to the exit programs. Return codes from the exit programs are checked and returned to DFHAPEX.

Control blocks

The control blocks associated with the user exit interface are illustrated in Figure 121 on page 684 and listed below. Further information about the control blocks is given in the "Design overview" on page 681 and in Figure 120 on page 681.

The main control blocks are as follows:

UETH User exit table header

UETE User exit table entry—one for every exit point

EPB Exit program block—one for every enabled user exit program, containing information about the location and activity of the program, and any global work area owned or shared by the program

EPL. Exit program link—each EPL indicates one exit program to be invoked at an exit point and which EPL, if any, contains information about the next program to be invoked at that exit point.

See the *CICS Data Areas* manual for a detailed description of these control blocks.

Modules

Module	Function
DFHAPEX	The interface between an exit point in a domain (other than the AP domain) and the AP domain.
DFHSUEX	Handles the invocation of user exit programs at exit points in CICS domains (other than the AP domain). Processing is similar to DFHUEH, passing a parameter list defined in DFHAPEX.
DFHUEH	Links an exit point in a CICS management module in the AP domain and the user code. DFHUEH invokes in turn each started exit program for that exit point, passing a parameter list defined in the CICS management module.
DFHUEM	The EXEC interface processor for the ENABLE, DISABLE, and EXTRACT user exit commands.

Exits

No global user exit points are provided for this function.

Trace

The following point IDs are provided for this function:

- AP D5xx, for which the trace levels are UE 1, AP 1, AP 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

For user exit programs running at an exit point within the AP domain, UE level-1 trace entries are produced.

For user exit programs running at an exit point in a CICS domain other than the AP domain, the UE level-1 trace entries are not produced. Instead, the D5xx trace entries for AP level 1 and AP level 2 are available, providing more information than the UE trace. For AP level 1, the DFHUEPAR parameter list is traced, containing the addresses of fields special to that exit point. For AP level-2 tracing, the contents of the fields are printed, each field being truncated to 200 bytes if necessary.

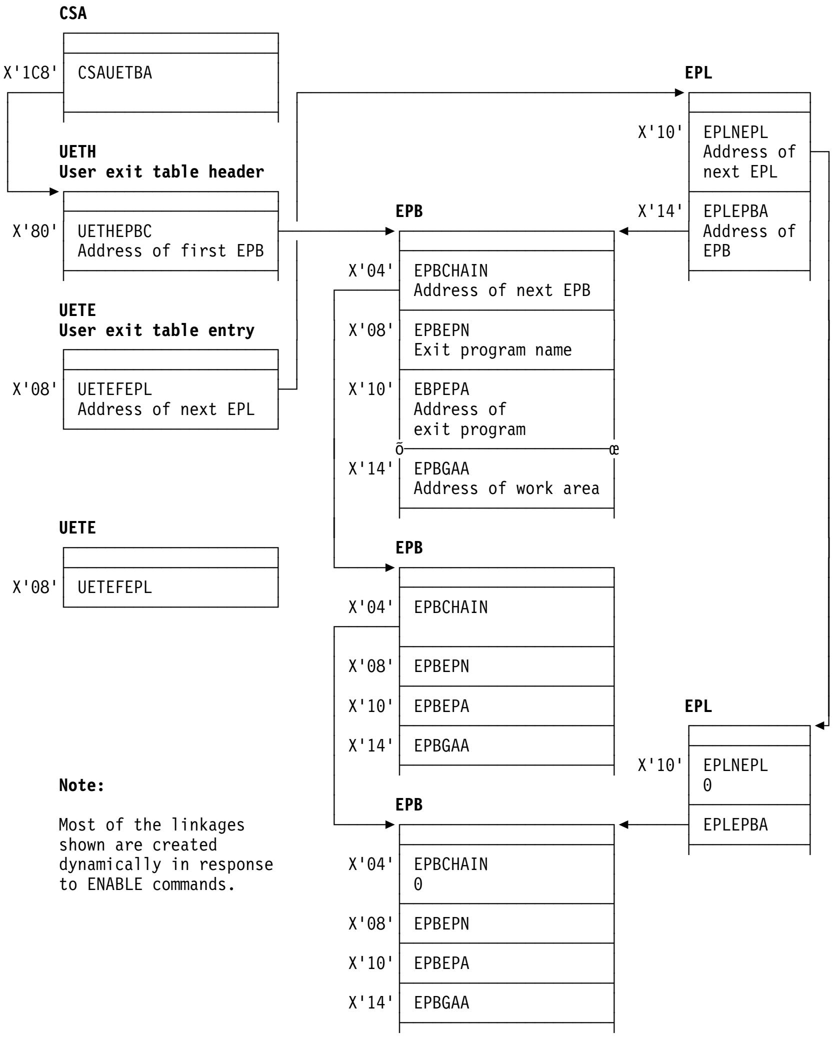


Figure 121. Control blocks associated with the user exit interface

Chapter 99. VTAM generic resource

This section describes how the generic resource support provided by release 4.2 of VTAM is used by CICS.

A CICS system may register as a VTAM generic resource. It may then be known either by its unique applid or by the generic resource name which is shared by a number of CICS systems, all of which are registered to the same generic resource.

For more information about CICS support for VTAM generic resource consult the CICS Release Guide or the CICS Intercommunication Guide. Consult the VTAM Programming Manual for information about generic resource from the VTAM point of view.

Design Overview

If CICS is to register as a generic resource member, the GRNAME system initialization parameter must be specified.

If GRNAME is specified CICS attempts to register immediately after the ACB is open by issuing the VTAM SETLOGON OPTCD=GNAMEADD command.

If registration succeeds, CICS is then a member of the generic resource specified by the SIT GRNAME parameter and may be addressed either by its generic resource name or (subject to certain restrictions) by its unique applid. Use of the generic resource name allows VTAM to balance the workload by selecting whichever generic resource member is most lightly loaded.

If registration fails, CICS initialization continues but CICS will not be a generic resource member.

The registration status may be examined by means of the CEMT INQUIRE VTAM command.

CICS de-registers as a generic resource by means of the VTAM SETLOGON OPTCD=GNAMEDEL command immediately before the ACB is closed.

Generic resource and LU6.1/LU6.2

Although terminals may log on freely using either the generic resource name or the member name this is not the case with LU6.1 and LU6.2 connections which are more restricted in their use of member names.

LU6.2 GR to GR connections

For LU6.2 connections between generic resources the design makes use of LU6.2 autoinstall. Only connections which are intended to issue an ACQUIRE need be defined and these must all have the generic resource name specified as the NETNAME.

Two types of connection are possible.

Generic resource name connections. These are connections which have the generic resource name as the NETNAME. NETNAMEs must be unique and so there can only be one of these per partner generic resource.

Member name connections. These are connections which have the unique applid (member name) as the NETNAME.

Since there can only be one generic resource name connection for each partner generic resource it follows that most connections will be member name connections.

EXEC CICS INQUIRE CONNECTION or CEMT INQUIRE CONNECTION may be used to determine which is the generic resource name and which the member name.

When the first BIND from a different generic resource comes into the SCIP exit (DFHZBLX), a generic resource name connection will be established. If no predefined generic resource name connection exists one will be autoinstalled. Subsequent BINDs coming into DFHZBLX from different members of the same generic resource will cause member name connections to be autoinstalled. A member name connection should never be defined for a member of a different generic resource because this creates the possibility of having two definitions (TCSE's) for the same connected system.

Communications between members of the same generic resource must be by member names only.

Two new bits TCSE_GR and TCSE_GRNAME_CONN have been introduced to indicate the different connection types. They are only valid for LU6.2 connections between generic resources.

The table shows different values of TCTENNAM, TCSESID and TCSEX62N for LU6.2 connections between generic resources, depending on the settings of TCSE_GR and TCSE_GRNAME_CONN.

TCSE_GR	ON	ON
TCSE_GRNAME_CONN	ON	OFF
TCTENNAM	GRname	membername
TCSESID	GRname	membername
TCSEX62N	membername	GRname

LU6.2 GR to non-GR connections

If a single (non-generic resource) system has an LU6.2 connection to a generic resource member it may use either the generic resource name or the member name as the NETNAME.

If the member name is used the initial acquire of the connection must be done by the non-generic resource partner. This means that the generic resource side must not have autoconnect set on. This is because the generic resource partner relies on VTAM to tell it if it is to known by its member name. VTAM does this by setting a bit which is valid for the first BIND only. Sessions can be acquired by either partner once the SNASVCMG sessions have bound.

For these connections TCSE_GR is always set off and TCSE_GRNAME_CONN has no meaning on both systems. The rule here is that TCSESID always contains the NETNAME (as defined in the RDO connection definition) and TCSEX62N always contains the member name (unique applid). The table illustrates this.

TCSE_GR	OFF	OFF
TCSE_GRNAME_CONN	n/a	n/a
RDO_HOSTNAME	GRname	membername
TCTENNAM	GRname	membername
TCSESID	GRname	membername
TCSEX62N	membername	membername

If the generic resource name is to be used, the single system may itself be made into a generic resource allowing it to exploit the design for communications between generic resources. If this is not possible the solution is to use a "hub" or code a generic resource resolution exit to ensure that not more than one member of a generic resource communicates with the single system at any one time using the generic resource name. (The use of "hubs" is described in the CICS Intercommunications Guide).

LU6.1

There is no autoinstall for LU6.1, and so less flexibility is allowed for LU6.1 connections between generic resources. CICS-CICS LU6.1 connections can only communicate by generic resource names and must use a "hub" or a generic resource resolution exit.

TCSE_GR and TCSE_GRNAME_CONN do not apply to LU6.1. For LU6.1 connections with a generic resource the generic resource name is in TCTENNAM and TCSESID and the member name is in TCSEX61N.

Ending affinities

Affinities are records held by VTAM to show it where to direct data flows within a generic resource. Some of these affinities are "owned" by CICS. These are affinities for LU6.2 synclevel 2, LU6.2 limited resources and LU6.1 connections. They may be ended by means of the SET CONNECTION ENDAFFINITY and PERFORM ENDAFFINITY commands.

Generic resource and ATI

This section applies only to those terminals which are logged on using the generic resource name.

When an ATI request is issued in an AOR for a terminal that is logged on to a TOR, CICS uses the terminal definition in the AOR to determine the identity of the TOR to which the request should be shipped. If there is no terminal definition in the AOR, the “terminal-not-known” global user exits (XICTENF and XALTENF) may be used to supply the name of the TOR.

However, if the TOR in question is a member of a generic resource and the user has logged on using the generic resource name, VTAM will have connected the terminal to the generic resource member which was most lightly loaded at the time. If the user then logs off and on again the terminal may be connected to a different generic resource member. If this happens, the TOR which is to receive the ATI request cannot be determined from the terminal definition in the AOR or the “terminal-not-known” user exit.

CICS solves the problem in the following manner:

1. The ATI request is first shipped to the TOR specified in the terminal definition in the AOR (or by the “terminal-not-known” exit). If the terminal is logged on to this TOR (the “first-choice” TOR) the ATI request completes as normal.
2. If the terminal is not logged on to the first-choice TOR, the TOR issues a VTAM INQUIRE OPTCODE=SESSNAME to find which generic resource member, if any, the terminal is now logged on to. This information is passed back to the AOR and the request is then shipped to the correct TOR.
3. If the first-choice TOR is not available, the AOR issues a VTAM INQUIRE OPTCODE=SESSNAME to find where the terminal is now logged on. The INQUIRE is not attempted in the following situations:
    - The VTAM in the AOR is a pre-4.2 version and does not support generic resource.

- The AOR was started with the VTAM system initialization parameter set to NO.

The INQUIRE will not succeed if the TORs and the AOR are in different networks.

If the INQUIRE is successful the ATL request is shipped to the TOR where the terminal is logged on.

Modules

DFHZBLX

DFHZBLX is a new module which has been created to deal with LU6.2 BIND processing. Part of its function was formerly part of DFHZSCX. It is link-edited with DFHZSCX and is still logically part of it, but it returns directly to VTAM, not via DFHZSCX.

There is a new part of the module, apart from that which was once contained in DFHZSCX, which deals with generic resource BIND processing. If CICS is registered as a generic resource and the partner is also a generic resource, DFHZBLX has to decide on the appropriate type of connection. This may be either a generic resource name connection, in which the NETNAME is the partner's generic resource name, or a member name connection, in which the NETNAME is the partner's member name.

DFHZBLX is also responsible for setting the bits in the connection entry which are specific to generic resource.

If CICS is not registered as a generic resource, the generic resource code is not invoked.

DFHZGCH

DFHZGCH is a domain subroutine which is called by DFHEIQSC after one of the following commands.

EXEC CICS SET CONNECTION ENDAFFINITY

CEMT SET CONNECTION ENDAFFINITY

EXEC CICS PERFORM ENDAFFINITY

CEMT PERFORM ENDAFFINITY

Its function is to issue the VTAM CHANGE OPTCD=ENDAFFINITY command.

If the affinity is ended successfully,

> the connection is deleted if it is autoinstalled.
>
> If the connection is defined,
>
> > the generic resource specific information in the connection entry is reset,
> >
> > the catalog entry is updated,
> >
> > the connection is deleted from the TCSM index.

The VTAM return codes are reflected back to DFHEIQSC.

DFHZGIN

DFHZGIN is a domain subroutine.

In a TOR it is called by DFHCRS when a request has been shipped from a remote system, if a terminal cannot be located.

In an AOR it is called by DFHALP when the schedule of an AID fails because the TOR has gone away.

It has two functions:

1. INQUIRE_NQN

   A VTAM INQUIRE OPTCD=NQN is issued to find the fully qualified NETNAME of a terminal given the NETNAME as input. The fully qualified NETNAME is required for INQUIRE OPTCD=SESSNAME.

2. INQUIRE_SESSNAME

   A VTAM INQUIRE OPTCD=SESSNAME is issued to find which member of a generic resource a terminal is logged on to given a fully qualified NETNAME as input.

The following responses are returned to the caller:

- OK - VTAM return code was X'00' fdb2 X'00'
- NOT FOUND - VTAM return code X'14' fdb2 X'88'
- EXCEPTION - The call was rejected for some other reason than not found.

For the exception case an exception trace is written and a message in the range DFHZC0182 - DFHZC0185 is output to the CSNE log giving the VTAM return codes.

Problem solving for generic resource

Trace TC level 1, 2 & exception in the ranges AP FA50-FA59, FAB0-FABA and FB87-FB8F.

Messages DFHZC0170 to DFHZC0185 are written to the console and CSNE logs.

Information output by DFHZNAC following BIND failures.

If a dump is produced examine the generic resource status and generic resource flag bytes.

The following symptoms may indicate that an affinity should be ended and has not been.

- Sessions failing to acquire with message DFHZC2405 "Node not activated". This may also indicate a setup error.
- Sessions failing to acquire with various instances of DFHZC2411. This may also indicate that a rule has been violated.

- CICS fails to register as a generic resource when it has previously been a member of a different generic resource. Message DFHZC0171 is written to the console with VTAM rtncd X'14' fdb2 X'86'.
- Connections autoinstalling unexpectedly. If a non-generic resource is addressing a generic resource member by its member name this may also indicate that the first ACQUIRE was issued from the generic resource side.

Generic resource status byte (TCTV_GRSTATUS)

TCTV_GR_REGD (X'80') This CICS is registered as a member of a generic resource.

TCTV_GR_REGERR (X'40') This CICS attempted to register as a generic resource member (SIT GRNAME parameter specified) but the attempt was rejected by VTAM.

TCTV_GR_NOTAVAIL (X'20') This CICS attempted to register as a generic resource member (SIT GRNAME parameter specified) but the level of VTAM was not 4.2 or above.

TCTV_GR_DREGD (X'08') This CICS was previously a member of a generic resource but has successfully de-registered.

TCTV_GR_DREGERR (X'04') This CICS attempted to de-register as a member of a generic resource by issuing SETLOGON OPTCD=GNAMEDEL but the attempt was rejected by VTAM.

TCTV_GR_NOTAPPL (X'02') The GRNAME system initialization parameter was not specified.

TCTV_GR_NOTREG (X'00') CICS is not registered as a generic resource and has not attempted to register. (Holds this value before registration is attempted, if required.)

Generic resource flag byte (TCSEI_GR)

TCSE_GR (X'80) Both partners are registered as generic resources. Valid from initial acquire to ENDAFFINITY.

TCSE_GR_NAME_CONN (X'40') Set on for a generic resource name connection in which TCSESID contains the generic resource name and TCSEX62N contains the member name.

Set off for a member name connection in which TCSESID contains the member name and TCSEX62N contains the generic resource name.

This bit is only meaningful if TCSE_GR is set on.

TCSE_USE_OUR_MEMBER_NAME (X'20') The partner is using our member name. (An indication that the member name, not the generic resource name must be passed in the BIND).

Waits

TCSE_MSG179_ISSUED (X'10') Message DFHZC0179 has been issued. This message is issued when the secondary SNASVCMG session binds if TCSE_GR is set. It makes clear which is the generic resource name and which the member name of the partner session.

TCSE_CATLG_DONE (X'08') A defined connection with an affinity has been catalogued.

TCSE_MSG177_ISSUED (X'04') Message DFHZC0177 has been issued. This message is output whenever an LU6.2 limited resources, LU6.2 synclevel 2 or LU6.1 connection is acquired. It is output when the secondary SNASVCMG session binds. It is intended to alert the user to the fact that acquiring the connection has caused an affinity to be created and gives the NETNAME and NETID of the partner.

Trace

Trace point ids

- FA50 - FA59

  are provided for problem determination during ENDAFFINITY processing. (Module DFHZGCH)
- FAB0 - FABA

  are provided for problem determination during INQUIRE SESSNAME processing. (Module DFHZGIN)
- FB87 - FB8F

  are provided for problem determination during generic resource registration and de-registration. (Module DFHZGSL)

Module	Type	Resource Name	Resource Type	ECB	Function
DFHZGCH	MVS	CHANGECB	ZC_ZGCH	CHANGECB	Wait for completion of INQUIRE SESSNAME
DFHZGIN	MVS	INQ_ECB	ZC_ZGIN	INQ_ECB	Wait for ENDAFFINITY to complete

Chapter 100. VTAM LU6.2

This section describes the layer of CICS that manages the interface to VTAM for LU6.2 communication. VTAM LU6.2 provides advanced program-to-program communication (APPC) between transaction-processing systems, and enables device-level products (APPC terminals) to communicate with host-level products and with each other. APPC sessions can therefore be used for CICS-to-CICS communication, and for communication between CICS and other APPC systems (for example, AS/400) or terminals.

For information about the CICS functions that you can use to exploit LU6.2 communication, see Chapter 23, “Distributed program link” on page 169, Chapter 24, “Distributed transaction processing” on page 171, Chapter 40, “Function shipping” on page 333, Chapter 43, “Intersystem communication (ISC)” on page 353, Chapter 95, “Transaction routing” on page 653.

Design overview

The main feature that distinguishes LU6.2 from other LU types is the support for parallel sessions i.e. many sessions (and conversations) between the two LUs at the same time. These sessions are further grouped by use of the class of service facility in VTAM. The TCT structure for LU6.2 reflects this. Under the system entry (TCTSE) are a series of mode group entries (TCTMEs). Within a mode group there are a number of sessions represented by terminal entries (TCTTEs).

All the sessions within a mode group have the same transmission characteristics, that is, the same class of service. When a request to ALLOCATE a session is made, a MODENAME can be specified, indicating which class of service is required.

When a session has been allocated and a conversation started, data can be received and sent between the connected LUs. This is more or less directly under the control of the CICS application in the case of DTP, or indirectly under the control of the user for the other ISC facilities.

CICS also supports LU6.2 single session connections. These are represented by a TCTSE, a single TCTME and a single TCTTE. They support the same functions as parallel session connections.

Detailed information about VTAM LU6.2 commands and macros is given in the relevant VTAM manuals.

Session management

Systems Network Architecture (SNA) defines several processes to be used in managing LU6.2 sessions. The CICS implementation provides transaction code for the following Transaction Program Names (TPNs) defined by LU6.2.

- X'06F1' = CHANGE_NUMBER_OF_SESSIONS (CNOS)
- X'06F2' = EXCHANGE_LOG_NAME (XLN)

The required transaction definitions are:

TRANSACTION	XTRANID	PROGRAM
CLS1	X'06F10000'	DFHZLS1
CLS2	X'06F20000'	DFHCLS3

These resource definitions are provided in the DFHISC group.

So that the SNA service transaction programs can always communicate with each other, even when all the sessions between two systems are busy, two extra sessions are always created whenever parallel sessions exist between two systems. CICS generates these two extra sessions (with a reserved MODENAME of SNASVCMG) unless SINGLESESS(YES) is specified for the connection. Only SNA service transaction programs are allowed to use these two sessions.

Change Number Of Sessions (CNOS): When there are parallel sessions between two LU6.2 systems, it is possible to vary the number of sessions available using CEMT or EXEC CICS commands, either for the entire connection, or by modegroup. The number of available sessions for a modegroup is called the SESSION LIMIT. It corresponds to the number of in-service sessions in that modegroup. The two systems must agree on the session limit for a modegroup at any given time. To achieve this, the LU6.2 architecture defines a CNOS service transaction program which runs in each system, communicating with its counterpart using architected CNOS commands and replies. They negotiate the session limit and the numbers of contention winners and losers at each end. For CICS, the CNOS service transaction program is DFHZLS1.

CNOS commands are not required for the SNASVCMG modegroup on parallel session connections, or for single session connections, because the session limits are fixed.

Figure 122 on page 692 shows the flow of control for CNOS operations.

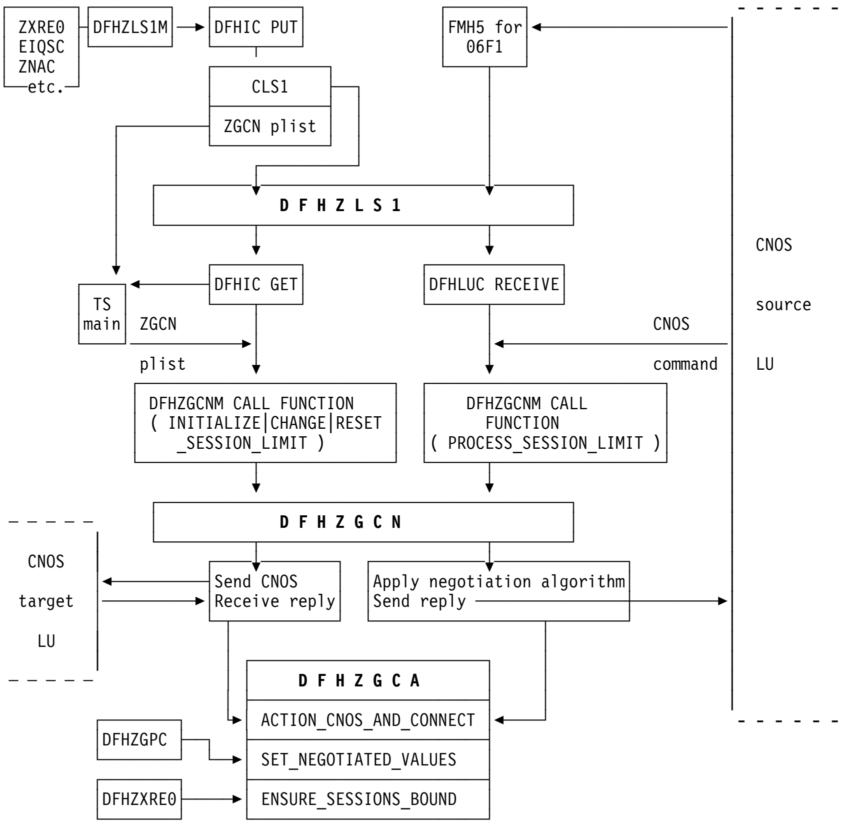


Figure 122. Flow of control for CNOS

Exchange Log Name (XLN): When DFHZNAC determines that it is necessary to exchange log names with a remote system, it starts the syncpoint resynchronization transaction, using the DFHCRERI macro specifying FUNCTION(XLN). The main program for this transaction is DFHCRRSY (in load module DFHLUP). When DFHCRRSY determines that resynchronization is required it will schedule other instances of itself to perform the resynchronization.

When TPN X'06F2' is received from a remote system, DFHCRRSY is called to handle the inbound Exchange Log Names and resynchronization.

LU6.2 session states

The following CICS modules maintain specific states of LU6.2 sessions.

Module	State	Macro
DFHZBKT	SNA bracket state	DFHZBSM
DFHZCNT	Contention state	DFHZCNM
DFHZCHS	Chain state	DFHZCHM
DFHZCRT	RPL_B state	DFHZCRM

These modules are invoked via the macros shown in the last column. Any query or change to the states is performed using these macros.

The LU6.2 states for each session are stored in the TCTTE for that session. The modules and associated TCTTE field are usually referred to as **state machines**. When a module, such as DFHZARL, wants to check that the session is in a suitable state to perform a given operation, it uses the appropriate state machine to perform the check by invoking the CHECK function of the relevant macro. If the operation subsequently causes a change in the state of the session, the SET function of the relevant macro is invoked to record the new state.

LU6.2 SEND and RECEIVE processing

LU6.2 SEND processing is done by DFHZSDL, using POST=SCHED to drive the VTAM exit DFHZSLX asynchronously when the request has been passed to VTAM.

DFHZRVL does LU6.2 RECEIVE processing, issuing the request to VTAM for asynchronous processing which drives the VTAM exit DFHZRLX on completion. DFHZRLX queues completed RPLs for further processing by DFHZRLP to a chain anchored off TCTVRPLQ in the TCT prefix. Entries are removed from the queue by DFHZDSP, and passed to the program designated to process the completed RPL. When authorized path VTAM support is used, the SEND and RECEIVE requests use the CICS high performance option (HPO) routines.

SEND and RECEIVE processing for LU6.2 use different RPLs:

- RECEIVE uses the receive RPL (also known as RPL_B, and addressed by TCTERPLB in the TCTTE LUC extension).
- SEND uses the send RPL (addressed by TCTERPLA in the TCTTE).

There are two exceptions when a SEND uses the receive RPL instead of the send RPL:

1. DFHZSDL sending a response
2. DFHZRLP sending DR1 response via synchronous SEND.

The processing state of the receive RPL is maintained in the LU6.2 RPL_B state machine field (TCTERPBS in the TCTTE LUC extension) by the DFHZCRT module and DFHZCRM macro combination, thus allowing rapid identification of the stage and type of RECEIVE being processed.

LU6.2 state machine transitions for contention, bracket, and chain states are performed via the DFHZCNM, DFHZBSM, and DFHZCHM macros as part of SEND and RECEIVE processing for LU6.2 sessions.

Limited resources

For efficient use of some network resources (for example, switched lines), SNA allows for such resources to be defined in the network as **limited resources**. Whenever a session is bound, VTAM indicates to CICS whether the bind is over a limited resource. Both single and parallel sessions may use limited resources.

The limited resources (LR) function is part of the LU6.2 base option set. When communicating over switched lines, it may be important to stop using this expensive resource as soon as possible. LR provides this facility. A bit in the BIND image is copied into the TCTTE to indicate LR usage. This bit (TCTE_LR) is used to determine whether CICS should UNBIND the link when the TCTTE is freed and no outstanding tasks are using the link.

SNASVCMG (parallel) sessions are not scheduled to be unbound until the initial CNOS exchange has been performed for all mode groups in the connection. They are then treated in the same way as user sessions.

Two bits in the terminal control table are used to reflect LR: TCTE_LR in the terminal entry (TCTTE) and TCSE_LR in the system entry (TCTSE). The following table shows the meanings of the TCTE_LR bit (ON or OFF) in combination with the TCTENIS 'node now in session' bits (YES or NO).

TCTE_LR	TCTENIS	Meaning
ON	YES	Current session over LR
ON	NO	Previous session over LR
OFF	YES	Current session not LR
OFF	NO	Never bound, or previous session not LR

TCSE_LR (in the system entry) is set ON when the first LR session is bound, and OFF as a result of CNOS negotiation to release the connection. If TCSE_LR is ON and there are no bound sessions, the connection state is then 'available'.

Modules

The modules listed below handle the VTAM LU6.2 support in CICS.

Session management state machines
- DFHZBKT
- DFHZCHS
- DFHZCNT
- DFHZCRT

Send and Receive processing
- DFHZRLP
- DFHZRLX
- DFHZRVL
- DFHZSDL
- DFHZSLX

CNOS
- DFHZLS1
- DFHZGCN
- DFHZGCA

Persistent Verification
- DFHCLS3

XLN and Resynchronization
- DFHCRRSY

DFHZRVL

DFHZRVL is invoked to issue an LU6.2 receive specific request to receive:

- Data
- Commands
- Responses
- Purge to end-chain (used by DFHZERH to clear incoming data)
- A single RU.

Two broad categories of RECEIVE data are recognized by CICS; both are processed as RECEIVE_WAIT requests to VTAM:

1. RECEIVE_WAIT, where CICS waits until input is received from VTAM before returning control to the caller. This applies to all RECEIVE response and command requests, and to data requests where the minimum length to be received is greater than zero.
2. RECEIVE_IMMEDIATE, where CICS immediately returns control to the caller without waiting for VTAM to complete the request unless the data is already in the VTAM buffer, in which case it processes the data in the same way as for RECEIVE_WAIT before returning to the caller. This is requested via a minimum length of zero. It

is used by the RECEIVE_IMMEDIATE call for the SAA communications interface, by a LOOK_AHEAD call, and in support of timely receipt of responses, ensuring earlier detection of an ISSUE_ERROR response from the partner LU.

The receive buffer is set up to receive the data, and the address of the receive exit DFHZRLX (driven on completion of the request) is stored into the receive RPL (RPL_B) before the RECEIVE macro is issued to VTAM. DFHZRVL is used by DFHZERH to determine the state of the session.

DFHZRLP

This module completes the LU6.2 receive specific processing for LU6.2 requests.

RECEIVE_IMMEDIATE requests are processed in two phases, that is, on two passes through DFHZRLP:

1. The RPL_B state machine (TCTERPBS) is set to indicate that the RECEIVE has been completed by VTAM; then the exit is taken from DFHZRLP.
2. This phase corresponds to the single phase used for processing RECEIVE_WAIT requests, that is, the requests are checked for successful completion, examined to determine whether data, a command, or a response has been received, and parameters indicating what has been received are then returned to the caller.

Data received: When data is received, DFHZRLP:

1. Sets the bracket and chain state machines, and returns indicators to DFHZARL according to the DFC flags received with the data:
   - Response type
   - CD
   - EC
   - CEB
   - FMH
2. If more data is required, DFHZRLP recalls DFHZRVL via the activate scan routine (DFHZACT) to reissue the RECEIVE, for example when:
   - End-chain has not yet been received, and there is still room in the receive buffer. If the minimum length requested has already been received, the type of RECEIVE is altered from RECEIVE_WAIT to RECEIVE_IMMEDIATE resulting in a READ_AHEAD call in anticipation of there being more data available, and any data already in the VTAM buffer is processed by DFHZRLP before returning to the caller.
   - The original request was for data, and what has been received and processed is a command (only LUSTAT or BIS can validly be processed by DFHZRLP).
3. Returns control to DFHZARL when:
   - Sufficient data has been received for a BUFFER or LL type request.
   - End-chain has been received because of CD, RQD2, or CEB.
   - FMH has been received.
   - The call was incomplete, but insufficient space remains in the receive buffer for further data.

If the data was received with RQD1, a response is sent synchronously by DFHZRLP using the receive RPL.

Command received: When a command is received, the actions of DFHZRLP depend on the command:

- For LUSTAT6 received, the command is treated as data. If BB is included, then an exception response is sent (sense X'0813' or X'0814').
- For BIS received, CLSDST is requested and the receive re-driven.

All other commands are incorrect.

Response received: When a response is received, DFHZRLP:

1. Carries out checks:
   - Does the sequence number match the number of the BB request?
   - If it is a definite response, was it expected?
   - If it is an exception response, was it a session-level error?
2. Sets the state machines.
3. Passes back the return code to the caller.

DFHZSDL

This module issues the SEND request to VTAM to transmit data, commands, and responses on LU6.2 sessions.

DFHZSDL transmits:

- Data from a send buffer or an application area
- The commands:
  – LUSTAT
  – RTR
  – BIS
- Responses.

Data transmission: If a SEND LAST command is issued, any outstanding completed receive RPL is first processed by queuing the TCTTE for RECEIVE processing by DFHZRLP, and any incomplete receive RPL is canceled via RESETSR.

For data transmission, DFHZSDL uses:

LMPEO Large message performance enhancement outbound. VTAM slices large messages into RUs.

BUFFLST Buffer list. VTAM accepts data from non-contiguous buffers.

USERRH User request header. The request header is passed in BUFFLST.

A maximum of two buffer list entries are used. The first buffer list entry addresses the data in the send buffer, and the second the data in the application area.

The request header is built in the first buffer list entry using parameters passed from DFHZARL. If an implicit send was requested, then CD, RQD2, and CEB are not checked. The first-in-chain (FIC) indicator is set after checking the chain state machine, and last-in-chain (LIC) is set whenever CD, RQD2, or CEB is included. Null data sent only-in-chain (OIC) is converted to an LUSTAT6 command. The address of the send exit DFHZSLX is stored in the send RPL, and the VTAM SEND macro is issued. On completion of the SEND request, the bracket and chain state machines are set according to the DFC indicators. These state machines are used extensively by DFHZERH to determine the state of the session before executing an error request.

Command transmission: The LUSTAT6 command is sent with:

- CEB to terminate the BIND_in_bracket state
- Null data for OIC
- CB, RQD1 to BID for bracket.

The RTR command requests BB after a BID request is rejected with sense code X'0814'.

The BIS command shows bracket termination before CLSDST.

On completion of the SEND request, the exit DFHZSLX is invoked. LUSTAT causes the bracket and chain state machines to be set as for normal data flow.

Response transmission: DFHZSDL transmits ER1 and DR2 responses. The sequence number associated with the response is that of the path information unit (PIU) that initiated the current bracket. DFHZSDL uses the receive RPL (RPL_B) to send responses thus ensuring that the RU is returned with the response, unless the response is an ISSUE_ERROR request, in which case the send RPL is used. The response is sent synchronously, and POST=SCHED is included in the VTAM command, so that an exit routine is not involved. On return from VTAM, DFHZSDL sets the bracket and chain state machines accordingly.

DFHZSLX

The DFHZSLX module is the VTAM exit that is driven on completion of a SEND request. If the request completed successfully, the bracket and chain state machines are set to show the new state of the session. If the SEND request was data DR1, DFHZRVL is invoked via DFHZACT to receive the response.

DFHZRLX

The DFHZRLX module is the VTAM exit that is scheduled on completion of an LU6.2 RECEIVE_SPECIFIC request. DFHZRLX queues the completed RPL to a chain anchored from TCTVRLPQ in the TCT prefix. DFHZDSP dequeues the RPLs for further processing by DFHZRLP.

DFHCLS3

In the local CICS system, DFHCLS3 is invoked using the DFHLUS macro, which issues a DFHIC TYPE=PUT macro to start the appropriate transaction (CLS3) with data recorded on temporary storage indicating the requested operation.

The DFHLUS operations can be:

SIGNOFF	Sign off a user on the other LU
TIMEOUT	Time out users.

The SIGNOFF and TIMEOUT operations apply to persistent verification signons only.

DFHCLS3 retrieves the temporary-storage record.

The SIGNOFF and TIMEOUT operations are performed directly by DFHCLS3. These operations are supported outbound only.

For SIGNOFF, DFHCLS3 is started by DFHZCUT when a user on the other LU must be signed off.

For TIMEOUT, DFHCLS3 is started by DFHZCUT during time-out processing of a **persistent verification signed-on-from list**, also known to CICS as a local userid table (LUIT).

DFHCLS3 performs the following actions:

1. Calls DFHZCUT to find a userid that needs to be timed out
2. Makes a sign-off call to the other LU
3. Calls DFHZCUT to remove the userid from the LUIT.

This sequence is repeated until there are no more userids to be timed out.

If DFHCLS3 abends during time-out processing, control passes to a SETXIT routine in DFHCLS3, which calls DFHZCUT to tidy up the relevant LUIT.

DFHZLS1

DFHZLS1 is the main program for the CICS implementation of the CNOS SNA service transaction. When acting as the initiator of a CNOS request (the CNOS source), it is invoked by the DFHZLS1M macro issuing a DFHIC TYPE=PUT for transaction id CLS1. The possible commands on the CNOS source system are:-

- INITIALIZE_SESSION_LIMIT

  Acquire the specified connection, using the MAXIMUM values from the RDO SESSIONS definitions (for the required session limit and number of winner sessions) on the CNOS command for each modegroup.

- CHANGE_SESSION_LIMIT

  Negotiate a change of the current session limit for a specified modegroup.

- RESET_SESSION_LIMIT

  Release the connection, negotiating all modegroups to a session limit of zero.

When acting as the receiver of a CNOS request (the CNOS target), DFHZLS1 is invoked by an attach FMH for TPN `X'06F1'` sent from the CNOS source system, which is not necessarily CICS. The CNOS command sent with the attach FMH requests changes to the sessions in specified modegroups. In SNA terms, DFHZLS1 is handling a PROCESS_SESSION_LIMIT command. It issues a DFHLUC RECEIVE for the CNOS GDS that contains the details of the required command.

DFHZLS1 passes the parameters for each of the above commands through to DFHZGCN, where the detailed processing takes place.

DFHZGCN

DFHZGCN is an AP domain subroutine. It handles the four architected CNOS functions, as described below.

INITIALIZE_SESSION_LIMIT: This is a two pass function in CICS. First time through, DFHZGCN initiates the bind of the SNASVCMG winner session and returns. The bind processing eventually causes the "session started" routine in DFHZNAC to run. This re-issues the DFHZLS1M INITIALIZE_SESSION_LIMIT request, and the CNOS negotiation can then take place.

DFHZGCN performs the following actions:

1. Does a 'privileged' allocate (for a SNASVCMG session).
2. Builds an attach header.
3. Completes the building of the CNOS command, using MAXIMUM values in the TCTME.
4. Issues a SEND INVITE WAIT.
5. Issues a RECEIVE LLID.
6. Analyzes the responses to the command; SNA decrees that the CNOS source must accept the values returned.
7. Calls DFHZGCA to action the new values.
8. Sends messages DFHZC4900 and DFHZC4901 as appropriate.
9. Frees the session.

The above steps are repeated for each user modegroup in the connection.

RESET_SESSION_LIMIT: A connection release request is passed via DFHZLS1 to DFHZGCN.

DFHZGCN performs the following actions:

1. Does a 'privileged' allocate.
2. Builds an attach header.
3. Completes the building of one CNOS command, setting MAX, WIN, and LOS values to zero, and mode names affected to ALL.
4. Issues SEND INVITE WAIT.
5. Issues RECEIVE LLID.
6. Analyzes the response to the command; the CNOS target must accept zero sessions (DRAIN can be changed from ALL to NONE).
7. Calls DFHZGCA to action the new values.
8. Sends message DFHZC4900.
9. Frees the session.

CHANGE_SESSION_LIMIT: DFHZLS1 is started from the EXEC API or CEMT via DFHEIQSM to change the session limit for a specific modegroup.

DFHZGCN performs the following actions:

1. Does a 'privileged' allocate.
2. Builds an attach header.
3. Completes the building of one CNOS command, setting MAX and WIN values.
4. Issues SEND INVITE WAIT.
5. Issues RECEIVE LLID.
6. Analyzes the responses to the command; SNA decrees that the CNOS source must accept the values returned.
7. Calls DFHZGCA to action the new values.
8. Sends messages DFHZC4900 and DFHZC4901 as appropriate.
9. Frees the session.

PROCESS_SESSION_LIMIT: DFHZLS1 is attached, and calls DFHZGCN.

DFHZGCN performs the following actions:

1. Addresses the CNOS command that DFHZLS1 passed.
2. For each mode group specified, determines whether the values for session limit, source contention winners and source contention losers are acceptable. If not, the values are adjusted (negotiated) according to rules laid down by SNA.
3. If this system is currently performing shutdown, negotiates down to session limit zero.
4. Calls DFHZGCA to action the new values.
5. Sends the CNOS reply containing the negotiated values.
6. Sends messages DFHZC4900 and DFHZC4901 as appropriate.

DFHZGCA

DFHZGCA is an AP domain subroutine. It has three separate functions, as described below.

ACTION_CNOS_AND_CONNECT: After a CNOS negotiation DFHZGCA is responsible for changing the state of a specified modegroup to reflect the new values. There are three types of action required.

1. Put sessions in/out of service for session limit increase/decrease.
2. Set sessions to winner/loser in line with negotiated values.
3. Bind/unbind sessions for session limit decrease, autoconnect processing or contention polarity switch.

SET_NEGOTIATED_VALUES: This function is used by DFHZGPC during persistent sessions restart to set the saved CNOS values in the modegroup without any binding/unbinding of sessions.

ENSURE_SESSIONS_BOUND: DFHZXRE0 invokes this function during persistent sessions restart because recovery processing can lead to LU6.2 sessions becoming unbound. It is important to ensure that they are re-bound in accordance with the autoconnect setting.

Exits

No global user exit points are provided for this function.

Trace

All of the above mentioned modules have entry and exit trace points. Several of them also have exception and level 2 trace points. All of these trace points are from the AP domain and have ids in the range FB00-FCFF.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 101. VTAM persistent sessions

This section describes how CICS handles VTAM persistent session support. It uses VTAM 3.4.1 persistent LU-LU session improvements to provide restart-in-place of a failed CICS without the need for network flows to re-bind CICS sessions.

Persistent sessions can either be Single Node Persistent Sessions (SNPS) or Multi Node Persistent Sessions (MNPS) depending on how your VTAM network is set up.

If CICS is to support MNPS then PSTYPE=MNPS must be specified in the SIT.

The following mainly describes SNPS. Sections are added where MNPS differs from SNPS.

For an overview of persistent sessions, and a comparison with XRF, see the *CICS Transaction Server for OS/390 Release Guide*.

For an introduction to this topic from the VTAM point of view, see the *Advanced Communications Function for VTAM Programming* manual, SC31-6348.

Design overview

CICS support of persistent sessions includes the support of all LU-LU sessions except LU0 pipeline and LU6.1 sessions. CICS determines for how long the sessions should be retained from the PSDINT system initialization parameter. (This is a user-defined time interval.) If a failed CICS is restarted within this time, it can use the retained sessions immediately—there is no need for network flows to re-bind them.

This interval can be changed using the CEMT SET VTAM command, or the EXEC CICS SET VTAM command, but the changed interval is not stored in the CICS global catalog, and therefore is not restored on an emergency restart.

If CICS is terminated through CEMT PERFORM SHUTDOWN IMMEDIATE, or if CICS fails, VTAM holds CICS' sessions in "recovery pending" state.

During emergency restart, CICS restores those sessions pending recovery from the CICS global catalog and the CICS system log to an "in session" state. This happens when CICS opens its ACB.

Subsequent processing is LU dependent: cleanup and recovery for non-LU6 persistent sessions is similar to that for non-LU6 backup sessions under XRF. Cleanup and recovery for LU6.2 persistent sessions maintains the bound session when possible but there may be cases where it is necessary to unbind and re-bind the sessions, for example, where CICS fails during a session resynchronization.

The end user of a terminal sees different symptoms of a CICS failure following a restart, depending on whether VTAM persistent sessions, or XRF, are in use:

- If CICS is running without VTAM persistent sessions, or XRF, and fails, the user sees the VTAM logon panel followed by the "good morning" message (if AUTOCONNECT(YES) is specified for the TYPETERM resource definition).
- If CICS does have persistent session support and fails, the user perception is that CICS is hanging: the screen on display at the time of the failure remains until persistent session recovery is complete. After a successful CICS emergency restart, the recovery options defined (in RECOVOPTION) for the terminals or sessions take effect. If SYSDEFAULT is specified as the value for RECOVOPTION, the user can clear the screen and continue to enter CICS transids. If MESSAGE is specified for the RECOVNOTIFY attribute of the TYPETERM resource definition, the user is notified of the successful recovery.

  If CICS does not restart within the specified interval, the sessions are unbound, as if there has been a CICS failure without persistent session support in the system.

Note: SNPS support does not retain LU-LU sessions after VTAM, MVS, or CEC failure. Nor are sessions retained after the following commands:

- SET VTAM FORCECLOSE
- SET VTAM IMMCLOSE
- SET VTAM CLOSED
- PERFORM SHUTDOWN
- VARY INACT ID=applid

MNPS differs from SNPS in that MNPS support retains LU-LU sessions after a VTAM and MVS failure. The sessions are also retained after:

- SET VTAM FORCECLOSE

Persistent Sessions Restart flow

The following describes the flow of control for:

1. The enabling of persistence
2. The sessions that persist at start up time
3. The sessions that persist during dynamic open.

Enabling of persistence

Summary

1. VTAM ACB opened with PARM=PERSIST=YES
2. VTAM levels checked.
3. VTAM SETLOGON OPTCD=PERSIST or NPERSIST

More detail: Persistence is enabled by:

1. The VTAM ACB is opened with PARM=PERSIST=YES - specified in DFHTCTPX.
2. DFHZSLS calls DFHZGSL to issue SETLOGON OPTCD=PERSIST/NPERSIST.

   DFHZSLS copies 8 bytes of VTAM information into the TCT prefix. These bytes contain details of the VTAM level and the functions which it supports. Previous releases of CICS only copy 4 bytes of VTAM data.

   The use of persistent sessions is dependent upon the level of VTAM present being at least V3R4.1. This level of VTAM returns more function bit data to CICS than previous versions and supports the use of persistent sessions. Checks are made by CICS of the current VTAM level and the VTAM level against which the TCT was generated. If either level is not high enough, parameters relating to the use of persistent sessions are not used when macros are called.

Sessions that persist at start up time

Summary

1. Task CGRP runs DFHZCGRP
2. DFHZCGRP calls DFHZGRP
3. DFHZGRP issues VTAM INQUIRE
4. DFHZGRP either:

   terminates session via DFHZGUB issuing CLSDST/TERMSESS or

   restores the session with OPNDST TYPE=RESTORE
5. DFHZGRP queues restored sessions for further processing.
6. DFHZGRP issues RECEIVE_ANYs.
7. DFHZGRP does some CNOS work.
8. DFHZGRP does some URD work.
9. Queued sessions get restored.

More detail: Sessions that persist at startup time are processed by:

1. Attach task CGRP - program DFHZCGRP in DFHSII1 after TCRP is attached.
2. DFHZCGRP calls DFHZGRP with a START_TYPE of:

   COLD

   WARM

   EMER_XRF

   EMER
3. DFHZGRP issues VTAM INQUIREs in 'chunks', that is VTAM is passed an area whose size is defined in the TCT Prefix.

   The area is filled with NIBS by VTAM. DFHZGRP scans the NIBS and decides whether to UNBIND or OPNDST each session.

   For COLD, WARM and EMER_XRF all sessions are unbound.

   For EMER some sessions are unbound and some restored depending on the circumstances.
4. Restored sessions are queued to DFHZACT for further processing by DFHZXRC or DFHZXPS.
5. RECEIVE_ANY Initialization done.
6. CNOS records are processed by making calls to DFHZGPC.
7. URDS are reset to AWAITING RE_SYNCHRONIZATION for EMER only.
8. DFHZACT calls DFHZXRC or DFHZXPS for each session queued by DFHZGRP.

Task and module Flow diagram

```
-> indicates an ATTACH

  TASK
                           TCRP
   1     TCP      III      CSSY           CGRP
         ---      ---      ----           ----
  .
  .
  SII1->ZCSTP
         ZDSP
         .ZSLS
         . ZGSL
         Spin on
         TCTV_RA_DONE
         .
  SII1---------->SII1 --->TCRP
                 SII1----------------->   ZCGRP
         .       .        . install       .ZGRP
         .       .        . TCTTEs        .  INQUIRE on
         .       .        . etc           .  persistent sessions
         .       .        .               .  wait on TCTVCECB (EMER)
         .       .        . Post TCTVCECB
         .       .        task end        .
         .       .                        .  process persistent
         .       .                        .  sessions
         .       .                        .  RECEIVE_ANY processing
         ZDSP continues <------------------- set TCTV_RA_DONE
                 .                           post TCTV_ZGRP_FIN_ECB
                 .                        task end
                 . Wait on
                 . TCTV_ZGRP_FIN_ECB
                 SIJ1
                 . SETLOGON START
                 . Start CXRE task
                 . Control is Given to CICS
         ZACT
         . ZXRC
         . ZXPS
```

Task and module flow - more detail.

1. Startup runs as normal until DFHSII1 has started the TCP (CSTP) task and DFHZDSP runs.
2. DFHZDSP calls DFHZSLS.
   - If VTAM is at least V3R4.1, DFHZSLS calls DFHZGSL to issue SETLOGON OPTCD=PERSIST if the SIT PSDINT value is a valid non 0 value.

- If the VTAM level is V3R4.0 or PSDINT is 0 or defaulted with higher levels of VTAM, DFHZSLS calls DFHZGSL to issue SETLOGON OPTCD=NPERSIST.
- If the VTAM level is lower than V3R4.0, the SETLOGON OPTCD call is not made since PERSIST and NPERSIST are not supported for these VTAM releases.

DFHZSLS does NOT issue RECEIVE OPTCD=ANY. It returns to DFHZDSP which ‘spins” until TCTV_RA_DONE is set by DFHZGRP when the RECEIVE_ANYs have been successfully issued.

3. DFHSII1 attaches the III task which continues to run code in DFHSII1.
4. DFHSII1 (III) attaches and calls DFHTCRP as a system task then attaches task CGRP, which runs program DFHZCGRP which calls ZGRP.
5. DFHZGRP calls DFHZGUB if there are any sessions to unbind.
6. DFHZGRP queues any sessions to be restored to DFHZACT.
7. DFHZGRP sets TCTV_RA_DONE after issuing RECEIVE_ANYs to allow DFHZDSP to continue.
8. DFHZGRP posts TCTV_ZGRP_FIN_ECB.
9. When DFHZGRP finishes, control is returned to code in DFHZCGRP.

   DFHZCGRP checks the RESPONSE and REASON code. It sets TCTV_ZGRP_FAILED off if RESPONSE(OK) or RESPONSE(EXCEPTION) with REASON(ACB_CLOSED|INQUIRE_FAILED). Otherwise it sets TCTV_ZGRP_FAILED on.
10. DFHSII1 waits on TCTV_ZGRP_FIN_ECB and checks TCTV_ZGRP_FAILED set by DFHSII1.

    If TCTV_ZGRP_FAILED is off then DFHSII1 continues Otherwise it sets INITDERR which causes CICS to terminate when the other tasks have finished.
11. Just before CONTROL IS GIVEN to CICS, DFHSIJ1 attaches the CXRE task to run DFHZXRE0 which does some additional PRSS processing.
12. DFHZXRC or DFHZXPS are then called to process any TCTTEs queued to DFHZACT.
13. DFHZXRC is called by DFHZACT to process non-APPC sessions which have not been unbound by DFHZGRP. It takes one of the following actions depending on the state of the session, the terminal type, and how the TYPETERM for the session has been defined to CICS.
    - Send END_BRACKET
    - Send CLEAR (followed by START_DATA_TRAFFIC for SNA devices which support it)
    - Unbind.

    For those devices for which the cleanup action is not to unbind, the TCTTE is queued to DFHZNAC and message DFHZC0146 is issued for the session.

    As part of the processing for message DFHZC0146, any recovery notification requested for the session is initiated:
    - If the requested recovery notification is MESSAGE, DFHZNCA sends a BMS map to the terminal.
    - If the requested recovery notification is TRANSACTION, DFHZNCA initiates the requested transaction.
14. DFHZXPS is called by DFHZACT to process APPC sessions.

    DFHZXPS takes one of the following courses of action depending on the setting of TCTE_PRSS on entry.
    - Examine the data pointed to by TCTV_PRSS_CV29_PTR to determine the state of the session at system failure.
      a. If a task is attached call DFHZGDA to issue DEALLOCATE,ABEND for the task still running on the partner.
      b. If no task is attached but there is further recovery to be done e.g. bid recovery, outstanding responses, set the TCTTE to a state which allows this further recovery to proceed. If the existing mechanism will carry out the recovery without further intervention by DFHZXPS then remove the TCTTE from the DFHZACT queue, otherwise requeue the TCTTE to DFHZACT and DFHZXPS will be recalled at a later stage to finish recovery processing.
      c. If no task is attached and there is no further recovery to be done, remove the TCTTE from the DFHZACT queue as recovery is now complete.
    - Recall DFHZGDA to continue with DEALLOCATE,ABEND or REJECT_ATTACH processing.
    - Requeue the TCTTE to DFHZACT if a SEND (for example of an outstanding response) which was set in motion by an earlier instance of DFHZXPS is still in progress.
    - CLSDST the session if an error has occurred during the recovery process.
    - Carry out further recovery as described above, if required, following successful completion of DEALLOCATE,ABEND processing.
    - Remove the TCTTE from the DFHZACT queue when all recovery has completed.

Sessions that persist at Dynamic Open: If VTAM fails but CICS stays up SNPS sessions do not exist. For MNPS they do persist. When VTAM crashes, CICS does not delete the autoinstalled resources and resets all the terminal and connection sessions to unopened state.

Summary

1. CEMT SET VTAM OPEN
2. DFHEIQVT calls DFHZOPA
3. DFHZOPA calls DFHZSLS
4. DFHZSLS call DFHZGSL
5. DFHZGSL issues SETLOGON PERSIST or NPERSIST
6. DFHZOPA calls DFHZGRP
7. DFHZGRP issues INQUIRE PERSESS
8. DFHZGRP terminates session via DFHZGUB issuing CLSDST/TERMSESS. However, if MNPS is in use the sessions are OPNDST RESTOREd instead.
9. DFHZGRP issues RECEIVE_ANYs
10. DFHZGRP deletes CNOS catalogue records
11. DFHZOPA issues SETLOGON START

More detail: Sessions that persist after the ACB has been opened using CEMT SET VTAM OPEN or EXEC CICS SET VTAM OPEN are processed by:

1. CICS is running with the VTAM ACB closed.

   CEMT SET VTAM OPEN or EXEC CICS SET VTAM OPEN is issued.
2. DFHEIQVT calls DFHZOPA to open the ACB.
3. DFHZOPA calls DFHZSLS.
4. DFHZSLS calls DFHZGSL.
5. DFHZGSL issues VTAM macro calls dependent upon the VTAM level and PSDINT value.
   - If VTAM is at least V3R4.1, DFHZGSL issues SETLOGON OPTCD=PERSIST if the SIT PSDINT value is a valid non 0 value.
   - If the VTAM level is V3R4.0 or PSDINT is 0 or defaulted with higher levels of VTAM, DFHZGSL issues SETLOGON OPTCD=NPERSIST.
   - If the VTAM level is lower than V3R4.0, the SETLOGON OPTCD call is not made since PERSIST and NPERSIST are not supported for these VTAM releases.
6. DFHZOPA then calls DFHZGRP with startup type of DYNOPEN.
7. DFHZGRP issues INQUIRE PERSESS with a storage area that will take up to about 400 sessions - INQUIRE PERSESS is reissued until all the NIBs have been obtained from VTAM.
8. DFHZGRP calls DFHZGUB if there are any sessions to unbind. For MNPS DFHZGRP instead issues OPNDST RESTORE for each session that persists.
9. DFHZGRP issues RECEIVE_ANYs.
10. DFHZGRP calls DFHZGCC to delete CNOS records.
11. If ZGRP returns RESPONSE(OK) or RESPONSE(EXCEPTION) with REASON(ACB_CLOSED|INQUIRE_FAILED) then DFHZOPA issues SETLOGON OPTCD=START. Otherwise it causes DFHZSHU to be run to close the VTAM ACB and then returns to DFHEIQVT.

TCB Concurrency

Summary: If SUBTSKS = 1 Specified in SIT

- DFHZGRP switches to concurrent TCB if enough NIBS to process.
- INQUIRE PERSESS work done concurrently with TCRP ZC INSTALL.
- DFHZGUB switches to concurrent TCB if enough NIBS to process. (EMER only).
- OPNDST RESTORE and CLSDST/TERMSESS done concurrently.

More detail: During startup DFHZGRP is attached as a task and runs at the same time as other startup tasks such as DFHTCRP and DFHRCRP. However, DFHZGRP also switches to use the CONCURRENT TCB if there are enough NIBS to process during EMER start.

This allows DFHZGRP to issue INQUIRE OPTCD=PERSESS as many times as is necessary, concurrently with the TCTTEs being restored by DFHTCRP.

When DFHZGRP finishes INQUIREing it waits for DFHTCRP to finish before matching each persisting NIB with the restored TCTTEs.

Each NIBLIST is then OPNDST OPTCD=RESTOREd and while this is running asynchronously DFHZGUB is called to run under the concurrent TCB if there are enough NIBs to be unbound in the NIBLIST.

Modules

ZC (terminal control) together with the following:

Module	Function
DFHZCGRP	Program initiated by task CGRP to set up the start type and to call DFHZGRP during initialization. It then analysis the response from DFHZGRP and decides if CICS can continue or not.
DFHZGCA	Sets the appropriate ZC control blocks to reflect the currently agreed Change Number Of Session (CNOS) values for an LU6.2 connection.

Module	Function
DFHZGCC	Performs catalogue and retrieval of CNOS data. This module is called when CICS needs either to store or to recover CNOS values. During a CICS run, all CNOS values are written to the global catalogue. Under normal circumstances they are not needed. However, if a persistent sessions restart is performed, it is necessary to recover the CNOS values which were in operation at the time of the CICS failure. This is achieved by having a record on the global catalogue which can be read in during PRSS restart and used to restore the sessions to their pre-failure state. This module will handle the maintenance of the CNOS records during normal CICS operation and the recovery of the records during PRSS recovery.
DFHZGCN	Handles the process of LU6.2 Change Number Of Sessions (CNOS) negotiation, acting as either the source or target end of the conversation, and calls DFHZGCA to action the resulting changes.
DFHZGDA	The role of DFHZGDA is to take control of APPC conversations which have persisted across a CICS failure, and to ensure that they are terminated cleanly, by issuing a Deallocate(Abend) informing the partner LU that the CICS transaction has abended. If DFHZGDA is working correctly, the fact that CICS has failed and been restarted should be transparent to the partner LU; all he knows is that the CICS transaction to which he was talking has terminated. DFHZGDA also performs REJECT_ATTACH processing for synclevel 2 conversation which are started by the partner before Exchange Lognames has been done after a persistent sessions restart.
DFHZGPC	Performs recovery of CNOS values for modegroups. This module is called when CICS is performing a persistent sessions (PRSS) restart. When a PRSS restart is performed, it is necessary to do more than merely recover the session. It is also necessary to recover the CNOS state which the sessions had prior to the CICS failure. DFHZGCC will have maintained a record of the CNOS state on the global catalogue. This record will now be used in this module in an attempt to restore CNOS values.
DFHZGPR	The role of DFHZGPR is to update the global catalog whenever it is necessary to add, delete, or test for a record indicating that an APPC connection has a Persistent Resource associated with it. A Persistent Resource can be defined as some session state, or piece of work upon which the partner LU is dependent, and which will be lost in the event of CICS failing. The only Persistent Resource so far identified is: • A shipped AID Prior to persistent sessions, the failure of the APPC session tells the partner that these resources have been lost, and drives his recovery. With the advent of persistent sessions, it is necessary for a persisting CICS to know that an APPC session had a Persistent Resource associated with it, so that the connection can be unbound (to drive the partners cleanup) and then rebound.
DFHZGRP	Initialize VTAM persistent sessions. DFHZGRP is a domain subroutine but is called by DFHZCGRP (task CGRP) during initialization. DFHZGRP is called during ZC initialization or when the VTAM ACB is opened dynamically by CEMT SET VTAM OPEN or EXEC CICS SET VTAM OPEN by DFHEIQVT. The module does the following: 1. OPNDST RESTOREs or CLSDST/TERMSESS any session that VTAM has held persisting, depending on start up type and session parameters. 2. It calls DFHZGPC to re-instate CNOS records during an EMER restart, or calls DFHZGCC to delete CNOS catalogue records. 3. It initializes the RECEIVE_ANY RPLs and issues the RECEIVE_ANYs.
DFHZGSL	Informs VTAM whether sessions are to persist or not. This module is called when CICS needs to set, unset or change the Persistent Sessions PSTIMER value.
DFHZGUB	Issue CLSDST or TERMSESS for individual NIBs in a NIBLIST. This module is called by DFHZGRP to unbind nibs in a niblist in two ways: • Unbind the entire NIBLIST for COLD, WARM, EMER+XRF and dynamic open. • Unbind only the NIBs with NIBUSER = 0 for EMER starts.
DFHZXPS	DFHZXPS handles Persistent Sessions recovery for APPC sessions. It does not deal with non-APPC sessions which are dealt with by DFHZXRC. DFHZXPS is called by DFHZACT after OPNDST OPTCD=RESTORE has been issued successfully for a persisting APPC session. Both single and parallel APPC sessions are dealt with but there is no difference in the processing. The task of DFHZXPS is to examine VTAM session tracking data which was hung off TCTE_PRSS_CV29_PTR by DFHZGRP following a Persistent Sessions restart and if possible to update the TCTTE to allow work to continue on the session. If it is not possible to determine the state of the session prior to system failure, or the session was not in a state which allows it to be recovered, the session will be unbound.
DFHZXRC	DFHZXRC analyses the Session State Vector data that is hung off TCTE_PRSS_CV29_PTR by DFHZGRP during an EMER restart, for each persisting session. The necessary action to cleanup and recover the session is then initiated.

Diagnosing Persistent Sessions Problems

The following should be consulted when diagnosing problems with persistent session.

- Trace, TC level 1, 2 and exception in the range of AP FB10-FBFF.
- CEMT INQUIRE VTAM showing the PSDINT value.
- Console and CSNE logs:
  - Persistent session messages (DFHZC0001 to DFHZC0162)
  - Information produced by DFHZNAC
- Dumps taken by some of the above messages.

If a NIBLIST was present at the time the dump was taken then it can be examined by printing the TCP section of the dump.

- Last flow information - that is the CV29, FMH5, BIS and BID information is useful if a session is in the wrong state after a persistent session restart. This may have been diagnosed by an error message, or maybe missed and message DFHZC0146 or DFHZC0156 issued.

  TCTE_PRSS_CV29_PTR points to the CV29 etc which was created by DFHZGRP and used by DFHZXPS or DFHZXRC. It is freed when DFHZNAC issues message DFHZC0146 or DFHZC0156. Otherwise it is freed when the session is unbound.

  It is traced by DFHZXPS as a TC level 1 trace.

  If you have a dump, but no trace level 1 available, it is dumped in the TCP section for each TCTTE for which it still exists.

- The contents of byte TCTE_PRSS are useful. Values other than X'00' and X'FF' indicate that something went wrong during the PRSS recovery. The possible values are listed in the *CICS Data Areas*. If a value is left in this byte, the meaning may give some indication as to where the recovery went wrong. The values are described later in this chapter.

- The contents of the state machines are useful.

  TCTECNTS - contention state machine.

  TCTEBKTS - bracket state machine.

  TCTECHSS - chain state machine.

  TCTEUSRS - user state machine.

- The contents of TCTE_BID_STATUS are useful. They are described later in this chapter.

Here are some possible problems:

- DFHZGRP may cause CICS to terminate during initialization for the following reasons:

  – DFHZGRP has been called with invalid parameters.

  – DFHZGRP is unable to complete the receive any process.

  – DFHZGRP has had a loop or abend.

  – DFHZGRP is unable to switch back to the QR TCB.

  – DFHZGRP has failed before any NIBs have been obtained from VTAM (with INQUIRE OPTCD=PERSESS).

  – DFHZGRP or DFHZGUB has issued a VTAM request that failed to respond within 5 minutes. Issued with message DFHZC0128 and a system dump.

  In each case DFHZGRP or a function it has called issues a message giving a reason for the failure.

- Sessions may be unbound by DFHZGRP for the following reasons:

  – This is a COLD, WARM, EMER + XRF restart.

  – This is a dynamic open of the ACB (e.g. CEMT SET VTAM OPE). However, if MNPS is in use sessions should be restored at this point.

  – The TCTTE has not been found - probably because it has not been cataloged (Autoinstall with AIRDELAY=0 or APPC clone). No message is written because this is considered to be normal.

  – CICS does not support recovery for LU61 or pipeline sessions.

  – The TCTTE does not match the NIB - possibly an operational mix-up - has the right GCD been used?

  – A terminal or session had RECOVOPT UNCONDREL|NONE specified.

  – A connection had PSRECOVERY NONE specified.

  – A matching mode group was not found - have you got the right GCD?

  – A suitable session was not found - this can occur if the CNOS values create many “up for grabs” sessions which were in use when CICS failed - this would occur if the session limit was high and the contention winners was low.

    It may also occur if CICS was in the process of CNOSing from a high session limit to a low session limit at the time CICS failed.

    Message DFHZC0111 is issued in this case.

  – An URD was found for the session so the entire connection is unbound to allow the connection to recover correctly.

- APPC Sessions may be unbound by DFHZXPS for the following reasons:

  Some of the reasons are known states for which the session cannot be recovered. Others are unexpected errors.

  Known states for which the session cannot be recovered:.

  – The last flow was a positive response to a bid with data.

  – Exchange log names (transaction CLS2) was running when the system failed.

  – A bind or bind security had not completed when the system failed.

  – Because of the last thing to flow e.g. SIGNAL, the state of the session at the time of system failure cannot be determined.

  Unexpected errors:

  – A bad return code was received from a call to DFGZGDA.

  – An attempt to reset the session from CS mode to CA mode or vice versa failed.

  - The TCTE_PRSS byte contained an unexpected value on entry to DFHZXPS.
  - The BIS, bid or CV29 data pointed to by TCTV_PRSS_CV29_PTR contained an unknown value or was inconsistent.
  - An error occurred during some other part of the recovery process.
  - An internal logic error occurred in DFHZXPS.
- Sessions may be unbound by DFHZGDA for the following reasons:
  - A SEND issued as part of Deallocate(Abend) processing has failed
  - A RECEIVE issued as part of Deallocate(Abend) processing has failed
  - A logic error is detected during Deallocate(Abend) processing
- Sessions may be unbound by DFHZXRC for the following reasons:
  - The user has specified RECOVOPT(RELEASESESS) and the session was in bracket at the time CICS failed.
  - End-Bracket and Clear/SDT could not be used to clean up the session.
  - Cold Start has been requested for the session.
- Message DFHZC0124 can be issued with inconsistent counts if:
  - DFHZGRP loops or abends.
  - The ACB is closed by VTAM operator commands whilst DFHZGRP is in control.
- LU6.2 Connections which might be expected to persist, may be unbound if there was a persistent resource associated with the connection when CICS failed (i.e. there was an asynchronous processing request in progress at the time CICS failed).
- Following a persistent sessions restart, LU6.2 partners may experience a series of unexpected abends with sense code 08640001 from the persisting CICS; this can occur either because there was a conversation in progress at the time CICS failed, and CICS has terminated the conversation with this code, or for synclevel 2 conversations, the partner has attempted to initiate a conversation before Exchange Lognames has run following a persistent sessions restart.
- Some APPC sessions may hang following a persistent sessions restart because CICS has determined that it was in RECEIVE state at the time of the CICS failure, and issued a RECEIVE for the expected data, but the partner has not sent the expected data; the RECEIVE will not timeout in this situation, because RTIMOUT does not apply to sends issued by DFHZGDA.

Persistent Sessions status byte (TCTE_PRSS)

A new byte TCTE_PRSS has been introduced into the TCTTE to track the stage reached in the persistent sessions recovery of a session. If for some reason persistent sessions recovery does not complete, this field can give a useful indication of the stage reached in recovery when the problem occurred.

TCTE_NO_PRSS_RECOVERY (X'00') The value TCTE_PRSS would normally contain, meaning:

- Persistent sessions are not being used.
- The session was successfully recovered following a persistent sessions restart.
- The session has been CLSDSTed and restarted since a persistent sessions restart.
- The session was started after any persistent sessions restart.

If this was a persisting VTAM session, then TCTE_PRSS will have been set to this value on completion of recovery notification for non-LU6.2 (see NAPES84 and NAPES83 routines), or in the session restarted logic of NAPES51 for LU6.2 sessions.

TCTE_NIB_MATCHED (X'01') Placed in TCTE_PRSS by DFHZGRP once a TCTTE has been found which matches the NIB of a persisting VTAM session. This should be a transient value, as the OPNDST OPTCD=RESTORE is issued soon after, and should cause TCTE_PRSS to be updated.

TCTE_OPNDST_RESTORE_COMPLETED (X'02') Placed in TCTE_PRSS once an OPNDST OPTCD=RESTORE has been successfully issued for a VTAM Session by DFHZGRP. Once this value has been placed in TCTE_PRSS, the TCTTE should be put onto the activate scan queue to await processing by DFHZXRC or DFHZXPS.

TCTE_ZXRC_CLEANUP (X'20') Placed in TCTE_PRSS by DFHZXRC when it begins processing a TCTTE. All TCTE_PRSS values relating to DFHZXRC processing are X'2x'. This value remains in TCTE_PRSS until the TCTTE is queued to DFHZNAC for the issuing of message DFHZC0146. If for some reason the TCTTE does not get recovered and TCTE_PRSS contains this value, then DFHZXRC may be the culprit.

TCTE_ZXRC_ISSUE_RECOVERY_MSG (X'21') DFHZXRC has identified the cleanup and recovery actions required, and has queued the TCTTE to DFHZNAC for recovery message processing (message DFHZC0146). If there is any problem with the recovery notification processing in DFHZNCA, then TCTE_PRSS is likely to contain this value; it may be that the TCTTE has been taken off the DFHZACT or DFHZNAC queues for an unexpected reason.

TCTE_ZXPS_CLEANUP (X'30') All TCTE_PRSS values beginning (X'3x') indicate that DFHZXPS is doing its recovery/cleanup processing for this TCTTE. TCTE_PRSS is updated to this value on entering DFHZXPS for the first time. DFHZXPS should only be processing LU6.2 sessions.

TCTE_ZXPS_DEALLOCATE_ABEND (X'31') DFHZXPS places this value into TCTE_PRSS prior to calling DFHZGDA for the first time. It indicates that DFHZXPS has determined that an APPC conversation was taking place at the time CICS failed, and that DFHZXPS is calling DFHZGDA to terminate that conversation. Again, this should be a transient value, as DFHZGDA will update TCTE_PRSS as it proceeds with its DEALLOCATE(ABEND) processing.

TCTE_ZXPS_SEND_IN_PROGRESS (X'32') DFHZXPS has determined that bidding activity was taking place at the time CICS failed, and that some kind of SEND is required to complete the bid flows. If the session hangs with this value in TCTE_PRSS there may have been some kind of problem with unexpected bid flows taking place.

TCTE_ZXPS_ISSUE_RECOVERY_MSG (X'33') When DFHZXPS has completed recovery and cleanup for the session, it puts this value into TCTE_PRSS before queueing the TCTTE to DFHZNAC for recovery message processing.

TCTE_ZGDA_FMH7_SEND (X'41') All TCTE_PRSS values with X'4x' indicate that DFHZGDA is terminating the APPC conversation which was in progress on the session at the time CICS failed. This value indicates that DFHZGDA is in the process of issuing a SEND for the FMH7 which is to terminate the conversation.

TCTE_ZGDA_FMH7_COMP (X'42') DFHZGDA has completed its Deallocate(Abend) processing. This value in TCTE_PRSS indicates to DFHZXPS that it may continue with any outstanding recovery/cleanup processing of its own.

TCTE_ZGA_FMH7_REC (X'43') DFHZGDA has determined that CICS was in RECEIVE state at the time CICS failed, and has issued a RECEIVE for the RU expected from the partner. This value may appear in sessions which appear to be hanging following a persistent sessions restart. If the partner never issues the expected SEND, the RECEIVE will never be executed. Since this RECEIVE is issued under the TCP task, the RECEIVE will not be subject to any RTIMEOUT.

TCTE_ZGDA_REC_EOC (X'44') Placed in TCTE_PRSS if the first RECEIVE of the DFHZGDA module following the persistent sessions reveals that the partner is in the middle of sending a chain of RUs. If TCTE_PRSS contains this value, DFHZGDA has issued a RECEIVE_PURGE for the session. Again, depending on how quickly the partner sends the expected data, this session may appear to hang.

TCTE_ZGDA_SEND_RESP (X'45') Placed in TCTE_PRSS if DFHZGDA has to issue a SEND for a response during Deallocate(Abend) processing.

TCTE_PRSS_CLSDST_SCHEDULED (X'FF') This value is placed in TCTE_PRSS if there is an error, or if in the course of persistent sessions recovery it is decided to terminate the persisting session. This may be for a variety of reasons; some of which are:

- An error occurred issuing a SEND or RECEIVE during persistent sessions recovery.
- RECOVOPT(NONE) or RECOVOPT(UNCONDREL) was specified for the session.
- The only recovery action which DFHZXRC could take was to terminate the session.

The X'FF' value remains in TCTE_PRSS as an indicator that the session was terminated during PRSS recovery. Only when the session is restarted is the value overwritten with X'00'.

Bid status byte (TCTE_BID_STATUS)

DFHZXPS uses a byte in the TCTTE, TCTE_BID_STATUS, to track the various stages of recovery. It is possible to examine this byte to determine the stage of recovery reached by DFHZXPS.

The byte values have the following meanings.

- X'00'

  This session has not been processed by DFHZXPS.
- X'01' TCTE_SEND_POSITIVE_RESPONSE

  A positive response is to be sent to a bid which was received before system failure. This value is changed to X'07' TCTE_SENT_POSITIVE_RESPONSE before the TCTTE is requeued to DFHZACT for the SEND and so will only be seen if DFHZXPS abends. When the response has been sent DFHZXPS will be recalled.
- X'02' TCTE_SEND_NEGATIVE_RESPONSE

  A negative response is to be sent to a bid with data which was sent before system failure. This needs to be followed by RTR and so the status byte is changed to X'03' SEND_RTR before the TCTTE is requeued to

DFHZACT for the SEND. This is another value which should only be seen if DFHZXPS abends. DFHZXPS will be recalled when the response has been sent.

- X'03' TCTE_SEND_RTR

  Recovery is complete apart from the need to send RTR. This will be done by DFHZDET and DFHZXPS will not be recalled.

- X'04' TCTE_SENT_RTR

  RTR was sent before system failure. There is no recovery to be done. DFHZXPS will not be recalled.

- X'05' TCTE_SEND_LUSTAT_EB

  Either we received a positive response to a bid or we sent a positive response to RTR before the system failed. The bid now has to be canceled. This will be done by DFHZDET and DFHZXPS will not be recalled.

- X'06' TCTE_AWAITING_BB_RESPONSE

  A bid was sent before the system failed. No further recovery is required. When the response arrives from the partner the bid will be canceled. DFHZXPS will not be recalled.

- X'07' TCTE_SENT_POSITIVE_RESPONSE

  Either a positive response has been sent to a bid or one is about to be sent (see above under SEND_POSITIVE_RESPONSE). In the former case DFHZXPS will not be recalled, in the latter case it will.

- X'08' TCTE_0814_RECEIVED

  A negative response was sent to a bid before the system failed. Any further recovery will be carried out by DFHZDET and DFHZXPS will not be recalled.

- X'09' TCTE_0813_RECEIVED

  As above except that no RTR is expected in this case. No further recovery processing is needed from either DFHZXPS or DFHZDET.

- X'0A' TCTE_SEND_RECOVERY_MESSAGE

  All recovery is now complete.

- X'0B' TCTE_DR1_OUTSTANDING

  The last flow was inbound with CEB,RQD1 and so although there is no task to ABEND a response is still expected by the partner. We requeue for DFHZSDL to send the response and any further recovery processing will be done by DFHZDET. DFHZXPS will not be recalled.

- X'0C' TCTE_DR1_EXPECTED

  As above except that the last flow was inbound. DFHZDET will arrange for the response to be received. DFHZXPS will not be recalled.

TCTE_BID_STATUS must be used in conjunction with TCTE_PRSS to determine the state of the recovery. If TCTE_PRSS is set to TCTE_ZXPS_ISSUE_RECOVERY_MESSAGE, or to a state which indicates that recovery is complete, DFHZXPS has finished processing. If not DFHZXPS will be recalled at a later stage.

Summary of persistent session waits

The DFHDSSRM waits are summarized here. All but PSUNBECB are posted by DFHZGRP.

Module	Type	Resource_name	Resource_type	ECB
DFHSII1	MVS	ZGRPECB	AP_INIT	TCTV_ZGRP_FIN_ECB
DFHZGUB	OLDC	PSUNBECB	ZC_ZGUB	WAIT_RPL_ECB
DFHZGRP	MVS	PSOP1ECB	ZC_ZGRP	OPNDST_ECB
DFHZGRP	MVS	PSOP2ECB	ZC_ZGRP	OPNDST_ECB
DFHZGRP	MVS	PSINQECB	ZC_ZGRP	INQUIRE_ECB
DFHZGRP	OLDC	TCTVCECB	ZC_ZGRP	TCTVCECB

where the waits are issued for the following reasons:

ZGRPECB Wait for DFHZGRP to complete.

PSUNBECB Wait for free unbind RPL from RPL pool anchored from TCTV_PRSS_RPL_POOL_PTR.

PSOP1ECB Wait for OPNDST RESTORE to complete.

PSOP2ECB Wait for OPNDST RESTORE to complete after UNBINDs have failed.

PSINQECB Wait for INQUIRE PERSESS to complete.

TCTVCECB Wait for TCTTEs to finish installing (DFHTCRP).

VTAM exits

The VTAM exits SYNAD (DFHZSYX) or LERAD (DFHZLEX) may be driven during persistent sessions recovery.

In DFHZGRP, before INQUIRE OPTCD=PERSIST is issued, or in DFHZGUB before CLSDST or TERMSESS are issued CICS sets the RPL user field to -2 to indicate to the exits that they must do NO processing at all. This is because these macros may be issued under the concurrent TCB.

In DFHZGRP before OPNDST OPTCD=RESTORE is issued CICS sets the RPL user field to -1 to indicate to the exits that they should try minimum recovery - that is they set the return code to TCZSYXPR if an error can be retried, or TCZSYXCF if it is a permanent error.

If an error occurs in DFHZGSL for SETLOGON OPTCD=PERSIST DFHZSYX returns immediately (as for RPL user field = -2).

If MNPS is in use and VTAM crashes DFHZTPX is driven with a code of 8. If SIT parameter PSTYPE=MNPS was specificed then DFHZTPX does NOT schedule the autoinstalled TCTTEs for deletion. They are scheduled for CLSDST CLEANUP instead by DFHZSHU.

See the *OS/390 eNetwork Communications Server: SNA Programming* manual, SC31-8573, for general VTAM exit information.

Trace

The following point IDs are provided for persistent sessions recovery (DFHZGCA, DFHZGCC, DFHZGCN, DFHZGDA, DFHZGPC, DFHZGPR, DFHZGRP, DFHZGSL, DFHZGUB, DFHZCGRP, DFHZXPS, DFHZXRC):

- AP FB10 through AP FBFF, for which the trace levels are TC 1 and TC 2.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Statistics

The following statistics are produced by DFHZGRP. They are treated in the same way as other terminal control VTAM statistics.

A03_PRSS_NIB_COUNT
The number of active VTAM sessions when INQUIRE OPTCD=COUNTS was issued - this represents the number of persisting sessions.

A03_PRSS_INQUIRE_COUNT
The number of times DFHZGRP issues INQURE OPTCD=PERSESS. Each INQUIRE should be given about 400 sessions.

A03_PRSS_UNBIND_COUNT
The number of times CLSDST or TERMSESS were issued by DFHZGUB.

A03_PRSS_OPNDST_COUNT
The number of sessions that OPNDST RESTORE restored successfully.

A03_PRSS_ERROR_COUNT
The number of sessions with NIBUSER=tctte address, that VTAM failed to restore with OPNDST RESTORE. This occurs if VTAM operator commands are issued whilst DFHZGRP is in control and sessions are closed as a result.

Chapter 102. WTO and WTOR

Design overview

The DFHSUWT module provides the following support for executing MVS WTO and WTOR SVCs:

SEND supports Write To Operator (WTO):

- A single-line message up to 113 characters, or a multiline message consisting of a control line and up to nine lines of 69 characters
- Route code specification (route code list of 1 through 28 numbers, each in the range 1 through 28)
- Descriptor code specification (descriptor code list of 1 through 16 numbers, each in the range 1 through 16).

CONVERSE supports Write To Operator With Reply (WTOR):

- A single-line message up to 121 characters
- Route code specification (route code list of 1 through 28 numbers, each in the range 1 through 28)
- Descriptor code specification (descriptor code list of 1 through each in the range 1 through 28) 16 numbers, each in the range 1 through 16)
- A reply with maximum length of 119 characters.

The DFHWTO macro may be used to send a message, normally to the system operator, when neither the CICS message domain nor the old message program (DFHMGP) can be used. The message domain cannot be used during certain phases of initialization and XRF processing, because it requires a kernel stack environment. DFHMGP cannot be used during initialization, nor during any sort of abend or dump processing, because it uses task LIFO storage and may therefore invoke the storage control program.

The DFHWTO macro may also be used to terminate CICS abnormally or to request a reply from the operator.

Any WTO or WTOR macros that are issued by CICS might be intercepted by the console message handling facility described under "Console message handling" on page 539. This service optionally inserts the CICS region's applid into CICS messages before they are displayed on the console.

Modules

DFHSUWT and DFHWTO

Exits

No global user exit points are provided for this function.

Trace

The following point IDs are provided for this function:

- AP FF0x, for which the trace levels are AP 1 and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Chapter 103. CICS Web Interface and CICS business logic interface

The CICS Web Interface allows Web browsers to use transaction processing services by calling CICS programs or by running CICS transactions. The Web browsers use TCP/IP to communicate with the CICS Web Interface.

The CICS business logic interface allows other external users to use transactions processing services.

Design overview

For information about the design and implementation of the CICS Web Interface and CICS business logic interface, see the *CICS Internet Guide*.

Control blocks

Figure 123 shows the control blocks used by the CICS Web Interface 3270 support.

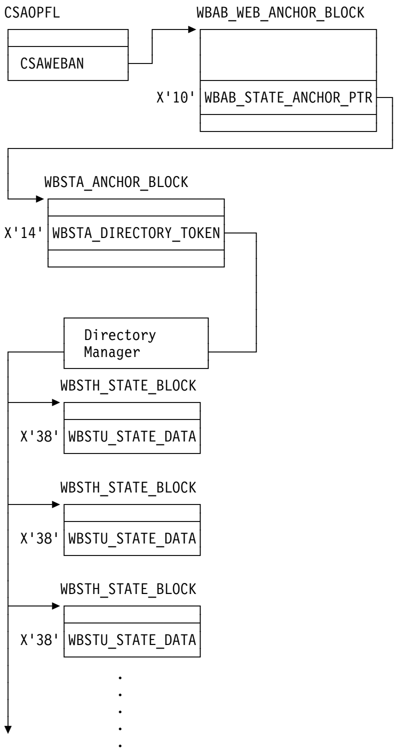


Figure 123. Web Interface module list

Modules

The modules of the CICS Web Interface are organized as follows:

1. CICS Initialization
2. Web attach processing
3. Alias transaction
4. CICS business logic interface
5. CICS Web bridge
6. HTML template manager
7. Environment variables

CICS Initialization

DFHWBIP: DFHWBIP initializes the web environment at CICS startup.

Web attach processing

DFHWBXN: DFHWBXN is the Web attach processing module. It is the initial program invoked for transaction CWXN (or an alias of CWXN), which is attached for a new sockets connection received on a port associated with a Web TCPIPSERVICE.

- Calls Web domain WBSR gate to process the incoming data
- Attaches the Web alias transaction (default transaction ID is CWBA).

Alias transaction

DFHWBA: DFHWBA is the alias program. An alias transaction is started by Web attach processing for each request received from TCP/IP. It sets up a parameter list for DFHWBA1, and then calls it.

CICS business logic interface

DFHWBA1: DFHWBA1 is the CICS business logic interface program. The interface to the CICS business logic interface program is described in *CICS Internet Guide*.

The CICS business logic interface program is called by DFHWBA. If its parameters list specifies a user-replaceable converter, it calls the **Decode** function of the converter. If its parameter list specifies a CICS program, it calls the CICS program. If its parameters list specifies a user-replaceable converter, it calls the **Encode** function of the converter.

CICS Web bridge

DFHWBGB: DFHWBGB removes redundant state data from the system.

DFHWBST: DFHWBST manages the state data held for the CICS Web bridge.

DFHWBTC: DFHWBTC performs 3270/HTML conversion for the CICS Web bridge.

DFHWBTTA: DFHWBTTA sets up the parameters for bridging to transactions from the CICS Web Interface.

DFHWBLT: DFHWBLT is the CICS Web bridge exit.

HTML template manager

DFHWBTL: DFHWBTL is the HTML template manager. The interface to the template manager is described in *CICS Internet Guide*.

Environment variables

DFHWBENV: DFHWBENV is the environment variables program. The interface to the environment variables program is described in *CICS Internet Guide*.

DFHWBPA: DFHWBPA provides a parsing function for HTML forms and HTTP environment variable information built by DFHWBENV.

DFHWBUN: DFHWBUN provides an unescaping function for data which has been transmitted to CICS in its escaped form, but which the application needs to manipulate in its unescaped form.

Exits

No global user exit points are provided for this function.

Trace

The trace point IDs for this function are of the form WB xxxx. The trace levels are WB 1, WB 2, and Exc.

For more information about the trace points, see the *CICS Trace Entries*. For more information about using traces in problem determination, see the *CICS Problem Determination Guide*.

Part 3. CICS modules

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This part contains:

Chapter 104. CICS directory

This section lists, in alphanumeric order by element name, the contents of the distribution tapes listed in Table 108 on page 716.

The list shows, for each element:

- The name of the element
- The type of element
- A description of the element
- The names of the source and object distribution libraries containing the element.

Classification of elements

Name

This is the name of the element in the distribution library.

Type

The types of elements are:

CSECT. A control section or, in the case of a source element only, the first part of a control section (other source elements may be copied by the CSECT). Where an object module is OCO, this is indicated following the type CSECT; no source code is provided for modules thus classified.

DSECT. A dummy section (or appropriate high-level language equivalent) defining a CICS data area.

Macro. A macro definition.

Source. Source code that is not a CSECT.

Sample. Sample tables, programs, map sets, partition sets, or data files.

Symbolic. A definition (with no DSECT statement) of a CICS data area, or a group of EQU statements that symbolically define values used throughout a program.

Other. Job control language statements or cataloged procedures. See the *CICS Transaction Server for OS/390 Installation Guide* and the *CICS System Definition Guide* for the handling of these elements.

Library

Two columns are given under the heading **Library**. These correspond to source code and object code distribution respectively. The distribution tapes are in SMP/E RELFILE format, and a RELFILE number indicates the position of each data set on a particular tape. For further details about the format of the distribution tapes, see the *CICS Transaction Server for OS/390 Program Directory*.

Some elements have several COBOL, PL/I, C/370, and assembler-language versions with the same name; these elements are shown here as cataloged in more than one source distribution library.

The meanings of the letters in the library columns is given in Table 108 on page 716.

Table 108. CICS Transaction Server for OS/390 Release 3 distribution tapes

Letter	Tape volser	File name	Library
02	CI5300	HCI5300.F2	CICSTS13.CICS.ADFHINST
03	CI5300	HCI5300.F3	CICSTS13.CICS.ADFHPROC
04	CI5300	HCI5300.F4	CICSTS13.CICS.ADFHMAC
05	CI5300	HCI5300.F5	CICSTS13.CICS.ADFHSAMP
06	CI5300	HCI5300.F6	CICSTS13.CICS.ADFHMOD *
07	CI5300	HCI5300.F7	CICSTS13.CICS.ADFHSRC
08	CI5300	HCI5300.F8	CICSTS13.CICS.ADFHAPD1
09	CI5300	HCI5300.F9	CICSTS13.CICS.ADFHAPD2
10	CI5300	HCI5300.F10	CICSTS13.CICS.ADFHMSGS
11	CI5300	HCI5300.F11	CICSTS13.CICS.ADFHPARM
12	CI5300	HCI5300.F12	CICSTS13.CICS.ADFHMSRC
13	CI5300	HCI5300.F13	CICSTS13.CICS.ADFHCLIB
14	CI5300	HCI5300.F14	CICSTS13.CICS.ADFHMLIB
15	CI5300	HCI5300.F15	CICSTS13.CICS.ADFHPLIB
16	CI5300	HCI5300.F16	CICSTS13.CICS.ADFHLANG
C2	CI5300	JCI5301.F1	CICSTS13.CICS.ADFHCOB
C3	CI5300	JCI5301.F2	COBOL elements of CICSTS13.CICS.ADFHSAMP
C4	CI5300	JCI5301.F2	COBOL elements of CICSTS13.CICS.ADFHMOD
P2	CI5300	JCI5302.F1	CICSTS13.CICS.ADFHPLI
P3	CI5300	JCI5302.F2	PL/I elements of CICSTS13.CICS.ADFHSAMP
D2	CI5300	JCI5303.F1	CICSTS13.CICS.ADFHC370
D3	CI5300	JCI5303.F2	C/370 elements of CICSTS13.CICS.ADFHSAMP
OS	CI530S	CICSTS13.CICS.OPTSRC01	

An asterisk (*) following the RELFILE number indicates that the distribution library contains object modules.

Note: Object modules only are supplied for the Japanese language feature; corresponding source code is ***not*** provided for these modules.

Optional listings

Assembled listings of programs and source listings of macros, DSECTs, and symbolic definitions are available with CICS, and can be supplied on CD-ROM or microfiche. For further information about the optional listings, see the *CICS Transaction Server for OS/390 Program Directory*.

Contents of the distribution tapes

Table 109 (Page 1 of 90). CICS modules directory

Name	Type	Description	Library	
ACCTINDX	Sample	Primer - batch index file recovery - COBOL	C3	-
ACCTREC	Sample	Primer - account record - COBOL	C3	-
ACCTSET	Sample	Primer - map set - COBOL	05	-
ACCT00	Sample	Primer - menu display - COBOL	C3	-
ACCT01	Sample	Primer - initial request processing - COBOL	C3	-
ACCT02	Sample	Primer - update processing - COBOL	C3	-
ACCT03	Sample	Primer - requests for printing - COBOL	C3	-
ACCT04	Sample	Primer - error processing - COBOL	C3	-
ACIXREC	Sample	Primer - index record - COBOL	C3	-
AXMBF	CSECT	Buffer management routine	-	06
AXMER	CSECT	Server task error recovery	-	06
AXMEV	CSECT	Event control and task management routine	-	06
AXMEV1	CSECT	Event management MVS POST exit	-	06
AXMFL	CSECT	Sequential file I/O routine	-	06
AXMHP	CSECT	Heap storage routine	-	06
AXMHS	CSECT	Hash value generation subroutine	-	06
AXMLF	CSECT	Server environment LIFO storage routine	-	06
AXMLFMVS	CSECT	LIFO storage routine - MVS batch version	-	06
AXMLK	CSECT	Lock management routine	-	06
AXMMS	CSECT	Message editing and processing routine	-	06
AXMMSTAB	CSECT	Message filtering table	-	06
AXMOP	CSECT	Operator communication routine	-	06
AXMOS	CSECT	Server operating system interface	-	06
AXMPG	CSECT	Page storage routine	-	06
AXMRM	CSECT	Resource manger initialization/termination	-	06
AXMRS	CSECT	Resource tracking routine	-	06
AXMSC	CSECT	Server connection routine	-	06
AXMSC1	CSECT	Locate server connection system area	-	06
AXMSC2	CSECT	Server connection services interface	-	06
AXMSI	CSECT	Subsystem initialization routine	-	06
AXMTI	CSECT	Timer interval service	-	06
AXMTK	CSECT	Task attach and detach routine	-	06
AXMTM	CSECT	Mode-independent time and date service	-	06
AXMTR	CSECT	Server trace management routine	-	06
AXMVS	CSECT	Variable sized shared storage routine	-	06
AXMWH	CSECT	AXMWH - data areas	-	06
AXMWT	CSECT	AXMWT - data areas	-	06
AXMXM	CSECT	Cross memory interface	-	06
AXMXM1	CSECT	Cross memory interface POST module	-	06
CALLDLI	Macro	CALL DL/I services	04	-
CAUBLD	CSECT	CAU builder front end	-	06
CAUBLDIN	CSECT	CAU builder input processor	-	06
CAUBLDMR	CSECT	CAU builder merge processor	-	06
CAUBLDOT	CSECT	CAU builder output processor	-	06
CAUCAFBE	CSECT	CAU CAFB abend exit	-	06
CAUCAFB1	CSECT	CAU CAFB main program	-	06
CAUCAFB2	CSECT	CAU CAFB data save program	-	06
CAUCAFDT	CSECT	CAU CAFF date utility	-	06
CAUCAFFE	CSECT	CAU CAFF abend exit	-	06
CAUCAFF1	CSECT	CAU CAFF main program	-	06
CAUCAFF2	CSECT	CAU CAFF options	-	06
CAUCAFF3	CSECT	CAU CAFF start program	-	06
CAUCAFF4	CSECT	CAU CAFF stop program	-	06
CAUCAFF5	CSECT	CAU CAFF pause program	-	06

Table 109 (Page 2 of 90). CICS modules directory

Name	Type	Description	Library	
CAUCAFF6	CSECT	CAU CAFF continue program	-	06
CAUCAFF7	CSECT	CAU CAFF help program	-	06
CAUCAFP	CSECT	CAU CAFB request handler	-	06
CAUJCLBL	Sample	Sample JCL for running CAU builder	02	-
CAUJCLCA	Sample	Sample JCL for CAU Affinity data files	02	-
CAUJCLCC	Sample	Sample JCL for CAU Affinity control file	02	-
CAUJCLLD	Sample	Sample JCL for running CAU scanner (Detail mode)	02	-
CAUJCLLS	Sample	Sample JCL for running CAU scanner (Summary mode)	02	-
CAUJCLRP	Sample	Sample JCL for running CAU Reporter	02	-
CAULMS	CSECT	CAU load module scanner	-	06
CAUMAP1	CSECT	CAU BMS map CAFF01	-	06
CAUMAP2	CSECT	CAU BMS map CAFF02	-	06
CAUMAP3	CSECT	CAU BMS map CAFFH1	-	06
CAUMAP4	CSECT	CAU BMS map CAFFH2	-	06
CAUMSGCS	CSECT	CAU message manager CICS stub	-	06
CAUMSGMN	CSECT	CAU message manager	-	06
CAUMSGTB	CSECT	CAU message table	-	06
CAUREP	CSECT	CAU reporter main module	-	06
CAUREPFM	CSECT	CAU reporter file manager	-	06
CAUREPPM	CSECT	CAU reporter print manager	-	06
CAUREPRM	CSECT	CAU reporter report manager	-	06
CAUTABM	CSECT	CAU detector table manager	-	06
CAUTABS	CSECT	CAU detector table storage manager	-	06
CAUXDUMM	CSECT	CAU detector dummy exit	-	06
CAUXITIR	CSECT	CAU detector pseudo-conv end exit	-	06
CAUXITI1	CSECT	CAU detector TRUE	-	06
CAUXITML	CSECT	CAU detector logoff exit	-	06
CAUXITMS	CSECT	CAU detector signoff exit	-	06
CAUXITM1	CSECT	CAU detector XMEOUT exit	-	06
CAUXITOA	CSECT	CAU detector ADDRESS exit	-	06
CAUXITOC	CSECT	CAU detector CANCEL exit	-	06
CAUXITOE	CSECT	CAU detector ENQ/DEQ exit	-	06
CAUXITOG	CSECT	CAU detector GETMAIN exit	-	06
CAUXITOL	CSECT	CAU detector LOAD/RELEASE exit	-	06
CAUXITOQ	CSECT	CAU detector TS exit	-	06
CAUXITOR	CSECT	CAU detector RETRIEVE exit	-	06
CAUXITOS	CSECT	CAU detector SPI exit	-	06
CAUXITOW	CSECT	CAU detector WAIT exit	-	06
CAUXITOY	CSECT	CAU detector LOAD/FREEMAIN exit	-	06
CAUXITO1	CSECT	CAU detector XEIOUT exit	-	06
CAUXITXX	CSECT	CAU detector ICE expiry exit	-	06
CAUXITX1	CSECT	CAU detector XICEXP exit	-	06
CMC	Symbolic	SAA communications pseudonyms for C	D3	-
CMCOBOL	Symbolic	SAA communications pseudonyms for COBOL	C2	-
CMHASM	Symbolic	SAA communications pseudonyms for assembler	04	-
CMPLI	Symbolic	SAA communications pseudonyms for PL/I	P2	-
DFHABAB	CSECT	AP domain abend handling	-	06
DFHABABA	DSECT	ABAB parameter list	OS	-
DFHABABM	Macro	ABAB request	OS	-
DFHABABT	CSECT	ABAB trace interpretation data	-	06
DFHABEND	Macro	Issue an ABEND macro	OS	-

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Name	Type	Description	Library	
DFHABREV	CSECT	String abbreviation checker	OS	06
DFHACP	CSECT	Abnormal condition program	OS	06
DFHACPTB	Macro	ACP abend table	OS	-
DFHAFCD	Macro	Authorized function control block (AFCB)	04	-
DFHAFCS	Macro	Authorized function common storage anchor	OS	-
DFHAFCTA	DSECT	Application file control table entry	OS	-
DFHAFMT	CSECT (OCO)	AFCT manager	-	06
DFHAFMTA	DSECT	AFMT parameter list	OS	-
DFHAFMTM	Macro	AFMT request	OS	-
DFHAFMTT	CSECT (OCO)	AFMT trace interpretation data	-	06
DFHAIBD	Macro	Application interface control block	04	-
DFHAICB	Macro	Application interface control block	04	-
DFHAICBP	CSECT	Application interface control block module	OS	06
DFHAID	Symbolic	3270 attention identifiers	04	-
DFHAID	Symbolic	3270 attention identifiers - COBOL	C2	-
DFHAID	Symbolic	3270 attention identifiers - PL/I	P2	-
DFHAID	Symbolic	3270 attention identifiers - C/370	D3	-
DFHAIDDS	DSECT	Automatic initiate descriptor	04	-
DFHAIDUF	CSECT (OCO)	Autoinstall terminal model manager (AITMM) SDUMP formatter	-	06
DFHAIINA	DSECT	AIIN parameter list	OS	-
DFHAIINM	Macro	AIIN request	OS	-
DFHAIINT	CSECT (OCO)	AIIN trace interpretation data	-	06
DFHAIIN1	CSECT (OCO)	AITMM - initialization management program	-	06
DFHAIIN2	CSECT (OCO)	AITMM - initialization subtask program	-	06
DFHAIIQ	CSECT (OCO)	AITMM - locate/unlock/inquire/browse	-	06
DFHAIIQA	DSECT	AIIQ parameter list	OS	-
DFHAIIQM	Macro	AIIQ request	OS	-
DFHAIIQT	CSECT (OCO)	AIIQ trace interpretation data	-	06
DFHAIRP	CSECT (OCO)	AITMM - initialization/recovery	-	06
DFHAIRPA	DSECT	AIRP parameter list	OS	-
DFHAIRPM	Macro	AIRP request	OS	-
DFHAIRPT	CSECT (OCO)	AIRP trace interpretation data	-	06
DFHAITDS	DSECT	AITMM - static storage	OS	-
DFHAITM	CSECT (OCO)	AITMM - add replace/delete	-	06
DFHAITMA	DSECT	AITM parameter list	OS	-
DFHAITMM	Macro	AITM request	OS	-
DFHAITMT	CSECT (OCO)	AITM trace interpretation data	-	06
DFHALP	CSECT	Terminal allocation	OS	06
DFHALRC	CSECT	Automatic initiate descriptor recovery	-	06
DFHAMCSD	CSECT	RDO command logger	OS	06
DFHAMD2	CSECT		-	06
DFHAMER	CSECT	RDO error message builder	OS	06
DFHAMFC	CSECT	RDO install for FCT resources	OS	06
DFHAMGL	CSECT	RDO list generator	OS	06
DFHAMLM	CSECT	Program to install log manager objects	-	06
DFHAMPAB	CSECT	RDO AMP error handler	OS	06
DFHAMPAD	CSECT	RDO add command	OS	06
DFHAMPAP	CSECT	RDO append command	OS	06
DFHAMPCH	CSECT	RDO check command	OS	06
DFHAMPCO	CSECT	RDO copy and rename commands	OS	06
DFHAMPDF	CSECT	RDO define/redefine command	OS	06
DFHAMPDI	CSECT	RDO display command	OS	06
DFHAMPDL	CSECT	RDO delete/remove commands	OS	06
DFHAMPEN	CSECT	RDO end AMP handler	OS	06
DFHAMPEX	CSECT	RDO expand command	OS	06

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Name	Type	Description	Library	
DFHAMPFI	CSECT	RDO begin AMP handler	OS	06
DFHAMPIL	CSECT	RDO install command	OS	06
DFHAMPLO	CSECT	RDO lock/unlock command	OS	06
DFHAMPN	CSECT	RDO install for partner resources	OS	06
DFHAMPVW	CSECT	RDO view command	OS	06
DFHAMP00	CSECT	RDO allocation manager (DFHAMP)	OS	06
DFHAMRDI	CSECT	RDO install logger	OS	06
DFHAMSN	CSECT	RDO set name/type/set/stype from arg list	OS	06
DFHAMST	CSECT	RDO update time and date in arg list	OS	06
DFHAMTD	CSECT	Program to install Transient Data objects	-	06
DFHAMTP	CSECT	RDO AMP request processor	OS	06
DFHAMXM	CSECT	Install XM domain resources (transaction and tranclass objects)	OS	06
DFHANRAT	Macro	3270 attribute character resolution	04	-
DFHANRWC	Macro	3270 control character resolution	04	-
DFHAPAC	DSECT	AP domain abnormal condition reporting interface	OS	06
DFHAPACA	DSECT	APAC parameter list	OS	-
DFHAPACM	Macro	APAC request	OS	-
DFHAPACT	CSECT	APAC translate table	-	06
DFHAPAPA	DSECT	APAP parameter list	OS	-
DFHAPAPM	Macro	APAP request	OS	-
DFHAPAPT	CSECT	APAP trace interpretation data	OS	06
DFHAPATT	CSECT	AP domain - entrypoint attach	OS	06
DFHAPDDS	DSECT	DFHAPDM static storage	OS	-
DFHAPDM	CSECT	AP domain - initialization/termination	OS	06
DFHAPDN	CSECT	AP domain - transaction definition notify	OS	06
DFHAPDUF	CSECT (OCO)	AP domain - formatted dump print	-	06
DFHAPEVI	Macro	AP domain - environment initialization	OS	-
DFHAPEX	CSECT	AP domain - user exit service	OS	06
DFHAPEXA	DSECT	APEX parameter list	OS	-
DFHAPEXM	Macro	APEX request	OS	-
DFHAPEXT	CSECT	APEX trace interpretation data	OS	06
DFHAPIDS	DSECT	Interval control static storage	OS	-
DFHAPIN	CSECT	AP domain - special initialization for programs and user-replaceable modules	OS	06
DFHAPIQ	CSECT (OCO)	AP domain - user exit data access service	-	06
DFHAPIQT	CSECT (OCO)	APIQ trace interpretation data	-	06
DFHAPIQX	Macro	APIQ request	04	-
DFHAPIQY	DSECT	APIQ parameter list	04	-
DFHAPJC	CSECT	AP domain - journal interface gate service	OS	06
DFHAPLIA	CSECT	AP domain - language interface program	OS	-
DFHAPLIT	CSECT (OCO)	AP domain - language interface service	-	06
DFHAPLI1	CSECT (OCO)	AP domain - language interface functions 1	-	06
DFHAPLI2	CSECT (OCO)	AP domain - language interface functions 2	-	06
DFHAPLI3	CSECT (OCO)	AP domain - language interface functions 3	-	06
DFHAPNT	CSECT	AP domain - MXT notify gate	OS	06
DFHAPPG	CSECT	AP domain - optimize initial_link for DFHMIRS	-	06
DFHAPRC	CSECT	User log record recovery module	-	06
DFHAPRDR	CSECT	Resource definition recovery gate	-	06
DFHAPRDT	CSECT	APRD translate table	-	06
DFHAPRT	CSECT	AP Domain - route transaction gate	OS	06
DFHAPRTA	DSECT	APRT parameter list	OS	-
DFHAPRTM	Macro	APRT request	OS	-

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Name	Type	Description	Library	
DFHAPRTT	CSECT	APRM trace interpretation data	OS	06
DFHAPSI	CSECT	AP domain - gate initialization	OS	06
DFHAPSIP	CSECT	AP domain - system initialization program	OS	06
DFHAPSM	CSECT	AP domain - storage notify gate	OS	06
DFHAPST	CSECT	AP domain - statistics collection	OS	06
DFHAPTI	CSECT	AP domain - timer notify gate	OS	06
DFHAPTIM	CSECT	AP domain - interval control midnight task	OS	06
DFHAPTIX	CSECT	AP domain - expiry analysis task	OS	06
DFHAPTPA	Symbolic	IRC trace point ID aliases	OS	-
DFHAPTRA	CSECT	IRC trace interpreter	OS	06
DFHAPTRB	CSECT	XRF trace interpreter	OS	06
DFHAPTRC	CSECT	User exit trace interpreter	OS	06
DFHAPTRD	CSECT	DFHAPDM/DFHAPAP trace interpreter	OS	06
DFHAPTRE	CSECT (OCO)	Data tables trace interpreter	-	06
DFHAPTRF	CSECT (OCO)	SAA communications and resource recovery interfaces trace interpreter	-	06
DFHAPTRG	CSECT	ZC exception and VTAM exit trace interpreter	OS	06
DFHAPTRI	CSECT	AP domain - trace interpretation router	OS	06
DFHAPTRJ	CSECT	ZC VTAM interface trace interpreter	OS	06
DFHAPTRK	CSECT	AP domain - resource definition interpretation module	-	06
DFHAPTRL	CSECT	CICS OS/2 LU2 mirror trace interpreter	OS	06
DFHAPTRN	CSECT (OCO)	Autoinstall terminal model manager trace interpreter	-	06
DFHAPTRO	CSECT	LU6.2 application request logic trace interpreter	OS	06
DFHAPTRP	CSECT	Program control trace interpreter	OS	06
DFHAPTRR	CSECT (OCO)	Partner resource manager trace interpreter	-	06
DFHAPTRS	CSECT (OCO)	AP domain - DFHEISR trace interpreter	-	06
DFHAPTRU	CSECT	ZC install trace interpretation	OS	06
DFHAPTRV	CSECT (OCO)	AP domain - DFHSRP trace interpreter	-	06
DFHAPTRW	CSECT (OCO)	AP domain - FEPI trace interpreter	-	06
DFHAPTRX	CSECT	ZC persistent sessions trace interpretation	OS	06
DFHAPTRY	CSECT	AP domain - trace formatting (APRM, APXM, ICXM, and TDXM)	OS	06
DFHAPTR0	CSECT	Trace interpreter for old-style AP trace	OS	06
DFHAPTR2	CSECT	AP domain - statistics trace interpreter	OS	06
DFHAPTR5	CSECT	File control trace interpreter	OS	06
DFHAPTR6	CSECT	DBCTL trace interpreter	OS	06
DFHAPTR7	CSECT	Transaction routing trace interpreter	OS	06
DFHAPTR8	CSECT	Security trace interpreter	OS	06
DFHAPTR9	CSECT	Interval control trace interpreter	OS	06
DFHAPUEA	DSECT	APUE parameter list	OS	-
DFHAPUEM	Macro	APUE request	OS	-
DFHAPUET	CSECT	APUE trace interpretation data	OS	06
DFHAPXDD	CSECT	AP domain - transaction definition extension	OS	-
DFHAPXM	CSECT	AP domain - transaction initialization and termination services	OS	06
DFHAPXMA	DSECT	APXM parameter list	OS	-
DFHAPXME	CSECT	AP domain - XM exception handler	OS	06
DFHAPXMT	CSECT (OCO)	APXM trace interpretation data	-	06

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Name	Type	Description	Library	
DFHASMVS	Other	Cataloged procedure to assemble CICS programs and user-written macro-level programs	03	-
DFHASSUA	DSECT	ASSU parameter list	OS	-
DFHASSUM	Macro	ASSU request	OS	-
DFHASSUT	CSECT	ASSU trace interpretation data	OS	06
DFHASV	CSECT	Authorized services interface	OS	06
DFHAUDUF	CSECT		-	06
DFHAUPLE	Other	Cataloged procedure to assemble and link-edit CICS control tables, and provide information to SMP/E	02	-
DFHAUTH	Macro	Verify environment and activate CICS SVCs	OS	-
DFHAXI	Macro	XRF alternate subsystem identifier table	OS	-
DFHA03DS	DSECT	VTAM statistics	04	-
DFHA03DS	DSECT	VTAM statistics - COBOL	C2	-
DFHA03DS	DSECT	VTAM statistics - PL/I	P2	-
DFHA04DS	DSECT	Autoinstall statistics	04	-
DFHA04DS	DSECT	Autoinstall statistics - COBOL	C2	-
DFHA04DS	DSECT	Autoinstall statistics - PL/I	P2	-
DFHA06DS	DSECT	Terminal statistics	04	-
DFHA06DS	DSECT	Terminal statistics - COBOL	C2	-
DFHA06DS	DSECT	Terminal statistics - PL/I	P2	-
DFHA08DS	DSECT	LSR pool statistics	04	-
DFHA08DS	DSECT	LSR pool statistics - COBOL	C2	-
DFHA08DS	DSECT	LSR pool statistics - PL/I	P2	-
DFHA09DS	DSECT	LSR pool file-related statistics	04	-
DFHA09DS	DSECT	LSR pool file-related statistics	C2	-
DFHA09DS	DSECT	LSR pool file-related statistics	P2	-
DFHA14DS	DSECT	ISC/IRC statistics for system entries	04	-
DFHA14DS	DSECT	ISC/IRC statistics for system entries	C2	-
DFHA14DS	DSECT	ISC/IRC statistics for system entries	P2	-
DFHA16DS	DSECT	Table manager statistics	04	-
DFHA16DS	DSECT	Table manager statistics	C2	-
DFHA16DS	DSECT	Table manager statistics	P2	-
DFHA17DS	DSECT	File control statistics	04	-
DFHA17DS	DSECT	File control statistics	C2	-
DFHA17DS	DSECT	File control statistics	P2	-
DFHA20DS	DSECT	ISC/IRC statistics for mode entries	04	-
DFHA20DS	DSECT	ISC/IRC statistics for mode entries	C2	-
DFHA20DS	DSECT	ISC/IRC statistics for mode entries	P2	-
DFHA21DS	DSECT	ISC/IRC attach-time statistics	04	-
DFHA21DS	DSECT	ISC/IRC attach-time statistics	C2	-
DFHA21DS	DSECT	ISC/IRC attach-time statistics	P2	-
DFHA22DS	DSECT	FEPI pool statistics	04	-
DFHA22DS	DSECT	FEPI pool statistics	C2	-
DFHA22DS	DSECT	FEPI pool statistics	P2	-
DFHA23DS	DSECT	FEPI connection statistics	04	-
DFHA23DS	DSECT	FEPI connection statistics	C2	-
DFHA23DS	DSECT	FEPI connection statistics	P2	-
DFHA24DS	DSECT	FEPI target statistics	04	-
DFHA24DS	DSECT	FEPI target statistics	C2	-
DFHA24DS	DSECT	FEPI target statistics	P2	-
DFHBAM51	CSECT	CSDUP - SPI offline messages table (51xx)	OS	06

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Name	Type	Description	Library	
DFHBAM52	CSECT	CSDUP - SPI offline messages table (52xx)	OS	06
DFHBAM55	CSECT	CSDUP - SPI offline messages table (55xx)	OS	06
DFHBAM56	CSECT	CSDUP - SPI offline messages table (56xx)	OS	06
DFHBEPB	CSECT	RDO batch error program	OS	06
DFHBEPC	CSECT	RDO message formatting module	OS	06
DFHBFTCA	Macro	Built-in functions TCA macro	04	-
DFHBMPIC	Macro	BMS picture analysis	04	-
DFHBMS	Macro	Basic mapping support request	04	-
DFHBMSCA	Symbolic	BMS attribute definitions	04	-
DFHBMSCA	Symbolic	BMS attribute definitions	C2	-
DFHBMSCA	Symbolic	BMS attribute definitions	P2	-
DFHBMSCA	Symbolic	BMS attribute definitions	D3	-
DFHBMSMM	Macro	Pre-VS BMS mapping program	OS	06
DFHBMSU	Macro		02	-
DFHBMSUP	Macro		-	06
DFHBMUTM	Macro	Trace BMS module generation options	OS	-
DFHBRACD	Symbolic	Bridge copybook	04	-
DFHBRACH	Symbolic	Bridge copybook	D3	-
DFHBRACL	Symbolic	Bridge copybook	P2	-
DFHBRACO	Symbolic	Bridge copybook	C2	-
DFHBRARD	Symbolic	Bridge copybook	04	-
DFHBRARH	Symbolic	Bridge copybook	D3	-
DFHBRARL	Symbolic	Bridge copybook	P2	-
DFHBRARO	Symbolic	Bridge copybook	C2	-
DFHBRBFB	CSECT	Bridge module	OS	-
DFHBRDUF	CSECT	Bridge module	-	06
DFHBRFM	CSECT	Bridge module	-	06
DFHBRFMT	Symbolic	Trace interpretation data	-	06
DFHBRIC	CSECT	Bridge module	-	06
DFHBRIQX	Macro	Bridge XPI macro	04	-
DFHBRIQY	Symbolic	Copybook	04	-
DFHBRMCD	Symbolic	Bridge copybook	05	-
DFHBRMCH	Symbolic	Bridge copybook	D2	-
DFHBRMCL	Symbolic	Bridge copybook	P3	-
DFHBRMCO	Symbolic	Bridge copybook	C3	-
DFHBRMHD	Symbolic	Bridge copybook	05	-
DFHBRMHH	Symbolic	Bridge copybook	D2	-
DFHBRMHL	Symbolic	Bridge copybook	P3	-
DFHBRMHO	Symbolic	Bridge copybook	C3	-
DFHBRMQD	Symbolic	Bridge copybook	05	-
DFHBRMQH	Symbolic	Bridge copybook	D2	-
DFHBRMQL	Symbolic	Bridge copybook	P3	-
DFHBRMQO	Symbolic	Bridge copybook	C3	-
DFHBRMS	CSECT	Bridge module	-	06
DFHBRSCD	Symbolic	Bridge copybook	05	-
DFHBRSCH	Symbolic	Bridge copybook	D2	-
DFHBRSCL	Symbolic	Bridge copybook	P3	-
DFHBRSCO	Symbolic	Bridge copybook	C3	-
DFHBRSDD	Symbolic	Bridge copybook	05	-
DFHBRSDH	Symbolic	Bridge copybook	D2	-
DFHBRSDL	Symbolic	Bridge copybook	P3	-
DFHBRSDO	Symbolic	Bridge copybook	C3	-
DFHBRSP	CSECT	Bridge module	-	06

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Name	Type	Description	Library	
DFHBRSPA	Symbolic	Bridge copybook	OS	-
DFHBRSPM	Symbolic	Bridge copybook	OS	-
DFHBRSPT	Symbolic	Bridge copybook	-	06
DFHBRTC	CSECT	Bridge module	-	06
DFHBRTRI	Macro	Bridge module	-	06
DFHBSC	Macro	Generate binary search code	04	-
DFHBSG	Macro	Switch subspace request	OS	-
DFHBSIB3	CSECT	BMS 3270 builder	OS	06
DFHBSIZ1	CSECT	Add SCS support	OS	06
DFHBSIZ3	CSECT	Add DFHZCP 3270 support	OS	06
DFHBSMIR	CSECT	Build terminal session	OS	06
DFHBSMPP	CSECT	Build pipeline pool table entry	OS	06
DFHBSM61	CSECT	Generate sessions for modegroup	OS	06
DFHBSM62	CSECT	Build a modegroup	OS	06
DFHBSS	CSECT	Build a connection	OS	06
DFHBSSA	CSECT	Build DFHKCP support in a system entry	OS	06
DFHBSSF	CSECT	Build stats support in a system entry	OS	06
DFHBSSS	CSECT	Build security support in a system entry	OS	06
DFHBSSZ	CSECT	Build VTAM support in a system entry	OS	06
DFHBSSZG	CSECT	Add an APPC single-session	OS	06
DFHBSSZI	CSECT	Add an indirect terminal system	OS	06
DFHBSSZL	CSECT	Add a local terminal system	OS	06
DFHBSSZM	CSECT	Introduce new system to ZCP	OS	06
DFHBSSZP	CSECT	Add an APPC parallel-session	OS	06
DFHBSSZR	CSECT	Add an MRO system	OS	06
DFHBSSZS	CSECT	Add an APPC	OS	06
DFHBSSZ6	CSECT	Add an LU6.1 connection	OS	06
DFHBST	CSECT	Common TCTTE builder	OS	06
DFHBSTB	CSECT	Add a resource for BMS	OS	06
DFHBSTBL	CSECT	Add logical device support	OS	06
DFHBSTB3	CSECT	Add partition support	OS	06
DFHBSTC	CSECT	Add install-time options support	OS	06
DFHBSTD	CSECT	Add DFHDIP support	OS	06
DFHBSTE	CSECT	Add EDF support	OS	06
DFHBSTH	CSECT	EXEC interface builder	OS	06
DFHBSTI	CSECT	Add DFHICP support	OS	06
DFHBSTM	CSECT	Add DFHMGP support	OS	06
DFHBSTO	CSECT	Spooler terminal builder	OS	06
DFHBSTP3	CSECT	Add 3270-copy support	OS	06
DFHBSTS	CSECT	Add DFHSNT support	OS	06
DFHBSTT	CSECT	Add DFHKCP support	OS	06
DFHBSTZ	CSECT	Build terminal or session resource	OS	06
DFHBSTZA	CSECT	Add DFHZCP support	OS	06
DFHBSTZB	CSECT	Add or delete bind-image	OS	06
DFHBSTZC	CSECT	Add single-session to APPC	OS	06
DFHBSTZE	CSECT	Set error message writer fields	OS	06
DFHBSTZL	CSECT	Add logical device code support	OS	06
DFHBSTZO	CSECT	Add an MVS console	OS	06
DFHBSTZP	CSECT	Pipeline terminal builder	OS	06
DFHBSTZR	CSECT	Add IRC session	OS	06
DFHBSTZS	CSECT	Add an APPC session	OS	06
DFHBSTZV	CSECT	Add VTAM and IRC information	OS	06

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Name	Type	Description	Library	
DFHBSTZZ	CSECT	Add non-APPC session	OS	06
DFHBSTZ1	CSECT	Add remote terminal support	OS	06
DFHBSTZ2	CSECT	Remote APPC builder	OS	06
DFHBSTZ3	CSECT	Add 3270 support	OS	06
DFHBSZZ	CSECT	Add terminal or session	OS	06
DFHBSZZS	CSECT	Add session to LU6.2 support	OS	06
DFHBSZZV	CSECT	Add VTAM terminal or session	OS	06
DFHBT	Macro	Parameter sublist translation	04	-
DFHCAPB	CSECT	CSDUP - command analysis program (DFHCAP)	OS	06
DFHCAPC	CSECT	RDO utility - RDL command locator	OS	06
DFHCCCC	CSECT (OCO)	GC/LC domains - functions	-	06
DFHCCCCA	DSECT	CCCC parameter list	OS	-
DFHCCCCM	Macro	CCCC request	OS	-
DFHCCCCT	CSECT (OCO)	CCCC trace interpretation data	-	06
DFHCCDM	CSECT (OCO)	GC/LC domains - initialization/termination	-	06
DFHCCDUF	CSECT (OCO)	SDUMP formatter for GC/LC domains	-	06
DFHCCNV	CSECT	Data conversion for CICS OS/2 ISC users	OS	06
DFHCCNV2	CSECT	Convert characters in multi-byte representation	OS	06
DFHCCTRI	CSECT (OCO)	Trace interpreter for GC/LC domains	-	06
DFHCCUTL	CSECT	CICS local catalog initialization program	OS	06
DFHCDBLK	Symbolic	CONVDATA area	04	D3
DFHCDBTC	Macro	Domain call argument conversion	04	-
DFHCDC	Macro	Syntax analysis and code generation for DFHxxyyM/X domain call macros	04	-
DFHCDCON	CSECT	Formatted parameter list translator	OS	06
DFHCDEDA	DSECT	CDED parameter list	OS	-
DFHCDEDM	Macro	CDED request	OS	-
DFHCDEDT	CSECT	CDED trace interpretation data	OS	06
DFHCDMIK	Macro	Domain call inner macro - generate assignments for IN keywords	04	-
DFHCDMOK	Macro	Domain call inner macro - generate assignments for OUT keywords	04	-
DFHCDSPL	Macro	Domain call inner macro - subvalues of character list	04	-
DFHCDSUB	Macro	Domain call inner macro - subvalues of sub-parameter list	04	-
DFHCDSYN	Macro	Syntax analysis on positional operands for DFHxxyyM/X domain call macros	04	-
DFHCDTST	Macro	DFHTEST inner macro	04	-
DFHCDTYP	Macro	Determine domain call argument data type	04	-
DFHCEGN	CSECT	Goodnight transaction stub	-	06
DFHCEID	CSECT	DCE table clear routine	-	06
DFHCESC	CSECT	Terminal, XRF, and enable timeout routines	-	06
DFHCESD	CSECT	CICS shutdown assist program	05	-
DFHCESDP	CSECT	CICS shutdown assist program	-	06
DFHCETRA	CSECT	Trace control transaction (CETR) - main program	OS	06
DFHCETRB	CSECT	CETR - trace component flags inquire/set	OS	06
DFHCETRC	CSECT	CETR - terminal/transaction trace control	OS	06
DFHCETRD	CSECT	CETR - common subroutines	OS	06
DFHCHS	CSECT	CICS mirror for CICS OS/2 and CICS/VM	OS	06

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Name	Type	Description	Library	
DFHCICS	CSECT	CICS copyright information	OS	06
DFHCLID	Macro	CICS service-level identifier	04	-
DFHCLS3	CSECT (OCO)	APPC signoff transaction program	-	06
DFHCLS4	CSECT (OCO)	APPC signon transaction program	-	06
DFHCLT	Macro	Command list table	04	-
DFHCLT1$	Sample	Command list table	05	06
DFHCMAC	CSECT (OCO)	ME domain - CICS messages and codes transaction (CMAC)	-	06
DFHCMACD	Other	Source data file for CMAC transaction	10	-
DFHCMACI	Other	JCL to install the CICS messages data set	02	-
DFHCMACU	Other	JCL to update the CICS messages data set	02	-
DFHCMASM	Macro	CPI pseudonym file for assembler	04	-
DFHCMC	CSECT (OCO)	CMAC transaction map set (C/370)	-	D3
DFHCMCM	CSECT (OCO)	CMAC transaction map set	-	06
DFHCMCOB	CSECT (OCO)	CMAC transaction map set (COBOL)	-	C2
DFHCMP	CSECT	CICS monitoring compatibility interface	OS	06
DFHCMPLI	CSECT (OCO)	CMAC transaction map set (PL/1)	-	P2
DFHCNEDS	Macro	TCT console control element	04	-
DFHCNV	Macro	ISC template definition	04	-
DFHCNVCA	DSECT	DFHCNV commarea layout	OS	-
DFHCNVE	Macro	DFHCNV data conversion tables	OS	-
DFHCNVH	Macro	DFHCNV data conversion tables	OS	-
DFHCNVXX	Macro	DFHCNV data conversion related	OS	-
DFHCNV01	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV02	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV03	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV04	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV05	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV06	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV07	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV08	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV09	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV10	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV11	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV12	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV13	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV14	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV15	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV16	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV17	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV18	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV19	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV20	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV21	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV22	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV23	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV24	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV25	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV26	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV27	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV28	CSECT	DFHCNV data conversion tables	OS	06
DFHCNV29	CSECT	DFHCNV data conversion tables	OS	06
DFHCN06A	CSECT	DFHCNV data conversion tables	OS	-
DFHCN06E	CSECT	DFHCNV data conversion tables	OS	-
DFHCN13A	CSECT	DFHCNV data conversion tables	OS	-

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Name	Type	Description	Library	
DFHCN13E	CSECT	DFHCNV data conversion tables	OS	-
DFHCN28A	CSECT	DFHCNV data conversion tables	OS	-
DFHCN28E	CSECT	DFHCNV data conversion tables	OS	-
DFHCOMDS	Other	JCL to delete and recreate CICS system data sets common to all regions	02	-
DFHCOMP	Macro	Generate compare equate values	OS	-
DFHCOVER	Macro	Cover page generator	04	-
DFHCPARH	CSECT (OCO)	CPIC - CMxxxx application request handler	-	06
DFHCPCAC	CSECT (OCO)	CPIC - Accept_Conversation	-	06
DFHCPCAL	CSECT (OCO)	CPIC - Allocate	-	06
DFHCPCBA	CSECT (OCO)	CPIC - Create_CPC (Accept)	-	06
DFHCPCBB	CSECT (OCO)	CPIC - Increment_Last_Convid	-	06
DFHCPCBD	CSECT (OCO)	CPIC - Delete_Conversation	-	06
DFHCPCBE	CSECT (OCO)	CPIC - Extract_Syncpoint_rc	-	06
DFHCPCBG	CSECT (OCO)	CPIC - Initialize_CPC	-	06
DFHCPCBI	CSECT (OCO)	CPIC - Create_CPC (Initialize)	-	06
DFHCPCBL	CSECT (OCO)	CPIC - Locate_CPC	-	06
DFHCPCBS	CSECT (OCO)	CPIC - Set_CPC_Log_Data	-	06
DFHCPCBT	CSECT (OCO)	CPIC - Load module branch table	-	06
DFHCPCCA	DSECT	CPCC parameter list	OS	-
DFHCPCCD	CSECT (OCO)	CPIC - Confirmed	-	06
DFHCPCCF	CSECT (OCO)	CPIC - Confirm	-	06
DFHCPCCM	Macro	CPCC request	OS	-
DFHCPCCT	CSECT (OCO)	CPCC trace interpretation data	-	06
DFHCPCDE	CSECT (OCO)	CPIC - Deallocate	-	06
DFHCPCEA	CSECT (OCO)	CPIC - Extract_Conversation_Type	-	06
DFHCPCEB	CSECT (OCO)	CPIC - Extract_Mode_Name	-	06
DFHCPCEC	CSECT (OCO)	CPIC - Extract_Partner_LU_Name	-	06
DFHCPCED	CSECT (OCO)	CPIC - Extract_Sync_Level	-	06
DFHCPCEE	CSECT (OCO)	CPIC - Extract_Conversation_State	-	06
DFHCPCFL	CSECT (OCO)	CPIC - Flush	-	06
DFHCPCFS	CSECT (OCO)	CPIC - finite state machine	-	06
DFHCPCIC	CSECT (OCO)	CPIC - Initialize_Conversation	-	06
DFHCPCLC	CSECT (OCO)	CPIC - interface to DFHLUC	-	06
DFHCPCLM	CSECT (OCO)	CPIC - build send list	-	06
DFHCPCLR	CSECT (OCO)	DFHLUC to CPIC return code conversion	-	06
DFHCPCND	CSECT (OCO)	CPIC - Send_Data	-	06
DFHCPCNE	CSECT (OCO)	CPIC - Send_Error	-	06
DFHCPCN1	CSECT (OCO)	CPIC - Send_and_Buffer	-	06
DFHCPCN2	CSECT (OCO)	CPIC - Send_and_Flush	-	06
DFHCPCN3	CSECT (OCO)	CPIC - Send_and_Prep_To_Receive	-	06
DFHCPCN4	CSECT (OCO)	CPIC - Send_and_Confirm	-	06
DFHCPCN5	CSECT (OCO)	CPIC - Send_and_Deallocate	-	06
DFHCPCOJ	CSECT (OCO)	CPIC - Output_Journaling	-	06
DFHCPCPR	CSECT (OCO)	CPIC - Prepare_To_Receive	-	06
DFHCPCRA	CSECT (OCO)	CPIC - Receive mapped data	-	06
DFHCPCRB	CSECT (OCO)	CPIC - Receive GDS header	-	06
DFHCPCRC	CSECT (OCO)	CPIC - Receive basic data	-	06
DFHCPCRI	CSECT (OCO)	CPIC - Receive_Immediate	-	06
DFHCPCRS	CSECT (OCO)	CPIC - Request_To_Send	-	06
DFHCPCRV	CSECT (OCO)	CPIC - Receive	-	06
DFHCPCRW	CSECT (OCO)	CPIC - Receive_and_Wait	-	06
DFHCPCSA	CSECT (OCO)	CPIC - Set_Conversation_Type	-	06
DFHCPCSB	CSECT (OCO)	CPIC - Set_Deallocate_Type	-	06
DFHCPCSC	CSECT (OCO)	CPIC - Set_Error_Direction	-	06

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Name	Type	Description	Library	
DFHCPCSD	CSECT (OCO)	CPIC - Set_Fill	-	06
DFHCPCSE	CSECT (OCO)	CPIC - Set_Log_Data	-	06
DFHCPCSF	CSECT (OCO)	CPIC - Set_Mode_Name	-	06
DFHCPCSG	CSECT (OCO)	CPIC - Set_Partner_LU_Name	-	06
DFHCPCSH	CSECT (OCO)	CPIC - Set_Prepare_To_Receive	-	06
DFHCPCSI	CSECT (OCO)	CPIC - Set_Receive_Type	-	06
DFHCPCSJ	CSECT (OCO)	CPIC - Set_Return_Control	-	06
DFHCPCSK	CSECT (OCO)	CPIC - Set_Send_Type	-	06
DFHCPCSL	CSECT (OCO)	CPIC - Set_Sync_Level	-	06
DFHCPCSM	CSECT (OCO)	CPIC - Set_TP_Name	-	06
DFHCPCTE	CSECT (OCO)	CPIC - Test_Request_To_Send_Received	-	06
DFHCPDUF	CSECT (OCO)	SDUMP formatter for CP keyword	-	06
DFHCPI	CSECT (OCO)	Common programming interface (CPI) program	-	06
DFHCPINA	DSECT	CPIN parameter list	OS	-
DFHCPINM	Macro	CPIN request	OS	-
DFHCPINT	CSECT (OCO)	CPIN trace interpretation data	-	06
DFHCPIN1	CSECT (OCO)	CPI initialization management program	-	06
DFHCPIN2	CSECT (OCO)	CPI initialization subtask program	-	06
DFHCPIR	CSECT (OCO)	SRRxxxx application request processor	-	06
DFHCPLC	CSECT (OCO)	Link-edit stub for application programs using SAA communications interface	-	06
DFHCPLRR	CSECT (OCO)	Link-edit stub for application programs using SAA resource recovery interface	-	06
DFHCPOST	Macro	POST macro for extended ECBs	OS	-
DFHCPSDS	DSECT	CPI static storage	OS	-
DFHCPSPA	DSECT	CPSP parameter list	OS	-
DFHCPSPM	Macro	CPSP request	OS	-
DFHCPSPT	CSECT (OCO)	CPSP trace interpretation data	-	06
DFHCPSRH	CSECT (OCO)	CPIC - syncpoint request handler	-	06
DFHCPY	CSECT	3270 hard copy support	OS	06
DFHCRBDS	DSECT	CICS region control block	OS	-
DFHCRBU	CSECT	UOW back-to-front processor module	-	06
DFHCRC	CSECT	Interregion abnormal exit module	OS	06
DFHCRD	DSECT	Communications recovery services declares	04	-
DFHCRERI	DSECT	AP domain - Communications recovery management - resync	OS	-
DFHCRERP	DSECT	Perform unshunt invoked by RM	-	06
DFHCRERS	DSECT	Session failure during syncpoint	-	06
DFHCRESI	DSECT	AP domain - communication recovery management	OS	-
DFHCRIU	CSECT	IRC RMC syncpoint event processor	-	06
DFHCRL	CSECT	RMC logging back-to-front processor	-	06
DFHCRLB	CSECT	RMC bind time logging for old MRO/LU6.2	-	06
DFHCRLBA	CSECT	CRLB parameter list	OS	-
DFHCRLBM	Macro	CRLB parameter list	OS	-
DFHCRLBT	CSECT	CRLB translate tables	-	06
DFHCRNP	CSECT	Interregion connection manager	OS	06
DFHCRQ	CSECT	ATI purge program	OS	06
DFHCRR	CSECT	Interregion session recovery program	OS	06
DFHCRRSY	CSECT	Communications resynchronization	-	06
DFHCRS	CSECT	Remote scheduler program	OS	06
DFHCRSP	CSECT	CICS IRC startup module	OS	06
DFHCRT	CSECT	Transaction routing relay program for APPC devices	OS	06

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Name	Type	Description	Library	
DFHCRTRI	CSECT	Offline trace formatting - interpretation routine parameter list	-	06
DFHCR1U	CSECT	IRC LU61 syncpoint event processor	-	06
DFHCR2U	CSECT	IRC LU62 RMC syncpoint event processor	-	06
DFHCSA	CSECT	Common system area	OS	06
DFHCSAD	Macro	Common system area	04	-
DFHCSADS	DSECT	Common system area definition	04	-
DFHCSCDS	Symbolic	CICS SVC startup return codes	OS	-
DFHCSDUF	CSECT (OCO)	SDUMP formatter for CSA and CSA optional features list	-	06
DFHCSVC	CSECT	CICS SVC startup	OS	06
DFHCTRH	CSECT	CETR transaction help screens map set	OS	06
DFHCTRM	CSECT	CETR transaction main screens map set	OS	06
DFHCUADD	CSECT	CSDUP - add command	OS	06
DFHCUALG	CSECT	RDO off-line generic alter utility program	-	06
DFHCUALT	CSECT	CSDUP - alter command	OS	06
DFHCUAPP	CSECT	CSDUP - append command	OS	06
DFHCUCAB	CSECT	CSDUP - command analyzer (DFHCUCA)	OS	06
DFHCUCAC	CSECT	CSD manager - return and reason codes	OS	06
DFHCUCB	CSECT	CSDUP - command builder	OS	06
DFHCUCCB	CSECT	CSDUP - RDL command locator (DFHCUCC)	OS	06
DFHCUCDB	CSECT	CSDUP - default values (DFHCUCD)	OS	06
DFHCUCDC	CSECT	CSD manager - return and reason codes	OS	06
DFHCUCOG	CSECT	CSDUP - generic copy command	OS	06
DFHCUCOM	CSECT		-	06
DFHCUCOP	CSECT	CSDUP - copy command	OS	06
DFHCUCP	CSECT	CSDUP - command processor	OS	06
DFHCUCS	CSECT	CSDUP - CSD open and close	OS	06
DFHCUCSE	CSECT	CSDUP - CSD error check routine	OS	06
DFHCUCV	CSECT	CSDUP - command validation	OS	06
DFHCUDEF	CSECT	CSDUP - define command	OS	06
DFHCUERA	CSECT	CSDUP - delete/erase command	OS	06
DFHCUFA	CSECT	Offline utilities - free automatic storage	OS	06
DFHCUFAM	Macro	Offline DFHPROC - free automatic storage	OS	-
DFHCUGA	CSECT	Offline utilities - get automatic storage	OS	06
DFHCUGAM	Macro	Offline DFHPROC - get automatic storage	OS	-
DFHCUINI	CSECT	CSDUP - initialize command	OS	06
DFHCULIS	CSECT	CSDUP - extract and list commands	OS	06
DFHCULOC	CSECT	CSDUP - lock/unlock routine	OS	06
DFHCUMD2	CSECT		-	06
DFHCUMF1	CSECT	CSDUP - FCT migration, files	OS	06
DFHCUMF2	CSECT	CSDUP - FCT migration, LSR pools	OS	06
DFHCUMIG	CSECT	CSDUP - migrate command	OS	06
DFHCUMT	CSECT	CSDUP - TCT migration	OS	06
DFHCUMTD	CSECT	RDO migration utility program for the DCT	-	06
DFHCUMWR	CSECT	CSDUP - CSD record write routine	OS	06
DFHCUMXI	CSECT	SPI offline utility for handling cross reference of IBM groups	OS	06
DFHCUPRO	CSECT	CSDUP - CSD upgrade routine	OS	06
DFHCURDD	CSECT	CSD utilities - delete all existing CICS-supplied groups from previous releases	OS	06
DFHCURDI	CSECT	CSD utilities - RDL for basic initialize	OS	06
DFHCURDM	CSECT	CSD utilities - RDL for maintenance	OS	06
DFHCURDN	CSECT	CSD utilities - delete all CICS-supplied groups newly created in current release	OS	06
DFHCURDS	CSECT	CSD utilities - RDL for sample definitions	OS	06
DFHCURDX	CSECT	CSD utilities - RDL for compatibility gp	OS	06

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Name	Type	Description	Library	
DFHCUREM	CSECT	CSDUP - remove command	OS	06
DFHCURUG	CSECT	CSDUP - upgrade command	OS	06
DFHCUSER	CSECT	CSDUP - service command	OS	06
DFHCUSHL	CSECT	CSDUP - short lock/unlock routine	OS	06
DFHCUS1	CSECT	CSD utilities - sample service request	OS	06
DFHCUVER	CSECT	CSDUP - verify command	OS	06
DFHCUXRT	CSECT	RDO offline utility for building cross reference table of IBM groups	OS	06
DFHCVDAA	Symbolic	System programming command cvda names	OS	-
DFHCWTO	CSECT	Write to console operator program	OS	06
DFHCXCU	CSECT	XRF catch-up transaction	OS	06
DFHC3TRI	CSECT (OCO)	Trace interpreter for DFHCLS3 trace points	-	06
DFHDATE	Macro	Date formatting	OS	-
DFHDBAT	CSECT	CICS-DBCTL adapter/transformer	OS	06
DFHDBCON	CSECT	CICS-DBCTL connection program	OS	06
DFHDBCR	CSECT	CICS-DBCTL XRF tracking program	OS	06
DFHDBCT	CSECT	CICS-DBCTL control program	OS	06
DFHDBCTX	CSECT	CICS-DBCTL control exit	OS	06
DFHDBDE	CSECT	CICS-DBCTL operator transaction map set	-	06
DFHDBDI	CSECT	CICS-DBCTL disable program	OS	06
DFHDBDSC	CSECT	CICS-DBCTL disconnection program	OS	06
DFHDBDUF	CSECT (OCO)	SDUMP formatter for DBCTL, local DL/I, and remote DL/I	-	06
DFHDBIE	CSECT	CICS-DBCTL inquiry screens map set	OS	06
DFHDBIK	CSECT (OCO)	CICS-DBCTL inquiry screens map set	-	06
DFHDBIQ	CSECT	CICS-DBCTL inquiry program	OS	06
DFHDBME	CSECT	CICS-DBCTL menu program	OS	06
DFHDBMOX	CSECT	CICS-DBCTL monitoring exit	OS	06
DFHDBMP	CSECT	EDF browse map set	-	06
DFHDBMS	CSECT	EDF browse map set	OS	06
DFHDBNE	CSECT	CICS-DBCTL menu screens map set	OS	06
DFHDBNK	CSECT (OCO)	CICS-DBCTL menu screens map set	-	06
DFHDBP	CSECT	Dynamic backout program	OS	06
DFHDBREX	CSECT	CICS-DBCTL resume exit	OS	06
DFHDBSPX	CSECT	CICS-DBCTL suspend exit	OS	06
DFHDBSSX	CSECT	CICS-DBCTL status exit	OS	06
DFHDBSTX	CSECT	CICS-DBCTL statistics exit	OS	06
DFHDBTI	CSECT	EXEC DLI LD table	OS	06
DFHDBTOX	CSECT	CICS-DBCTL token exit	OS	06
DFHDBUCA	DSECT	COMMAREA passed to DFHDBUEX	04	-
DFHDBUDS	DSECT	DBCTL unsolicited statistics	04	-
DFHDBUDS	DSECT	DBCTL unsolicited statistics	C2	-
DFHDBUDS	DSECT	DBCTL unsolicited statistics	P2	-
DFHDBUEX	CSECT	User-replaceable CICS-DBCTL exit	05	06
DFHDC	Macro	Dump service request	04	-
DFHDCPR	CSECT	Transaction dump macro-compatibility program	OS	06
DFHDCRDS	DSECT	Transaction dump control record format	OS	-
DFHDCT	Macro	Destination control table	04	-
DFHDCTD	Macro	Destination control table	04	-
DFHDCTDS	DSECT	Destination control table	04	-
DFHDDBR	CSECT (OCO)	DD domain - browse Services	-	06
DFHDDBRT	CSECT (OCO)	DDBR trace interpretation data	-	06
DFHDDDI	CSECT (OCO)	DD domain - directory services	-	06
DFHDDDIA	CSECT (OCO)	DDDI parameter list	OS	-

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Name	Type	Description	Library	
DFHDDDIM	CSECT (OCO)	DDDI parameter list	OS	-
DFHDDDIT	CSECT (OCO)	DDDI trace interpretation data	-	06
DFHDDDM	CSECT (OCO)	DD domain - domain services	-	06
DFHDDDU	CSECT (OCO)	DD domain - dump browse services	-	06
DFHDDDUF	CSECT (OCO)	DD domain - dump formatting	-	06
DFHDDLO	CSECT (OCO)	DD domain - locate service	-	06
DFHDDLOA	CSECT (OCO)	DDLO parameter list	OS	-
DFHDDLOM	CSECT (OCO)	DDLO parameter list	OS	-
DFHDDLOT	CSECT (OCO)	DDLO trace interpretation data	-	06
DFHDDTRI	CSECT (OCO)	DD domain - trace interpretation	-	06
DFHDECOX	CSECT (OCO)	DCE services domain - communications exit	-	06
DFHDEDM	CSECT (OCO)	DCE services domain - services	-	06
DFHDEDUF	CSECT (OCO)	DCE service domain - dump formatting	-	06
DFHDEFDS	Other	JCL to delete and recreate CICS system data sets unique to each region	02	-
DFHDEIS	CSECT (OCO)	DCE services domain - inquire/set gate	-	06
DFHDEIST	CSECT	DEIS trace interpretation data	-	06
DFHDEREX	CSECT	DCE services domain - resume exit	-	06
DFHDESST	DSECT	DCE services domain - system services trace interpretation data	-	06
DFHDEST	CSECT (OCO)	DCE services domain - stub	-	06
DFHDESV	CSECT (OCO)	DCE services domain - general services gate	-	06
DFHDESVT	DSECT	DESV trace interpretation data	-	06
DFHDETRI	DSECT (OCO)	DCE services domain - trace interpreter	-	06
DFHDI	Macro	Data interchange request	04	-
DFHDIBDS	Macro	Data interchange	OS	-
DFHDIP	CSECT	Data interchange program	OS	06
DFHDIPDY	CSECT	Data interchange program (dummy)	OS	06
DFHDITOP	Macro	Data interchange internal macro	OS	-
DFHDKCR	CSECT (OCO)	DCE services domain - APPC DES-based authentication	-	06
DFHDKDUF	CSECT (OCO)	DCE service domain - table management dump formatting	-	06
DFHDKMR	CSECT (OCO)	DCE services domain - table manager	-	06
DFHDKMRA	DSECT	DKMR parameter list	OS	-
DFHDKMRM	Macro	DKMR request	OS	-
DFHDKMRT	CSECT	DKMR trace interpretation data	-	06
DFHDKTRI	CSECT (OCO)	DD domain - trace interpreter	-	06
DFHDLI	CSECT	DL/I call router	OS	06
DFHDLIAI	CSECT	Application interface for DL/I	OS	06
DFHDLIDP	CSECT	DBCTL call processor	OS	06
DFHDLIRP	CSECT	DL/I remote call processor	OS	06
DFHDLP	Macro	CICS-DL/I interface	04	-
DFHDLPSB	Macro	Generate DL/I PSB directory list	04	-
DFHDLXDF	CSECT	DU domain - transaction dump formatter for DL/I related areas	OS	06
DFHDMDM	CSECT (OCO)	DM domain - domain initialization/quiesce	-	06
DFHDMDMA	DSECT	DMDM parameter list	OS	-
DFHDMDMM	Macro	DMDM request	OS	-
DFHDMDMT	CSECT (OCO)	DMDM trace interpretation data	-	06
DFHDMDS	CSECT (OCO)	DM domain - task reply handler	-	06
DFHDMDUF	CSECT (OCO)	SDUMP formatter for DM domain	-	06
DFHDMEN	CSECT (OCO)	Domain manager ENF support	-	06
DFHDMENF	CSECT (OCO)	Domain manager event notification routine	-	06
DFHDMENS	CSECT (OCO)	CICS ENF SRBEXIT	-	06
DFHDMENT	CSECT (OCO)	DMEN translation tables	-	06

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Name	Type	Description	Library	
DFHDMIQ	CSECT (OCO)	DM domain - browse and inquiry	-	06
DFHDMIQA	DSECT	DMIQ parameter list	OS	-
DFHDMIQM	Macro	DMIQ request	OS	-
DFHDMIQT	CSECT (OCO)	DMIQ trace interpretation data	-	06
DFHDMPB	CSECT	CSDUP - definition file (CSD) manager, batch environment router (DFHDMP batch)	OS	06
DFHDMPBA	CSECT	CSDUP - batch environment adapter	OS	06
DFHDMPC	CSECT	CSD manager - CICS environment router (DFHDMP CICS)	OS	06
DFHDMPCA	CSECT	CSD manager - CICS environment adapter	OS	06
DFHDMPH	Symbolic	DM domain - phase definitions	OS	-
DFHDMRM	CSECT (OCO)	CSD manager - CSD close routine	-	06
DFHDMSVC	CSECT (OCO)	DM domain - SVC processing routine	-	06
DFHDMTRI	CSECT (OCO)	DM domain - trace interpreter	-	06
DFHDMWQ	CSECT (OCO)	DM domain - wait queue subroutine	-	06
DFHDMWQA	DSECT	DMWQ parameter list	OS	-
DFHDMWQM	Macro	DMWQ request	OS	-
DFHDMWQT	CSECT (OCO)	DMWQ trace interpretation data	-	06
DFHDM01B	CSECT	CSDUP - connect (DFHDM01 batch)	OS	06
DFHDM01C	CSECT	CSD manager - connect (DFHDM01 CICS)	OS	06
DFHDM02B	CSECT	CSDUP - disconnect (DFHDM02 batch)	OS	06
DFHDM02C	CSECT	CSD manager - disconnect (DFHDM02 CICS)	OS	06
DFHDM03B	CSECT	CSDUP - write (DFHDM03 batch)	OS	06
DFHDM03C	CSECT	CSD manager - write (DFHDM03 CICS)	OS	06
DFHDM04B	CSECT	CSDUP - read (DFHDM04 batch)	OS	06
DFHDM04C	CSECT	CSD manager - read (DFHDM04 CICS)	OS	06
DFHDM05B	CSECT	CSDUP - delete (DFHDM05 batch)	OS	06
DFHDM05C	CSECT	CSD manager - delete (DFHDM05 CICS)	OS	06
DFHDM06B	CSECT	CSDUP - lock/unlock (DFHDM06 batch)	OS	06
DFHDM06C	CSECT	CSD manager - lock/unlock (DFHDM06 CICS)	OS	06
DFHDM08B	CSECT	CSDUP - setbrowse (DFHDM08 batch)	OS	06
DFHDM08C	CSECT	CSD manager - setbrowse (DFHDM08 CICS)	OS	06
DFHDM09B	CSECT	CSDUP - getnext (DFHDM09 batch)	OS	06
DFHDM09C	CSECT	CSD manager - getnext (DFHDM09 CICS)	OS	06
DFHDM10B	CSECT	CSDUP - endbrowse (DFHDM10 batch)	OS	06
DFHDM10C	CSECT	CSD manager - endbrowse (DFHDM10 CICS)	OS	06
DFHDM11B	CSECT	CSDUP - createset (DFHDM11 batch)	OS	06
DFHDM11C	CSECT	CSD manager - createset (DFHDM11 CICS)	OS	06
DFHDM12B	CSECT	CSDUP - eraseset (DFHDM12 batch only)	OS	06
DFHDM13B	CSECT	CSDUP - queryset (DFHDM13 batch)	OS	06
DFHDM13C	CSECT	CSD manager - queryset (DFHDM13 CICS)	OS	06
DFHDM15B	CSECT	CSDUP - read/write control records (DFHDM15 batch)	OS	06
DFHDM15C	CSECT	CSD manager - read/write control records (DFHDM15 CICS)	OS	06
DFHDM16B	CSECT	CSDUP - buildkey (DFHDM16 batch)	OS	06
DFHDM16C	CSECT	CSD manager - buildkey (DFHDM16 CICS)	OS	06
DFHDM17B	CSECT	CSDUP - relsekwa (DFHDM17 batch)	OS	06
DFHDM17C	CSECT	CSD manager - relsekwa (DFHDM17 CICS)	OS	06
DFHDM18B	CSECT	CSDUP - tokenize utilities (DFHDM18 batch)	OS	06
DFHDM18C	CSECT	CSD manager - tokenize utilities (DFHDM18 CICS)	OS	06
DFHDM19B	CSECT	CSDUP - free generic tokens chain (DFHDM19 batch)	OS	06

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Name	Type	Description	Library	
DFHDM19C	CSECT	CSD manager - free generic tokens chain (DFHDM19 CICS)	OS	06
DFHDM21B	CSECT	CSDUP - generic qualification (DFHDM21 batch)	OS	06
DFHDM21C	CSECT	CSD manager - generic qualification (DFHDM21 CICS)	OS	06
DFHDM22B	CSECT	CSDUP - resequence utility (DFHDM22 batch)	OS	06
DFHDM22C	CSECT	CSD manager - resequence utility (DFHDM22 CICS)	OS	06
DFHDM23B	CSECT	CSDUP - verify key work area (DFHDM23 batch)	OS	06
DFHDM23C	CSECT	CSD manager - verify key work area (DFHDM23 CICS)	OS	06
DFHDNSRT	Macro	Internal index sorting macro	OS	-
DFHDRX	Macro	DL/I resource table	OS	-
DFHDSAT	CSECT (OCO)	DS domain - attach, change mode, change/set priority, cancel task	-	06
DFHDSATA	DSECT	DSAT parameter list	OS	-
DFHDSATM	Macro	DSAT request	OS	-
DFHDSATT	CSECT (OCO)	DSAT trace interpretation data	-	06
DFHDSATX	Macro	DSAT request (XPI)	04	-
DFHDSATY	DSECT	DSAT parameter list (XPI)	04	-
DFHDSAUT	CSECT (OCO)	DS domain - authorized services	-	06
DFHDSB	CSECT	BMS data stream build	OS	-
DFHDSBA$	CSECT	BMS data stream build (standard)	OS	06
DFHDSBR	CSECT (OCO)	DS domain - browse, inquire task	-	06
DFHDSBRA	DSECT	DSBR parameter list	OS	-
DFHDSBRM	Macro	DSBR request	OS	-
DFHDSBRT	CSECT (OCO)	DSBR trace interpretation data	-	06
DFHDSB1$	CSECT	BMS data stream build (full)	OS	06
DFHDSCPX	CSECT (OCO)	POST routine for DS WAIT_MVS requests	-	06
DFHDSCSA	CSECT (OCO)	DS domain - update CSA on task dispatch	-	06
DFHDSDM	CSECT (OCO)	DS domain - initialization/termination	-	06
DFHDSDSA	DSECT	DSDS parameter list	OS	-
DFHDSDSM	Macro	DSDS request	OS	-
DFHDSDST	CSECT (OCO)	DSDS trace interpretation data	-	06
DFHDSDS2	CSECT (OCO)	DS domain - broadcast new max task limit	-	06
DFHDSDS3	CSECT (OCO)	DS domain - main dispatch loop	-	06
DFHDSDS4	CSECT (OCO)	DS domain - task purge routine	-	06
DFHDSDUF	CSECT (OCO)	SDUMP formatter for DS domain	-	06
DFHDSGDS	DSECT	DS domain - global statistics	04	-
DFHDSGDS	DSECT	DS domain - global statistics	C2	-
DFHDSGDS	DSECT	DS domain - global statistics	P2	-
DFHDSIT	CSECT (OCO)	DS domain - set/inquire DS parameters	-	06
DFHDSITA	DSECT	DSIT parameter list	OS	-
DFHDSITM	Macro	DSIT request	OS	-
DFHDSITT	CSECT (OCO)	DSIT trace interpretation data	-	06
DFHDSKE	CSECT (OCO)	DS domain - kernel interfaces	-	06
DFHDSND	Macro	File control data set name	04	-
DFHDSPEX	CSECT (OCO)	DS domain - MVS POST exit stub	-	06
DFHDSSM	CSECT (OCO)	DS domain - storage notify handler	-	06
DFHDSSR	CSECT (OCO)	DS domain - suspend/resume/wait	-	06
DFHDSSRA	DSECT	DSSR parameter list	OS	-
DFHDSSRM	Macro	DSSR request	OS	-
DFHDSSRT	CSECT (OCO)	DSSR trace interpretation data	-	06

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Name	Type	Description	Library	
DFHDSSRV	Macro	DS domain - inline dispatcher services	OS	-
DFHDSSRX	Macro	DSSR request (XPI)	04	-
DFHDSSRY	DSECT	DSSR parameter list (XPI)	04	-
DFHDSST	CSECT (OCO)	DS domain - statistics collection	-	06
DFHDSSTX	CSECT (OCO)	DS domain - STIMERM exit	-	06
DFHDSTA	Macro	DBCTL statistics area (DFSDSTA)	OS	-
DFHDSTCB	CSECT (OCO)	DS domain - KEDS TCB_REPLY handler	-	06
DFHDSTIQ	Macro	DS domain - obtain domain index of task issuing trace put	OS	-
DFHDSTRI	CSECT (OCO)	DS domain - Trace interpreter	-	06
DFHDSTSD	DSECT	DS domain - Task Area	OS	-
DFHDSUE	CSECT (OCO)	DS domain - enable/disable user exits	-	06
DFHDTCF	CSECT (OCO)	Shared data tables connect file PC function	-	06
DFHDTCP	CSECT (OCO)	Shared data tables cell pool management	-	06
DFHDTCV	CSECT (OCO)	Shared data tables connection validation	-	06
DFHDTDA	CSECT (OCO)	Shared data tables data space and ALET code	-	06
DFHDTDM	CSECT (OCO)	Shared data tables data management	-	06
DFHDTINS	CSECT (OCO)	Shared data tables initialization	-	06
DFHDTIX	CSECT (OCO)	Shared data tables index management	-	06
DFHDTLA	CSECT (OCO)	Shared data table load attach	-	06
DFHDTLI	CSECT (OCO)	Shared data tables local initialization	-	06
DFHDTLX	CSECT (OCO)	Shared data tables load transaction	-	06
DFHDTPDS	DSECT	Data tables - services interface block	OS	-
DFHDTPC	CSECT (OCO)	Shared data tables program call stub	-	06
DFHDTRC	CSECT (OCO)	Shared data tables remote file connection and disconnection	-	06
DFHDTRE	CSECT (OCO)	Shared data tables remote file connection and disconnection	-	06
DFHDTRI	CSECT (OCO)	Shared data tables remote environment initialization	-	06
DFHDTRM	CSECT (OCO)	Shared data tables record management	-	06
DFHDTRR	CSECT (OCO)	Shared data tables remote retrieval	-	06
DFHDTSR	CSECT (OCO)	Shared data tables shared retrieval	-	06
DFHDTSS	CSECT (OCO)	Shared data table server status	-	06
DFHDTST	CSECT (OCO)	Shared data table state services	-	06
DFHDTSVS	CSECT (OCO)	Shared data tables SVC services	-	06
DFHDTUP	CSECT (OCO)	Shared data tables update and syncpoint services	-	06
DFHDTXS	CSECT (OCO)	Shared data tables connection security	-	06
DFHDUDDA	DSECT	DUDD parameter list	OS	-
DFHDUDDM	Macro	DUDD request	OS	-
DFHDUDDT	CSECT	DUDD trace interpretation data	OS	06
DFHDUDM	CSECT	DU domain - initialization/termination	OS	06
DFHDUDT	CSECT	DU domain - dump table services	OS	06
DFHDUDTA	DSECT	DUDT parameter list	OS	-
DFHDUDTM	Macro	DUDT request	OS	-
DFHDUDTT	CSECT	DUDT trace interpretation data	OS	06
DFHDUDU	CSECT	DU domain - take system/transaction dump	OS	06
DFHDUDUA	DSECT	DUDU parameter list	OS	-
DFHDUDUF	CSECT (OCO)	SDUMP formatter for DU domain	-	06
DFHDUDUM	Macro	DUDU request	OS	-
DFHDUDUT	CSECT	DUDU trace interpretation data	OS	06
DFHDUDUX	Macro	DUDU request (XPI)	04	-

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Name	Type	Description	Library	
DFHDUDUY	DSECT	DUDU parameter list (XPI)	04	-
DFHDUF	CSECT (OCO)	SDUMP formatting router	-	06
DFHDUFFT	CSECT (OCO)	PRDUMP formatter - service functions	OS	06
DFHDUFT	CSECT (OCO)	Dump domain services	OS	06
DFHDUFTA	DSECT	DUFT parameter list	OS	-
DFHDUFTD	DSECT	Dump formatting routines parameter declares	OS	-
DFHDUFTM	Macro	DUFT macro	OS	-
DFHDUFTT	DSECT (OCO)	DUFT translate tables	OS	06
DFHDUFTX	Macro	DUFT macro	04	-
DFHDUFTY	DSECT	DUFT call structured parameter list	OS	-
DFHDUFUT	CSECT (OCO)	SDUMP formatting - service functions	-	06
DFHDUIO	CSECT	DU domain - open/close/switch/write	OS	06
DFHDUIOA	DSECT	DUIO parameter list	OS	-
DFHDUIOM	Macro	DUIO request	OS	-
DFHDUIOT	CSECT	DUIO trace interpretation data	OS	06
DFHDUMPX	CSECT	DU domain - SDUMPX IEASDUMP.QUERY exit	OS	06
DFHDUPH	CSECT	Dump utility program - dump index summary	OS	06
DFHDUPM	CSECT	Dump utility program - module index	OS	06
DFHDUPMC	DSECT	Dump utility program - parameter block for module index routine	OS	-
DFHDUPP	CSECT	Dump utility program - I/O routines	OS	06
DFHDUPPC	DSECT	Dump utility program - parameter block for print routine	OS	-
DFHDUPR	CSECT	Dump utility program - main component	OS	06
DFHDUPS	CSECT	Dump utility program - dump selection	OS	06
DFHDUPSC	DSECT	Dump utility program - parameter block for dump selection routine	OS	-
DFHDUSR	CSECT	DU domain - dump services	OS	06
DFHDUSRA	DSECT	DUSR parameter list	OS	-
DFHDUSRM	Macro	DUSR request	OS	-
DFHDUSRT	CSECT	DUSR trace interpretation data	OS	06
DFHDUSU	CSECT	DU domain - subroutines	OS	06
DFHDUSUA	DSECT	DUSU parameter list	OS	-
DFHDUSUM	Macro	DUSU request	OS	-
DFHDUSUT	CSECT	DUSU trace interpretation data	OS	06
DFHDUSVC	CSECT	DU domain - SVC processing routine	OS	06
DFHDUTM	CSECT	DU domain - dump table manager	OS	06
DFHDUTRI	CSECT	Trace interpreter for DU domain	OS	06
DFHDUXD	CSECT	DU domain - transaction dump control	OS	06
DFHDUXFA	DSECT	DUXF parameter list	OS	-
DFHDUXFM	Macro	DUXF request	OS	-
DFHDUXFT	CSECT	DUXF trace interpretation data	OS	06
DFHDUXW	CSECT	DU domain - transaction dump buffer control	OS	06
DFHDUXWA	DSECT	DUXW parameter list	OS	-
DFHDUXWM	Macro	DUXW request	OS	-
DFHDUXWT	CSECT	DUXW trace interpretation data	OS	06
DFHDWE	Macro	Deferred work element	OS	-
DFHDWEDS	DSECT	Deferred work element	04	-

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Name	Type	Description	Library	
DFHDXACH	CSECT	CICS-DBCTL XRF subtask router	OS	06
DFHDXAX	CSECT	CICS-DBCTL XRF connection handling	OS	06
DFHDXCU	CSECT	CICS-DBCTL XRF catch-up transaction	OS	06
DFHDXSTM	CSECT	CICS-DBCTL XRF subtask manager	OS	06
DFHDXUEP	DSECT	CICS-DBCTL XRF plist to global user exits	04	-
DFHDYP	Sample	Dynamic routing program	C2	-
DFHDYP	Sample	Dynamic routing program	P2	-
DFHDYP	Sample	Dynamic routing program	D3	-
DFHDYP	CSECT	User-replaceable dynamic routing program	05	06
DFHDYPDS	DSECT	COMMAREA passed to DFHDYP	04	-
DFHDYPDS	DSECT	COMMAREA passed to DFHDYP	C2	-
DFHDYPDS	DSECT	COMMAREA passed to DFHDYP	P2	-
DFHDYPDS	DSECT	COMMAREA passed to DFHDYP	D3	-
DFHD2CC	CSECT	DB2 module	-	06
DFHD2CCT	CSECT	DB2 module	-	06
DFHD2CMP	CSECT	DB2 module	-	06
DFHD2CM0	CSECT	DB2 module	-	06
DFHD2CM1	CSECT	DB2 module	-	06
DFHD2CM2	CSECT	DB2 module	-	06
DFHD2CM3	CSECT	DB2 module	-	06
DFHD2CNV	CSECT	DB2 module	-	06
DFHD2DUF	CSECT	DB2 module	-	06
DFHD2EDF	CSECT	DB2 module	-	06
DFHD2EXS	CSECT	DB2 module	-	06
DFHD2EX1	CSECT	DB2 module	-	06
DFHD2EX2	CSECT	DB2 module	-	06
DFHD2EX3	CSECT	DB2 module	-	06
DFHD2GDS	CSECT	DB2 module	C2	04
DFHD2GDS	CSECT	DB2 module	P2	-
DFHD2INI	CSECT	DB2 module	-	06
DFHD2IN1	CSECT	DB2 module	-	06
DFHD2IN2	CSECT	DB2 module	-	06
DFHD2MSB	CSECT	DB2 module	-	06
DFHD2RDS	CSECT	DB2 module	C2	04
DFHD2RDS	CSECT	DB2 module	P2	-
DFHD2RP	CSECT	DB2 module	-	06
DFHD2SSD	CSECT	DB2 module	OS	-
DFHD2ST	CSECT	DB2 module	-	06
DFHD2STP	CSECT	DB2 module	-	06
DFHD2STR	CSECT	DB2 module	-	06
DFHD2TM	CSECT	DB2 module	-	06
DFHD2TMT	CSECT	DB2 module	-	06
DFHD2TRI	CSECT	DB2 module	-	06
DFHEAI	CSECT	EXEC interface link-edit stub for EXEC calls in assembler language programs	OS	06
DFHEAI0	CSECT	EXEC interface link-edit stub for prolog and epilog calls in assembler language programs	OS	06
DFHEAMAA	CSECT	Assembler-language translator - advanced	OS	06

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Name	Type	Description	Library	
		code generation functions		
DFHEAMEE	CSECT	Assembler-language translator - error editor	OS	06
DFHEAMPA	CSECT	Assembler-language translator - primary code generation functions	OS	06
DFHEAMSA	CSECT	Assembler-language translator - source scanner	OS	06
DFHEAM02	CSECT	Assembler-language translator - initialization	OS	06
DFHEAM07	CSECT	Assembler-language translator - options card	OS	06
DFHEAM08	CSECT	Assembler-language translator - check options	OS	06
DFHEAM11	CSECT	Assembler-language translator - atomization	OS	06
DFHEBF	CSECT	EXEC interface for BIF DEEDIT command	OS	06
DFHEBRCT	CSECT	CBRC LD table	OS	06
DFHEBU	CSECT	EXEC FMH construction	OS	06
DFHECADS	DSECT	Event control area for interval control elements	OS	-
DFHECALL	Macro	EXEC interface call macro for assembler-language	04	-
DFHECB	Macro	CICS posting and testing of operating system ECBs	OS	-
DFHECI	CSECT	EXEC interface stub for EXEC calls (COBOL)	OS	06
DFHECMAC	CSECT	COBOL translator - advanced code generation functions	OS	06
DFHECMEE	CSECT	COBOL translator - error editor	OS	06
DFHECMPC	CSECT	COBOL translator - primary code generation functions	OS	06
DFHECMSC	CSECT	COBOL translator - input scanner	OS	06
DFHECM02	CSECT	COBOL translator - initialization	OS	06
DFHECM07	CSECT	COBOL translator - options card	OS	06
DFHECM08	CSECT	COBOL translator - check options	OS	06
DFHECM10	CSECT	COBOL translator - analyze program	OS	06
DFHECM11	CSECT	COBOL translator - atomization	OS	06
DFHECM14	CSECT	COBOL translator - read input	OS	06
DFHECM17	CSECT	COBOL translator - generate output	OS	06
DFHEDC	CSECT	EXEC interface for dump control	OS	06
DFHEDCP	CSECT (OCO)	EXEC interface for dump system/transaction	-	06
DFHEDFBR	CSECT	Temporary-storage browse transaction, CEBR	OS	06
DFHEDFCB	CSECT	Build one page	OS	06
DFHEDFCC	CSECT	Parameter copy program	OS	06
DFHEDFCE	CSECT	Extract from one page	OS	06
DFHEDFCR	CSECT	LD table utilities	OS	06
DFHEDFCS	CSECT	CICS special cases	OS	06
DFHEDFCX	CSECT	Display unformatted arguments	OS	06
DFHEDFD	CSECT	EDF display program	OS	06
DFHEDFDL	CSECT	DL/I special cases	OS	06
DFHEDFDS	DSECT	EDF communication area	OS	-

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Name	Type	Description	Library	
DFHEDFE	CSECT	EDF attach error handler	OS	06
DFHEDFM	CSECT	EDF map set	OS	06
DFHEDFP	CSECT	EDF control program	OS	06
DFHEDFR	CSECT	EDF response table	OS	06
DFHEDFS	CSECT	EDF display handling routines	OS	06
DFHEDFU	CSECT	Data utilities	OS	06
DFHEDFW	CSECT	Display working storage	OS	06
DFHEDFX	CSECT	EDF task switch program	OS	06
DFHEDI	CSECT	EXEC interface for data interchange	OS	06
DFHEDMAD	CSECT	C/370 translator - advanced code generation functions	OS	06
DFHEDMEE	CSECT	C/370 translator - error editor	OS	06
DFHEDMPD	CSECT	C/370 translator - primary code generation functions	OS	06
DFHEDMSD	CSECT	C/370 translator - input scanner	OS	06
DFHEDM02	CSECT	C/370 translator - initialization	OS	06
DFHEDM07	CSECT	C/370 translator - options card	OS	06
DFHEDM08	CSECT	C/370 translator - check options	OS	06
DFHEDM10	CSECT	C/370 translator - analyze program	OS	06
DFHEDM11	CSECT	C/370 translator - atomization	OS	06
DFHEDM14	CSECT	C/370 translator - read input	OS	06
DFHEDM17	CSECT	C/370 translator - generate output	OS	06
DFHEDP	CSECT	EXEC DLI command stub	OS	06
DFHEEI	CSECT	EXEC interface for HANDLE, ADDRESS, ASSIGN	OS	06
DFHEEX	CSECT	EXEC FMH extraction	OS	06
DFHEFRM	CSECT	EXEC file control syncpoint processor	OS	06
DFHEGL	CSECT	EXEC interface for unmapped LU6.2 commands	OS	06
DFHEIACQ	CSECT (OCO)	EXEC ACQUIRE TERMINAL	-	06
DFHEIAR	Macro	EIP arguments macro	OS	-
DFHEIBLC	DSECT	EXEC interface block	C2	-
DFHEIBLK	DSECT	EXEC interface block	04	-
DFHEIBLK	DSECT	EXEC interface block	C2	-
DFHEIBLK	DSECT	EXEC interface block	P2	-
DFHEICDS	DSECT	EXEC interface COMMAREA	04	-
DFHEICRE	DSECT	EXEC CICS CREATE command	-	06
DFHEIDDS	Macro	EXEC interface argument 0 descriptor	04	-
DFHEIDTI	CSECT	EXEC ask-time, format-time program	OS	06
DFHEIEIA	DSECT	EIEI parameter list	OS	-
DFHEIEIM	Macro	EIEI request	OS	-
DFHEIEIT	CSECT	EIEI trace interpretation data	OS	06
DFHEIEND	Macro	EXEC interface storage end macro	04	-
DFHEIENT	Macro	EXEC interface prolog macro	04	-
DFHEIFC	Macro	File control exec interface module	OS	06
DFHEIFSP	Macro	Free space	OS	-
DFHEIGBL	Macro	EXEC interface globals definition macro	04	-
DFHEIGDS	CSECT	Translator table (GDS commands)	OS	06
DFHEIGSP	Macro	Get space	OS	-
DFHEIIC	CSECT (OCO)	EXEC interface IC module	-	06
DFHEIIF	Macro	EXEC interface IF macro	OS	-

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Name	Type	Description	Library	
DFHEILIA	Other	Used by DFHEITAL cataloged procedure	04	-
DFHEILIC	Other	Used by DFHEITCL cataloged procedure	C2	-
DFHEILID	Other	Used by DFHEITDL cataloged procedure	D3	-
DFHEILIP	Other	Used by DFHEITPL cataloged procedure	P2	-
DFHEIMDS	Macro	Master terminal return codes	OS	-
DFHEIMOP	CSECT	Translator options	OS	06
DFHEIMSG	Macro	EXEC interface message macro	04	-
DFHEIMV	Macro	EXEC interface move macro	OS	-
DFHEIN00	CSECT	Interpreter - CECI/CECS program	OS	06
DFHEIN01	CSECT	Interpreter - control module	OS	06
DFHEIN02	CSECT	Interpreter - initialization	OS	06
DFHEIN03	CSECT	CBRC/CECI/CEDA/CEMT - storage manager	OS	06
DFHEIN11	CSECT	CBRC/CECI - atomization	OS	06
DFHEIN12	CSECT	Interpreter - argument analysis	OS	06
DFHEIN13	CSECT	CECI/CEDA/CEMT - diagnosis	OS	06
DFHEIN16	CSECT	CECI/CEDA/CEMT - binary conversion	OS	06
DFHEIN19	CSECT	Interpreter - command analysis	OS	06
DFHEIN20	CSECT	Interpreter - table analysis	OS	06
DFHEIN21	CSECT	Interpreter - keyword analysis	OS	06
DFHEIN22	CSECT	Interpreter - special case code	OS	06
DFHEIN23	CSECT	Interpreter - plist generation	OS	06
DFHEIN26	CSECT	CECI/CEMT - message editor	OS	06
DFHEIN27	CSECT	Interpreter - spelling correction	OS	06
DFHEIN28	CSECT	Interpreter - basic messages	OS	06
DFHEIN50	CSECT	Interpreter - special displays	OS	06
DFHEIN51	CSECT	Interpreter - display extraction	OS	06
DFHEIN52	CSECT	Interpreter - syntax display	OS	06
DFHEIN53	CSECT	Interpreter - utilities	OS	06
DFHEIN54	CSECT	Interpreter - further utilities	OS	06
DFHEIP	CSECT	EXEC (command-level) interface program	OS	06
DFHEIPA	CSECT	EXEC interface prolog and epilog code for assembler-language programs	OS	06
DFHEIPAD	Macro	EXEC interface intermodule addressing	OS	-
DFHEIPDS	DSECT	EXEC interface control blocks	04	-
DFHEIPEL	Source	EXEC interface layer epilog code	OS	-
DFHEIPEQ	Symbolic	EXEC interface EQU statements	OS	-
DFHEIPER	Source	EXEC interface error handling data	OS	-
DFHEIPLR	Macro	EXEC interface epilog code	OS	-
DFHEIPLS	Macro	EXEC interface prolog code	OS	-
DFHEIPPL	Source	EXEC interface layer prolog code	OS	-
DFHEIPRT	CSECT (OCO)	EXEC interface for perform resettime	-	06
DFHEIPSE	CSECT (OCO)	EXEC interface for perform security	-	06
DFHEIPSH	CSECT (OCO)	EXEC interface for perform shutdown	-	06
DFHEIQDE	CSECT (OCO)	EXEC inquire/set for DCE services domain	-	06
DFHEIQDN	CSECT (OCO)	EXEC inquire/set for external data sets	-	06
DFHEIQDS	CSECT (OCO)	EXEC inquire/set/discard for files	-	06
DFHEIQDU	CSECT (OCO)	EXEC inquire/set for dump data sets and dump codes	-	06
DFHEIQD2	CSECT (OCO)		-	06
DFHEIQIR	CSECT (OCO)	EXEC inquire/set for IRC	-	06
DFHEIQMS	CSECT (OCO)	EXEC inquire/set for monitor and stats	-	06
DFHEIQMT	CSECT	EXEC inquire/set for CEMT-only commands	OS	06
DFHEIQPF	CSECT (OCO)	EXEC inquire/discard for profiles	-	06
DFHEIQPN	CSECT (OCO)	EXEC inquire/discard for partners	-	06
DFHEIQRQ	CSECT (OCO)	EXEC inquire for queued requests (REQIDs)	OS	06
DFHEIQSA	CSECT (OCO)	EXEC inquire/set for system attributes	-	06

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Name	Type	Description	Library	
DFHEIQSC	CSECT (OCO)	EXEC inquire/set for connections	-	06
DFHEIQSJ	CSECT (OCO)	EXEC inquire/set for journals or discard for journalnames	-	06
DFHEIQSK	CSECT (OCO)	EXEC inquire/set for tasks	-	06
DFHEIQSL	CSECT (OCO)	EXEC inquire/for journalmodel or streamname or discard for journalmodel	-	06
DFHEIQSM	CSECT (OCO)	EXEC inquire/set for modenames	-	06
DFHEIQSP	CSECT (OCO)	EXEC inquire/set/discard for programs	-	06
DFHEIQSQ	CSECT (OCO)	EXEC inquire/set for TD queues	-	06
DFHEIQST	CSECT (OCO)	EXEC inquire/set for terminals	-	06
DFHEIQSV	CSECT (OCO)	EXEC inquire/set for volumes	-	06
DFHEIQSX	CSECT (OCO)	EXEC inquire/set/discard for transactions	-	06
DFHEIQSZ	CSECT (OCO)	EXEC CICS SPI commands for FEPI	-	06
DFHEIQTM	CSECT (OCO)	EXEC inquire/discard for autinstmodel	-	06
DFHEIQTR	CSECT (OCO)	EXEC inquire/set for trace	-	06
DFHEIQTS	CSECT (OCO)	EXEC inquire for TS queues	-	06
DFHEIQUE	CSECT (OCO)	EXEC inquire for exit programs	-	06
DFHEIQVT	CSECT	EXEC inquire/set for VTAM and autoinstall	OS	06
DFHEIRET	Macro	EXEC interface epilog macro	04	-
DFHEIS	Macro	EXEC interface storage	04	-
DFHEISDS	DSECT	EXEC interface storage definition	04	-
DFHEISP	CSECT (OCO)	EXEC interface syncpoint processor	-	06
DFHEISR	CSECT (OCO)	EXEC interface service routines	-	06
DFHEISRA	DSECT	EISR parameter list	OS	-
DFHEISRM	Macro	EISR request	OS	-
DFHEISRT	CSECT (OCO)	EISR trace interpretation data	-	06
DFHEISTG	Macro	EXEC interface storage start macro	04	-
DFHEITAB	CSECT	Translator table (basic commands)	OS	06
DFHEITAL	Other	Cataloged procedure to translate, assemble, and link-edit assembler-language application programs	03	-
DFHEITBS	CSECT	Translator table (special commands)	OS	06
DFHEITCL	CSECT		03	-
DFHEITCU	CSECT	RDO offline LD table	OS	06
DFHEITDL	Other	Cataloged procedure to translate, compile, and link-edit C/370 application programs	03	-
DFHEITHG	CSECT	EXEC interface hired gun lookup table	OS	06
DFHEITMT	CSECT	Command language table for CEMT	OS	06
DFHEITOT	CSECT	Command language table for CEOT	OS	06
DFHEITPL	Other	Cataloged procedure to translate, compile, and link-edit PL/I application programs	03	-
DFHEITS	CSECT	Temporary storage exec layer	-	06
DFHEITSP	CSECT	Language definition table	OS	06
DFHEITRD	DSECT	Trace point IDs for DFHETC	OS	-
DFHEITST	CSECT	CEST language definition table	OS	06
DFHEITSZ	CSECT (OCO)	EXEC CICS language definition table	-	06
DFHEITTR	CSECT	EXEC interface lookup table	OS	06
DFHEITT2	CSECT	EXEC interface level 2 lookup table	OS	06
DFHEITUT	Source	Definition of EIP trace entries	OS	-
DFHEITVL	Other	Cataloged procedure to translate, compile, and link-edit VS COBOL II application programs	03	-
DFHEIUOW	DSECT	EXEC inquire/set uow, or inquire uoqenq uowlink and uowdsnfail	-	06

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Name	Type	Description	Library	
DFHEIUS	DSECT	EXEC interface storage - USER part	OS	-
DFHEIVAR	DSECT	COBOL working storage	C2	-
DFHEJC	CSECT	EXEC interface for journaling	OS	06
DFHEJECT	Macro	Page eject/space option	04	-
DFHEKC	CSECT	EXEC interface for task control	OS	06
DFHELII	CSECT	EXEC interface link-edit stub for C/370 application programs	OS	06
DFHEMEX	CSECT	EXEC interface for ME domain	-	06
DFHEMPID	CSECT	Monitoring emp-ids	04	-
DFHEMS	CSECT	EXEC interface for BMS	OS	06
DFHEMT00	CSECT	Master terminal - CEMT/CEOT/CEST program	OS	06
DFHEMT01	CSECT	Master terminal - control module	OS	06
DFHEMT02	CSECT	Master terminal - initialization	OS	06
DFHEMT11	CSECT	Master terminal - atomization	OS	06
DFHEMT12	CSECT	Master terminal - argument analysis	OS	06
DFHEMT19	CSECT	Master terminal - command analysis	OS	06
DFHEMT20	CSECT	Master terminal - table analysis	OS	06
DFHEMT21	CSECT	Master terminal - keyword analysis	OS	06
DFHEMT22	CSECT	Master terminal - special case code	OS	06
DFHEMT23	CSECT	Master terminal - plist generation	OS	06
DFHEMT27	CSECT	Master terminal - spelling correction	OS	06
DFHEMT50	CSECT	Master terminal - special displays	OS	06
DFHEMT51	CSECT	Master terminal - display extraction	OS	06
DFHEMT52	CSECT	Master terminal - syntax display	OS	06
DFHEMT53	CSECT	Master terminal - utilities	OS	06
DFHEMT54	CSECT	Master terminal - further utilities	OS	06
DFHEMT55	CSECT	Master terminal - fulists	OS	06
DFHEMT56	CSECT	Master terminal - execution interface	OS	06
DFHEND	Macro	Generate END statement	04	-
DFHENV	Macro	CICS environment service request	OS	-
DFHEOP	CSECT (OCO)	EXEC interface for write operator	-	06
DFHEPC	CSECT	EXEC interface for program control	OS	06
DFHEPILO	Macro	Free automatic storage application epilog	OS	-
DFHEPMAP	CSECT	PL/I translator - advanced code generation functions	OS	06
DFHEPMEE	CSECT	PL/I translator - error editor	OS	06
DFHEPMPP	CSECT	PL/I translator - primary code generation functions	OS	06
DFHEPMSP	CSECT	PL/I translator - input scanner	OS	06
DFHEPM02	CSECT	PL/I translator - initialization	OS	06
DFHEPM07	CSECT	PL/I translator - options card	OS	06
DFHEPM08	CSECT	PL/I translator - check options	OS	06
DFHEPM10	CSECT	PL/I translator - analyze program	OS	06
DFHEPM11	CSECT	PL/I translator - atomization	OS	06
DFHEPM14	CSECT	PL/I translator - read input	OS	06
DFHEPM17	CSECT	PL/I translator - generate output	OS	06
DFHEPS	CSECT	System spooling interface stub	OS	06
DFHERDUF	CSECT (OCO)	SDUMP error message index processor	-	06
DFHERM	CSECT	Resource manager interface (RMI) module	OS	06
DFHERMRS	CSECT	ERM resync processor	-	06
DFHERMSP	CSECT	ERM syncpoint processor	-	06
DFHESC	CSECT	EXEC interface for storage control	OS	06
DFHESE	CSECT (OCO)	EXEC interface for query security	-	06
DFHESN	CSECT (OCO)	EXEC interface for signon and sign-off	-	06
DFHESP00	CSECT	RDO - CEDA/CEDB/CEDC program	OS	06

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Name	Type	Description	Library	
DFHESP01	CSECT	RDO - CEDA control module	OS	06
DFHESP02	CSECT	RDO - CEDA initialization	OS	06
DFHESP11	CSECT	RDO - CEDA atomization	OS	06
DFHESP12	CSECT	RDO - CEDA argument analysis	OS	06
DFHESP19	CSECT	RDO - CEDA command analysis	OS	06
DFHESP20	CSECT	RDO - CEDA table analysis	OS	06
DFHESP21	CSECT	RDO - CEDA keyword analysis	OS	06
DFHESP22	CSECT	RDO - CEDA special case code	OS	06
DFHESP23	CSECT	RDO - CEDA plist generation	OS	06
DFHESP26	CSECT	RDO - CEDA message editor	OS	06
DFHESP27	CSECT	RDO - CEDA spelling correction	OS	06
DFHESP50	CSECT	RDO - CEDA special displays	OS	06
DFHESP51	CSECT	RDO - CEDA display extraction	OS	06
DFHESP52	CSECT	RDO - CEDA syntax display	OS	06
DFHESP53	CSECT	RDO - CEDA utilities	OS	06
DFHESP54	CSECT	RDO - CEDA further utilities	OS	06
DFHESP55	CSECT	RDO - CEDA fulists	OS	06
DFHESZ	CSECT (OCO)	EXEC CICS API commands for FEPI	-	06
DFHETC	CSECT	EXEC interface for terminal control	OS	06
DFHETCB	Macro	EXEC terminal control block macro	OS	-
DFHETD	CSECT	EXEC interface for transient data	OS	06
DFHETL	CSECT	LU6.2 EXEC interface stub	OS	06
DFHETR	CSECT	EXEC interface for trace control	OS	06
DFHETRX	CSECT (OCO)	EXEC interface for enter tracenum, monitor	-	06
DFHEXAI	CSECT	Link-edit stub for assembler-language programs using CSD offline extract function	OS	06
DFHEXCI	CSECT	Link-edit stub for COBOL programs using CSD offline extract function	OS	06
DFHEXDUF	CSECT (OCO)	EXCI dump formatting routine	-	06
DFHEXI	CSECT	Terminal exceptional input program	OS	06
DFHEXLI	CSECT	EXCI stub	04	-
DFHEXMAB	CSECT	Translators - default argument text build	OS	06
DFHEXMAN	CSECT	Translators - statement syntax analysis	OS	06
DFHEXMG1	CSECT	Translators - EXEC DLI code generator	OS	06
DFHEXMG2	CSECT	Translators - EXEC CICS code generator	OS	06
DFHEXMG3	CSECT	Translators - EXEC CICS GDS code generator	OS	06
DFHEXMG4	CSECT	Translators - EXEC EXCI code generator	OS	06
DFHEXMG5	CSECT	Translators - CICSPlex SM EXEC CICS command code generator	-	06
DFHEXMKW	CSECT	Translators - keyword analysis	OS	06
DFHEXMPE	CSECT	Translators - fatal error handler	OS	06
DFHEXMS1	CSECT	Translators - DL/I WHERE operand code generator	OS	06
DFHEXMS2	CSECT	Translators - EXEC CICS special case code generator	OS	06
DFHEXMS3	CSECT	Translators - EXEC CICS GDS special case code generator	OS	06
DFHEXMS4	CSECT	Translators - EXEC EXCI special case code generator	OS	06
DFHEXMS5	CSECT	Translators - EXEC EXCI special case code generator for CICSPlex SM	-	06
DFHEXMTD	CSECT	Translators - temporaries declaration	OS	06
DFHEXMTG	CSECT	Translators - EXEC trigger detection	OS	06
DFHEXMXK	CSECT	Translators - syntax checker	OS	06

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Name	Type	Description	Library	
DFHEXMXM	CSECT	Translators - syntax check error messages	OS	06
DFHEXMXS	CSECT	Translators - syntax check control module	OS	06
DFHEXM01	CSECT	Translators - control module	OS	06
DFHEXM05	CSECT	Translators - PARM analysis	OS	06
DFHEXM06	CSECT	Translators - process single option	OS	06
DFHEXM09	CSECT	Translators - print options	OS	06
DFHEXM12	CSECT	Translators - match brackets	OS	06
DFHEXM13	CSECT	Translators - diagnosis	OS	06
DFHEXM15	CSECT	Translators - I/O module	OS	06
DFHEXM16	CSECT	Translators - conversions	OS	06
DFHEXM18	CSECT	Translators - insert in I/O buffer	OS	06
DFHEXM25	CSECT	Translators - print xref	OS	06
DFHEXM27	CSECT	Translators - spelling correction	OS	06
DFHEXPI	CSECT	Link-edit stub for PL/I programs using CSD offline extract function	OS	06
DFHEXTAL	Other	Cataloged procedure to translate, assemble, and link-edit Assembler-language application programs (EXCI)	03	-
DFHEXTDL	Other	Cataloged procedure to translate, compile, and link-edit C/370 application programs (EXCI)	03	-
DFHEXTM	Macro	Dummy macro for DOS compatibility	OS	-
DFHEXTPL	Other	Cataloged procedure to translate, compile, and link-edit PL/I application programs (EXCI)	03	-
DFHEXTRI	Macro	EXCI trace interpretation routine	-	06
DFHEXTVL	Other	Cataloged procedure to translate, compile, and link-edit VS COBOL II application programs (EXCI)	03	-
DFHFAUED	DSECT		-	04
DFHFBPDS	DSECT	File buffer pool control block	OS	-
DFHFCAT	CSECT	File control catalog manager	OS	06
DFHFCATA	DSECT	FCAT parameter list	OS	-
DFHFCATM	Macro	FCAT request	OS	-
DFHFCATT	CSECT	FCAT translate tables	OS	06
DFHFCBD	CSECT	File control BDAM request processor	OS	06
DFHFCCA	CSECT (OCO)	File control RLS control ACB manager	-	06
DFHFCCAT	CSECT (OCO)	FCCA translate tables	-	06
DFHFCDN	CSECT (OCO)	File control DSN block manager	-	06
DFHFCDNA	DSECT	FCDN parameter list	OS	-
DFHFCDNM	Macro	FCDN request	OS	-
DFHFCDNT	CSECT (OCO)	FCDN translate tables	-	06
DFHFCDTS	CSECT (OCO)	Shared data table request program	-	06
DFHFCDTX	CSECT (OCO)	File control shared data table function ship program	-	06
DFHFCDUF	CSECT (OCO)	File control SDUMP formatter	-	06
DFHFCEDS	DSECT	File control EXEC argument list	04	-
DFHFCENT	Macro	File control operation entry	OS	-
DFHFCES	CSECT (OCO)	File control ENF servicer	-	06
DFHFCFL	CSECT (OCO)	File control FRAB/FLAB processor	-	06
DFHFCFLA	DSECT	FCFL parameter list	OS	-
DFHFCFLI	Macro	File control test file user	OS	-
DFHFCFLM	Macro	FCFL request	OS	-
DFHFCFLT	CSECT	FCFL translate tables	-	06
DFHFCFR	CSECT	File control file request handler	OS	06
DFHFCFRA	DSECT	FCFR parameter list	OS	-

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Name	Type	Description	Library	
DFHFCFRM	Macro	FCFR request	OS	-
DFHFCFRT	CSECT	FCFR trace interpretation data	OS	06
DFHFCFS	CSECT	File control file state program	OS	06
DFHFCFSA	DSECT	FCFS parameter list	OS	-
DFHFCFSM	Macro	FCFS request	OS	-
DFHFCFST	CSECT	FCFS translate tables	OS	06
DFHFCINA	DSECT	FCIN parameter list	OS	-
DFHFCINM	Macro	FCIN request	OS	-
DFHFCINT	CSECT	FCIN translate tables	OS	06
DFHFCIN1	CSECT	File control initialization program 1	OS	06
DFHFCIN2	CSECT	File control initialization program 2	OS	06
DFHFCIR	CSECT (OCO)	File control initialize recovery module	-	06
DFHFCL	CSECT	File control VSAM LSR pool processor	OS	06
DFHFCLF	CSECT (OCO)	File control logger failures	-	06
DFHFCLGD	CSECT	File control part of log record	04	-
DFHFCLJ	CSECT (OCO)	File control logging and journaling	-	06
DFHFCLJA	DSECT	FCLJ parameter list	OS	-
DFHFCLJM	Macro	FCLJ request	OS	-
DFHFCLJT	CSECT	FCLJ translate tables	-	06
DFHFCLTD	DSECT	File control logger user token	04	-
DFHFCM	CSECT	File control VSAM KSDS base open/close	OS	06
DFHFCMT	CSECT (OCO)	File control table manager	-	06
DFHFCMTA	DSECT	FCMT parameter list	OS	-
DFHFCMTM	Macro	FCMT request	OS	-
DFHFCMTT	CSECT (OCO)	FCMT translate tables	-	06
DFHFCN	CSECT	File control open/close program	OS	06
DFHFCNC	Source	File control - close request	OS	-
DFHFCNO	Source	File control - open request	OS	-
DFHFCNQ	CSECT (OCO)	File control non-RLS lock handler	-	06
DFHFCOR	CSECT (OCO)	File control RLS offsite recovery completion	-	06
DFHFCQI	CSECT	File control - VSAM RLS quiesce initiation module	-	06
DFHFCQIT	DSECT	FCQI translate tables	-	06
DFHFCQR	CSECT (OCO)	File control - VSAM RLS quiesce receive module	-	06
DFHFCQRT	DSECT	FCQR translate tables	-	06
DFHFCQS	CSECT (OCO)	File control - VSAM RLS quiesce send module	-	06
DFHFCQST	DSECT	FCQS translate tables	-	06
DFHFCQT	CSECT (OCO)	File control - VSAM RLS quiesce - common system transaction	-	06
DFHFCQU	CSECT (OCO)	File control - VSAM RLS quiesce process module	-	06
DFHFCQUT	DSECT	FCQU translate tables	-	06
DFHFCQX	CSECT (OCO)	File control - VSAM RLS quiesce exit module	-	06
DFHFCRC	CSECT (OCO)	File control recovery control	-	06
DFHFCRD	CSECT (OCO)	File control VSAM RLS post server-failure recovery	-	06
DFHFCRL	CSECT (OCO)	File control VSAM SHRCTL block manager	-	06
DFHFCRLA	DSECT	FCRL parameter list	OS	-
DFHFCRLM	Macro	FCRL request	OS	-
DFHFCRLT	CSECT (OCO)	FCRL translate tables	-	06

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Name	Type	Description	Library	
DFHFCRO	CSECT (OCO)	File control VSAM RLS open/close processor	-	06
DFHFCRP	CSECT	File control restart program	OS	06
DFHFCRPA	DSECT	FCRP parameter list	OS	-
DFHFCRPM	Macro	FCRP request	OS	-
DFHFCRPT	CSECT	FCRP translate tables	OS	06
DFHFCRR	CSECT (OCO)	File control RLS restart program	-	06
DFHFCRRT	CSECT	FCRR translate tables	-	06
DFHFCRS	CSECT (OCO)	File control RLS record management program	-	06
DFHFCRV	CSECT (OCO)	File control RLS VSAM interface program	-	06
DFHFCSD	CSECT	File control shutdown program	OS	06
DFHFCSDA	DSECT	FCSD parameter list	OS	-
DFHFCSDM	Macro	FCSD request	OS	-
DFHFCSDS	DSECT	File control static storage	OS	-
DFHFCSDT	CSECT	FCSD translate tables	OS	06
DFHFCST	CSECT	File control statistics program	OS	06
DFHFCSTA	DSECT	FCST parameter list	OS	-
DFHFCSTM	Macro	FCST request	OS	-
DFHFCSTT	CSECT	FCST translate tables	OS	06
DFHFCT	Macro	File control table	04	-
DFHFCTDS	DSECT	File control table entry	04	-
DFHFCTRN	Symbolic	File control trace, message, and catalog constants for assembler modules	OS	-
DFHFCTSP	Macro	FCT shared resources control block generator	04	-
DFHFCTSR	DSECT	FCT shared resources control block	04	-
DFHFCU	CSECT	File open utility program	OS	06
DFHFCVR	CSECT	File control VSAM interface program	OS	06
DFHFCVS	CSECT	File access VSAM request processor	OS	06
DFHFCWS	Macro	File control work areas	OS	-
DFHFCXDF	CSECT	DU domain - transaction dump formatter for file-related areas	OS	06
DFHFEP	CSECT	Field engineering program	OS	06
DFHFIOA	DSECT	File input/output area	OS	-
DFHFLABD	DSECT	File lasting access block	OS	-
DFHFMH	Macro	Function management header	OS	-
DFHFMHDS	DSECT	Function management header	04	-
DFHFMIDS	Symbolic	Function and module identifiers	04	-
DFHFORM	CSECT	Domain definition tables	OS	06
DFHFRABD	DSECT	File request anchor block	OS	-
DFHFRDUF	CSECT (OCO)	File control recoverable work elements SDUMP formatter	-	06
DFHFRTED	DSECT	File request thread element	OS	-
DFHFTDUF	CSECT (OCO)	Print feature 'FT' keyword processor	-	06
DFHFTTRI	CSECT (OCO)	Offline TR entries trace interpretation	OS	06
DFHGCAA	CSECT	Language Environment/370 - get common anchor area	OS	06
DFHGDEFS	Symbolic	CICS global symbol definitions	04	-
DFHGMM	CSECT	VTAM LU startup message	OS	06
DFHHASH	Macro	Locate TCTTE entries	OS	-
DFHHLPDS	DSECT	DL/I interface block	D3	-
DFHHLPDS	Macro	CICS-IMS HLPI control blocks	OS	-
DFHHMDCD	DSECT	Handle manager table block	OS	-
DFHHPSVC	CSECT	HPO type 6 SVC	OS	06
DFHIC	Macro	Time service request	04	-
DFHICDUF	CSECT (OCO)	Interval control SDUMP formatter	-	06

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Name	Type	Description	Library	
DFHICEDS	DSECT	Interval control element	04	-
DFHICP	CSECT	Interval control program	OS	06
DFHICRC	CSECT	Interval control recovery module	-	06
DFHICUED	CSECT	EXEC argument list for Interval Control	04	-
DFHICXM	CSECT	AP domain - bind, inquire, and release facility IC functions	OS	06
DFHICXMA	DSECT	ICXM parameter list	OS	-
DFHICXMM	Macro	ICXM request	OS	-
DFHICXMT	CSECT	ICXM translate tables	OS	06
DFHIIP	CSECT	BMS non-3270 input mapping	OS	-
DFHIIPA$	CSECT	BMS non-3270 input mapping (standard)	OS	06
DFHIIP1$	CSECT	BMS non-3270 input mapping (full)	OS	06
DFHILG1	Other	Define logstream CF structures to MVS logger	02	-
DFHILG2	Other	Define logstream models for system log streams	02	-
DFHILG3	Other	Define logstream models for individual CICS region	02	-
DFHILG4	Other	Define specific logstream for log of logs	02	-
DFHILG5	Other		02	-
DFHILG6	Other		02	-
DFHILG7	Other		02	-
DFHIMSDS	DSECT	ISC message inserts	04	-
DFHINDAP	CSECT	Indoubt tool	-	06
DFHINDSP	CSECT	Indoubt tool syncpoint processor	-	06
DFHINDT	CSECT	Indoubt tool	-	06
DFHINST	Other	TSO CLIST to generate installation jobs	02	-
DFHINSTA	Other	JCL to create an additional target zone, CSI, and set of target libraries	02	-
DFHINSTJ	Other	JCL to RECEIVE, APPLY, and ACCEPT the Japanese language feature	02	-
DFHINST1	Other	JCL to allocate and catalog CICS target and distribution libraries	02	-
DFHINST2	Other	JCL to allocate and catalog CICS RELFILE data sets	02	-
DFHINST3	Other	JCL to allocate and catalog CICS SMP/E data sets	02	-
DFHINST4	Other	JCL to initialize CICS SMP/E data sets	02	-
DFHINST5	Other	JCL to RECEIVE the CICS base-level function SYSMOD	02	-
DFHINST6	Other	JCL to APPLY and ACCEPT the CICS base-level function SYSMOD	02	-
DFHINTRU	CSECT	Indoubt tool task related user exit	-	06
DFHIONCD	Other	Replace DDDEFS for LE/370 or TCP/IP libraries in SMP/E target zone	02	-
DFHIONCL	Other	Relink-edit DFHRPRP load module outside SMP/E	02	-
DFHIPCSP	Other	IPCS parmlib imbed member for DFHPDxxxx	-	11
DFHIPDUF	CSECT (OCO)	SDUMP formatter for kernel stack internal procedures	-	06
DFHIR	Macro	Interregion request	-	04
DFHIRP	CSECT	Interregion communication program	OS	06
DFHIRPAD	Source	IRC dynamic add of connections routines	OS	-
DFHIRPC	Source	IRC connect and disconnect routines	OS	-
DFHIRPCL	Source	IRC clear and logoff routines	OS	-
DFHIRPD	Macro	IRC program internal control blocks	04	-

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Name	Type	Description	Library	
DFHIRPL	Source	IRC logon routines	OS	-
DFHIRPM	Source	IRC subroutines	OS	-
DFHIRPQ	Source	IRC in-service and quiesce routines	OS	-
DFHIRPR	Source	IRC recovery routines	OS	-
DFHIRPS	Source	IRC subroutines	OS	-
DFHIRPSP	Source	IRC SRB processor	OS	-
DFHIRPSW	Source	IRC switch and pull routines	OS	-
DFHIRRDS	Macro	Interregion session recovery data stream	04	-
DFHIRRXD	Sample	IRC XCF retry DIE subroutine	OS	-
DFHIRRXP	Sample	IRC XCF termination subroutine	OS	-
DFHIRRXS	Sample	IRC XCF SRB processor	OS	-
DFHIRSDS	DSECT	Interregion subsystem control blocks	04	-
DFHIRW10	CSECT	IRC work delivery exit program	OS	06
DFHIS	Macro	ISC request	OS	-
DFHISCRQ	Macro	ISC request parameter list	04	-
DFHISP	CSECT	Intersystem communication program	OS	06
DFHISTAR	Other	JCL to invoke DFHINST	02	-
DFHIVPBT	Other	IVP (batch) to verify CICS startup	02	-
DFHIVPDB	Other	IVP to verify CICS running with DBCTL	02	-
DFHIVPOL	Other	IVP (online) to verify CICS, without DL/I	02	-
DFHIWBL	Other		02	-
DFHJC	Macro	Journal service request	OS	-
DFHJCA	Macro	Journal control area definition	04	-
DFHJCADS	DSECT	Journal control area	04	-
DFHJCJCA	DSECT	JCJC parameter list	OS	-
DFHJCJCM	Macro	JCJC request	OS	-
DFHJCJCT	CSECT	JCJC trace interpretation data	OS	06
DFHJCJCX	Macro	JCJC request (XPI)	04	-
DFHJCJCY	DSECT	JCJC parameter list (XPI)	04	-
DFHJCP	CSECT	Journal control program	-	06
DFHJCR	Macro	Journal control record	04	-
DFHJUP	CSECT	Journal control print utility	OS	06
DFHJVCV@	CSECT		-	06
DFHJVTRI	CSECT		-	06
DFHKC	Macro	Task service request	04	-
DFHKCQ	CSECT	Transaction manager - secondary requests	OS	06
DFHKCRP	CSECT	Task control restart program	OS	06
DFHKCSC	CSECT	DFHKCQ chain scanning for discard	OS	06
DFHKCSCA	DSECT	KCSC parameter list	OS	-
DFHKCSCM	Macro	KCSC request	OS	-
DFHKCSCT	CSECT	KCSC trace interpretation data	OS	06
DFHKCSP	CSECT	Task SRB control program	OS	06
DFHKEALI	Macro	KE domain - label alignment	OS	-
DFHKEAR	CSECT (OCO)	KE domain - MVS ARM support services	-	06
DFHKEARA	DSECT	KEAR parameter list	OS	-
DFHKEARM	Macro	KEAR request	OS	-
DFHKEART	CSECT (OCO)	KEAR trace interpretation data	-	06
DFHKEDCL	CSECT (OCO)	KE domain - domain call request handler	-	06
DFHKEDD	CSECT (OCO)	KE domain - domain definition services	-	06
DFHKEDDA	DSECT	KEDD parameter list	OS	-
DFHKEDDM	Macro	KEDD request	OS	-
DFHKEDDT	CSECT (OCO)	KEDD trace interpretation data	-	06
DFHKEDRT	CSECT (OCO)	KE domain - domain return request handler	-	06
DFHKEDS	CSECT (OCO)	KE domain - dispatcher interfaces	-	06
DFHKEDSA	DSECT	KEDS parameter list	OS	-
DFHKEDSI	Macro	KE domain - optimize kernel path lengths	OS	-
DFHKEDSM	Macro	KEDS request	OS	-
DFHKEDST	CSECT (OCO)	KEDS trace interpretation data	-	06

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Name	Type	Description	Library	
DFHKEDSX	Macro	KEDS request	04	-
DFHKEDSY	CSECT	KEDS parameter list	04	-
DFHKEDUF	CSECT (OCO)	SDUMP formatter for KE domain	-	06
DFHKEEDA	CSECT (OCO)	KE domain - execute deferred abend	-	06
DFHKEENV	Macro	KE domain - declare/switch environment	04	-
DFHKEGD	CSECT (OCO)	KE domain - global data services	-	06
DFHKEGDA	DSECT	KEGD parameter list	OS	-
DFHKEGDM	Macro	KEGD request	OS	-
DFHKEGDT	CSECT (OCO)	KEGD trace interpretation data	-	06
DFHKEIN	CSECT (OCO)	KE domain - initialization	-	06
DFHKEINA	DSECT	KEIN parameter list	OS	-
DFHKEINM	Macro	KEIN request	OS	-
DFHKEINT	CSECT (OCO)	KEIN trace interpretation data	-	06
DFHKELCL	CSECT (OCO)	KE domain - LIFO push simulation	-	06
DFHKELOC	CSECT (OCO)	SDUMP routine for locating domain anchors	-	06
DFHKELRT	CSECT (OCO)	KE domain - LIFO return/pop simulation	-	06
DFHKEMD	Macro	KE domain - domain/subroutine prolog code	OS	-
DFHKEPUB	DSECT	KE domain - some control blocks	OS	-
DFHKERCD	CSECT (OCO)	KE domain - kernel error data construction	-	06
DFHKERER	CSECT (OCO)	KE domain - record error routine	-	06
DFHKERET	CSECT (OCO)	KE domain - reset address service	-	06
DFHKERKE	CSECT (OCO)	KE domain - KERNERROR response handler	-	06
DFHKERN	Macro	KE domain - generate call to kernel	04	-
DFHKERPC	CSECT (OCO)	KE domain - recovery percolation	-	06
DFHKERRI	CSECT (OCO)	KE domain - recovery invocation	-	06
DFHKERRQ	CSECT (OCO)	KE domain - recovery request service	-	06
DFHKERRU	CSECT (OCO)	KE domain - runaway task error handler	-	06
DFHKERRX	CSECT (OCO)	KE domain - recovery exit service	-	06
DFHKESCL	CSECT (OCO)	KE domain - subroutine call handler	-	06
DFHKESFM	CSECT (OCO)	KE domain - disposable segments freemain	-	06
DFHKESGM	CSECT (OCO)	KE domain - new stack segments getmain	-	06
DFHKESIP	CSECT (OCO)	KE domain - system initialization program	-	06
DFHKESRT	CSECT (OCO)	KE domain - subroutine return handler	-	06
DFHKESTP	DSECT	KE domain - kernel stack structure	OS	-
DFHKESTX	CSECT (OCO)	KE domain - kernel ESTAE exit	-	06
DFHKESVC	CSECT (OCO)	KE domain - authorized service routine	-	06
DFHKETA	CSECT (OCO)	KE domain - task reply services	-	06
DFHKETAB	CSECT (OCO)	KE domain - list of domains requiring preinitialization on CICS run	-	06
DFHKETB2	CSECT (OCO)	KE domain - list of domains requiring preinitialization on DFHSTUP run	-	06
DFHKETCB	CSECT (OCO)	KE domain - kernel TCB startup routine	-	06
DFHKETI	CSECT (OCO)	KE domain - timer services	-	06
DFHKETIA	DSECT	KETI parameter list	OS	-
DFHKETIM	Macro	KETI request	OS	-
DFHKETIT	CSECT (OCO)	KETI trace interpretation data	-	06
DFHKETIX	CSECT (OCO)	KE domain - STIMER exit	-	06
DFHKEXM	CSECT (OCO)	KE domain - XM domain services	-	06
DFHKEXMA	DSECT	KEXM parameter list	OS	-
DFHKEXMM	Macro	KEXM request	OS	-
DFHKEXMT	CSECT (OCO)	KEXM trace interpretation data	OS	06
DFHKETRI	CSECT (OCO)	Trace interpreter for KE domain	-	06
DFHLANG	Other	List of National Languages for CICS - alias for MEULANG	16	-
DFHLDDM	CSECT (OCO)	LD domain - initialization/termination	-	06

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Name	Type	Description	Library	
DFHLDDMI	CSECT (OCO)	LD domain - secondary initialization	-	06
DFHLDDUF	CSECT (OCO)	SDUMP formatter for LD domain	-	06
DFHLDGDS	DSECT	LD domain - global statistics	04	-
DFHLDGDS	DSECT	LD domain - global statistics	C2	-
DFHLDGDS	DSECT	LD domain - global statistics	P2	-
DFHLDLD	CSECT (OCO)	LD domain - request router (to LDLD1/2/3)	-	06
DFHLDLDA	DSECT	LDLD parameter list	OS	-
DFHLDLDM	Macro	LDLD request	OS	-
DFHLDLDT	CSECT (OCO)	LDLD trace interpretation data	-	06
DFHLDLDX	Macro	LDLD request (XPI)	04	-
DFHLDLDY	DSECT	LDLD parameter list (XPI)	04	-
DFHLDLD1	CSECT (OCO)	LD domain - acquire/release/refresh	-	06
DFHLDLD2	CSECT (OCO)	LD domain - define/delete	-	06
DFHLDLD3	CSECT (OCO)	LD domain - general functions	-	06
DFHLDNT	CSECT (OCO)	LD domain - storage notify handler	-	06
DFHLDRDS	DSECT	LD domain - program statistics	04	-
DFHLDRDS	DSECT	LD domain - program statistics	C2	-
DFHLDRDS	DSECT	LD domain - program statistics	P2	-
DFHLDST	CSECT (OCO)	LD domain - statistics collection	-	06
DFHLDSUA	DSECT	LDSU parameter list	OS	-
DFHLDSUM	Macro	LDSU request	OS	-
DFHLDSUT	CSECT (OCO)	LDSU trace interpretation data	-	06
DFHLDSVC	CSECT (OCO)	LD domain - authorized service routine	-	06
DFHLDTRI	CSECT (OCO)	Trace interpreter for LD domain	-	06
DFHLFM	Macro	LIFO macro	04	-
DFHLFT	Macro	LIFO trace macro	04	-
DFHLFX	Macro	LIFO stack entry	04	-
DFHLGBAA	DSECT	LGBA parameter list	04	-
DFHLGBAM	Macro	LGBA request	OS	-
DFHLGBAT	DSECT (OCO)	LGBA translate tables	-	06
DFHLGCBT	DSECT	LGCB translate tables	-	06
DFHLGCCA	CSECT (OCO)	LGCC parameter list	OS	-
DFHLGCCM	Macro	LGCC request	OS	-
DFHLGCCT	DSECT (OCO)	LGCC translate tables	-	06
DFHLGDM	CSECT (OCO)	Logger domain - domain initialization	-	06
DFHLGDUF	CSECT (OCO)	Log Manager domain dump formatting	-	06
DFHLGFLD	DSECT	Log Manager log of log format	04	-
DFHLGGFD	DSECT	Log Manager general log format	04	-
DFHLGGL	CSECT (OCO)	Log Manager general log gate module	-	06
DFHLGGLA	CSECT (OCO)	LGGL parameter list	OS	-
DFHLGGLI	CSECT (OCO)	Journal number to name conversion	OS	-
DFHLGGLM	Macro	LGGL request	OS	-
DFHLGGLT	DSECT (OCO)	LGGL translate tables	-	06
DFHLGICV	CSECT (OCO)	LG SSI log record conversion to old format	-	06
DFHLGIGT	DSECT	LG LOGR SSI dataset GET exit	-	06
DFHLGILA	CSECT (OCO)	LG Subsytem exit - lexical analyzer	-	06
DFHLGIMS	CSECT (OCO)	LG Subsytem exit - syntax message composer	-	06
DFHLGIPA	CSECT (OCO)	LG Subsytem exit - parser	-	06
DFHLGIPI	CSECT (OCO)	LG Subsytem exit - parse interface routine	-	06
DFHLGISM	CSECT (OCO)	LG Subsytem exit - parse message exits	-	06
DFHLGJN	CSECT (OCO)	Log Manager journal inventory gate module	-	06
DFHLGJNT	DSECT (OCO)	LGJN translate tables	-	06
DFHLGLBA	CSECT (OCO)	LGLB parameter list	OS	-
DFHLGLBM	Macro	LGLB request	OS	-
DFHLGLBT	DSECT (OCO)	LGLB translate tables	-	06

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Name	Type	Description	Library	
DFHLGLD	CSECT (OCO)	Log Manager JournalModel gate	-	06
DFHLGLDT	DSECT (OCO)	LGLD translate tables	-	06
DFHLGMSD	CSECT (OCO)	Log Manager MVS SMF log format	04	-
DFHLGMVA	CSECT (OCO)	LGMV parameter list	OS	-
DFHLGMVM	Macro	LGMV request	OS	-
DFHLGMVT	DSECT	LGMV translate tables	-	06
DFHLGPA	CSECT (OCO)	Logger Domain - inquire/set parameters	-	06
DFHLGPAA	CSECT (OCO)	LGPA parameter list	OS	-
DFHLGPAM	Macro	LGPA request	OS	-
DFHLGPAT	DSECT (OCO)	LGPA translate tables	-	06
DFHLGPAX	Macro	Log Manager parameter manager PLIST	04	-
DFHLGPAY	DSECT	Log Manager parameter manager PLIST	04	-
DFHLGQC	CSECT (OCO)	Log Manager RLS cleanup	-	06
DFHLGRDS	CSECT (OCO)	Log Manager journal statistics	04	-
DFHLGRDS	CSECT (OCO)	Log Manager journal statistics	C2	-
DFHLGRDS	CSECT (OCO)	Log Manager journal statistics	P2	-
DFHLGSC	CSECT (OCO)	Log Manager statistics collection	-	06
DFHLGSDS	CSECT (OCO)	Log Manager logstream statistics	04	-
DFHLGSDS	CSECT (OCO)	Log Manager logstream statistics	C2	-
DFHLGSDS	CSECT (OCO)	Log Manager logstream statistics	P2	-
DFHLGSRA	CSECT (OCO)	LGSR parameter list	OS	-
DFHLGSRT	DSECT (OCO)	LGSR translate tables	OS	06
DFHLGSSI	CSECT (OCO)	Log Manager LOGR SSI dataset exit	-	06
DFHLGST	CSECT (OCO)	Log Manager stream connection gate	-	06
DFHLGSTT	DSECT (OCO)	LGST translate tables	-	06
DFHLGTRI	CSECT (OCO)	Logger - trace interpretation	-	06
DFHLGWFT	DSECT	LGWF translate tables	-	06
DFHLIFO	DSECT	KE domain - LIFO control blocks	OS	-
DFHLILBD	Source	Language interface program language block	OS	-
DFHLILIA	Source	Language interface parameter list	OS	-
DFHLILII	Source	AP domain - Perform goto call to language interface	OS	-
DFHLILIM	Source	Language interface services	OS	-
DFHLILIT	CSECT (OCO)	Language interface trace interpretation data	-	06
DFHLIRET	CSECT (OCO)	Language interface return program	-	06
DFHLITRI	CSECT (OCO)	Language interface trace interpreter	-	06
DFHLIWAD	Source	Language interface work area	OS	-
DFHLLDC	DSECT	Local logical device code table	04	-
DFHLLDLI	DSECT	DLI call level api macro (alias of CALLDLI)	04	-
DFHLMDM	CSECT (OCO)	LM domain - initialization/termination	-	06
DFHLMDS	CSECT (OCO)	LM domain - dispatcher notify handler	-	06
DFHLMDUF	CSECT (OCO)	SDUMP formatter for LM domain	-	06
DFHLMIQ	CSECT (OCO)	LM domain - browse and inquiry	-	06
DFHLMIQA	DSECT	LMIQ parameter list	OS	-
DFHLMIQM	Macro	LMIQ request	OS	-
DFHLMIQT	CSECT (OCO)	LMIQ trace interpretation data	-	06
DFHLMLM	CSECT (OCO)	LM domain - services	-	06
DFHLMLMA	DSECT	LMLM parameter list	OS	-
DFHLMLMM	Macro	LMLM request	OS	-
DFHLMLMT	CSECT (OCO)	LMLM trace interpretation data	-	06
DFHLMTRI	CSECT (OCO)	Trace interpreter for LM domain	-	06
DFHLNKVS	Other	Cataloged procedure to link-edit CICS programs and application programs	03	-
DFHLOCK	Macro	KE domain - lock/unlock TCB entry	OS	-

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Name	Type	Description	Library	
DFHLPCHN	Other	Apply sample usermod (DFHUCHN) to move chinese language feature mods.into LPA	02	-
DFHLPJPN	Other	JCL to RECEIVE and APPLY the DFH$UJPN SMP/E USERMOD	02	-
DFHLPUMD	Other	JCL to RECEIVE and APPLY the DFH$UMOD SMP/E USERMOD	02	-
DFHLSCU	CSECT		-	06
DFHLTRC	CSECT	Local terminal recovery module	-	06
DFHLUC	Macro	LU6.2 service request	OS	-
DFHLUCM	Macro	LU6.2 migration request	OS	-
DFHLUS	Macro	LU6.2 services manager driver macro	OS	-
DFHL2BA	CSECT (OCO)	Log Manager LGBA gate	-	06
DFHL2BL1	CSECT (OCO)	Logger block initialize class procedure	-	06
DFHL2BL2	CSECT (OCO)	Logger block restore current position	-	06
DFHL2BS1	CSECT (OCO)	Obtain and initialize BrowseableStream class data	-	06
DFHL2BS2	CSECT (OCO)	Construct a BrowseableStream object and return to caller	-	06
DFHL2BS3	CSECT (OCO)	Destroy a BrowseableStream object	-	06
DFHL2BS4	CSECT (OCO)	Terminate all browseable stream instances known to BrowseableStream class	-	06
DFHL2CB	CSECT (OCO)	Log Manager LGCB gate	-	06
DFHL2CC	CSECT (OCO)	Log Manager LGCC gate	-	06
DFHL2CHA	CSECT (OCO)	Logger chain start browse all procedure	-	06
DFHL2CHE	CSECT (OCO)	Logger chain delete history procedure	-	06
DFHL2CHG	CSECT (OCO)	Logger chain get next chain procedure	-	06
DFHL2CHH	CSECT (OCO)	Logger chain start browse chains procedure	-	06
DFHL2CHI	CSECT (OCO)	Logger chain end browse chains procedure	-	06
DFHL2CHL	CSECT (OCO)	Logger chain end browse all procedure	-	06
DFHL2CHM	CSECT (OCO)	Logger chain move procedure	-	06
DFHL2CHN	CSECT (OCO)	Logger chain browse all get next procedure	-	06
DFHL2CHR	CSECT (OCO)	Logger chain restore procedure	-	06
DFHL2CHS	CSECT (OCO)	Logger chain set history procedure	-	06
DFHL2CH1	CSECT (OCO)	Logger chain initialize class procedure	-	06
DFHL2CH2	CSECT (OCO)	Logger chain create fresh procedure	-	06
DFHL2CH3	CSECT (OCO)	Logger chain start chain browse procedure	-	06
DFHL2CH4	CSECT (OCO)	Logger chain browse get next procedure	-	06
DFHL2CH5	CSECT (OCO)	Logger chain end chain browse procedure	-	06
DFHL2DM	CSECT (OCO)	Log Manager L2 domain management	-	06
DFHL2DU0	CSECT (OCO)	Log Manager L2_Dump_Formatting_Module	-	06
DFHL2HB	CSECT (OCO)		-	06
DFHL2HSF	CSECT (OCO)	Logger HardStream write MVS retry intro.	-	06
DFHL2HSG	CSECT (OCO)	Logger HardStream read browse cursor	-	06
DFHL2HSJ	CSECT (OCO)	Logger HardStream end browse cursor	-	06
DFHL2HS2	CSECT (OCO)	Logger HardStream connect procedure	-	06
DFHL2HS3	CSECT (OCO)	Logger HardStream disconnect procedure	-	06
DFHL2HS4	CSECT (OCO)	Logger HardStream delete all procedure	-	06
DFHL2HS5	CSECT (OCO)	Logger HardStream delete history procedure	-	06
DFHL2HS6	CSECT (OCO)	Logger HardStream start browse cursor	-	06
DFHL2HS7	CSECT (OCO)	Logger HardStream start read procedure	-	06
DFHL2HS8	CSECT (OCO)	Logger HardStream read block procedure	-	06
DFHL2HS9	CSECT (OCO)	Logger HardStream end read procedure	-	06
DFHL2LB	CSECT (OCO)	Log Manager LGLB gate	-	06
DFHL2MV	CSECT (OCO)	Log Manager LGMV gate	-	06
DFHL2OFI	CSECT (OCO)	Logger object factory initialize procedure	-	06

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Name	Type	Description	Library	
DFHL2SLE	CSECT (OCO)	Logger system log notify failure method	-	06
DFHL2SLN	CSECT (OCO)	Logger system log open stream method	-	06
DFHL2SL1	CSECT (OCO)	Logger system log initialize class procedure	-	06
DFHL2SR	CSECT (OCO)	Log Manager stream class class declaration	-	06
DFHL2SR1	CSECT (OCO)	Logger stream class initialize class	-	06
DFHL2SR2	CSECT (OCO)	Logger stream class construct procedure	-	06
DFHL2SR3	CSECT (OCO)	Logger stream class destruct procedure	-	06
DFHL2SR4	CSECT (OCO)	Logstream statistics module	-	06
DFHL2SR5	CSECT (OCO)	Logger stream class terminate all procedure	-	06
DFHL2TI2	CSECT (OCO)		-	06
DFHL2TRI	CSECT (OCO)	Log Manager trace interpretation	-	06
DFHL2VP1	CSECT (OCO)	Logger storage manager initialize class	-	06
DFHL2WF	CSECT (OCO)	Log Manager LGWF gate	-	06
DFHMAPDS	DSECT	BMS map description	OS	-
DFHMAPS	Other	Cataloged procedure to prepare physical and symbolic maps	03	-
DFHMBCDS	DSECT	Transient data buffer control	OS	-
DFHMBMBA	DSECT	File control DFHMBMBI parameter list	OS	-
DFHMBMBI	Macro	File control buffer management inline	OS	-
DFHMCAD	Macro	Map control area	04	-
DFHMCBDS	DSECT	BMS message control block	04	-
DFHMCP	CSECT	BMS mapping control program	OS	-
DFHMCPA$	CSECT	BMS mapping control program (standard)	OS	06
DFHMCPE	CSECT	BMS minimum function mapping control	OS	-
DFHMCPE$	CSECT	BMS mapping control program (minimum)	OS	06
DFHMCPIN	CSECT	BMS input mapping request handler	OS	-
DFHMCPLK	Macro	Linkage to BMS modules	OS	-
DFHMCP1$	CSECT	BMS mapping control program (full)	OS	06
DFHMCRDS	DSECT	BMS message control record	04	-
DFHMCT	Macro	Monitoring control table	04	-
DFHMCTA$	Sample	Monitoring control table for an AOR	05	-
DFHMCTDR	Macro	Monitoring dictionary definition	04	-
DFHMCTDS	Macro	MCT root section definition	04	-
DFHMCTDT	Macro	Transaction monitoring field and dictionary entry definition	04	-
DFHMCTD$	Sample	Monitoring control table for an AOR with DBCTL	05	-
DFHMCTEN	Macro	MCT option macro	04	-
DFHMCTF$	Sample	Monitoring control table for an FOR	05	-
DFHMCTMP	Macro	MCT class macro	04	-
DFHMCTNM	Macro	Monitoring numeric string check	04	-
DFHMCTSE	Macro	MCT option entry generator	04	-
DFHMCTT$	Sample	Monitoring control table for a TOR	05	-
DFHMCT2$	Sample	Monitoring control table	05	06
DFHMCX	CSECT	BMS fast path module	OS	06
DFHMDC	Macro	Build C language symbolic description map	04	-
DFHMDCL	Macro	Convert C field names to lowercase	04	-
DFHMDF	Macro	Generate BMS field definition	04	-
DFHMDI	Macro	Generate BMS map definition	04	-
DFHMDX	Macro		04	-
DFHMEACC	CSECT	ME domain - DFHACxxxx message set simplified Chinese version	12	06
DFHMEACE	CSECT	ME domain - DFHACxxxx message set	12	06
DFHMEACK	CSECT (OCO)	ME domain - DFHACxxxx message set	12	06
DFHMEAIC	CSECT	ME domain - DFHAIxxxx message set simplified Chinese version	12	06

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Name	Type	Description	Library	
DFHMEAIE	CSECT	ME domain - DFHAIxxxx message set	12	06
DFHMEAIK	CSECT (OCO)	ME domain - DFHAIxxxx message set	12	06
DFHMEAMC	CSECT	ME domain - DFHAMxxxx message set simplified Chinese version	12	06
DFHMEAME	CSECT	ME domain - DFHAMxxxx message set	12	06
DFHMEAMK	CSECT (OCO)	ME domain - DFHAMxxxx message set	12	06
DFHMEAPC	CSECT	ME domain - DFHAPxxxx message set simplified Chinese version	12	06
DFHMEAPE	CSECT	ME domain - DFHAPxxxx message set	12	06
DFHMEAPK	CSECT (OCO)	ME domain - DFHAPxxxx message set	12	06
DFHMEBM	CSECT (OCO)	ME domain - batch message program	-	06
DFHMEBMA	DSECT	MEBM parameter list	OS	-
DFHMEBMM	Macro	MEBM request	OS	-
DFHMEBMT	CSECT (OCO)	MEBM trace interpretation data	-	06
DFHMEBRC	CSECT (OCO)	ME domain	12	06
DFHMEBRE	CSECT (OCO)	ME domain	12	06
DFHMEBRK	CSECT (OCO)	ME domain	12	06
DFHMEBU	CSECT (OCO)	ME domain - build message	-	06
DFHMEBUA	DSECT	MEBU parameter list	OS	-
DFHMEBUM	Macro	MEBU request	OS	-
DFHMEBUT	CSECT (OCO)	MEBU trace interpretation data	-	06
DFHMECAC	CSECT	ME domain - message set for GC/LC domains simplified Chinese version	12	06
DFHMECAE	CSECT	ME domain - DFHCAxxxx message set	12	06
DFHMECAK	CSECT	ME domain - DFHCAxxxx message set Japanese (Kanji) version	12	06
DFHMECCC	CSECT	ME domain - DFHCCxxxx message set simplified Chinese version	12	06
DFHMECCE	CSECT	ME domain - message set for GC/LC domains	12	06
DFHMECCK	CSECT (OCO)	ME domain - message set for GC/LC domains	12	06
DFHMECEC	CSECT	ME domain - DFHCExxxx message set simplified Chinese version	12	06
DFHMECEE	CSECT	ME domain - DFHCExxxx message set	12	06
DFHMECEK	CSECT (OCO)	ME domain - DFHCExxxx message set	12	06
DFHMECPC	CSECT	ME domain - DFHCPxxxx message set simplified Chinese version	12	06
DFHMECPE	CSECT	ME domain - DFHCPxxxx message set	12	06
DFHMECPK	CSECT (OCO)	ME domain - DFHCPxxxx message set	12	06
DFHMECRC	CSECT	ME domain - DFHCRxxxx message set simplified Chinese version	12	06
DFHMECRE	CSECT	ME domain - DFHCRxxxx message set	12	06
DFHMECRK	CSECT (OCO)	ME domain - DFHCRxxxx message set	12	06
DFHMEDBC	CSECT	ME domain - DFHDBxxxx message set simplified Chinese version	12	06
DFHMEDBE	CSECT	ME domain - DFHDBxxxx message set	12	06
DFHMEDBK	CSECT (OCO)	ME domain - DFHDBxxxx message set	12	06
DFHMEDDE	CSECT	ME domain - message set for DD domain	12	06
DFHMEDM	CSECT (OCO)	ME domain - initialization/termination	-	06
DFHMEDME	CSECT	ME domain - message set for DM domain	12	06
DFHMEDSE	CSECT	ME domain - message set for DS domain	12	06
DFHMEDUC	CSECT	ME domain - message set for DU domain simplified Chinese version	12	06
DFHMEDUE	CSECT	ME domain - message set for DU domain	12	06
DFHMEDUF	CSECT (OCO)	SDUMP formatter for ME domain	-	06
DFHMEDUK	CSECT (OCO)	ME domain - message set for DU domain	12	06
DFHMEDXC	CSECT	ME domain - DFHDXxxxx message set simplified Chinese version	12	06
DFHMEDXE	CSECT	ME domain - DFHDXxxxx message set	12	06

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Name	Type	Description	Library	
DFHMEDXK	CSECT (OCO)	ME domain - DFHDXxxxx message set	12	06
DFHMEERE	CSECT	ME domain - DFHERxxxx message set	12	06
DFHMEEXE	CSECT	ME domain - DFHEXxxxx message set	-	06
DFHMEFCC	CSECT	ME domain - DFHFCxxxx message set simplified Chinese version	12	06
DFHMEFCE	CSECT	ME domain - DFHFCxxxx message set	12	06
DFHMEFCK	CSECT (OCO)	ME domain - DFHFCxxxx message set	12	06
DFHMEFEC	CSECT	ME domain - DFHFExxxx message set simplified Chinese version	12	06
DFHMEFEE	CSECT	ME domain - DFHFExxxx message set	12	06
DFHMEFEK	CSECT (OCO)	ME domain - DFHFExxxx message set	12	06
DFHMEFO	CSECT (OCO)	ME domain - format message subroutine	-	06
DFHMEFOA	DSECT	MEFO parameter list	OS	-
DFHMEFOM	Macro	MEFO request	OS	-
DFHMEFOT	CSECT (OCO)	MEFO trace interpretation data	-	06
DFHMEICC	CSECT	ME domain - DFHICxxxx message set simplified Chinese version	12	06
DFHMEICE	CSECT	ME domain - DFHICxxxx message set	12	06
DFHMEICK	CSECT (OCO)	ME domain - DFHICxxxx message set	12	06
DFHMEIN	CSECT (OCO)	ME domain - inquire message data	-	06
DFHMEINA	DSECT	MEIN parameter list	OS	-
DFHMEINC	DSECT	ME domain - DFHINxxxx message set simplified Chinese version	12	06
DFHMEINE	DSECT	ME domain - DFHINxxxx message set	12	06
DFHMEINK	DSECT	ME domain - DFHINxxxx message set Japanese (Kanji) version	12	06
DFHMEINM	Macro	MEIN request	OS	-
DFHMEINT	CSECT (OCO)	MEIN trace interpretation data	-	06
DFHMEIRC	CSECT	ME domain - DFHIRxxxx message set simplified Chinese version	12	06
DFHMEIRE	CSECT	ME domain - DFHIRxxxx message set	12	06
DFHMEIRK	CSECT (OCO)	ME domain - DFHIRxxxx message set Japanese (Kanji) version	12	06
DFHMEJCC	CSECT	ME domain - DFHJCxxxx message set simplified Chinese version	12	06
DFHMEJCE	CSECT	ME domain - DFHJCxxxx message set	12	06
DFHMEJCK	CSECT (OCO)	ME domain - DFHJCxxxx message set	12	06
DFHMEKCC	CSECT	ME domain - DFHKCxxxx message set simplified chinese version	12	06
DFHMEKCE	CSECT	ME domain - DFHKCxxxx message set	12	06
DFHMEKCK	CSECT (OCO)	ME domain - DFHKCxxxx message set Japanese (Kanji) version	12	06
DFHMEKEE	CSECT	ME domain - message set for KE domain	12	06
DFHMELDE	CSECT	ME domain - message set for LD domain	12	06
DFHMELGC	CSECT	ME domain - DFHLGxxxx message set simplified Chinese version	12	06
DFHMELGE	CSECT	ME domain - DFHLGxxxx message set	12	06
DFHMELGK	CSECT	ME domain - DFHLGxxxx message set Japanese (Kanji) version	12	06
DFHMELME	CSECT	ME domain - message set for LM domain	12	06
DFHMEMCC	CSECT	ME domain - DFHMCxxxx message set simplified Chinese version	12	06
DFHMEMCE	CSECT	ME domain - DFHMCxxxx message set	12	06
DFHMEMCK	CSECT (OCO)	ME domain - DFHMCxxxx message set Japanese (Kanji) version	12	06

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Name	Type	Description	Library	
DFHMEME	CSECT (OCO)	ME domain - main functions	-	06
DFHMEMEA	DSECT	MEME parameter list	OS	-
DFHMEMEE	CSECT	ME domain - DFHMExxxx message set	12	06
DFHMEMEM	Macro	MEME request	OS	-
DFHMEMET	CSECT (OCO)	MEME trace interpretation data	-	06
DFHMEMNE	CSECT	ME domain - message set for MN domain	12	06
DFHMEMUE	CSECT	ME domain - DFHMUxxxx message set	12	06
DFHMENQE	CSECT	ME domain - DFHNQxxxx message set	12	06
DFHMEPAE	CSECT	ME domain - message set for PA domain	12	06
DFHMEPCC	CSECT	ME domain - DFHPCxxxx message set simplified Chinese version	12	06
DFHMEPCE	CSECT	ME domain - DFHPCxxxx message set	12	06
DFHMEPCK	CSECT (OCO)	ME domain - DFHPCxxxx message set Japanese (Kanji) version	12	06
DFHMEPGC	CSECT	ME domain - DFHPGxxxx message set simplified Chinese version	12	06
DFHMEPGE	CSECT	ME domain - DFHPGxxxx message set	12	06
DFHMEPGK	CSECT (OCO)	ME domain - DFHPGxxxx message set Japanese (Kanji) version	12	06
DFHMEPRC	CSECT	ME domain - DFHPRxxxx message set simplified Chinese version	12	06
DFHMEPRE	CSECT	ME domain - DFHPRxxxx message set	12	06
DFHMEPRK	CSECT (OCO)	ME domain - DFHPRxxxx message set Japanese (Kanji) version	12	06
DFHMEPSC	CSECT	ME domain - DFHPSxxxx message set simplified Chinese version	12	06
DFHMEPSE	CSECT	ME domain - DFHPSxxxx message set	12	06
DFHMEPSK	CSECT (OCO)	ME domain - DFHPSxxxx message set	12	06
DFHMERDC	CSECT	ME domain - DFHRDxxxx message set simplified Chinese version	12	06
DFHMERDE	CSECT	ME domain - DFHRDxxxx message set	12	06
DFHMERDK	CSECT (OCO)	ME domain - DFHRDxxxx message set Japanese (Kanji) version	12	06
DFHMERMC	CSECT	ME domain - DFHRMxxxx message set simplified Chinese version	12	06
DFHMERME	CSECT	ME domain - DFHRMxxxx message set	12	06
DFHMERMK	CSECT (OCO)	ME domain - DFHRMxxxx message set Japanese (Kanji) version	12	06
DFHMEROC	CSECT	ME domain - DFHRPxxxx message set simplified Chinese version	12	06
DFHMEROE	CSECT	ME domain - DFHRPxxxx message set	12	06
DFHMEROK	CSECT (OCO)	ME domain - DFHRPxxxx message set Japanese (Kanji) version	12	06
DFHMERPC	CSECT	ME domain - DFHRPxxxx message set simplified Chinese version	12	06
DFHMERPE	CSECT	ME domain - DFHRPxxxx message set	12	06
DFHMERPK	CSECT (OCO)	ME domain - DFHRPxxxx message set Japanese (Kanji) version	12	06
DFHMERQC	CSECT	ME domain - DFHRPxxxx message set simplified Chinese version	12	06
DFHMERQE	CSECT	ME domain - DFHRPxxxx message set	12	06
DFHMERQK	CSECT (OCO)	ME domain - DFHRPxxxx message set Japanese (Kanji) version	12	06
DFHMERRC	CSECT	ME domain - DFHRPxxxx message set simplified Chinese version	12	06

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Name	Type	Description	Library	
DFHMERRE	CSECT	ME domain - DFHRPxxxx message set	12	06
DFHMERRK	CSECT (OCO)	ME domain - DFHRPxxxx message set Japanese (Kanji) version	12	06
DFHMERSC	CSECT	ME domain - DFHRSxxxx message set simplified Chinese version	12	06
DFHMERSE	CSECT	ME domain - DFHRSxxxx message set	12	06
DFHMERSK	CSECT (OCO)	ME domain - DFHRSxxxx message set Japanese (Kanji) version	12	06
DFHMERTC	CSECT	ME domain - DFHRTxxxx message set simplified Chinese version	12	06
DFHMERTE	CSECT	ME domain - DFHRTxxxx message set	12	06
DFHMERTK	CSECT (OCO)	ME domain - DFHRTxxxx message set Japanese (Kanji) version	12	06
DFHMERUE	CSECT	ME domain - DFHRUxxxx message set	12	06
DFHMESIC	CSECT	ME domain - DFHSIxxxx message set simplified Chinese version	12	06
DFHMESIE	CSECT	ME domain - DFHSIxxxx message set	12	06
DFHMESIK	CSECT (OCO)	ME domain - DFHSIxxxx message set Japanese (Kanji) version	12	06
DFHMESKE	CSECT	ME domain - DFHSKxxxx message set	12	06
DFHMESME	CSECT	ME domain - message set for SM domain	12	06
DFHMESNC	CSECT	ME domain - DFHSNxxxx message set simplified Chinese version	12	06
DFHMESNE	CSECT	ME domain - DFHSNxxxx message set	12	06
DFHMESNK	CSECT (OCO)	ME domain - DFHSNxxxx message set Japanese (Kanji) version	12	06
DFHMESR	CSECT (OCO)	ME domain - SIT overrides collection	-	06
DFHMESRA	DSECT	MESR parameter list	OS	-
DFHMESRE	CSECT	ME domain - DFHSRxxxx message set	12	06
DFHMESRM	Macro	MESR request	OS	-
DFHMESRT	CSECT (OCO)	MESR trace interpretation data	-	06
DFHMESTC	CSECT	ME domain - message set for ST domain simplified Chinese version	12	06
DFHMESTE	CSECT	ME domain - message set for ST domain	12	06
DFHMESTK	CSECT (OCO)	ME domain - message set for ST domain Japanese (Kanji) version	12	06
DFHMESZC	CSECT (OCO)	ME domain - DFHSZxxxx message set (FEPI) simplified Chinese version	12	06
DFHMESZE	CSECT (OCO)	ME domain - DFHSZxxxx message set (FEPI)	12	06
DFHMESZK	CSECT (OCO)	ME domain - DFHSZxxxx message set (FEPI) Japanese (Kanji) version	12	06
DFHMETCC	CSECT	ME domain - DFHTCxxxx message set simplified Chinese version	12	06
DFHMETCE	CSECT	ME domain - DFHTCxxxx message set	12	06
DFHMETCK	CSECT (OCO)	ME domain - DFHTCxxxx message set Japanese (Kanji) version	12	06
DFHMETDC	CSECT	ME domain - DFHTDxxxx message set simplified Chinese version	12	06
DFHMETDE	CSECT	ME domain - DFHTDxxxx message set	12	06
DFHMETDK	CSECT	ME domain - DFHTDxxxx message set Japanese (Kanji) version	12	06
DFHMETFC	CSECT	ME domain - DFHTFxxxx message set simplified Chinese version	12	06
DFHMETFE	CSECT	ME domain - DFHTFxxxx message set	12	06

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Name	Type	Description	Library	
DFHMETFK	CSECT (OCO)	ME domain - DFHTFxxxx message set Japanese (Kanji) version	12	06
DFHMETIE	CSECT	ME domain - message set for TI domain	12	06
DFHMETMC	CSECT	ME domain - DFHTMxxxx message set simplified Chinese version	12	06
DFHMETME	CSECT	ME domain - DFHTMxxxx message set	12	06
DFHMETMK	CSECT	ME domain - DFHTMxxxx message set Japanese (Kanji) version	12	06
DFHMETOC	CSECT	ME domain - DFHTOxxxx message set simplified Chinese version	12	06
DFHMETOE	CSECT	ME domain - DFHTOxxxx message set	12	06
DFHMETOK	CSECT (OCO)	ME domain - DFHTOxxxx message set Japanese (Kanji) version	12	06
DFHMETPC	CSECT	ME domain - DFHTPxxxx message set simplified Chinese version	12	06
DFHMETPE	CSECT	ME domain - DFHTPxxxx message set	12	06
DFHMETPK	CSECT (OCO)	ME domain - DFHTPxxxx message set Japanese (Kanji) version	12	06
DFHMETRC	CSECT	ME domain - message set for TR domain simplified Chinese version	12	06
DFHMETRE	CSECT	ME domain - message set for TR domain	12	06
DFHMETRI	CSECT (OCO)	Trace interpreter for ME domain	-	06
DFHMETRK	CSECT (OCO)	ME domain - message set for TR domain Japanese (Kanji) version	12	06
DFHMETSC	CSECT	ME domain - DFHTSxxxx message set simplified Chinese version	12	06
DFHMETSE	CSECT	ME domain - DFHTSxxxx message set	12	06
DFHMETSK	CSECT (OCO)	ME domain - DFHTSxxxx message set Japanese (Kanji) version	12	06
DFHMET1	CSECT	ME domain - DFHMET1x online message table	12	06
DFHMET1C	CSECT	MEU message link module	12	-
DFHMET1E	CSECT	DFHMEU base messages link-edit module	12	-
DFHMET1K	CSECT	MEU message link module	12	-
DFHMET2	CSECT (OCO)	ME domain - DFHMET2x offline translator message table	-	06
DFHMET3	CSECT (OCO)	ME domain - DFHMET3x offline message table for DFHSTUP	-	06
DFHMET4	CSECT (OCO)	Offline message table for EXCI	-	06
DFHMET5	CSECT	ME domain - DFHMET5x online message table	12	06
DFHMET5E	CSECT	DFHMEU ONC RPS messages link-edit module	12	-
DFHMET9	CSECT	ME domain - DFHMET9x online message table	-	06
DFHMEU	CSECT	Message translation utility program	-	06
DFHMEUA	DSECT (OCO)	Message editing utility parameter list	-	06
DFHMEUC	CSECT (OCO)	Message editing utility copy message dataset	-	06
DFHMEUCL	CSECT (OCO)	Message editing utility copy message dataset	13	-
DFHMEUD	CSECT (OCO)	Message editing utility set/validate system defaults	-	06
DFHMEUE	CSECT (OCO)	Message editing utility edit message	-	06
DFHMEUL	CSECT (OCO)	Message editing utility compile, assemble and link-edit message data sets	-	06
DFHMEULT	CSECT (OCO)	Message editing utility CLIST to create language codes table	13	-
DFHMEUM	Macro (OCO)	Message editing utility ISPF editor profile	-	06
DFHMEUP	CSECT (OCO)	Message editing utility display PTF panel and submit PTF job	-	06

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Name	Type	Description	Library	
DFHMEUPE	CSECT (OCO)	ME domain - DFHUPxxxx message set	12	06
DFHMEUSC	CSECT (OCO)	Message editing utility check state of message data set simplified Chinese version	12	06
DFHMEUSE	CSECT (OCO)	Message editing utility check state of message data set	12	06
DFHMEUSK	CSECT (OCO)	Message editing utility check state of message data set Japanese (Kanji) version	12	06
DFHMEUU	CSECT (OCO)	Message editing utility compare PTF & English message data sets	-	06
DFHMEU00	CSECT	Message editing utility help index panel	15	-
DFHMEU01	CSECT	Message editing utility main help panel 1	15	-
DFHMEU10	CSECT	Message editing utility main panel	15	-
DFHMEU11	CSECT	Message editing utility main help panel 2	15	-
DFHMEU12	CSECT	Message editing utility main help panel 3	15	-
DFHMEU20	CSECT	Message editing utility set defaults panel (part 1 of 2)	15	-
DFHMEU21	CSECT	Message editing utility set defaults (part 1) help panel 1	15	-
DFHMEU22	CSECT	Message editing utility set defaults (part 1) help panel 2	15	-
DFHMEU30	CSECT	Message editing utility set defaults panel (part 2 of 2)	15	-
DFHMEU31	CSECT	Message editing utility set defaults (part 2) help panel	15	-
DFHMEU40	CSECT	Message editing utility language selection panel	15	-
DFHMEU41	CSECT	Message editing utility language selection help panel	15	-
DFHMEU50	CSECT	Message editing utility message selection panel	15	-
DFHMEU51	CSECT	Message editing utility message selection help panel	15	-
DFHMEU60	CSECT	Message editing utility message edit panel	15	-
DFHMEU61	CSECT	Message editing utility message edit help panel	15	-
DFHMEU70	CSECT	Message editing utility apply PTF updates panel	15	-
DFHMEU71	CSECT	Message editing utility apply PTF updates help panel	15	-
DFHMEWBC	CSECT (OCO)	ME domain	12	06
DFHMEWBE	CSECT (OCO)	ME domain	12	06
DFHMEWBK	CSECT (OCO)	ME domain	12	06
DFHMEWS	CSECT (OCO)	ME domain - write symptom string to SYS1.LOGREC	-	06
DFHMEWSA	DSECT	MEWS parameter list	OS	-
DFHMEWSM	Macro	MEWS request	OS	-
DFHMEWST	CSECT (OCO)	MEWS trace interpretation data	-	06
DFHMEWT	CSECT (OCO)	ME domain - WTOR service routine	-	06
DFHMEWTA	DSECT	MEWT parameter list	OS	-
DFHMEWTM	Macro	MEWT request	OS	-
DFHMEWTT	CSECT (OCO)	MEWT trace interpretation data	-	06
DFHMEXAE	CSECT	ME domain - DFHXAxxxx message set	12	06
DFHMEXCE	CSECT	ME domain - DFHXCxxxx message set	12	06
DFHMEXGC	CSECT	ME domain - DFHXGxxxx message set simplified Chinese version	12	06
DFHMEXGE	CSECT	ME domain - DFHXGxxxx message set	12	06

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Name	Type	Description	Library	
DFHMEXGK	CSECT (OCO)	ME domain - DFHXGxxxx message set Japanese (Kanji) version	12	06
DFHMEXMC	CSECT	ME domain - DFHXMxxxx message set simplified Chinese version	12	06
DFHMEXME	CSECT	ME domain - DFHXMxxxx message set	12	06
DFHMEXMK	CSECT (OCO)	ME domain - DFHXMxxxx message set Japanese (Kanji) version	12	06
DFHMEXOE	CSECT	ME domain - DFHXOxxxx message set	12	06
DFHMEXSC	CSECT	ME domain - DFHXSxxxx message set simplified Chinese version	12	06
DFHMEXSE	CSECT	ME domain - DFHXSxxxx message set	12	06
DFHMEXSK	CSECT (OCO)	ME domain - DFHXSxxxx message set Japanese (Kanji) version	12	06
DFHMEZAC	CSECT	ME domain - DFHZAxxxx message set simplified Chinese version	12	06
DFHMEZAE	CSECT	ME domain - DFHZAxxxx message set	12	06
DFHMEZAK	CSECT (OCO)	ME domain - DFHZAxxxx message set Japanese (Kanji) version	12	06
DFHMEZBC	CSECT	ME domain - DFHZBxxxx message set simplified Chinese version	12	06
DFHMEZBE	CSECT	ME domain - DFHZBxxxx message set	12	06
DFHMEZBK	CSECT (OCO)	ME domain - DFHZBxxxx message set Japanese (Kanji) version	12	06
DFHMEZCC	CSECT	ME domain - DFHZCxxxx message set simplified Chinese version	12	06
DFHMEZCE	CSECT	ME domain - DFHZCxxxx message set	12	06
DFHMEZCK	CSECT (OCO)	ME domain - DFHZCxxxx message set Japanese (Kanji) version	12	06
DFHMEZDC	CSECT	ME domain - DFHZDxxxx message set simplified Chinese version	12	06
DFHMEZDE	CSECT	ME domain - DFHZDxxxx message set	12	06
DFHMEZDK	CSECT (OCO)	ME domain - DFHZDxxxx message set Japanese (Kanji) version	12	06
DFHMEZEC	CSECT	ME domain - DFHZExxxx message set simplified Chinese version	12	06
DFHMEZEE	CSECT	ME domain - DFHZExxxx message set	12	06
DFHMEZEK	CSECT (OCO)	ME domain - DFHZExxxx message set Japanese (Kanji) version	12	06
DFHMEZNC	CSECT	ME domain - DFHZNxxxx message set simplified Chinese version	12	06
DFHMEZNE	CSECT	ME domain - DFHZNxxxx message set	12	06
DFHMEZNK	CSECT (OCO)	ME domain - DFHZNxxxx message set Japanese (Kanji) version	12	06
DFHME00C	CSECT	ME domain - NLS message language globals simplified Chinese version	12	06
DFHME00E	CSECT	ME domain - NLS message language globals	12	06
DFHME00K	CSECT (OCO)	ME domain - NLS message language globals Japanese (Kanji) version	12	06
DFHME1UC	CSECT	ME domain	-	06
DFHME1UE	CSECT	ME domain - DFH1Uxx message set	-	06
DFHME1UK	CSECT (OCO)	ME domain - DFH1Uxx message set	-	06
DFHME70C	CSECT	ME domain - DFH70xx message set simplified Chinese version	-	06
DFHME70E	CSECT	ME domain - DFH70xx message set	-	06
DFHME70K	CSECT (OCO)	ME domain - DFH70xx message set	-	06

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Name	Type	Description	Library	
DFHME71C	CSECT	ME domain - DFH71xx message set simplified Chinese version	-	06
DFHME71E	CSECT	ME domain - DFH71xx message set	-	06
DFHME71K	CSECT (OCO)	ME domain - DFH71xx message set	-	06
DFHME72C	CSECT	ME domain - DFH72xx message set simplified Chinese version	-	06
DFHME72E	CSECT	ME domain - DFH72xx message set	-	06
DFHME72K	CSECT (OCO)	ME domain - DFH72xx message set	-	06
DFHMGM	Macro	Message prototype macro	04	-
DFHMGMI0	Macro	Message prototype literal macro-1	04	-
DFHMGMI1	Macro	Message prototype literal macro-2	04	-
DFHMGPME	CSECT	DFHMGP NLS message support	OS	06
DFHMGP00	CSECT	DFHMGP error message find	OS	06
DFHMGT	CSECT	Message generation table	04	06
DFHMGT01	CSECT	Subsystem interface message table segment	04	-
DFHMGT20	CSECT	Message generation table segment	04	-
DFHMGT21	CSECT	Message generation table segment	04	-
DFHMGT22	CSECT	Message generation table segment	04	-
DFHMGT24	CSECT	Message generation table segment	04	-
DFHMGT26	CSECT	Message generation table segment	04	-
DFHMGT33	CSECT	Message generation table segment	04	-
DFHMGT34	CSECT	Message generation table segment	04	-
DFHMGT35	CSECT	Message generation table segment	04	-
DFHMGT37	CSECT	Message generation table segment	04	-
DFHMGT44	CSECT	Message generation table segment	04	-
DFHMGT49	CSECT	Message generation table segment	04	-
DFHMGT50	CSECT	Message generation table segment	04	-
DFHMGT85	CSECT	Message generation table segment	04	-
DFHMGT90	CSECT	Message generation table segment	04	-
DFHMIN	Source	BMS 3270 input mapping	OS	-
DFHMIRS	CSECT	ISC request shipping - mirror program	OS	06
DFHMKEYS	CSECT	Alias for MEUKEYS	15	-
DFHML1	CSECT	BMS LU1 printer mapping program	OS	06
DFHMN	Macro	MN domain - inline request	OS	-
DFHMNDEF	Macro	MN domain - some control blocks	OS	-
DFHMNDM	CSECT (OCO)	MN domain - initialization/termination	-	06
DFHMNDUF	CSECT (OCO)	SDUMP formatter for MN domain	-	06
DFHMNDUP	CSECT (OCO)	Monitoring dictionary utility	-	06
DFHMNEXC	Macro	MN domain - monitoring exception record	04	-
DFHMNGDS	DSECT	MN domain - global statistics	04	-
DFHMNGDS	DSECT	MN domain - global statistics	C2	-
DFHMNGDS	DSECT	MN domain - global statistics	P2	-
DFHMNMN	CSECT (OCO)	MN domain - functions	-	06
DFHMNMNA	DSECT	MNMN parameter list	OS	-
DFHMNMNM	Macro	MNMN request	OS	-
DFHMNMNT	CSECT	MNMN trace interpretation data	OS	06
DFHMNMNX	Macro	MNMN request (XPI)	04	-
DFHMNMNY	DSECT	MNMN parameter list (XPI)	04	-
DFHMNNT	CSECT (OCO)	MN domain - XM notify gate	-	06
DFHMNPBI	Macro	MN domain - access to MVS WLM performance block token	OS	-
DFHMNPDA	CSECT	Monitoring facility performance class record	05	-
DFHMNSMF	Macro	MN domain - monitoring SMF header and SMF product section	04	-

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Name	Type	Description	Library	
DFHMNSR	CSECT (OCO)	MN domain - services	-	06
DFHMNSRA	DSECT	MNSR parameter list	OS	-
DFHMNSRM	Macro	MNSR request	OS	-
DFHMNSRT	CSECT	MNSR trace interpretation data	OS	06
DFHMNST	CSECT (OCO)	MN domain - statistics services	-	06
DFHMNSU	CSECT (OCO)	MN domain - subroutines	-	06
DFHMNSUA	DSECT	MNSU parameter list	OS	-
DFHMNSUM	Macro	MNSU request	OS	-
DFHMNSUT	CSECT	MNSU trace interpretation data	OS	06
DFHMNSVC	CSECT (OCO)	MN domain - authorized service routine	-	06
DFHMNTDS	DSECT	MN domain - transaction monitoring data	04	-
DFHMNTDS	DSECT	MN domain - transaction monitoring data	C2	-
DFHMNTDS	DSECT	MN domain - transaction monitoring data	P2	-
DFHMNTI	CSECT (OCO)	MN domain - timer gate	-	06
DFHMNTRI	CSECT (OCO)	Trace interpreter for MN domain	-	06
DFHMNUE	CSECT (OCO)	MN domain - user exit service	-	06
DFHMNXM	CSECT (OCO)	MN domain functional gate	-	06
DFHMNXMT	DSECT	MNXM translate tables	-	06
DFHMOVE	Macro	Domain call argument MOVE macro	OS	-
DFHMPARS	CSECT	Parameter syntax checking	OS	-
DFHMRCDS	DSECT	Transient data VSAM control	OS	-
DFHMRDUF	CSECT (OCO)	MRO SDUMP formatter	-	06
DFHMROQM	Macro	MRO work queue manager interface	OS	-
DFHMROQP	CSECT	MRO work queue manager - enable/disable	OS	06
DFHMROSM	Macro	MRO work queue manager quickcell interface	OS	-
DFHMRQDS	DSECT	MRO work queue manager control blocks	OS	-
DFHMSCAN	CSECT	Macro scan utility	OS	06
DFHMSD	Macro	Generate BMS map set definition	04	-
DFHMSET	CSECT	Parameter syntax checking record	OS	-
DFHMSG	Macro	Generate a message	04	-
DFHMSG00	CSECT	MEU MEU00x message set (alias MEU00)	14	-
DFHMSG01	CSECT	MEU MEU01x message set (alias MEU01)	14	-
DFHMSG02	CSECT	MEU MEU02x message set (alias MEU02)	14	-
DFHMSG03	CSECT	MEU MEU03x message set (alias MEU03)	14	-
DFHMSG04	CSECT	MEU MEU04x message set (alias MEU04)	14	-
DFHMSG05	CSECT	MEU MEU05x message set (alias MEU05)	14	-
DFHMSGEN	Macro	Generate messages in BMS modules	OS	-
DFHMSP	CSECT	Message switching program	OS	06
DFHMSPUT	Macro	Put messages to terminals in BMS	OS	-
DFHMSRCA	Symbolic	Magnetic slot reader control values	04	-
DFHMSRCA	Symbolic	Magnetic slot reader control values	C2	-
DFHMSRCA	Symbolic	Magnetic slot reader control values	P2	-
DFHMSRCA	Symbolic	Magnetic slot reader control values	D3	-
DFHMSX	Symbolic		04	-
DFHMVRMS	CSECT (OCO)	MVS recovery/termination manager RESMGR exit stub	-	06
DFHMWCDS	DSECT	Transient data wait control	OS	-
DFHMXP	CSECT	Local queuing shipper	OS	06
DFHM32	CSECT	BMS 3270 mapping	OS	-
DFHM32A$	CSECT	BMS 3270 mapping (standard)	OS	06
DFHM321$	CSECT	BMS 3270 mapping (full)	OS	06
DFHNEPCA	DSECT	NEP communication area	D3	-
DFHNEPCA	Macro	NEP communication area	04	-
DFHNQDM	CSECT	NQ domain management	-	06
DFHNQDUF	CSECT	NQ offline dump formatting	-	06
DFHNQED	CSECT	NQED format enqueue/dequeue	-	06

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Name	Type	Description	Library	
DFHNQEDA	CSECT	NQED parameter list	OS	-
DFHNQEDM	Macro	NQED request	OS	-
DFHNQEDT	DSECT	NQED translate tables	-	06
DFHNQGDS	CSECT	NQ enqueue manager statistics	04	-
DFHNQGDS	CSECT	NQ enqueue manager statistics	C2	-
DFHNQGDS	CSECT	NQ enqueue manager statistics	P2	-
DFHNQIB	CSECT	NQ inquire/browse module	-	06
DFHNQIBA	CSECT	NQIB parameter list	OS	-
DFHNQIBM	Macro	NQIB request	OS	-
DFHNQIBT	DSECT	NQIB translate tables	-	06
DFHNQIE	CSECT	NQ default enqueue interpreter	-	06
DFHNQNQ	CSECT	NQ main functions	-	06
DFHNQNQA	CSECT	NQNQ parameter list	OS	-
DFHNQNQM	Macro	NQNQ request	OS	-
DFHNQNQT	DSECT	NQNQ translate tables	-	06
DFHNQST	CSECT (OCO)	NQ statistics	-	06
DFHNQTRI	CSECT (OCO)	NQ offline trace interpretation	-	06
DFHNXDUF	CSECT (OCO)	SDUMP control block index processor	-	06
DFHOPSRC	Other	JCL to install optional source tapes	02	-
DFHOSPWA	DSECT	BMS common control area	04	-
DFHPADM	CSECT (OCO)	PA domain - initialization/termination	-	06
DFHPADUF	CSECT (OCO)	SDUMP formatter for PA domain	-	06
DFHPAGP	CSECT (OCO)	PA domain - get parameters service	-	06
DFHPAGPA	DSECT	PAGP parameter list	OS	-
DFHPAGPM	Macro	PAGP request	OS	-
DFHPAGPT	CSECT (OCO)	PAGP trace interpretation data	-	06
DFHPAIO	CSECT (OCO)	PA domain - communication with SYSIN data set and operator console	-	06
DFHPAIOA	DSECT	PAIO parameter list	OS	-
DFHPAIOM	Macro	PAIO request	OS	-
DFHPAIOT	CSECT (OCO)	PAIO trace interpretation data	-	06
DFHPAPL	Macro	DBCTL architected parameter list	OS	-
DFHPASY	CSECT (OCO)	PA domain - system initialization parameter checker and syntax analyzer	-	06
DFHPASYA	DSECT	PASY parameter list	OS	-
DFHPASYM	Macro	PASY request	OS	-
DFHPASYT	CSECT (OCO)	PASY trace interpretation data	-	06
DFHPATCH	Macro	Generate patch area	04	-
DFHPATRI	CSECT (OCO)	Trace interpreter for PA domain	-	06
DFHPBP	CSECT	BMS page and text build	OS	-
DFHPBPA$	CSECT	BMS page and text build (standard)	OS	06
DFHPBP1$	CSECT	BMS page and text build (full)	OS	06
DFHPC	Macro	Program service request	04	-
DFHPCEDS	DSECT	EXEC argument list for Program Control	-	04
DFHPCEXT	CSECT	AP recovery point when called from kernel	OS	-
DFHPCOM	Macro	PEP communication area	04	-
DFHPCOMD	DSECT	PEP communication area	D3	-
DFHPCPC2	CSECT	PCP interface to COBOL stub for OS/VS COBOL V1 R2.3 or R2.4 application programs	OS	06
DFHPCPG	CSECT	PM domain - interface program	-	06
DFHPCTDS	DSECT	Program control table	04	-
DFHPCTPF	Macro	Generate a profile entry	04	-
DFHPCUE	DSECT	Program control data block for user exits	04	-

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Name	Type	Description	Library	
DFHPCXDF	CSECT	DU domain - transaction dump formatter for program related areas	OS	06
DFHPDI	Macro	Generate BMS partition definition	04	-
DFHPDKW	CSECT (OCO)	SDUMP formatting - CICSDATA operand string validation	-	06
DFHPDX1	CSECT (OCO)	SDUMP formatting - control program	-	06
DFHPEP	CSECT	User-replaceable program error program	05	06
DFHPEPD	Sample	Program error program - C/370	D2	-
DFHPESAD	Source	Program environment save area (PESA)	OS	-
DFHPGACD	Macro	PG domain - autoinstall exit program parameter list - Assembler	04	-
DFHPGACH	CSECT	PG domain - autoinstall exit program parameter list - C/370	D3	-
DFHPGACL	CSECT	PG domain - autoinstall exit program parameter list - PL/I	P2	-
DFHPGACO	CSECT	PG domain - autoinstall exit program parameter list - COBOL	C2	-
DFHPGADS	DSECT	BMS page control area	OS	-
DFHPGADX	CSECT	Program autoinstall exit - Assembler	05	06
DFHPGAHX	Sample	Program autoinstall exit - C/370	D2	-
DFHPGAI	CSECT	Program autoinstall function	-	06
DFHPGAIT	CSECT	PGAI trace interpretation data	-	06
DFHPGALX	Sample	Program autoinstall exit - PL/I	P3	-
DFHPGAOX	Sample	Program autoinstall exit - COBOL	C3	-
DFHPGAQ	CSECT	PG domain - inquire/set autoinstall	-	06
DFHPGAQA	DSECT	PGAQ parameter list	OS	-
DFHPGAQM	Macro	PGAQ request	OS	-
DFHPGAQT	CSECT	PGAQ trace interpretation data	-	06
DFHPGAQX	Macro	PGAQ request	04	-
DFHPGAQY	DSECT	PGAQ parameter list	04	-
DFHPGDCD	Source	PG domain anchor block	OS	-
DFHPGDD	CSECT (OCO)	PG domain - define/delete program	-	06
DFHPGDDA	DSECT	PGDD parameter list	OS	-
DFHPGDDM	Macro	PGDD request	OS	-
DFHPGDDT	CSECT (OCO)	PGDD trace interpretation data	-	06
DFHPGDM	CSECT	PG domain - initialize, quiesce, and terminate domain functions	-	06
DFHPGDUF	CSECT (OCO)	PG domain - SDUMP formatter	-	06
DFHPGEX	CSECT (OCO)	PG domain - initialize and terminate exits functions	-	06
DFHPGEXA	DSECT	PGEX parameter list	OS	-
DFHPGEXI	Macro	PGEX inline version of DFHPGEXM	OS	-
DFHPGEXM	Macro	PGEX request	OS	-
DFHPGEXT	Macro (OCO)	PGEX trace interpretation data	-	06
DFHPGGDS	Macro	PG domain - statistics	04	-
DFHPGGDS	Macro	PG domain - statistics	C2	-
DFHPGGDS	Macro	PG domain - statistics	P2	-
DFHPGHM	CSECT (OCO)	PG domain - handle manager services	-	06
DFHPGHMA	DSECT	PGHM parameter list	OS	-
DFHPGHMI	Macro	PGHM inline version of DFHPGHMM	OS	-
DFHPGHMM	Macro	PGHM request	OS	-
DFHPGHMT	CSECT (OCO)	PGHM trace interpretation data	-	06
DFHPGIS	CSECT (OCO)	PG domain - PGIS functions	-	06
DFHPGISA	DSECT	PGIS parameter list	OS	-
DFHPGISI	Macro	PGIS inline version of DFHPGHMM	OS	-

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Name	Type	Description	Library	
DFHPGISM	Macro	PGIS request	OS	-
DFHPGIST	CSECT (OCO)	PGIS trace interpretation data	-	06
DFHPGISX	Macro	PGIS request	04	-
DFHPGISY	CSECT	PGIS parameter list	04	-
DFHPGLD	CSECT (OCO)	PG domain - load and release functions	-	06
DFHPGLDA	DSECT	PGLD parameter list	OS	-
DFHPGLDM	Macro	PGLD request	OS	-
DFHPGLDT	CSECT (OCO)	PGLD trace interpretation data	-	06
DFHPGLE	CSECT (OCO)	PG domain - link exec function	-	06
DFHPGLEA	DSECT	PGLE parameter list	OS	-
DFHPGLEM	Macro	PGLE request	OS	-
DFHPGLET	CSECT (OCO)	PGLE trace interpretation data	-	06
DFHPGLK	CSECT (OCO)	PG domain - link and link PLT functions	-	06
DFHPGLKA	DSECT	PGLK parameter list	OS	-
DFHPGLKM	Macro	PGLK request	OS	-
DFHPGLKT	CSECT (OCO)	PGLK trace interpretation data	-	06
DFHPGLU	CSECT (OCO)	PG domain - link URM function	-	06
DFHPGLUA	DSECT	PGLU parameter list	OS	-
DFHPGLUM	Macro	PGLU request	OS	-
DFHPGLUT	CSECT (OCO)	PGLU trace interpretation data	-	06
DFHPGP	Macro	Validate group name for PCT/PPT migrate	04	-
DFHPGPG	CSECT (OCO)	PG domain - initial link function	-	06
DFHPGPGA	DSECT	PGPG parameter list	OS	-
DFHPGPGM	Macro	PGPG request	OS	-
DFHPGPGT	CSECT (OCO)	PGPG trace interpretation data	-	06
DFHPGRE	CSECT (OCO)	PG domain - prepare return function	-	06
DFHPGREA	DSECT	PGRE parameter list	OS	-
DFHPGREM	Macro	PGRE request	OS	-
DFHPGRET	CSECT (OCO)	PGRE trace interpretation data	-	06
DFHPGRP	CSECT (OCO)	PG domain - recovery program	-	06
DFHPGRPT	CSECT (OCO)	PGRP trace interpretation data	-	06
DFHPGST	CSECT (OCO)	PG domain - statistics	-	06
DFHPGTRI	CSECT (OCO)	PG domain - trace interpreter	-	06
DFHPGUE	CSECT (OCO)	PG domain - service requests user exit	-	06
DFHPGXE	CSECT (OCO)	PG domain - prepare XCTL function	-	06
DFHPGXEA	DSECT	PGXE parameter list	OS	-
DFHPGXEM	Macro	PGXE request	OS	-
DFHPGXET	CSECT (OCO)	PGXE trace interpretation data	-	06
DFHPGXM	CSECT (OCO)	PG domain - initialize and terminate transactions functions	-	06
DFHPGXMT	CSECT (OCO)	PGXM trace interpretation data	-	06
DFHPH	Macro	Partition handling macro	04	-
DFHPHN	CSECT	Phonetic code conversion	OS	06
DFHPHP	CSECT	Partition handling program	OS	06
DFHPLARG	DSECT	Generalized domain call parameter list (header, standard fields, responses)	OS	-
DFHPLT	Macro	Program list table	04	-
DFHPLTDS	DSECT	Program list table definition	OS	-
DFHPPFDS	DSECT	KC domain - profile data	OS	-
DFHPRCM	CSECT (OCO)	Partner resource manager command interface	-	06
DFHPRCMA	DSECT	PRCM parameter list	OS	-
DFHPRCMM	Macro	PRCM request	OS	-
DFHPRCMT	CSECT (OCO)	PRCM trace interpretation data	-	06
DFHPRDUF	CSECT (OCO)	Partner resource manager SDUMP formatter	-	06

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Name	Type	Description	Library	
DFHPRFS	CSECT (OCO)	Partner resource manager interface to SAA communications interface	-	06
DFHPRFSA	DSECT	PRFS parameter list	OS	-
DFHPRFSM	Macro	PRFS request	OS	-
DFHPRFST	CSECT (OCO)	PRFS trace interpretation data	-	06
DFHPRINA	DSECT	PRIN parameter list	OS	-
DFHPRINM	Macro	PRIN request	OS	-
DFHPRINT	Macro	DSECT print control	04	-
DFHPRINU	CSECT (OCO)	PRIN trace interpretation data	-	06
DFHPRIN1	CSECT (OCO)	Partner resource manager initialization management program	-	06
DFHPRIN2	CSECT (OCO)	Partner resource manager initialization subtask program	-	06
DFHPRK	CSECT	3270 print key program	OS	06
DFHPRMCK	Macro	Parameter checking macro	04	-
DFHPROLG	Source	Prologue to DFHENTER	OS	-
DFHPROLM	Source	Acquire LIFO storage application prolog	OS	-
DFHPROLO	Macro	Acquire automatic storage appl prolog	OS	-
DFHPRPT	CSECT (OCO)	Partner resource table (PRT) manager	-	06
DFHPRPTA	DSECT	PRPT parameter list	OS	-
DFHPRPTM	Macro	PRPT request	OS	-
DFHPRPTT	CSECT (OCO)	PRPT trace interpretation data	-	06
DFHPRRP	CSECT (OCO)	Partner resource manager recovery program	-	06
DFHPRRPA	DSECT	PRRP parameter list	OS	-
DFHPRRPM	Macro	PRRP request	OS	-
DFHPRRPT	CSECT (OCO)	PRRP trace interpretation data	-	06
DFHPRSDS	DSECT	Partner static storage area	OS	-
DFHPS	Macro	System spooling interface	OS	-
DFHPSD	Macro	Generate BMS partition set definition	04	-
DFHPSDDS	DSECT	Partition set control block	OS	-
DFHPSGDS	DSECT	Spooler global control block	04	-
DFHPSIP	CSECT	Spooler initialization program	OS	06
DFHPSP	CSECT	System spooling interface program	OS	06
DFHPSPCK	CSECT	System spooling subsystem activator	OS	06
DFHPSPDW	CSECT	System spooling interface, DWE processor	OS	06
DFHPSPSS	CSECT	System spooling JES interface subtask	OS	06
DFHPSPST	CSECT	System spooling JES interface control	OS	06
DFHPSSVC	CSECT	System spooling interface, retrieve a data set name	OS	06
DFHPTDUF	CSECT (OCO)	Program control table SDUMP formatter	-	06
DFHPUPAB	CSECT	CSDUP - initialize RDO parameter fields and address list (DFHPUPA)	OS	06
DFHPUPAC	CSECT	CSDUP - initialize RDO parameter fields and address list (DFHPUPA)	OS	06
DFHPUPB	CSECT	CSDUP - RDO parameter utility program, batch environment (DFHPUP batch)	OS	06
DFHPUPC	CSECT	RDO parameter utility program, CICS environment (DFHPUP CICS)	OS	06
DFHPUPDB	CSECT	CSDUP - default parameter values lookup (DFHPUPD batch)	OS	06
DFHPUPDC	CSECT	RDO parameter utility - default parameter values lookup (DFHPUPD CICS)	OS	06
DFHPUPXB	CSECT	CSDUP - language table referencing functions (DFHPUPX batch)	OS	06

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Name	Type	Description	Library	
DFHPUPXC	CSECT	RDO parameter utility - language table referencing functions (DFHPUPX CICS)	OS	06
DFHP3270	CSECT	3270 print function support	OS	06
DFHQRY	CSECT	Query transaction	OS	06
DFHQSSS	CSECT (OCO)	Qualified subsystem services	-	06
DFHRCEX	CSECT	Recovery control enable exit	OS	06
DFHRCNO	Other	Used by DFHSTART cataloged procedure	05	-
DFHRCSDS	DSECT	Recovery control static storage	OS	-
DFHRCT1$	Sample	Recovery control table sample	05	06
DFHRCYES	Other	Used by DFHSTART cataloged procedure	05	-
DFHRDDUF	CSECT	Resource definition recovery offline dump exit	-	06
DFHRDJPN	CSECT (OCO)	CSD utilities - RDL for Japanese language feature upgrade	-	06
DFHREGS	Macro	Standard register name definition	04	-
DFHREST	CSECT	User-replaceable restart program	05	06
DFHREQ	Macro	Attention ID coding macro	04	-
DFHRITRI	CSECT	RMI trace interpretation routine	-	06
DFHRKB	CSECT	3270 release keyboard program	OS	06
DFHRLR	CSECT	BMS route list resolution	OS	-
DFHRLRA$	CSECT	BMS route list resolution (standard)	OS	06
DFHRLR1$	CSECT	BMS route list resolution (full)	OS	06
DFHRMCAL	Macro	Resource manager call	04	-
DFHRMCD	CSECT	Recovery manager client directory	-	06
DFHRMCDA	CSECT	RMCD parameter list	OS	-
DFHRMCDM	Macro	RMCD request	OS	-
DFHRMCDT	DSECT	RMCD translate tables	-	06
DFHRMCD1	CSECT	RM client directory class initialization	-	06
DFHRMCD2	CSECT	RM client directory class quiesce proc	-	06
DFHRMCI2	CSECT	RM client directory set gate procedure	-	06
DFHRMCI3	CSECT	RM client directory wait for client proc	-	06
DFHRMCI4	CSECT	RM client directory send procedure	-	06
DFHRMDEA	CSECT	RMDE parameter list	OS	-
DFHRMDEM	Macro	RMDE request	OS	-
DFHRMDET	DSECT	RMDE translate tables	-	06
DFHRMDM	CSECT	Recovery manager domain management	-	06
DFHRMDMA	CSECT	RMDM parameter list	OS	-
DFHRMDMM	Macro	RMDM request	OS	-
DFHRMDMT	DSECT	RMDM translate tables	-	06
DFHRMDUF	CSECT (OCO)	Resource recovery manager SDUMP formatter	-	06
DFHRMDU0	CSECT	RMCI dump formatting	-	06
DFHRMDU2	CSECT	RMDU start work token browse procedure	-	06
DFHRMDU3	CSECT	RMDU get next work token procedure	-	06
DFHRMDU4	CSECT	RMDU end work token browse procedure	-	06
DFHRMGDS	CSECT	Recovery manager global statistics	04	-
DFHRMGDS	CSECT	Recovery manager global statistics	C2	-
DFHRMGDS	CSECT	Recovery manager global statistics	P2	-
DFHRMKDA	CSECT	RMKD parameter list	OS	-
DFHRMKDM	Macro	RMKD request	OS	-
DFHRMKDT	DSECT	RMKD translate tables	-	06
DFHRMKPA	CSECT	RMKP parameter list	OS	-
DFHRMKPM	Macro	RMKP request	OS	-
DFHRMKPT	DSECT	RMKP translate tables	-	06
DFHRMLKQ	CSECT	RMLK quiesce procedure	-	06
DFHRMLKT	DSECT	RMLK translate tables	-	06
DFHRMLK1	CSECT	RMLK initialize class procedure	-	06

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Name	Type	Description	Library	
DFHRMLK2	CSECT	RMLK initiate recovery2 procedure	-	06
DFHRMLK3	CSECT	RMLK inquire logname procedure	-	06
DFHRMLK4	CSECT	RMLK clear pending2 procedure	-	06
DFHRMLK5	CSECT	RMLK collect statistics procedure	-	06
DFHRMLN	CSECT	RMLN gate handler module	-	06
DFHRMLNA	CSECT	RMLN parameter list	OS	-
DFHRMLNM	Macro	RMLN request	OS	-
DFHRMLNT	DSECT	RMLN translate table	-	06
DFHRMLSD	CSECT	Recovery Manager LinkSet class declaration	-	06
DFHRMLSF	CSECT	RMLS inquire awaiting forget procedure	-	06
DFHRMLSO	CSECT	RMLS commit procedure	-	06
DFHRMLSP	CSECT	RMLS prepare procedure	-	06
DFHRMLSS	CSECT	RMLS shunt procedure	-	06
DFHRMLSU	CSECT	RMLS unshunt procedure	-	06
DFHRML1D	CSECT	RMLK deliver data procedure	-	06
DFHRMNM	CSECT	Recovery Manager Lognames class	-	06
DFHRMNMA	CSECT	RMNM parameter list	OS	-
DFHRMNMM	Macro	RMNM request	OS	-
DFHRMNMT	DSECT	RMNM translate tables	-	06
DFHRMNM1	CSECT	RMNM initialize class procedure	-	06
DFHRMNS1	CSECT	RMNS initialize class procedure	-	06
DFHRMNS2	CSECT	RMNS quiesce procedure	-	06
DFHRMOFI	CSECT	RMOF initialize procedure	-	06
DFHRMREA	CSECT	RMRE parameter list	OS	-
DFHRMREM	Macro	RMRE request	OS	-
DFHRMRET	DSECT	RMRE translate tables	-	06
DFHRMRO	CSECT	RM resource owner class	-	06
DFHRMROA	CSECT	RMRO parameter list	OS	-
DFHRMROM	Macro	RMRO request	OS	-
DFHRMROO	CSECT	RMRO forgotten procedure	-	06
DFHRMROS	CSECT	RMRO shunt procedure	-	06
DFHRMROT	CSECT	RMRO translate tables	-	06
DFHRMROU	CSECT	RMRO unshunt procedure	-	06
DFHRMROV	CSECT	RMRO avail procedure	-	06
DFHRMRO1	CSECT	RMRO initialize class procedure	-	06
DFHRMRO2	CSECT	RMRO start back out procedure	-	06
DFHRMRO3	CSECT	RMRO deliver back out data procedure	-	06
DFHRMRO4	CSECT	RMRO end back out procedure	-	06
DFHRMR1D	CSECT	RMRO deliver data procedure	-	06
DFHRMR1E	CSECT	RMRO end delivery procedure	-	06
DFHRMR1K	CSECT	RMRO take keypoint procedure	-	06
DFHRMR1S	CSECT	RMRO start delivery procedure	-	06
DFHRMSL	CSECT	RM system log class	-	06
DFHRMSLA	CSECT	RMSL parameter list	OS	-
DFHRMSLF	CSECT	RMSL force procedure	-	06
DFHRMSLJ	CSECT	RMSL notify disjoint chains procedure	-	06
DFHRMSLL	CSECT	RMSL close chain procedure	-	06
DFHRMSLM	Macro	RMSL request	OS	-
DFHRMSLO	CSECT	RMSL open chain procedure	-	06
DFHRMSLT	CSECT	RMSL translate tables	-	06
DFHRMSLV	CSECT	RMSL move chain procedure	-	06
DFHRMSLW	CSECT	RMSL write procedure	-	06
DFHRMSL1	CSECT	RMSL initialize class procedure	-	06
DFHRMSL2	CSECT	RMSL start chain browse procedure	-	06
DFHRMSL3	CSECT	RMSL chain browse read procedure	-	06

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Name	Type	Description	Library	
DFHRMSL4	CSECT	RMSL end chain browse procedure	-	06
DFHRMSL5	CSECT	RMSL restart procedure	-	06
DFHRMSL6	CSECT	RMSL schedule keypoint procedure	-	06
DFHRMSL7	CSECT	RMSL take keypoint procedure	-	06
DFHRMST	CSECT	RM statistics class	-	06
DFHRMST1	CSECT	RMST initialize class procedure	-	06
DFHRMSY	CSECT	Resource Manager resynchronization program	-	06
DFHRMTRI	CSECT	Offline trace formatting interpretation routine parameter list	-	06
DFHRMUC	CSECT	Resource Manager create UOW	-	06
DFHRMUO	CSECT	Resource Manager commit UOW	-	06
DFHRMUW	CSECT	Resource Manager unit of work class	-	06
DFHRMUTL	CSECT	Resource Manager batch utility program	-	06
DFHRMUWA	CSECT	RMUW parameter list	OS	-
DFHRMUWB	CSECT	RMUW deliver backout procedure	-	06
DFHRMUWE	CSECT	RMUW unshunt reply procedure	-	06
DFHRMUWF	CSECT	RMUW force procedure	-	06
DFHRMUWH	CSECT	RMUW hold procedure	-	06
DFHRMUWI	Macro	RMUWI inquire UOQ ID	OS	-
DFHRMUWJ	CSECT	RMUW force heurism procedure	-	06
DFHRMUWL	CSECT	RMUW forget links procedure	-	06
DFHRMUWM	Macro	RMUW request	OS	-
DFHRMUWN	CSECT	RMUW unshunt procedure	-	06
DFHRMUWP	CSECT	RMUW process avail procedure	-	06
DFHRMUWQ	CSECT	RMUW process indoubt resolution procedure	-	06
DFHRMUWS	CSECT	RMUW record decision procedure	-	06
DFHRMUWT	DSECT	RM unit of work class (timeout)	-	06
DFHRMUWU	CSECT	RMUW set local lu name procedure	-	06
DFHRMUWV	CSECT	RMUW avail procedure	-	06
DFHRMUWW	CSECT	RMUW write procedure	-	06
DFHRMUW0	CSECT	RMUW release procedure	-	06
DFHRMUW1	CSECT	RMUW initialize class procedure	-	06
DFHRMUW2	CSECT	RMUW collect statistics procedure	-	06
DFHRMUW3	CSECT	RMUW inquire work token procedure	-	06
DFHRMUXD	DSECT	Define parts of UOW objects accessible by inline macros	OS	-
DFHRMU1C	CSECT	RMUW set chain token procedure	-	06
DFHRMU1D	CSECT	RMUW deliver data procedure	-	06
DFHRMU1E	CSECT	RMUW end delivery procedure	-	06
DFHRMU1F	CSECT	RMUW wait timeout notify procedure	-	06
DFHRMU1G	CSECT	RMUW	-	06
DFHRMU1J	CSECT	RMUW inquire disjoint chains procedure	-	06
DFHRMU1K	CSECT	RMUW take keypoint procedure	-	06
DFHRMU1L	CSECT	XMPP force purge inhibit query gate	-	06
DFHRMU1N	CSECT	RMU1 force purge query procedure	-	06
DFHRMU1Q	CSECT	TISR notify gate	-	06
DFHRMU1R	CSECT	RMUW restart procedure	-	06
DFHRMU1S	CSECT	RMUW start delivery procedure	-	06
DFHRMU1U	CSECT	RMUW process restart procedure	-	06
DFHRMU1V	CSECT	RMUW request wait timeout procedure	-	06
DFHRMU1W	CSECT	RMUW cancel wait timeout procedure	-	06
DFHRMVP1	CSECT	RMVP initialize class procedure	-	06
DFHRMWTA	CSECT	RMWT parameter list	OS	-
DFHRMWTI	Macro	Supports the Inquire_work_token and Set_work_token of RMWT CDURUN interface	OS	-
DFHRMWTM	Macro	RMWT request	OS	-
DFHRMWTT	DSECT	RMWT translate tables	-	06
DFHRMXNE	CSECT	RMXN reattach procedure	-	06
DFHRMXN2	CSECT	RMXN schedule keypoint procedure	-	06
DFHRMXN3	CSECT	RMXN keypoint transaction	-	06

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Name	Type	Description	Library	
DFHRMXN4	CSECT	RMXN restart procedure	-	06
DFHRMXN5	CSECT	RMXN inc trandef statistic procedure	-	06
DFHROINA	CSECT	ROIN parameter list	OS	-
DFHROINM	Macro	ROIN request	OS	-
DFHROINT	DSECT	ROIN translate tables	OS	06
DFHRPAL	CSECT (OCO)	ONC RPC Feature alias list	-	06
DFHRPALT	DSECT	RPAL translate tables	-	06
DFHRPAS	CSECT (OCO)	ONC RPC alias main program	-	06
DFHRPCC	CSECT (OCO)	RPCC parameter list	-	06
DFHRPCB	Macro	Extension to DL/I PCB control block - contains ISC information about PCB	OS	-
DFHRPCDH	CSECT	RPPC caller DFHRPCC parameter list	D3	-
DFHRPCDO	CSECT	RPPC caller DFHRPCC parameter list	C2	-
DFHRPC0A	CSECT (OCO)	CRPC dataset list processing	-	06
DFHRPC0B	CSECT (OCO)	CRPC common subroutines	-	06
DFHRPC0D	CSECT (OCO)	CRPC register remote procedures	-	06
DFHRPC0E	CSECT (OCO)	CRPC register remote procedures	-	06
DFHRPC01	CSECT (OCO)	CRPC initial processing	-	06
DFHRPC03	CSECT (OCO)	CRPC manage feature dataset	-	06
DFHRPC04	CSECT (OCO)	CRPC disable processing	-	06
DFHRPC05	CSECT (OCO)	CRPC manage feature dataset	-	06
DFHRPC06	CSECT (OCO)	CRPC update feature	-	06
DFHRPC08	CSECT (OCO)	CRPC ONC RPC feature	-	06
DFHRPC09	CSECT (OCO)	ONC RPC registration table management	-	06
DFHRPC10	CSECT (OCO)	CRPC alias list processing	-	06
DFHRPC4C	CSECT (OCO)	ONC RPC initialization	-	06
DFHRPC42	CSECT (OCO)	CRPC enable request processing	-	06
DFHRPDUF	CSECT (OCO)	System dump formatting routine for ONC/RPC	OS	06
DFHRPMS	CSECT (OCO)	ONC RPC feature server controller	-	06
DFHRPRDH	CSECT	RPRSC parameter list	D3	-
DFHRPRDO	CSECT	RPRSC parameter list	C2	-
DFHRPRP	CSECT (OCO)	ONC RPC feature RPC caller	-	06
DFHRPRPT	CSECT (OCO)	RPRP call structured parameter list	-	06
DFHRPTRI	CSECT (OCO)	ONC RPC feature trace interpretation	-	06
DFHRPTRU	CSECT (OCO)	ONC RPC task-related user exit	-	06
DFHRPUCH	CSECT	Constants used by user replaceable programs	D3	-
DFHRPUCO	CSECT	Constants used by user replaceable programs	C2	-
DFHRP0	CSECT (OCO)	BMS mapset for CRPC main panels	-	06
DFHRP0H	CSECT (OCO)	CRPC DFHRP0 help panels	-	06
DFHRST	Macro	DBCTL XRF recoverable service table	04	-
DFHRTC	CSECT	CRTE cancel command processor	OS	06
DFHRTE	CSECT	Transaction routing program	OS	06
DFHRTSU	CSECT	Surrogate terminal interface program	-	06
DFHRTSUA	CSECT	RTSU parameter list	OS	-
DFHRTSUI	CSECT	Provide Assign/Relay relay link functions of DFHRTSU	OS	-
DFHRTSUM	Macro	RTSU request	OS	-
DFHRTSUT	DSECT	RTSU translate tables	-	06
DFHRTTRI	CSECT	ISC transaction routing (APRT) trace interpreter	OS	06
DFHRTTR1	CSECT	RTSU trace interpretation	-	06
DFHSAADS	DSECT	Storage accounting area	04	-
DFHSABDS	DSECT	Subsystem anchor block	OS	-
DFHSAIQ	CSECT (OCO)	AP domain - system data inquire & set	-	06
DFHSAIQT	CSECT (OCO)	SAIQ trace interpretation data	-	06
DFHSAIQX	Macro	SAIQ request	04	-
DFHSAIQY	DSECT	SAIQ parameter list	04	-
DFHSAXDF	CSECT	DU domain - transaction dump formatter for system areas (CSA, TCA, and so on)	OS	06
DFHSC	Macro	Storage service request	04	-

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Name	Type	Description	Library	
DFHSCAA	CSECT	Language Environment/370 - set common anchor area	OS	06
DFHSCALL	Macro	EXEC interface call macro for CICSPlex SM commands in assembler-language pgms	04	-
DFHSCCOS	Symbolic	Storage control class of storage	OS	-
DFHSDGDS	DSECT	System dump global statistics	04	-
DFHSDGDS	DSECT	System dump global statistics	C2	-
DFHSDGDS	DSECT	System dump global statistics	P2	-
DFHSDMP	Macro	SDUMP parameter area and MD=L expansion	OS	-
DFHSDRDS	DSECT	System dump statistics by dump code	04	-
DFHSDRDS	DSECT	System dump statistics by dump code	C2	-
DFHSDRDS	DSECT	System dump statistics by dump code	P2	-
DFHSETCD	CSECT	Set storage control	OS	-
DFHSFP	CSECT	Sign-off program	OS	06
DFHSHWPL	DSECT	File control SHOWCAT parameter list	OS	-
DFHSIA1	CSECT	System initialization - module A1	OS	06
DFHSIB1	CSECT	System initialization - module B1	OS	06
DFHSIB1A	Source	DFHSIB1 pre-nucleus load routines	OS	-
DFHSIB1B	Source	DFHSIB1 nucleus load routine	OS	-
DFHSIB1C	Source	DFHSIB1 post-nucleus load routine	OS	-
DFHSIB1D	Source	DFHSIB1 subroutines	OS	-
DFHSICOM	Macro	System initialization definitions	OS	-
DFHSIC1	CSECT	System initialization - module C1	OS	06
DFHSID1	CSECT	System initialization - module D1	OS	06
DFHSIF1	CSECT	System initialization - module F1	OS	06
DFHSIG1	CSECT	System initialization - module G1	OS	06
DFHSIH1	CSECT	System initialization - module H1	OS	06
DFHSII1	CSECT	System initialization - module I1	OS	06
DFHSIJ1	CSECT	System initialization - module J1	OS	06
DFHSIPD	Macro	Generate system initialization communication area	OS	-
DFHSIPDS	DSECT	SIP communication area	OS	-
DFHSIPLT	CSECT	System initialization - PLT processor	OS	06
DFHSIT	Macro	System initialization table	04	-
DFHSIT$$	Sample	Default system initialization table	05	06
DFHSIT6$	Sample	System initialization table	05	06
DFHSK	Macro	Subtasking interface	OS	-
DFHSKC	CSECT	Subtask control program	OS	06
DFHSKE	CSECT	Subtask execution program	OS	06
DFHSKM	CSECT	Subtask manager	OS	06
DFHSKR	Macro	Generate SKR table entries in SIT	04	-
DFHSKTSK	CSECT	General purpose subtask entry point	OS	06
DFHSLDC	DSECT	System logical device code table	04	-
DFHSMAD	CSECT (OCO)	SM domain - add/delete subpool	-	06
DFHSMADA	DSECT	SMAD parameter list	OS	-
DFHSMADM	Macro	SMAD request	OS	-
DFHSMADT	CSECT (OCO)	SMAD trace interpretation data	-	06
DFHSMAFA	DSECT	SMAF parameter list	OS	-
DFHSMAFT	CSECT (OCO)	SMAF trace interpretation data	-	06
DFHSMAR	CSECT (OCO)	SM domain - handle functions	-	06
DFHSMART	CSECT (OCO)	SMAR trace interpretation data	-	06
DFHSMCK	CSECT (OCO)	SM domain - storage checking/recovery	-	06
DFHSMCKA	DSECT	SMCK parameter list	OS	-
DFHSMCKM	Macro	SMCK request	OS	-
DFHSMCKT	CSECT (OCO)	SMCK trace interpretation data	-	06
DFHSMDDS	DSECT	SM domain - storage statistics for domain subpools	04	-
DFHSMDDS	DSECT	SM domain - storage statistics for domain subpools	C2	-

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Name	Type	Description	Library	
DFHSMDDS	DSECT	SM domain - storage statistics for domain subpools	P2	-
DFHSMDM	CSECT (OCO)	SM domain - initialization/termination	-	06
DFHSMDUF	CSECT (OCO)	SDUMP formatter for SM domain	-	06
DFHSMFDS	DSECT	SMF header and product section (JC/MN/ST)	04	-
DFHSMGF	CSECT (OCO)	SM domain - getmain/freemain	-	06
DFHSMGFA	DSECT	SMGF parameter list	OS	-
DFHSMGFI	Macro	SM domain - inline getmain/freemain	OS	-
DFHSMGFM	Macro	SMGF request	OS	-
DFHSMGFT	CSECT (OCO)	SMGF trace interpretation data	-	06
DFHSMMCA	DSECT	SMMC parameter list	OS	-
DFHSMMCI	CSECT (OCO)	SM domain - macro-compatibility initialize	-	06
DFHSMMCM	Macro	SMMC request	OS	-
DFHSMMCT	CSECT (OCO)	SMMC trace interpretation data	-	06
DFHSMMCX	Macro	SMMC request (XPI)	04	-
DFHAM	Macro	Address mode switching	04	-
DFHSMMCY	DSECT	SMMC parameter list (XPI)	04	-
DFHSMMC2	CSECT (OCO)	SM domain - macro-compatibility system freemain functions	-	06
DFHSMMF	CSECT (OCO)	SM domain - macro-compatibility freemain interface	-	06
DFHSMMG	CSECT (OCO)	SM domain - macro-compatibility getmain interface	-	06
DFHSMNTA	DSECT	SMNT parameter list	OS	-
DFHSMNTM	Macro	SMNT request	OS	-
DFHSMNTT	CSECT (OCO)	SMNT trace interpretation data	-	06
DFHSMPE	Other	Cataloged procedure to execute SMP/E	02	-
DFHSMPP	CSECT (OCO)	SM domain - pagepool manager functions 1	-	06
DFHSMPPT	CSECT (OCO)	SMPP trace interpretation data	-	06
DFHSMPQ	CSECT (OCO)	SM domain - pagepool manager functions 2	-	06
DFHSMPQT	CSECT (OCO)	SMPQ trace interpretation data	-	06
DFHSMPT	Macro	SMP/E control card generator	04	-
DFHSMSCP	CSECT (OCO)	Storage control program	-	06
DFHSMSDS	DSECT	SM domain - storage statistics for DSAs	04	-
DFHSMSDS	DSECT	SM domain - storage statistics for DSAs	C2	-
DFHSMSDS	DSECT	SM domain - storage statistics for DSAs	P2	-
DFHSMSQ	CSECT (OCO)	SM domain - suspend queue manager function	-	06
DFHSMSQT	CSECT (OCO)	SMSQ trace interpretation data	-	06
DFHSMSR	CSECT (OCO)	SM domain - services	-	06
DFHSMSRA	DSECT	SMSR parameter list	OS	-
DFHSMSRI	CSECT	SM domain - in-line INQUIRE_ACCESS	OS	-
DFHSMSRM	Macro	SMSR request	OS	-
DFHSMSRT	CSECT (OCO)	SMSR trace interpretation data	-	06
DFHSMSRX	Macro (OCO)	SMSR request (XPI)	04	-
DFHSMSRY	DSECT (OCO)	SMSR parameter list	04	-
DFHSMST	CSECT (OCO)	SM domain - statistics collection	-	06
DFHSMSU	CSECT (OCO)	Subspace manager	-	06
DFHSMSUT	CSECT (OCO)	Subspace manager trace interpretation data	-	06
DFHSMSVC	CSECT (OCO)	SM domain - authorized service routine	-	06
DFHSMSY	CSECT (OCO)	SM domain - system task	-	06
DFHSMTAB	CSECT	CICSPLex SM commands language table	-	06
DFHSMTDS	DSECT	SM domain - storage statistics for task subpools	04	-

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Name	Type	Description	Library	
DFHSMTDS	DSECT	SM domain - storage statistics for task subpools	C2	-
DFHSMTDS	DSECT	SM domain - storage statistics for task subpools	P2	-
DFHSMTRI	CSECT (OCO)	Trace interpreter for SM domain	-	06
DFHSMXDF	CSECT (OCO)	Transaction dump - task subpools	-	06
DFHSNAS	CSECT	create signon/sign-off ATI sessions	-	06
DFHSNEP	Macro	Node error program generator	04	-
DFHSNEPH	Macro	NEP inner macro	04	-
DFHSNET	Macro	Node error table generator	04	-
DFHSNEX	Macro	Signon extension block generator	04	-
DFHSNEXD	DSECT	Signon extension to TCTTE	OS	-
DFHSNGND	DSECT	CEGN parameter list	OS	-
DFHSNGSD	DSECT	GNTRAN parameter list	04	-
DFHSNGSH	DSECT	GNTRAN parameter list (C/370)	D3	-
DFHSNGSL	DSECT	GNTRAN parameter list (PL/I)	P2	-
DFHSNGSO	DSECT	GNTRAN parameter list (COBOL)	C2	-
DFHSNLE	CSECT	Signon large screens map set	OS	06
DFHSNLK	CSECT (OCO)	Signon large screens map set	-	06
DFHSNMIG	CSECT	Signon table migration utility	OS	06
DFHSNNFY	CSECT	RACF CICS segment notify exit	OS	06
DFHSNP	CSECT	Signon program	OS	06
DFHSNPTO	CSECT	CICS segment (RACF) TIMEOUT keyword print exit routine	-	06
DFHSNPU	CSECT	Preset userid signon/sign-off	-	06
DFHSNSC	CSECT	Timeout transaction (CESC) scheduler	-	06
DFHSNSCA	CSECT	SNSC parameter list	OS	-
DFHSNSCM	Macro	SNSC requests	OS	-
DFHSNSE	CSECT	Signon small screens map set	OS	06
DFHSNSG	CSECT	Surrogate terminal signon/off	-	06
DFHSNSGI	Macro	Surrogate terminals sign-on and signoff requests	OS	-
DFHSNSK	CSECT (OCO)	Signon small screens map set	-	06
DFHSNSTA	DSECT	ISC/IRC attach-time statistics area	OS	-
DFHSNSU	CSECT	Session userid signon/sign-off	-	06
DFHSNTRI	CSECT	SN trace interpreter	-	06
DFHSNTU	CSECT	Terminal userid signon/sign-off	-	06
DFHSNUS	CSECT (OCO)	US domain - local and remote signon	-	06
DFHSNUSA	DSECT	SNUS parameter list	OS	-
DFHSNUSM	Macro	SNUS macro	OS	-
DFHSNUST	CSECT (OCO)	SNUS trace interpretation data	-	06
DFHSNVCL	CSECT	RACF CICS segment OPCLASS validation exit	OS	06
DFHSNVID	CSECT	RACF CICS segment OPIDENT validation exit	OS	06
DFHSNVPR	CSECT	RACF CICS segment OPPRTY validation exit	OS	06
DFHSNVTO	CSECT	RACF CICS segment TIMEOUT validation exit	OS	06
DFHSNXR	CSECT (OCO)	XRF reflecting signon state	-	06
DFHSNXRA	DSECT	SNXR parameter list	OS	-
DFHSNXRM	Macro	SNXR requests	OS	-
DFHSNXRT	CSECT (OCO)	SNXR trace interpretation data	-	06
DFHSORT	Macro	Auxiliary sort	04	-
DFHSP	Macro	Syncpoint service request	04	-
DFHSPDBB	CSECT		OS	06
DFHSPDBC	CSECT		OS	06
DFHSPDBE	CSECT		OS	06
DFHSPFIB	CSECT	CSDUP - cross-keyword validation for files	OS	06
DFHSPFIC	CSECT	RDO - cross-keyword validation for files	OS	06
DFHSPFIE	CSECT	RDO file definition validation	OS	06

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Name	Type	Description	Library	
DFHSPKCB	CSECT	CSDUP - cross-keyword validation for transactions and profiles	OS	06
DFHSPKCC	CSECT	RDO - cross-keyword validation for transactions and profiles	OS	06
DFHSPKCE	CSECT	RDO txn control definition validation	OS	06
DFHSPLMB	CSECT	RDO JournalModel definition validation	-	06
DFHSPLMC	CSECT	RDO JournalModel definition validation	-	06
DFHSPLME	CSECT	RDO JournalModel definition validation	-	06
DFHSPLSB	CSECT	CSDUP - cross-keyword validation for LSR pools	OS	06
DFHSPLSC	CSECT	RDO - cross-keyword validation for LSR pools	OS	06
DFHSPLSE	CSECT	RDO - Lsrpool definition validation	OS	06
DFHSPPCB	CSECT	CSDUP - cross-keyword validation for programs, map sets, and partition sets	OS	06
DFHSPPCC	CSECT	RDO - cross-keyword validation for programs, map sets, and partition sets	OS	06
DFHSPPCE	CSECT	RDO - program definition validation	OS	06
DFHSPPNB	CSECT	CSDUP - cross-keyword validation for partners	OS	06
DFHSPPNC	CSECT	RDO - cross-keyword validation for partners	OS	06
DFHSPPNE	CSECT	RDO - partner definition validation	OS	06
DFHSPTCB	CSECT	CSDUP - cross-keyword validation for terminals	OS	06
DFHSPTCC	CSECT	RDO - cross-keyword validation for terminals	OS	06
DFHSPTCE	CSECT	RDO - terminal definition validation	OS	06
DFHSPTDB	CSECT	RDO - TDQueue definition validation	-	06
DFHSPTDC	CSECT	RDO - TDQueue definition validation	-	06
DFHSPTDE	CSECT	RDO - TDQueue definition validation	-	06
DFHSPTIB	CSECT	CSDUP - cross-keyword validation for sessions	OS	06
DFHSPTIC	CSECT	RDO - cross-keyword validation for sessions	OS	06
DFHSPTIE	CSECT	RDO - sessions definition validation	OS	06
DFHSPTNB	CSECT	CSDUP - cross-keyword validation for connections	OS	06
DFHSPTNE	CSECT	RDO - connection definition validation	OS	06
DFHSPTNC	CSECT	RDO - cross-keyword validation for connections	OS	06
DFHSPTRI	CSECT	SPI trace interpreter	OS	06
DFHSPTYB	CSECT	CSDUP - cross-keyword validation for typeterms	OS	06
DFHSPTYC	CSECT	RDO - cross-keyword validation for typeterms	OS	06
DFHSPTYE	CSECT	RDO - Typeterms definition validation	OS	06
DFHSPP	CSECT	Syncpoint program	OS	06
DFHSPTM1	Sample	TCAM MCP and message handlers	05	-
DFHSPTM2	Sample	TCAM MCP for TCAM direct and tables	05	-
DFHSPXMB	CSECT	CSDUP - cross-keyword validation for transactions	-	06
DFHSPXMC	CSECT	RDO - cross-keyword validation for transactions	-	06
DFHSPXME	CSECT	RDO - TranClass definition validation	-	06

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Name	Type	Description	Library	
DFHSRADS	DSECT	SRB interface control area	OS	-
DFHSRASM	CSECT	Alias for SRRHASM	04	-
DFHSRCOB	CSECT	Alias for SRRCOBOL	C2	-
DFHSRED	DSECT	System recovery error data for XSRAB exit	04	-
DFHSRLI	CSECT	SRP LIFO storage subroutine	OS	06
DFHSRLIA	DSECT	SRLI parameter list	OS	-
DFHSRLIM	Macro	SRLI request	OS	-
DFHSRLIT	CSECT	SRLI trace interpretation data	OS	06
DFHSRP	CSECT	System recovery program	OS	06
DFHSRPLI	CSECT	Alias for SRRPLI	P2	-
DFHSRRC	CSECT	Alias for SRRC	D3	-
DFHSRSRA	Source	SRSR parameter list	OS	-
DFHSRSRM	Source	SRSR request	OS	-
DFHSRT	Macro	System recovery table	04	-
DFHSRTDS	DSECT	System recovery table	OS	-
DFHSRT1$	Sample	System recovery table	05	06
DFHSRXDS	DSECT	SRB and extensions in SQA	OS	-
DFHSR1	CSECT	System recovery program	-	06
DFHSSAD	Macro	Static storage area address list	04	-
DFHSSDUF	CSECT (OCO)	SDUMP formatter for static storage areas	-	06
DFHSSEN	CSECT	Subsystem interface EOT and EOM routine	OS	06
DFHSSGC	CSECT	Subsystem interface generic connect	OS	06
DFHSSIN	CSECT	CICS subsystem initialization	OS	06
DFHSSMGP	CSECT	Subsystem interface message program	OS	06
DFHSSMGT	CSECT	Subsystem interface message table	OS	06
DFHSSREQ	Macro	Subsystem interface (SSI) request	OS	-
DFHSSWT	CSECT	Subsystem interface WTO router	OS	06
DFHSSWTF	CSECT	SSI MODIFY command password suppression	OS	06
DFHSSWTO	CSECT	SSI CICS console message reformatting	OS	06
DFHSTAB	Macro	Table scan macro	04	-
DFHSTACK	Macro	Save/restore registers on subroutine calls	OS	-
DFHSTART	Other	CICS startup cataloged procedure	02	-
DFHSTDBX	CSECT (OCO)	STUP - DBCTL statistics summary formatter	-	06
DFHSTDEX	CSECT (OCO)	STUP - DCE services domain extended formatter	-	06
DFHSTDM	CSECT (OCO)	ST domain - initialization/termination	-	06
DFHSTDSX	CSECT (OCO)	STUP - DS domain stats summary formatter	-	06
DFHSTDUF	CSECT (OCO)	SDUMP formatter for ST domain	-	06
DFHSTDUX	CSECT (OCO)	STUP - DU domain stats summary formatter	-	06
DFHSTD2	Macro	Standard names of domains, gates, formats	04	-
DFHSTD2X	CSECT		-	06
DFHSTE15	CSECT (OCO)	STUP - DFSORT interface to E15 user exit	-	06
DFHSTE35	CSECT (OCO)	STUP - DFSORT interface to E35 user exit	-	06
DFHSTFC	CSECT	AP domain - file control statistics	OS	06
DFHSTGDS	DSECT	ST domain - global statistics	04	-
DFHSTGDS	DSECT	ST domain - global statistics	C2	-
DFHSTGDS	DSECT	ST domain - global statistics	P2	-
DFHSTIDS	DSECT	Statistics common record header and record identifiers	04	-
DFHSTIDS	DSECT	Statistics common record header and record identifiers	C2	-
DFHSTIDS	DSECT	Statistics common record header and record identifiers	P2	-
DFHSTIN	CSECT (OCO)	STUP - DFSORT E15 user exit input routine	-	06
DFHSTLDX	CSECT (OCO)	STUP - LD domain stats summary formatter	-	06
DFHSTLGX	CSECT (OCO)	Logger Domain statistics extended	-	06

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Name	Type	Description	Library	
DFHSTLK	CSECT	AP domain - ISC/IRC statistics	OS	06
DFHSTLS	CSECT	AP domain - LSR pool statistics	OS	06
DFHSTMNX	CSECT (OCO)	STUP - MN domain stats summary formatter	-	06
DFHSTNQX	CSECT (OCO)	Enqueue Manager domain statistics	-	06
DFHSTOT	CSECT (OCO)	STUP - DFSORT E35 user exit output routine	-	06
DFHSTP	CSECT	System termination program	OS	06
DFHSTPGX	CSECT	STUP - PG domain autoinstall statistics	-	06
DFHSTRD	CSECT (OCO)	STUP - read interface	-	06
DFHSTRDA	DSECT	STRD parameter list	OS	-
DFHSTRDM	Macro	STRD request	OS	-
DFHSTSMF	Macro	ST domain - statistics SMF header and SMF product section	04	-
DFHSTRMX	CSECT (OCO)	Recovery Manager domain statistics	-	06
DFHSTSMX	CSECT (OCO)	STUP - SM domain stats summary formatter	-	06
DFHSTST	CSECT (OCO)	ST domain - services	-	06
DFHSTSTA	DSECT	STST parameter list	OS	-
DFHSTSTM	Macro	STST request	OS	-
DFHSTSTT	CSECT	STST trace interpretation data	OS	06
DFHSTSTX	CSECT (OCO)	STUP - ST domain stats summary formatter	-	06
DFHSTSZ	CSECT	AP domain - FEPI statistics	-	06
DFHSTTD	CSECT	AP domain - transient data statistics	OS	06
DFHSTTI	CSECT (OCO)	ST domain - timer notify handler	-	06
DFHSTTM	CSECT	AP domain - table manager statistics	OS	06
DFHSTTQX	CSECT	STUP - TDQueue id extended formatting	-	06
DFHSTTR	CSECT	AP domain - terminal statistics	OS	06
DFHSTTRI	CSECT (OCO)	Trace interpreter for ST domain	-	06
DFHSTTSX	CSECT (OCO)	Shared TS statistics	-	06
DFHSTUDB	CSECT (OCO)	STUP - DBCTL statistics formatter	-	06
DFHSTUDE	CSECT (OCO)	STUP - DE domain statistics formatter	-	06
DFHSTUDS	CSECT (OCO)	STUP - DS domain statistics formatter	-	06
DFHSTUDU	CSECT (OCO)	STUP - DU domain statistics formatter	-	06
DFHSTUD2	CSECT (OCO)	STUP - DU domain statistics formatter	-	06
DFHSTUE	CSECT (OCO)	ST domain - user exit service	-	06
DFHSTULD	CSECT (OCO)	STUP - LD domain statistics formatter	-	06
DFHSTULG	CSECT (OCO)	STUP - Logger domain formatting routine	-	06
DFHSTUMN	CSECT (OCO)	STUP - MN domain statistics formatter	-	06
DFHSTUNQ	CSECT (OCO)	STUP - Enqueue manager domain statistics	-	06
DFHSTUPG	CSECT (OCO)	STUP - PG domain autoinstall statistics formatter	-	06
DFHSTUP1	CSECT (OCO)	STUP - preinitialize	-	06
DFHSTURM	CSECT (OCO)	STUP - Recovery manager domain statistics	-	06
DFHSTURS	CSECT (OCO)	STUP - US domain statistics formatter	-	06
DFHSTURX	CSECT (OCO)	STUP - US domain statistics summary formatter	-	06
DFHSTUSM	CSECT (OCO)	STUP - SM domain statistics formatter	-	06
DFHSTUST	CSECT (OCO)	STUP - ST domain statistics formatter	-	06
DFHSTUTQ	CSECT (OCO)	STUP - Transient data statistics	-	06
DFHSTUTS	CSECT (OCO)	Shared TS statistics	-	06
DFHSTUXC	CSECT (OCO)	STUP - Transaction manager domain statistics	-	06
DFHSTUXM	CSECT (OCO)	STUP - XM domain statistics formatter	-	06
DFHSTU03	CSECT (OCO)	STUP - VTAM statistics formatter	-	06
DFHSTU04	CSECT (OCO)	STUP - autoinstall terminals statistics formatter	-	06
DFHSTU06	CSECT (OCO)	STUP - terminal statistics formatter	-	06
DFHSTU08	CSECT (OCO)	STUP - LSRPOOL resource statistics formatter	-	06
DFHSTU09	CSECT (OCO)	STUP - LSRPOOL file statistics formatter	-	06

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Name	Type	Description	Library	
DFHSTU14	CSECT (OCO)	STUP - ISC/IRC statistics formatter	-	06
DFHSTU16	CSECT (OCO)	STUP - table manager statistics formatter	-	06
DFHSTU17	CSECT (OCO)	STUP - file control statistics formatter	-	06
DFHSTU21	CSECT (OCO)	STUP - ISC/IRC attach-time statistics formatter	-	06
DFHSTU22	CSECT (OCO)	STUP - FEPI statistics formatter	-	06
DFHSTWR	CSECT (OCO)	STUP - write interface	-	06
DFHSTWRA	DSECT	STWR parameter list	OS	-
DFHSTWRM	Macro	STWR request	OS	-
DFHSTXCX	CSECT (OCO)	STUP - Transaction manager domain extended formatting routine for TranClass Stats	-	06
DFHSTXMX	CSECT (OCO)	STUP - XM statistics extended formatter	-	06
DFHST03X	CSECT (OCO)	STUP - VTAM statistics summary formatter	-	06
DFHST04X	CSECT (OCO)	STUP - autoinstall terminals statistics summary formatter	-	06
DFHST06X	CSECT (OCO)	STUP - terminal stats summary formatter	-	06
DFHST08X	CSECT (OCO)	STUP - LSRPOOL resource statistics summary formatter	-	06
DFHST09X	CSECT (OCO)	STUP - LSRPOOL file statistics summary formatter	-	06
DFHST14X	CSECT (OCO)	STUP - ISC/IRC stats summary formatter	-	06
DFHST16X	CSECT (OCO)	STUP - table manager statistics summary formatter	-	06
DFHST17X	CSECT (OCO)	STUP - file control statistics summary formatter	-	06
DFHST21X	CSECT (OCO)	STUP - ISC/IRC attach-time statistics summary formatter	-	06
DFHST22X	CSECT (OCO)	STUP - FEPI statistics summary formatter	-	06
DFHSUDUF	CSECT (OCO)	SDUMP formatter for DU domain summary	-	06
DFHSUEX	CSECT	User exit handler subroutine	OS	06
DFHSUEXA	DSECT	SUEX parameter list	OS	-
DFHSUEXM	Macro	SUEX request	OS	-
DFHSUEXT	CSECT	SUEX trace interpretation data	OS	06
DFHSUME	CSECT (OCO)	ME domain - produce and issue messages subroutine (used by ME and LM domains)	-	06
DFHSUMEA	DSECT	SUME parameter list	OS	-
DFHSUMEM	Macro	SUME request	OS	-
DFHSUMET	CSECT	SUME trace interpretation data	-	06
DFHSUSX	CSECT	XRF signon	OS	06
DFHSUSXA	DSECT	SUSX parameter list	OS	-
DFHSUSXM	Macro	SUSX request	OS	-
DFHSUSXT	DSECT	SUSX translate tables	OS	06
DFHSUTRI	CSECT	WTO/WTOR subroutine trace interpreter	OS	06
DFHSUWT	CSECT	WTO/WTOR interface subroutine	OS	06
DFHSUWTA	DSECT	SUWT parameter list	OS	-
DFHSUWTM	Macro	SUWT request	OS	-
DFHSUWTT	CSECT	SUWT trace interpretation data	OS	06
DFHSUZX	CSECT	ZC trace controller	OS	06
DFHSUZXA	DSECT	SUZX parameter list	OS	-
DFHSUZXM	Macro	SUZX request	OS	-
DFHSUZXT	CSECT	SUZX trace interpretation data	OS	06
DFHSVCHK	Macro	SVC level check	04	-
DFHSWXK	Macro	Switch execution key routine	OS	-
DFHSYS	Macro	System definition macro	04	-
DFHSZAPA	DSECT	FEPI programming copybook - assembler	04	-

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Name	Type	Description	Library	
DFHSZAPC	DSECT	FEPI programming copybook - C/370	D3	-
DFHSZAPO	DSECT	FEPI programming copybook - COBOL	C2	-
DFHSZAPP	DSECT	FEPI programming copybook - PL/I	P2	-
DFHSZATC	CSECT (OCO)	FEPI adaptor command tables	-	06
DFHSZATR	CSECT (OCO)	FEPI adaptor program	-	06
DFHSZBCL	CSECT (OCO)	FEPI cleanup API requests at error routine	-	06
DFHSZBCS	CSECT (OCO)	FEPI RM collect statistics	-	06
DFHSZBFT	CSECT (OCO)	FEPI FREE transaction requests scheduler	-	06
DFHSZBLO	CSECT (OCO)	FEPI lost session reporter	-	06
DFHSZBRS	CSECT (OCO)	FEPI RM collect resource ID statistics	-	06
DFHSZBSI	CSECT (OCO)	FEPI signon exit scheduler	-	06
DFHSZBST	CSECT (OCO)	FEPI STSN transaction scheduler	-	06
DFHSZBUN	CSECT (OCO)	FEPI unsolicited data transaction scheduler	-	06
DFHSZBUS	CSECT (OCO)	FEPI RM unsolicited statistics recording	-	06
DFHSZDUF	CSECT (OCO)	FEPI dump formatting routine	-	06
DFHSZFRD	CSECT (OCO)	FEPI formatted 3270 RECEIVE support	-	06
DFHSZFSD	CSECT (OCO)	FEPI formatted 3270 SEND support	-	06
DFHSZIDX	CSECT (OCO)	FEPI SLU P queue install/discard exit	-	06
DFHSZPCP	CSECT (OCO)	FEPI SLU P flow controller	-	06
DFHSZPDX	CSECT (OCO)	FEPI SLU P drain completion exit	-	06
DFHSZPID	CSECT (OCO)	FEPI SLU P send data processor	-	06
DFHSZPIX	CSECT (OCO)	FEPI SLU P send completion exit	-	06
DFHSZPOA	CSECT (OCO)	FEPI SLU P send response processor	-	06
DFHSZPOD	CSECT (OCO)	FEPI SLU P receive data processor	-	06
DFHSZPOR	CSECT (OCO)	FEPI SLU P response processor	-	06
DFHSZPOX	CSECT (OCO)	FEPI SLU P receive specific response exit	-	06
DFHSZPOY	CSECT (OCO)	FEPI SLU P receive specific response processor	-	06
DFHSZPQS	CSECT (OCO)	FEPI SLU P REQSESS (request session) issuer	-	06
DFHSZPQX	CSECT (OCO)	FEPI SLU P REQSESS exit	-	06
DFHSZPSB	CSECT (OCO)	FEPI SLU P bind processor	-	06
DFHSZPSC	CSECT (OCO)	FEPI SLU P session controller	-	06
DFHSZPSD	CSECT (OCO)	FEPI SLU P SDT processor	-	06
DFHSZPSH	CSECT (OCO)	FEPI SLU P SHUTC processor	-	06
DFHSZPSQ	CSECT (OCO)	FEPI SLU P quiesce complete (QC) processor	-	06
DFHSZPSR	CSECT (OCO)	FEPI RESETSR processor CSECT	-	06
DFHSZPSS	CSECT (OCO)	FEPI SLU P STSN processor	-	06
DFHSZPSX	CSECT (OCO)	FEPI SLU P OPNSEC completion exit	-	06
DFHSZPTE	CSECT (OCO)	FEPI SLU P TERMSESS processor	-	06
DFHSZRCA	CSECT (OCO)	FEPI node control processor	-	06
DFHSZRCT	CSECT (OCO)	FEPI issue processor	-	06
DFHSZRDC	CSECT (OCO)	FEPI delete connection processor	-	06
DFHSZRDG	CSECT (OCO)	FEPI discard node processor	-	06
DFHSZRDN	CSECT (OCO)	FEPI delete node processor	-	06
DFHSZRDP	CSECT (OCO)	FEPI dispatcher	-	06
DFHSZRDS	CSECT (OCO)	FEPI discard property set processor	-	06
DFHSZRDT	CSECT (OCO)	FEPI discard target processor	-	06
DFHSZREQ	CSECT (OCO)	FEPI request processor	-	06
DFHSZRFC	CSECT (OCO)	FEPI FREE completion processor	-	06
DFHSZRGR	CSECT (OCO)	FEPI Dispatcher work queue processor	-	06
DFHSZRIA	CSECT (OCO)	FEPI allocate processor	-	06
DFHSZRIC	CSECT (OCO)	FEPI define connection processor	-	06
DFHSZRID	CSECT (OCO)	FEPI discard processor	-	06
DFHSZRIF	CSECT (OCO)	FEPI install free processor	-	06
DFHSZRII	CSECT (OCO)	FEPI install processor	-	06

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Name	Type	Description	Library	
DFHSZRIN	CSECT (OCO)	FEPI install node processor	-	06
DFHSZRIO	CSECT (OCO)	FEPI ACB open processor	-	06
DFHSZRIP	CSECT (OCO)	FEPI install pool processor	-	06
DFHSZRIQ	CSECT (OCO)	FEPI inquire processor	-	06
DFHSZRIS	CSECT (OCO)	FEPI install processor	-	06
DFHSZRIT	CSECT (OCO)	FEPI install target processor	-	06
DFHSZRIW	CSECT (OCO)	FEPI SET processor	-	06
DFHSZRNC	CSECT (OCO)	FEPI NODE processor	-	06
DFHSZRNO	CSECT (OCO)	FEPI NOOP processor	-	06
DFHSZRPM	CSECT (OCO)	FEPI timer services	-	06
DFHSZRPW	CSECT (OCO)	FEPI request preparation	-	06
DFHSZRQR	CSECT (OCO)	FEPI queue for REQSESS processing	-	06
DFHSZRQW	CSECT (OCO)	FEPI request queue processor	-	06
DFHSZRRD	CSECT (OCO)	FEPI RECEIVE request processor	-	06
DFHSZRRT	CSECT (OCO)	FEPI request release processor	-	06
DFHSZRSC	CSECT (OCO)	FEPI connection processor	-	06
DFHSZRSE	CSECT (OCO)	FEPI SEND request processor	-	06
DFHSZRST	CSECT (OCO)	FEPI START request processor	-	06
DFHSZRTM	CSECT (OCO)	FEPI recovery services	-	06
DFHSZRXD	CSECT (OCO)	FEPI EXTRACT processor	-	06
DFHSZRZZ	CSECT (OCO)	FEPI TERMINATE processor	-	06
DFHSZSDS	DSECT	FEPI storage control block	04	-
DFHSZSIP	CSECT (OCO)	FEPI initialization processor	-	06
DFHSZVBN	CSECT (OCO)	FEPI copy NIB mask to real NIB	-	06
DFHSZVGF	CSECT (OCO)	FEPI get queue element FIFO	-	06
DFHSZVQS	CSECT (OCO)	FEPI REQSESS dispatcher	-	06
DFHSZVRA	CSECT (OCO)	FEPI VTAM receive_any processor	-	06
DFHSZVRI	CSECT (OCO)	FEPI VTAM receive_any issuer	-	06
DFHSZVSC	CSECT (OCO)	FEPI delayed bind processor	-	06
DFHSZVSL	CSECT (OCO)	FEPI SETLOGON request issuer	-	06
DFHSZVSQ	CSECT (OCO)	FEPI VTAM feedback interpreter	-	06
DFHSZVSR	CSECT (OCO)	FEPI VTAM feedback interpreter	-	06
DFHSZVSY	CSECT (OCO)	FEPI VTAM feedback interpreter	-	06
DFHSZWSL	CSECT (OCO)	FEPI RPL exit after SETLOGON	-	06
DFHSZXDA	CSECT (OCO)	FEPI VTAM DFASY exit	-	06
DFHSZXFR	CSECT (OCO)	FEPI RPL exit to free request block	-	06
DFHSZXLG	CSECT (OCO)	FEPI VTAM logon exit	-	06
DFHSZXLT	CSECT (OCO)	FEPI VTAM LOSTERM (lost terminal) exit	-	06
DFHSZXNS	CSECT (OCO)	FEPI VTAM NSEXIT (network services) exit	-	06
DFHSZXPM	CSECT (OCO)	FEPI STIMER IRB exit routine	-	06
DFHSZXRA	CSECT (OCO)	FEPI VTAM RECEIVE_ANY exit	-	06
DFHSZXSC	CSECT (OCO)	FEPI VTAM SCIP (session control) exit	-	06
DFHSZXTP	CSECT (OCO)	FEPI VTAM TPEND exit	-	06
DFHSZYLG	CSECT (OCO)	FEPI RPL exit following logon reject	-	06
DFHSZYQR	CSECT (OCO)	FEPI post for REQSESS processing	-	06
DFHSZYRI	CSECT (OCO)	FEPI VTAM RECEIVE_ANY issuer	-	06
DFHSZYSC	CSECT (OCO)	FEPI VTAM SCIP exit extension	-	06
DFHSZYSR	CSECT (OCO)	FEPI VTAM feedback interpreter	-	06
DFHSZYSY	CSECT (OCO)	FEPI VTAM feedback interpreter	-	06
DFHSZZAG	CSECT (OCO)	FEPI get RECEIVE_ANY request block	-	06
DFHSZZFR	CSECT (OCO)	FEPI free RECEIVE_ANY request block	-	06
DFHSZZNG	CSECT (OCO)	FEPI get session control request block	-	06
DFHSZZRG	CSECT (OCO)	FEPI get RPL request block	-	06
DFHSZ2CP	CSECT (OCO)	FEPI SLU2 flow controller	-	06
DFHSZ2DX	CSECT (OCO)	FEPI SLU2 drain completion exit	-	06

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Name	Type	Description	Library	
DFHSZ2ID	CSECT (OCO)	FEPI SLU2 send data processor	-	06
DFHSZ2IX	CSECT (OCO)	FEPI SLU2 send completion exit	-	06
DFHSZ2OA	CSECT (OCO)	FEPI SLU2 send response processor	-	06
DFHSZ2OD	CSECT (OCO)	FEPI SLU2 receive data processor	-	06
DFHSZ2OR	CSECT (OCO)	FEPI SLU2 response processor	-	06
DFHSZ2OX	CSECT (OCO)	FEPI SLU2 receive specific completion exit	-	06
DFHSZ2OY	CSECT (OCO)	FEPI SLU2 receive specific action module	-	06
DFHSZ2PX	CSECT (OCO)	FEPI SLU2 positive response drain exit	-	06
DFHSZ2QS	CSECT (OCO)	FEPI SLU2 REQSESS issuer	-	06
DFHSZ2QX	CSECT (OCO)	FEPI SLU2 REQSESS exit	-	06
DFHSZ2SB	CSECT (OCO)	FEPI SLU2 bind processor	-	06
DFHSZ2SC	CSECT (OCO)	FEPI SLU2 session controller	-	06
DFHSZ2SD	CSECT (OCO)	FEPI SLU2 SDT processor	-	06
DFHSZ2SH	CSECT (OCO)	FEPI SLU2 SHUTC processor	-	06
DFHSZ2SQ	CSECT (OCO)	FEPI SLU2 QC processor	-	06
DFHSZ2SR	CSECT (OCO)	FEPI SLU2 RESETSR processor	-	06
DFHSZ2SX	CSECT (OCO)	FEPI SLU2 OPNSEC processor	-	06
DFHSZ2TE	CSECT (OCO)	FEPI SLU2 TERMSESS processor	-	06
DFHTACB	Macro	Task abend control block	04	-
DFHTACLE	DSECT	TCT line entry prefix	04	-
DFHTACP	CSECT	Terminal abnormal condition program	OS	06
DFHTAJP	CSECT	Time adjustment program	OS	06
DFHTBS	Macro	Builder interface	OS	-
DFHTBSB	CSECT	Add a node	OS	06
DFHTBSBP	CSECT	Recursive part of DFHTBSB	OS	06
DFHTBSD	CSECT	Delete node program	OS	06
DFHTBSDP	CSECT	Recursive part of DFHTBSD	OS	06
DFHTBSL	CSECT	Create recovery record for node	OS	06
DFHTBSLP	CSECT	Recursive part of DFHTBSL	OS	06
DFHTBSQ	CSECT	Builder inquire process	OS	06
DFHTBSQP	CSECT	Recursive part of DFHTBSQ	OS	06
DFHTBSR	CSECT	Builder restore process	OS	06
DFHTBSRP	CSECT	Recursive part of DFHTBSR	OS	06
DFHTBSS	CSECT	TBS syncpoint processor	-	06
DFHTBSST	DSECT	TBSS translate tables	-	06
DFHTBS00	CSECT	Table builder services program	OS	06
DFHTC	Macro	Terminal service request	04	-
DFHTCA	Macro	Task control area	04	-
DFHTCADS	DSECT	Task control area	04	-
DFHTCAM	Source	CICS-TCAM interface logic	OS	-
DFHTCCLC	Source	Common line control logic	OS	-
DFHTCCOM	Source	Input data length computation	OS	-
DFHTCCSS	Source	Start-stop event analysis	OS	-
DFHTCDEF	Symbolic	Terminal control definitions	OS	-
DFHTCDPF	CSECT (OCO)	Terminal control prefix SDUMP module	-	06
DFHTCDUF	CSECT (OCO)	Terminal control SDUMP formatter	-	06
DFHTCORS	Source	Terminal storage routine	OS	-
DFHTCP	CSECT	Terminal control program	OS	06
DFHTCPCL	Macro	DFHZCP request	OS	-
DFHTCPCM	Macro	Common ZCP functions	04	-
DFHTCPLR	Macro	LU6.2 limited resources service	OS	-
DFHTCPQR	Macro	Queued response notification	OS	-
DFHTCPRA	DSECT	Receive-any control element	OS	-
DFHTCPRT	Macro	DFHZCP RETURN macro	OS	-
DFHTCPSM	Macro	TCT generation - VTAM DSECTs	04	-

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Name	Type	Description	Library	
DFHTCPSV	Macro	DFHZCP SAVE macro	OS	-
DFHTCPZR	Macro	VTAM RPL extension for HPO	04	-
DFHTCQUE	Macro	DFHZCP QUEUE macro	OS	-
DFHTCRP	CSECT	Terminal control recovery program	OS	06
DFHTCRPC	CSECT	XRF tracking interface for TCT contents	OS	06
DFHTCRPL	CSECT	Install TCT macro definitions	OS	06
DFHTCRPS	CSECT	XRF tracking interface for ZCP sessions	OS	06
DFHTCRPU	CSECT	XRF tracking interface for SNTTEs	OS	06
DFHTCRWE	DSECT	Remote install work element	OS	-
DFHTCSAM	Source	Sequential terminal logic	OS	-
DFHTCSRV	Macro	DFHTC inner service macro	04	-
DFHTCSUM	CSECT	Terminal control dump summary program	-	06
DFHTCT	Macro	Terminal control table	04	-
DFHTCTDY	CSECT	Terminal control table (dummy)	05	06
DFHTCTFN	Source	TCT TYPE=FINAL (VTAM)	04	-
DFHTCTFX	DSECT	TCT prefix	04	-
DFHTCTI	Source	Terminal control task initiation logic	OS	-
DFHTCTLC	Macro	TCT inner macro	04	-
DFHTCTLE	DSECT	TCT line entry	04	-
DFHTCTME	Macro	Generate TCT mode group entries	04	-
DFHTCTPR	Macro	TCTTE partition extension builder	04	-
DFHTCTPS	Macro	TCT inner macro	04	-
DFHTCTPX	Macro	TCT inner macro	04	-
DFHTCTRD	Macro	VTAM RDO command list builder	04	-
DFHTCTRE	Macro	TCT definition macro	04	-
DFHTCTRN	Source	Terminal control translation tables	OS	-
DFHTCTSA	Macro	TCT inner macro	04	-
DFHTCTSB	Macro	TCT inner macro	04	-
DFHTCTSE	Macro	Generate ISC system entry	04	-
DFHTCTSK	Macro	Generate TCT skeleton entry	04	-
DFHTCTST	Macro	TCT inner macro	04	-
DFHTCTSV	Macro	TCT inner macro	04	-
DFHTCTTE	DSECT	TCT terminal entry	04	-
DFHTCTUA	Macro	TCT inner macro	04	-
DFHTCTUB	Macro	TCT inner macro	04	-
DFHTCTWA	DSECT	TC transaction work area	04	-
DFHTCTWE	DSECT	TCT autodefine work element	OS	-
DFHTCTZE	Macro	TCTTE definition	04	-
DFHTCT5$	Sample	Terminal control table	05	06
DFHTCUDS	DSECT	COMMAREA passed to autoinstall exit	04	-
DFHTCUDS	DSECT	COMMAREA passed to autoinstall exit	C2	-
DFHTCUDS	DSECT	COMMAREA passed to autoinstall exit	P2	-
DFHTCUDS	DSECT	COMMAREA passed to autoinstall exit	D3	-
DFHTCV29	DSECT	XRF session state data control vector	OS	-
DFHTCX	Macro	TCA extension for LU6.2	04	-
DFHTCXDF	CSECT	DU domain - transaction dump formatter for terminal related areas	OS	06
DFHTD	Macro	Transient data service request	04	-
DFHTDA	CSECT	Transient data request processor	-	06
DFHTDB	CSECT	Transient data request processor	-	06
DFHTDCI	DSECT	Transient data VSAM CI map	OS	-
DFHTDDUF	CSECT (OCO)	Transient data SDUMP formatter	-	06
DFHTDEXL	CSECT	Transient data DCB exit list and DCB abend exit routine	OS	06
DFHTDGDS	DSECT	Transaction dump global statistics	04	-

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Name	Type	Description	Library	
DFHTDGDS	DSECT	Transaction dump global statistics	C2	-
DFHTDGDS	DSECT	Transaction dump global statistics	P2	-
DFHTDOA	DSECT	Transient data output area	04	-
DFHTDOC	CSECT	Transient data open/close for extrapartition queues	-	06
DFHTDOCA	DSECT	TDOC parameter list	OS	-
DFHTDOCM	Macro	TDOC request	OS	-
DFHTDOCT	CSECT	TDOC trace interpretation data	-	06
DFHTDRDS	DSECT	Transaction dump statistics by dump code	04	-
DFHTDRDS	DSECT	Transaction dump statistics by dump code	C2	-
DFHTDRDS	DSECT	Transaction dump statistics by dump code	P2	-
DFHTDRM	CSECT	Transient data recovery manager processor	-	06
DFHTDRP	CSECT	Transient data recovery program	OS	06
DFHTDSDS	DSECT	Transient data static storage	OS	-
DFHTDTDA	DSECT	TDTD parameter list	OS	-
DFHTDTDM	Macro	TDTD request	OS	-
DFHTDTDT	CSECT	TDTD trace interpretation data	-	06
DFHTDTM	CSECT	Transient data table management gate	-	06
DFHTDTMA	CSECT	TDTM parameter list	OS	-
DFHTDTMM	Macro	TDTM request	OS	-
DFHTDTMT	DSECT	TDTM translate tables	-	06
DFHTDTRI	CSECT	Transient data trace interpreter	OS	06
DFHTDUED	Macro	TD user exits EXEC argument list	04	-
DFHTDX	CSECT	Transient data phase 1 initialization	OS	06
DFHTDXM	CSECT (OCO)	XM domain - TD facility management services	OS	06
DFHTDXMA	DSECT	TDXM parameter list	OS	-
DFHTDXMM	Macro	TDXM request	OS	-
DFHTDXMT	CSECT (OCO)	TDXM trace interpretation data	OS	06
DFHTEPA	Macro	TEP inner macro	04	-
DFHTEPC	Macro	TEP inner macro	04	-
DFHTEPCA	Macro	TEP communication area	04	-
DFHTEPM	Macro	TEP module generator	04	-
DFHTEPS	Macro	TEP inner macro	04	-
DFHTEPT	Macro	TEP table generator	04	-
DFHTERID	Symbolic	Terminal error definitions	04	-
DFHTEST	Macro	Domain call argument TEST macro	04	-
DFHTFALA	DSECT	TFAL parameter list	OS	-
DFHTFALM	Macro	TFAL request	OS	-
DFHTFALT	CSECT (OCO)	TFAL trace interpretation data	-	06
DFHTFBFA	DSECT	TFBF parameter list	OS	-
DFHTFBFM	Macro	TFBF request	OS	-
DFHTFBFT	CSECT (OCO)	TFBF trace interpretation data	-	06
DFHTFIQ	CSECT (OCO)	Terminal facility manager inquire/set functions	-	06
DFHTFIQA	DSECT	TFIQ parameter list	OS	-
DFHTFIQI	DSECT	TFIQ requests (inline form)	OS	-
DFHTFIQM	DSECT	TFIQ requests	OS	-
DFHTFIQT	CSECT (OCO)	TFIQ trace interpretation data	-	06
DFHTFP	CSECT	Transaction failure program	OS	06
DFHTFRF	CSECT (OCO)	Terminal facility manager release function	-	06
DFHTFRFT	CSECT (OCO)	TFRF trace interpretation data	-	06
DFHTFTRI	CSECT (OCO)	Terminal facility manager trace interpreter	-	06
DFHTIDM	CSECT (OCO)	TI domain - initialization/termination	-	06
DFHTIDUF	CSECT (OCO)	SDUMP formatter for TI domain	-	06

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Name	Type	Description	Library	
DFHTIEDS	DSECT	Task interface element	OS	-
DFHTIEM	CSECT	Resource manager interface TIE manager	OS	06
DFHTIOA	DSECT	Terminal input/output area	04	-
DFHTIOA	DSECT	Terminal input/output area	C2	-
DFHTIOA	DSECT	Terminal input/output area	P2	-
DFHTISR	CSECT (OCO)	TI domain - services	-	06
DFHTISRA	DSECT	TISR parameter list	OS	-
DFHTISRM	Macro	TISR request	OS	-
DFHTISRT	CSECT	TISR trace interpretation data	-	06
DFHTITRI	CSECT (OCO)	Trace interpreter for TI domain	-	06
DFHTLT	Macro	Terminal list table	04	-
DFHTM	Macro	Table manager interface	04	-
DFHTMDUF	CSECT (OCO)	Table manager SDUMP formatter	-	06
DFHTMP01	CSECT (OCO)	Table manager program - part 1	-	06
DFHTMP02	CSECT (OCO)	Table manager program - part 2	-	06
DFHTMTRI	CSECT (OCO)	Table manager program trace interpreter	-	06
DFHTOACN	CSECT	Terminal object resolution (TOR) - add connection	OS	06
DFHTOAPT	CSECT	TOR - add pooled terminal	OS	06
DFHTOASE	CSECT	TOR - add session	OS	06
DFHTOATM	CSECT	TOR - add (non-pooled) terminal	OS	06
DFHTOATY	CSECT	TOR - add typeterm	OS	06
DFHTOBPS	CSECT	TOR - create BPS and check attributes	OS	06
DFHTOCAN	CSECT	TOR - dynamic backout processing	OS	06
DFHTOCMT	CSECT	TOR - syncpoint commit processing	OS	06
DFHTOLCR	CSECT	TOR - end logical unit of complex replacement	OS	06
DFHTOLUI	CSECT	TOR - end logical unit of installation	OS	06
DFHTOM	Macro	BMS terminal output	OS	-
DFHTON	CSECT	Terminal object resolution module	OS	06
DFHTONR	CSECT	Terminal object resolution recovery	-	06
DFHTONRT	DSECT	TONR translate tables	-	06
DFHTORP	CSECT	Terminal object recovery program	OS	06
DFHTOR00	CSECT	Terminal object resolution program (DFHTOR)	OS	06
DFHTOUT1	CSECT	TOR - set operation utilities	OS	06
DFHTOUT2	CSECT	TOR - map operation utilities	OS	06
DFHTPE	DSECT	Terminal partition extension	OS	-
DFHTPP	CSECT	BMS terminal page processor	OS	-
DFHTPPA$	CSECT	BMS terminal page processor (standard)	OS	06
DFHTPP1$	CSECT	BMS terminal page processor (full)	OS	06
DFHTPQ	CSECT	BMS terminal page cleanup program	OS	06
DFHTQGDS	CSECT	Global statistics for Transient Data	04	-
DFHTQGDS	CSECT	Global statistics for Transient Data	C2	-
DFHTQGDS	CSECT	Global statistics for Transient Data	P2	-
DFHTQRDS	CSECT	Transient data queue statistics	04	-
DFHTQRDS	CSECT	Transient data queue statistics	C2	-
DFHTQRDS	CSECT	Transient data queue statistics	P2	-
DFHTPR	CSECT	BMS terminal page retrieval program	OS	06
DFHTPS	CSECT	BMS terminal page scheduling program	OS	06
DFHTR	Macro	Trace service request	04	-
DFHTRA	DSECT	TR domain - anchor block	OS	-
DFHTRACE	Macro	Trace system macro	OS	-
DFHTRADS	DSECT	TR domain - parameter list to DFHTRAP	04	-
DFHTRAO	CSECT	TR domain - auxiliary trace output	OS	06
DFHTRAP	CSECT	TR domain - FE global trap/trace exit	04	06

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Name	Type	Description	Library	
DFHTRBL	DSECT	TR domain - internal trace table block	OS	-
DFHTRDM	CSECT	TR domain - initialization/termination	OS	06
DFHTRDS	DSECT	TR domain - control blocks	OS	-
DFHTRDUB	CSECT	TR & DU keyword copybook	OS	-
DFHTRDUF	CSECT (OCO)	SDUMP formatter for TR domain	-	06
DFHTREND	DSECT	TR domain - trace entry	04	-
DFHTREX	DSECT		-	06
DFHTRFCA	DSECT	Offline trace formatting control area	OS	-
DFHTRFFD	CSECT	Offline trace formatting - format data fields	OS	06
DFHTRFFE	CSECT	Offline trace formatting - format trace entry	OS	06
DFHTRFPB	CSECT	Offline trace formatting - process block	OS	06
DFHTRFPP	CSECT	Offline trace formatting - process selective print parameters	OS	06
DFHTRFT	CSECT	Trace put routine for features	OS	06
DFHTRFTA	CSECT	TRFT parameter list	OS	-
DFHTRFTD	CSECT	TR feature trace entry header	OS	-
DFHTRFTM	Macro	TRFT macro	OS	-
DFHTRFTT	CSECT	TRFT translate tables	OS	06
DFHTRFTX	Macro	TRFT macro	04	-
DFHTRFTY	Macro	TRFT call structured parameter list	04	-
DFHTRIB	CSECT	Trace interpretation string builder	OS	06
DFHTRP	CSECT	Trace control program	OS	06
DFHTRPRA	CSECT	Auxiliary trace offline formatting	OS	06
DFHTRPRG	CSECT	GTF trace offline formatting	OS	06
DFHTRPT	CSECT	TR domain - trace put (all destinations)	OS	06
DFHTRPTA	DSECT	TRPT parameter list	OS	-
DFHTRPTM	Macro	TRPT request	OS	-
DFHTRPTT	CSECT	TRPT trace interpretation data	OS	06
DFHTRPTX	Macro	TRPT request (XPI)	04	-
DFHTRPTY	DSECT	TRPT parameter list (XPI)	04	-
DFHTRPX	CSECT	TR domain - trace put (fast path)	OS	06
DFHTRSR	CSECT	TR domain - trace destination services	OS	06
DFHTRSRA	DSECT	TRSR parameter list	OS	-
DFHTRSRM	Macro	TRSR request	OS	-
DFHTRSRT	CSECT	TRSR trace interpretation data	OS	06
DFHTRSU	CSECT	TR domain - subroutines	OS	06
DFHTRSUA	DSECT	TRSU parameter list	OS	-
DFHTRSUM	Macro	TRSU request	OS	-
DFHTRSUT	CSECT	TRSU trace interpretation data	OS	06
DFHTRTRI	CSECT	Trace interpreter for TR domain	OS	06
DFHTRTST	Macro	TR domain - test if trace point active	OS	-
DFHTRUDS	DSECT	TRUE 24-bit parameter list save area	04	-
DFHTRXDF	CSECT	DU domain - transaction dump formatter for internal trace table	OS	06
DFHTRZCP	CSECT	Terminal object builder	OS	06
DFHTRZIP	CSECT	Session object builder	OS	06
DFHTRZPP	CSECT	Pool object builder	OS	06
DFHTRZXP	CSECT	Connection object builder	OS	06
DFHTRZYP	CSECT	Typeterm object builder	OS	06
DFHTRZZP	CSECT	Terminal object matching	OS	06
DFHTS	Macro	Temporary-storage service request	04	-
DFHTSAM	CSECT	TS auxiliary manager functions subroutine	-	06
DFHTSAMT	DSECT	TSAM translate tables	-	06
DFHTSBR	CSECT	TS browse functions	-	06

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Name	Type	Description	Library	
DFHTSBRA	CSECT	TSBR parameter list	OS	-
DFHTSBRM	Macro	TSBR request	OS	-
DFHTSBRT	DSECT	TSBR translate tables	-	06
DFHTSDM	CSECT	TS domain manager functions (initialize, quiesce, terminate)	-	06
DFHTSDUC	CSECT (OCO)	Temporary-storage SDUMP analysis	-	06
DFHTSDUF	CSECT (OCO)	Temporary-storage SDUMP formatter	-	06
DFHTSDUS	CSECT (OCO)	Temporary-storage SDUMP summary	-	06
DFHTSGDS	DSECT	Temporary-storage statistics DSECT (Assembler)	04	-
DFHTSGDS	DSECT	Temporary-storage statistics DSECT (COBOL)	C2	-
DFHTSGDS	DSECT	Temporary-storage statistics DSECT (PL/I)	P2	-
DFHTSHD	Macro	Temporary-storage input/output area header	OS	-
DFHTSIOA	DSECT	Temporary-storage input/output area	04	-
DFHTSICT	CSECT	TSIC translate tables	-	06
DFHTSITR	CSECT	TS trace interpretation	-	06
DFHTSP	CSECT	Temporary-storage control program	OS	06
DFHTSPT	CSECT	TS put functions	-	06
DFHTSPTA	CSECT	TSPT request	OS	-
DFHTSPTM	Macro	TSPT request	OS	-
DFHTSPTT	DSECT	TSPT translate tables	-	06
DFHTSQR	CSECT	TS mainline queue request functions	-	06
DFHTSQRT	DSECT	TSQR translate tables	-	06
DFHTSRM	CSECT	TS recovery manager functions	-	06
DFHTSSBT	DSECT	TSSB translate tables	-	06
DFHTSSH	CSECT	TS shared TS functions	-	06
DFHTSSHT	DSECT	TSSH translate tables	-	06
DFHTSSR	CSECT	TS service functions (inquire, set)	-	06
DFHTSSRT	DSECT	TSSR translate tables	-	06
DFHTSST	CSECT	TS statistics functions	-	06
DFHTST	Macro	Temporary-storage table	04	-
DFHTSTDS	DSECT	Temporary-storage table	OS	-
DFHTSUED	CSECT	XTSEREQ and XTSEREQC EXEC parameter lists	04	-
DFHTSUTC	DSECT	TSUT abstract type internal control blocks	OS	-
DFHTSUTI	Macro	TSUT abstract type inline functions	OS	-
DFHTSWQ	CSECT	TS wait queue functions subroutine	-	06
DFHTSWQT	DSECT	TSWQ translate tables	-	06
DFHTTPDS	DSECT	BMS - terminal type parameter	04	-
DFHTUL	DSECT	Standard-labeled tape user labels	OS	-
DFHTUTEN	Macro	Trace table generation macro	OS	-
DFHUCNV	Sample	CICS OS/2 user data conversion program	05	06
DFHUEDUF	CSECT (OCO)	User exit SDUMP formatter	-	06
DFHUEFDS	DSECT	File control user exit file/data set info	04	-
DFHUEH	CSECT	User exit handler (AP domain)	OS	06
DFHUEHC	Source	User exit program invocation	OS	-
DFHUEHWA	DSECT	User exit work areas	OS	-
DFHUEIQ	CSECT	User exit inquire exitprogram function	-	06
DFHUEIQT	CSECT	EIQT trace interpreter	-	06
DFHUEM	CSECT	User exit manager	OS	06
DFHUEPBD	DSECT	User exit program block	04	-
DFHUEPLD	DSECT	User exit program link	04	-
DFHUERMD	DSECT	User exit resource manager	04	-
DFHUETED	DSECT	User exit table entry	04	-
DFHUETHD	DSECT	User exit table header	04	-
DFHUEXIT	Macro	User-exit-dependent code generator	04	-

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Name	Type	Description	Library	
DFHUEXPT	Macro	User exit point definition	04	-
DFHUIBA	DSECT	Assembler DSECT for User interface block	04	-
DFHUIBC	CSECT	C structure of the UIB	D3	-
DFHUIBO	CSECT	Cobol structure of the UIB	C2	-
DFHUIBP	CSECT	PLI structure of the UIB	P2	-
DFHUPDVS	Other	Cataloged procedure to update a temporary library during system generation	03	-
DFHURLDS	DSECT	BMS - user-supplied route list	04	-
DFHURLDS	DSECT	BMS - user-supplied route list	C2	-
DFHURLDS	DSECT	BMS - user-supplied route list	P2	-
DFHURLDS	DSECT	BMS - user-supplied route list	D3	-
DFHUSAD	CSECT (OCO)	US domain - Add, Delete and Inquire User	-	06
DFHUSADA	DSECT	USAD parameter list	OS	-
DFHUSADM	Macro	USAD request	OS	-
DFHUSADT	CSECT (OCO)	USAD trace interpretation data	-	06
DFHUSAGE	Macro	Usage pricing code generation macro	OS	-
DFHUSAND	CSECT (OCO)	US domain - anchor block	OS	-
DFHUSBP	CSECT	User backout program	OS	06
DFHUSDE	CSECT	US domain - delete user DCE references	-	06
DFHUSDET	DSECT	USDE translate tables	-	06
DFHUSDM	CSECT (OCO)	US domain - initialize, quiesce, and terminate domain functions	-	06
DFHUSDUF	CSECT (OCO)	US domain - dump formatter	-	06
DFHUSFL	CSECT (OCO)	US domain - Flatten and unflatten user	-	06
DFHUSFLA	DSECT	USFL parameter list	OS	-
DFHUSFLM	Macro	USFL request	OS	-
DFHUSFLT	CSECT (OCO)	USFL trace interpretation data	-	06
DFHUSGDS	DSECT	US domain - global statistics	04	-
DFHUSGDS	DSECT	US domain - global statistics	C2	-
DFHUSGDS	DSECT	US domain - global statistics	P2	-
DFHUSIS	CSECT (OCO)	US domain - inquire and set functions	-	06
DFHUSISA	DSECT	USIS parameter list	OS	-
DFHUSISM	Macro	USIS request	OS	-
DFHUSIST	CSECT (OCO)	USIS trace interpretation data	-	06
DFHUSST	CSECT (OCO)	US domain - statistics	-	06
DFHUSTI	CSECT (OCO)	US domain - timeout handler	-	06
DFHUSTIA	DSECT	USTI parameter list	OS	-
DFHUSTIM	Macro	USTI request	OS	-
DFHUSTIT	CSECT (OCO)	USTI trace interpretation data	-	06
DFHUSTRI	CSECT (OCO)	US domain - trace formatter	-	06
DFHUSXM	CSECT (OCO)	US domain - transaction support	-	06
DFHUSXMA	DSECT	USXM parameter list	OS	-
DFHUSXMI	Macro	USXM request (inline version of DFHUSXMM)	OS	-
DFHUSXMM	Macro	USXM request	OS	-
DFHUSXMT	CSECT (OCO)	USXM trace interpretation data	-	06
DFHVM	Macro	Version/modification level generator	04	-
DFHVSWA	DSECT	VSAM work area	04	-
DFHVTWA	DSECT	NACP LIFO storage definition	OS	-
DFHWBA	CSECT	Web module	-	06
DFHWBADX	CSECT	Web module	05	06
DFHWBAHX	CSECT	Web module	D2	-
DFHWBALX	CSECT	Web module	P3	-
DFHWBAOX	CSECT	Web module	C3	-
DFHWBAP@	CSECT	Web module	-	06
DFHWBA1	CSECT	Web module	-	06
DFHWBA1D	CSECT	Web module	04	-
DFHWBA1H	CSECT	Web module	D3	-

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Name	Type	Description	Library	
DFHWBA1L	CSECT	Web module	P2	-
DFHWBA1O	CSECT	Web module	C2	-
DFHWBCC@	CSECT	Web module	-	06
DFHWBCDD	CSECT	Web module	04	-
DFHWBCDH	CSECT	Web module	D3	-
DFHWBCDL	CSECT	Web module	P2	-
DFHWBCDO	CSECT	Web module	C2	-
DFHWBC0B	CSECT	Web module	-	06
DFHWBC01	CSECT	Web module	-	06
DFHWBC03	CSECT	Web module	-	06
DFHWBC04	CSECT	Web module	-	06
DFHWBC09	CSECT	Web module	-	06
DFHWBC42	CSECT	Web module	-	06
DFHWBDCD	CSECT	Web module	OS	-
DFHWBDUF	CSECT	Web module	-	06
DFHWBENV	CSECT	Web module	-	06
DFHWBIMG	CSECT	Web module	-	06
DFHWBIP	CSECT	Web module	-	06
DFHWBIPA	CSECT	Web module	OS	-
DFHWBIPM	CSECT	Web module	OS	-
DFHWBIPT	CSECT	Web module	-	06
DFHWBLT	CSECT	Web module	-	06
DFHWBM	CSECT	Web module	-	06
DFHWBOUT	CSECT	Web module	04	-
DFHWBPA	CSECT	Web module	-	06
DFHWBRP	CSECT	Web module	-	06
DFHWBST	CSECT	Web module	-	06
DFHWBSTT	CSECT	Web module	-	06
DFHWBTC	CSECT	Web module	-	06
DFHWBTC@	CSECT	Web module	-	06
DFHWBTCT	CSECT	Web module	-	06
DFHWBTDD	CSECT	Web module	04	-
DFHWBTDH	CSECT	Web module	D3	-
DFHWBTDL	CSECT	Web module	P2	-
DFHWBTDO	CSECT	Web module	C2	-
DFHWBTL	CSECT	Web module	-	06
DFHWBTLD	CSECT	Web module	04	-
DFHWBTLG	CSECT	Web module	04	-
DFHWBTLH	CSECT	Web module	D3	-
DFHWBTLL	CSECT	Web module	P2	-
DFHWBTLO	CSECT	Web module	C2	-
DFHWBTRI	CSECT	Web module	-	06
DFHWBTRU	CSECT	Web module	-	06
DFHWBTTA	CSECT	Web module	-	06
DFHWBUCD	CSECT	Web module	04	-
DFHWBUCH	CSECT	Web module	D3	-
DFHWBUCL	CSECT	Web module	P2	-
DFHWBUCO	CSECT	Web module	C2	-
DFHWBWB	CSECT	Web module	-	06
DFHWBWBT	CSECT	Web module	-	06
DFHWB0	CSECT	Web module	-	06
DFHWB0H	CSECT	Web module	-	06
DFHWB0U	CSECT	Web module	05	-
DFHWCCS	CSECT	CAVM common services	OS	06
DFHWCGDS	DSECT	CAVM global control block	OS	-
DFHWCGNT	CSECT	CAVM entry point table for routines above 16MB line	OS	06

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Name	Type	Description	Library	
DFHWCSDS	DSECT	XRF static storage	OS	-
DFHWDATT	CSECT	XRF process dispatcher attach control	OS	06
DFHWDINA	CSECT	XRF process dispatcher initialization	OS	06
DFHWDISP	CSECT	XRF process dispatcher	OS	06
DFHWDSDS	DSECT	CAVM dispatcher interface parameter block	OS	-
DFHWDSRP	CSECT	PC/ABEND handler for XRF dispatcher	OS	06
DFHWDWAT	CSECT	XRF process dispatcher wait services	OS	06
DFHWFGDS	DSECT	CAVM file control block	OS	-
DFHWKP	CSECT	Warm keypoint program	OS	06
DFHWLF	Macro	XRF LIFO free storage request	OS	-
DFHWLFRE	CSECT	XRF LIFO free allocation service	OS	06
DFHWLG	Macro	XRF LIFO get storage request	OS	-
DFHWLGET	CSECT	XRF LIFO get allocation service	OS	06
DFHWLIST	CSECT	WORDLIST function (used by DFHDBME)	OS	06
DFHWMG1	CSECT	XRF message manager, GETMSG process	OS	06
DFHWMI	CSECT	XRF message manager, signon initialization routine	OS	06
DFHWMMT	CSECT	XRF message manager, I/O services	OS	06
DFHWMPG	CSECT	XRF message manager, data copying service	OS	06
DFHWMP1	CSECT	XRF message manager, PUTMSG process	OS	06
DFHWMQG	CSECT	XRF message manager, CICS TCB part of GETMSG processing	OS	06
DFHWMQH	CSECT	XRF message manager, message block services for GETMSG	OS	06
DFHWMQP	CSECT	XRF message manager, CICS TCB part of PUTMSG processing	OS	06
DFHWMQS	CSECT	XRF message manager, work queue services	OS	06
DFHWMRD	CSECT	XRF message manager, message reader	OS	06
DFHWMS	CSECT	XRF message manager, request interface	OS	06
DFHWMS20	CSECT	XRF message manager, request router	OS	06
DFHWMWR	CSECT	XRF message manager, output routine	OS	06
DFHWNFDS	DSECT	CAVM NOTIFY exit parameter block	OS	-
DFHWORDS	CSECT	WORDS function (used by DFHDBME)	OS	06
DFHWOS	CSECT	XRF overseer startup module	OS	06
DFHWOSA	CSECT	XRF overseer initialization module	OS	06
DFHWOSB	CSECT	XRF overseer services module	OS	06
DFHWOSM	Macro	XRF overseer interface definition	04	-
DFHWSADS	DSECT	CAVM surveillance status control block	OS	-
DFHWSCDS	DSECT	CAVM time-of-day difference control area	OS	-
DFHWSMDS	DSECT	CAVM state management record	OS	-
DFHWSNDS	DSECT	XRF table of entry points in load module DFHWSMS	OS	-
DFHWSRDS	DSECT	CAVM surveillance communication area	OS	-
DFHWSRTR	CSECT	CAVM state management request router and subtask entry point	OS	06
DFHWSSDS	DSECT	CAVM state management parameter block	OS	-
DFHWSSN1	CSECT	CAVM state management signon initial entry point	OS	06
DFHWSSN2	CSECT	CAVM state management signon request handler	OS	06
DFHWSSN3	CSECT	CAVM state management data set initialization routine	OS	06
DFHWSSOF	CSECT	CAVM state management sign-off request handler	OS	06
DFHWSSR	CSECT	CAVM surveillance status reader	OS	06
DFHWSSW	CSECT	CAVM surveillance status writer	OS	06

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Name	Type	Description	Library	
DFHWSTDS	DSECT	XRF takeover parameter area	OS	-
DFHWSTI	CSECT	CAVM surveillance tick generator and system status monitor	OS	06
DFHWSTKV	CSECT	CAVM state management takeover request handler	OS	06
DFHWSXDS	DSECT	NOTIFY exit control block	OS	-
DFHWSXPI	CSECT	CAVM state management CAVM process initialization	OS	06
DFHWS2DS	DSECT	Parameter list for DFHWSSN2	OS	-
DFHWS3DS	DSECT	Parameter list for DFHWSSN3	OS	-
DFHWTADS	DSECT	XRF takeover initiation argument block	OS	-
DFHWTI	CSECT	XRF takeover initiation program	OS	06
DFHWTIA	Source	XRF takeover initiation program - RST specific routines	OS	-
DFHWTIC	Source	XRF takeover initiation program - CLT specific routines	OS	-
DFHWTII	Source	XRF takeover initiation program - inquire job status	OS	-
DFHWTIJ	Source	XRF takeover initiation program - job termination/wait	OS	-
DFHWTO	Macro	Write to console operator	04	-
DFHWTRP	CSECT	XRF trace routine	OS	06
DFHXCALL	Macro	EXCI EXEC Interface	04	-
DFHXCDMP	CSECT (OCO)	EXCI dump services	-	06
DFHXCEIP	CSECT (OCO)	EXCI EXEC API handler	-	06
DFHXCO	Macro	EXCI EXEC options	04	-
DFHXCOPT	DSECT	EXCI options table	05	06
DFHXCP	CSECT	Transaction manager (part)	OS	06
DFHXCPLD	Sample	EXCI CALL parameter list (Assembler)	04	-
DFHXCPLH	Sample	EXCI CALL parameter list (C)	-	D3
DFHXCPLL	Sample	EXCI CALL parameter list (PL/I)	-	P2
DFHXCPLO	Sample	EXCI CALL parameter list (COBOL)	-	C2
DFHXCPRH	DSECT	EXCI program request handler	-	06
DFHXCRCD	Sample	EXCI return codes (Assembler)	04	-
DFHXCRCH	Sample	EXCI return codes (C)	D3	-
DFHXCRCL	Sample	EXCI return codes (PL/I)	P2	-
DFHXCRCO	Sample	EXCI return codes (COBOL)	C2	-
DFHXCSTB	CSECT	EXCI stub	-	06
DFHXCSVC	CSECT (OCO)	EXCI SVC services	-	06
DFHXCTAB	CSECT (OCO)	EXCI language table	-	06
DFHXCTRA	CSECT	EXCI global trap program	04	06
DFHXCTRD	DSECT	EXCI global trap program parameter list	04	-
DFHXCTRI	CSECT	EXCI trace initialization termination, and recovery	-	06
DFHXCTRP	CSECT	EXCI trace services	-	06
DFHXCURM	CSECT	EXCI user-replaceable module	05	06
DFHXDTDS	Sample	Data Table User Exits Parameter List	04	-
DFHXDXDF	CSECT	DU domain - transaction dump formatter for headers and general information	OS	06
DFHXFDL	Macro	DL/I function shipping	OS	-
DFHXFFC	Macro	FC function shipping	OS	-
DFHXFHED	Macro	Produce transformation program headings	OS	-
DFHXFIC	Macro	IC function shipping	OS	-
DFHXFIOA	DSECT	Transformer I/O area	OS	-
DFHXFJC	Macro	JC function shipping	OS	-

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Name	Type	Description	Library	
DFHXFMOD	Macro	Produce data transformation programs	OS	-
DFHXFP	CSECT	Online data transformation program	OS	06
DFHXFPC	Macro	DFHXFMOD inner macro	OS	-
DFHXFQ	CSECT	Batch data transformation program	OS	06
DFHXFQU	Macro	TD and TS function shipping	OS	-
DFHXFRM	Macro	Function shipping recovery module	-	06
DFHXFSM	Macro	DFHXFMOD inner macro	OS	-
DFHXFSTG	Macro	XF control block and transformer	04	-
DFHXFX	CSECT	Optimized data transformation program	OS	06
DFHXIS	Sample	XISCONA global user exit program	05	06
DFHXISDS	Sample	XISCONA data set information	05	-
DFHXLT	Macro	Transaction list table	04	-
DFHXLTDS	DSECT	Transaction list table	OS	-
DFHXMAB	CSECT (OCO)	XM domain - abend handler	-	06
DFHXMAT	CSECT (OCO)	XM domain - attach	-	06
DFHXMATA	Source	XMAT parameter list	OS	-
DFHXMATM	Source	XMAT request	OS	-
DFHXMATT	CSECT (OCO)	XMAT trace interpretation data	-	06
DFHXMBD	CSECT (OCO)	XM domain - browse	-	06
DFHXMBDA	Source	XMBD parameter list	OS	-
DFHXMBDM	Source	XMBD request	OS	-
DFHXMBDT	CSECT (OCO)	XMBD trace interpretation data	-	06
DFHXMBR	CSECT		-	06
DFHXMBRT	CSECT		-	06
DFHXMCDS	DSECT	XM domain - TCLASS statistics	04	-
DFHXMCDS	DSECT	XM domain - TCLASS statistics	C2	-
DFHXMCDS	DSECT	XM domain - TCLASS statistics	P2	-
DFHXMCL	CSECT (OCO)	XM domain - transaction class functions	-	06
DFHXMCLA	Source	XMCL parameter list	OS	-
DFHXMCLM	Source	XMCL request	OS	-
DFHXMCLT	CSECT (OCO)	XMCL trace interpretation data	-	06
DFHXMCLX	Macro	XMCL request	04	-
DFHXMCLY	DSECT	XMCL parameter list	04	-
DFHXMCS	CSECT		-	06
DFHXMCSA	CSECT		OS	-
DFHXMCSD	CSECT		OS	-
DFHXMCSI	CSECT		OS	-
DFHXMCSM	CSECT		OS	-
DFHXMCST	CSECT		-	06
DFHXMDD	CSECT (OCO)	XM domain - delete installed transaction	-	06
DFHXMDDA	Source	XMDD parameter list	OS	-
DFHXMDDM	Source	XMDD request	OS	-
DFHXMDDT	CSECT (OCO)	XMDD trace interpretation data	-	06
DFHXMDM	CSECT (OCO)	XM domain - pre-initialize, initialize, and quiesce domain functions	-	06
DFHXMDNA	Source	XMDN parameter list	OS	-
DFHXMDNT	CSECT	XMDN trace interpretation data	-	06
DFHXMDUF	CSECT (OCO)	Transaction manager SDUMP formatter	-	06
DFHXMER	CSECT (OCO)	XM domain - XMER gate functions	-	06
DFHXMERA	Source	XMER parameter list	OS	-
DFHXMERM	Source	XMER request	OS	-
DFHXMERT	CSECT	XMER trace interpretation data	-	06
DFHXMFD	CSECT (OCO)	XM domain - XMFD gate functions	-	06
DFHXMFDA	Source	XMFD parameter list	OS	-
DFHXMFDM	Macro	XMFD requests	OS	-
DFHXMFDT	CSECT (OCO)	XMFD trace interpretation data	-	06
DFHXMGDS	DSECT	XM domain - global statistics	04	-
DFHXMGDS	DSECT	XM domain - global statistics	C2	-
DFHXMGDS	DSECT	XM domain - global statistics	P2	-
DFHXMIQ	CSECT (OCO)	XM domain - XMIQ gate functions	-	06
DFHXMIQA	Source	XMIQ parameter list	OS	-
DFHXMIQI	Source	XMIQ request (inline form of DFHXMIQM)	OS	-
DFHXMIQM	Source	XMIQ requests	OS	-

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Name	Type	Description	Library	
DFHXMIQT	CSECT (OCO)	XMIQ trace interpretation data	-	06
DFHXMIQX	Macro	XMIQ requests	04	-
DFHXMIQY	DSECT	XMIQ parameter list	04	-
DFHXMLD	CSECT (OCO)	XM domain - XMLD gate functions	-	06
DFHXMLDA	Source	XMLD parameter list	OS	-
DFHXMLDM	Source	XMLD requests	OS	-
DFHXMLDT	CSECT	XMLD trace interpretation data	-	06
DFHXMNTA	DSECT	XMNT parameter list	OS	-
DFHXMNTT	CSECT	XMNT trace interpretation data	-	06
DFHXMPPA	DSECT	XMPP parameter list	OS	-
DFHXMPPT	CSECT	XMPP trace interpretation data	-	06
DFHXMQC	CSECT (OCO)	XM domain - tclass functions subroutine	-	06
DFHXMQCA	Source	XMQC parameter list	OS	-
DFHXMQCM	Source	XMQC request	OS	-
DFHXMQCT	CSECT	XMQC trace interpretation data	-	06
DFHXMQD	CSECT (OCO)	XM domain - quiesce & delete transaction definitions functions subroutine	-	06
DFHXMQDT	CSECT (OCO)	XMQD trace interpretation data	-	06
DFHXMRDS	DSECT	XM domain - transaction statistics	04	-
DFHXMRDS	DSECT	XM domain - transaction statistics	C2	-
DFHXMRDS	DSECT	XM domain - transaction statistics	P2	-
DFHXMRP	CSECT (OCO)	XM domain - definition recovery subroutine	-	06
DFHXMRPT	CSECT (OCO)	XMRP trace interpretation data	-	06
DFHXMRSD	DSECT (OCO)	XM domain - communications area for transaction restart (Assembler)	04	-
DFHXMRSH	DSECT (OCO)	XM domain - communications area for transaction restart (C/370)	D3	-
DFHXMRSL	DSECT (OCO)	XM domain - communications area for transaction restart (PL/I)	P2	-
DFHXMRSO	DSECT (OCO)	XM domain - communications area for transaction restart (COBOL)	C2	-
DFHXMSG	CSECT	Default XRF recovery message	OS	06
DFHXMSR	CSECT (OCO)	XM domain - XMSR gate functions	-	06
DFHXMSRA	Source	XMSR parameter list	OS	-
DFHXMSRM	Source	XMSR request	OS	-
DFHXMSRT	CSECT (OCO)	XMSR trace interpretation data	-	06
DFHXMSRX	Macro	XMSR request	04	-
DFHXMSRY	DSECT	XMSR parameter list	04	-
DFHXMST	CSECT (OCO)	XM domain - statistics services	-	06
DFHXMSUA	DSECT	XMSU parameter list	OS	-
DFHXMSUM	Macro	XMSU request	OS	-
DFHXMSUT	CSECT	XMSU trace interpretation data	OS	06
DFHXMTA	CSECT (OCO)	XM domain - task reply gate	-	06
DFHXMTRI	CSECT (OCO)	XM domain - trace initialization, termination, and recovery	-	06
DFHXMTRM	Macro	Obtain 3 character task number from TCA of task issuing trace put	OS	-
DFHXMXD	CSECT (OCO)	XM domain - XMXD gate functions	-	06
DFHXMXDA	Source	XMXD parameter list	OS	-
DFHXMXDD	Source	XMXD transaction definition instance parameter list	OS	-
DFHXMXDI	Source	XMXD request (inline form of DFHXMXDM)	OS	-
DFHXMXDM	Source	XMXD request	OS	-
DFHXMXDT	CSECT (OCO)	XMXD trace interpretation data	-	06
DFHXMXDX	Macro	XMXD request	04	-

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Name	Type	Description	Library	
DFHXMXDY	DSECT	XMXD parameter list	04	-
DFHXMXE	CSECT (OCO)	XM domain - XMXE gate functions	-	06
DFHXMXEA	Source	XMXE parameter list	OS	-
DFHXMXEM	Source	XMXE request	OS	-
DFHXMXET	CSECT (OCO)	XMXE trace interpretation data	-	06
DFHXMXND	CSECT (OCO)	XM domain - transaction storage	OS	-
DFHXQBF	CSECT	XQ queue server buffer pool routines	-	06
DFHXQCF	CSECT	XQ queue server coupling facility I/O	-	06
DFHXQCN	CSECT	XQ queue server connect/disconnect	-	06
DFHXQDF	CSECT	XQ TS queue pool server definitions	-	06
DFHXQIF	CSECT	XQ queue server interface module	-	06
DFHXQIQ	CSECT	XQ queue server inquire module	-	06
DFHXQMN	CSECT	XQ queue server mainline	-	06
DFHXQMS	CSECT	XQ queue pool server messages	-	06
DFHXQOP	CSECT	XQ queue server command processing	-	06
DFHXQPR	CSECT	XQ queue server parameter processing	-	06
DFHXQRL	CSECT	XQ queue server reload routine	-	06
DFHXQRQ	CSECT	XQ queue server request routine	-	06
DFHXQST	CSECT	XQ queue server statistics	-	06
DFHXQS1D	CSECT	XQ list structure statistics record	04	-
DFHXQS2D	CSECT	XQ queue buffer statistics record	04	-
DFHXQS3D	CSECT	XQ main storage statistics record	04	-
DFHXQUL	CSECT	XQ queue server unload routine	-	06
DFHXR	Macro	XRF code generation macro	04	-
DFHXRA	CSECT	XRF request processing program	OS	06
DFHXRB	CSECT	XRF NOTIFY exit program	OS	06
DFHXRC	CSECT	XRF inquire status exit program	OS	06
DFHXRCP	CSECT	XRF console communication program	OS	06
DFHXRDUF	CSECT (OCO)	XRF SDUMP formatter	-	06
DFHXRE	CSECT	XRF startup program	OS	06
DFHXRF	CSECT	XRF CAVM sign-off interface	OS	06
DFHXRHDS	DSECT	XRF health data definition	04	-
DFHXROCL	Other	Used by DFHCRST cataloged procedure	04	-
DFHXRSP	CSECT	XRF surveillance program	OS	06
DFHXRXDF	CSECT	DU domain - transaction dump formatter for XRF related areas	OS	06
DFHXSAD	CSECT (OCO)	XS domain - XSAD gate functions	-	06
DFHXSADA	Source	XSAD parameter list	OS	-
DFHXSADM	Source	XSAD request	OS	-
DFHXSADT	CSECT (OCO)	XSAD trace interpretation data	-	06
DFHXSDM	CSECT (OCO)	XS domain - initialize, quiesce, terminate domain functions	-	06
DFHXSDUF	CSECT (OCO)	XS domain - SDUMP formatter	-	06
DFHXSEAI	CSECT	Early verification stub program	-	06
DFHXSEV	CSECT (OCO)	XS domain - early verification support	-	06
DFHXSFL	CSECT (OCO)	XS domain - XSFL gate functions	-	06
DFHXSFLA	Source	XSFL parameter list	OS	-
DFHXSFLM	Source	XSFL request	OS	-
DFHXSFLT	CSECT (OCO)	XSFL trace interpretation data	-	06
DFHXSIDT	CSECT (OCO)	XS domain - trace interpretation data	-	06
DFHXSIS	CSECT (OCO)	XS domain - XSIS gate functions	-	06
DFHXSISA	Source	XSIS parameter list	OS	-
DFHXSISM	Source	XSIS request	OS	-
DFHXSIST	CSECT (OCO)	XSIS trace interpretation data	-	06
DFHXSLU	CSECT (OCO)	XS domain - XSLU gate functions	-	06

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Name	Type	Description	Library	
DFHXSLUA	Source	XSLU parameter list	OS	-
DFHXSLUM	Source	XSLU request	OS	-
DFHXSLUT	CSECT (OCO)	XSLU trace interpretation data	-	06
DFHXSPUB	DSECT (OCO)	XS domain - public storage fields	OS	-
DFHXSPW	CSECT (OCO)	XS domain - XSPW gate functions	-	06
DFHXSPWA	Source	XSPW parameter list	OS	-
DFHXSPWM	Source	XSPW request	OS	-
DFHXSPWT	CSECT (OCO)	XSPW trace interpretation data	-	06
DFHXSRC	CSECT (OCO)	XS domain - XSRC gate functions	-	06
DFHXSRCA	Source	XSRC parameter list	OS	-
DFHXSRCI	Source	XSRC request (inline form of DFHXSRCM)	OS	-
DFHXSRCM	Macro	XSRC requests	OS	-
DFHXSRCT	CSECT (OCO)	XSRC trace interpretation data	-	06
DFHXSSA	CSECT (OCO)	XS domain - supervisor request router	-	06
DFHXSSAT	CSECT (OCO)	XSSA trace interpretation data	-	06
DFHXSSB	CSECT (OCO)	XS domain - supervisor extraction services	-	06
DFHXSSBT	CSECT (OCO)	XSSB trace interpretation data	-	06
DFHXSSC	CSECT (OCO)	XS domain - resource checking functions	-	06
DFHXSSCT	CSECT (OCO)	XSSC trace interpretation data	-	06
DFHXSSD	CSECT (OCO)	XS domain - create passticket function	-	06
DFHXSSDT	CSECT (OCO)	XSSD trace interpretation data	-	06
DFHXSSI	CSECT (OCO)	XS domain - storage initialization	-	06
DFHXSSIT	CSECT (OCO)	XSSI trace interpretation data	-	06
DFHXSTRI	CSECT (OCO)	XS domain - trace initialization, termination, and recovery	-	06
DFHXSUXP	Macro	Installation data for ESM exits	04	-
DFHXSWM	CSECT	XRF message manager for security manager	OS	06
DFHXSWMA	CSECT	XSWM parameter list	OS	-
DFHXSWMM	Macro	XSWM request	OS	-
DFHXSXM	CSECT (OCO)	XS domain - XM domain interface	-	06
DFHXSXMA	DSECT	XSXM parameter list	OS	-
DFHXSXMI	Macro	XSXM requests (inline form)	OS	-
DFHXSXMM	Macro	XSXM requests	OS	-
DFHXSXMT	CSECT (OCO)	XSXM trace interpretation data	-	06
DFHXT	Macro	DFHXTP internal table generator	OS	-
DFHXTAB	Macro	BMS internal macro	04	-
DFHXTCI	CSECT	XRF terminal switching	OS	06
DFHXTENF	Sample	XICTENF/XALTENF global user exit program	05	06
DFHXTEP	CSECT	User-replaceable terminal error program	05	06
DFHXTEPT	CSECT	User-replaceable terminal error tables	05	06
DFHXTP	CSECT	Terminal sharing transformation program	OS	06
DFHXTPD	DSECT	XTP internal control blocks	OS	-
DFHXTSTG	Macro	XTP parameter list	OS	-
DFHXTT	Source	XTP data transformation argument descriptions (used by DFHXT macro)	OS	-
DFHXTTT	Macro	DFHXTT inner macro	OS	-
DFHXZIDS	DSECT	XZIQUE exit data set information	04	-
DFHYITDL	Other	Cataloged procedure to translate, compile, and link-edit Language Environment/370 C application programs	03	-
DFHYITEL	Other	Cataloged procedure to translate, compile, and link-edit C++ application programs using the LE/370 compiler	03	-

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Name	Type	Description	Library	
DFHYITPL	Other	Cataloged procedure to translate, compile, and link-edit Language Environment/370 PL/I application programs	03	-
DFHYITVL	Other	Cataloged procedure to translate, compile, and link-edit Language Environment/370 VS COBOL application programs	03	-
DFHYXTDL	Other	Cataloged procedure to translate, compile, and link-edit Language Environment/370 C application programs that are to use the external CICS interface	03	-
DFHYXTEL	Other	Cataloged procedure to translate (EXCI), compile, and link-edit C++ application programs using the LE/370 compiler	03	-
DFHYXTPL	Other	Cataloged procedure to translate, compile, and link-edit Language Environment/370 PL/I application programs that are to use the external CICS interface	03	-
DFHYXTVL	Other	Cataloged procedure to translate, compile, and link-edit Language Environment/370 VS COBOL application programs that are to use the external CICS interface	03	-
DFHZABD	CSECT	No VTAM support abend handler	OS	06
DFHZACT	CSECT	Activate scan	OS	06
DFHZAIT	CSECT	Attach initialization table	OS	-
DFHZAND	CSECT	Abend control block	OS	06
DFHZAPB	Sample	3770 application program	05	-
DFHZARER	CSECT	LU6.2 protocol error and exception handler	OS	06
DFHZARL	CSECT	LU6.2 application request logic	OS	06
DFHZARM	CSECT	LU6.2 migration logic	OS	06
DFHZARQ	CSECT	Application request handler	OS	06
DFHZARR	CSECT	LU6.2 application receive request logic	OS	06
DFHZARRA	CSECT	LU6.2 application receive buffer support	OS	06
DFHZARRC	CSECT	LU6.2 classify what next to receive	OS	06
DFHZARRF	CSECT	LU6.2 receive FMH7 and ER1	OS	06
DFHZASX	CSECT	DFASY exit	OS	06
DFHZATA	CSECT	Autoinstall program	OS	06
DFHZATD	CSECT	Autoinstall delete program	OS	06
DFHZATDX	CSECT	User-replaceable autoinstall exit	05	06
DFHZATDY	CSECT	User-replaceable autoinstall exit with APPC	05	06
DFHZATI	CSECT	Automatic task initiation	OS	06
DFHZATMD	CSECT	Automatic terminal remote definition program	-	06
DFHZATMF	CSECT	Mass flag program for time-out delete	-	06
DFHZATR	CSECT	Autoinstall restart program	OS	06
DFHZATS	CSECT	Remote autoinstall/delete program	OS	06
DFHZATT	CSECT	Task attach	OS	06
DFHZBAN	CSECT	Terminal control bind analysis	OS	06
DFHZBKT	CSECT	LU6.2 bracket state machine	OS	06
DFHZBLX	CSECT	VTAM SCIP exit LU6.2 bind handling	OS	06
DFHZBSM	Macro	LU6.2 bracket state macro	OS	-
DFHZCA	CSECT	VTAM working set module	OS	06

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Name	Type	Description	Library	
DFHZCB	CSECT	VTAM working set module	OS	06
DFHZCC	CSECT	VTAM working set module	OS	06
DFHZCGRP	CSECT (OCO)	Attach CGRP task (for DFHZGRP)	-	06
DFHZCHM	Macro	LU6.2 chain state macro	OS	-
DFHZCHS	CSECT	LU6.2 chain state machine	OS	06
DFHZCLS	CSECT	CLSDST	OS	06
DFHZCLX	CSECT	CLSDST exit	OS	06
DFHZCNA	CSECT	System console activity control	OS	06
DFHZCNM	Macro	LU6.2 contention state macro	OS	-
DFHZCNR	CSECT	System console application request	OS	06
DFHZCNT	CSECT	LU6.2 contention state machine	OS	06
DFHZCNVM	Macro	MRO application state setting	OS	-
DFHZCN1	CSECT	CICS Client CCIN Transaction	-	06
DFHZCN2	CSECT	CICS Client CCIN ZC domain subroutine	-	06
DFHZCN2T	DSECT	ZCN2 translate tables	-	06
DFHZCTR1	CSECT	ZC CICS Client trace interpretation	-	06
DFHZCOVR	CSECT	Terminal control open VTAM retry	-	06
DFHZCP	CSECT	Terminal management program	OS	06
DFHZCPBK	Macro	Bracket control	OS	-
DFHZCPLR	CSECT	PL/AS call for TCPLR	OS	06
DFHZCQ	Macro	Terminal control install interface	04	-
DFHZCQCH	CSECT	Catalog a TCT element	OS	06
DFHZCQDL	CSECT	Dynamic delete TCT element	OS	06
DFHZCQIN	CSECT	Initialize DFHZCQ	OS	06
DFHZCQIQ	CSECT	Inquire about a TCTTE	OS	06
DFHZCQIS	CSECT	Install a TCTTE	OS	06
DFHZCQRS	CSECT	Restore a terminal control resource	OS	06
DFHZCQRT	CSECT	ZC resource types table	OS	06
DFHZCQ00	CSECT	Dynamic add/replace TCT elements	OS	06
DFHZCRM	Macro	LU6.2 RPL_B state macro	OS	-
DFHZCRQ	CSECT	CTYPE command request	OS	06
DFHZCRT	CSECT	LU6.2 RPL_B state machine	OS	06
DFHZCSTP	CSECT	Attach CSTP (TCP task)	OS	06
DFHZCTDX	Sample	Autoinstall user exit - COBOL	C3	-
DFHZCTRI	CSECT	Persistent sessions trace interpreter	-	06
DFHZCT1	CSECT	CICS Client CTIN transaction	-	06
DFHZCUT	CSECT	Persistent verification signed-on-from list management program	OS	06
DFHZCUTA	DSECT	ZCUT parameter list	OS	-
DFHZCUTM	Macro	ZCUT request	OS	-
DFHZCUTT	CSECT	ZCUT trace interpretation data	OS	06
DFHZCW	CSECT	VTAM nonworking set module	OS	06
DFHZCX	CSECT	LOCATE, ISC/IRC request	OS	06
DFHZCXR	CSECT	Transaction routing module address list	OS	06
DFHZCY	CSECT	VTAM nonworking set module	OS	06
DFHZCZ	CSECT	VTAM nonworking set module	OS	06
DFHZDET	CSECT	Task detach	OS	06
DFHZDSP	CSECT	Dispatcher	OS	06
DFHZDST	CSECT	SNA-ASCII translator	OS	06
DFHZDTDX	Sample	Autoinstall user exit - C/370	D2	-
DFHZEMW	CSECT	Error message writer	OS	06
DFHZEPD	DSECT	TCP/ZCP module entry address list	04	-
DFHZEQU	Symbolic	ZCP equates	04	-
DFHZERH	CSECT	LU6.2 error program	OS	06
DFHZERRM	Macro	ZCP error-handling macro	OS	-

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Name	Type	Description	Library	
DFHZETR	Macro	ZC VTAM exit GTF trace macro	OS	-
DFHZEV1	CSECT	LU6.2 security encryption program part 1	OS	06
DFHZEV2	CSECT	LU6.2 security encryption program part 2	OS	06
DFHZFRE	CSECT	FREEMAIN request	OS	06
DFHZGAI	CSECT (OCO)	APPC autoinstall - create APPC clones	-	06
DFHZGAIA	Source	ZGAI parameter list	OS	-
DFHZGAIM	Source	ZGAI request	OS	-
DFHZGAIT	CSECT	ZGAI trace interpretation data	OS	06
DFHZGBM	CSECT (OCO)	APPC manipulate bitmap	-	06
DFHZGBMA	Source	ZGBM parameter list	OS	-
DFHZGBMM	Source	ZGBM request	OS	-
DFHZGBMT	CSECT (OCO)	ZGBM trace interpretation data	-	06
DFHZGCA	CSECT (OCO)	LU6.2 CNOS actioning	-	06
DFHZGCAA	Source	ZGCA parameter list	OS	-
DFHZGCAM	Source	ZGCA request	OS	-
DFHZGCAT	CSECT (OCO)	ZGCA trace interpretation data	-	06
DFHZGCC	CSECT (OCO)	Catalog CNOS services	-	06
DFHZGCCA	Source	ZGCC parameter list	OS	-
DFHZGCCM	Source	ZGCC request	OS	-
DFHZGCCT	CSECT (OCO)	ZGCC trace interpretation data	-	06
DFHZGCH	CSECT	ZC VTAM change macro domain subroutine	-	06
DFHZGCHA	CSECT	ZGCH parameter list	OS	-
DFHZGCHM	Macro	ZGCH request	OS	-
DFHZGCHT	DSECT	ZGCH translate tables	OS	06
DFHZGCN	CSECT (OCO)	LU6.2 CNOS negotiation	-	06
DFHZGCNA	Source	ZGCN parameter list	OS	-
DFHZGCNM	Source	ZGCN request	OS	-
DFHZGCNT	CSECT (OCO)	ZGCN trace interpretation data	-	06
DFHZGDA	CSECT (OCO)	VTAM persistent sessions deallocate abend functions	-	06
DFHZGDAA	Source	ZGDA parameter list	OS	-
DFHZGDAM	Macro	ZGDA requests	04	-
DFHZGDAT	CSECT (OCO)	ZGDA trace interpretation data	-	06
DFHZGDCD	CSECT	Terminal control subroutine constants	OS	-
DFHZGET	CSECT	GETMAIN request	OS	06
DFHZGIN	CSECT	ZC VTAM INQUIRE domain subroutine	-	06
DFHZGINA	CSECT	ZGIN parameter list	OS	-
DFHZGINM	Macro	ZGIN request	OS	-
DFHZGINT	DSECT	ZGIN translate tables	-	06
DFHZGPC	CSECT (OCO)	LU6.2 recover CNOS values for modegroups	-	06
DFHZGPCA	Source	ZGPC parameter list	OS	-
DFHZGPCM	Source	ZGPC request	OS	-
DFHZGPCT	CSECT (OCO)	ZGPC trace interpretation data	-	06
DFHZGPR	CSECT (OCO)	VTAM persistent sessions resource handler	-	06
DFHZGPRA	Source	ZGPR parameter list	OS	-
DFHZGPRI	Source	ZGPR request (inline form of DFHZGPRM)	OS	-
DFHZGPRM	Source	ZGPR request	OS	-
DFHZGPRT	CSECT (OCO)	ZGPR trace interpretation data	-	06
DFHZGRP	CSECT (OCO)	VTAM persistent sessions initialization	-	06
DFHZGRPA	Source	ZGRP parameter list	OS	-
DFHZGRPD	Source	ZGRP control blocks	OS	-
DFHZGRPM	Source	ZGRP request	OS	-
DFHZGRPT	CSECT (OCO)	ZGRP trace interpretation data	-	06
DFHZGSL	CSECT (OCO)	VTAM persistent sessions set logon	-	06
DFHZGSLA	Source	ZGSL parameter list	OS	-

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Name	Type	Description	Library	
DFHZGSLM	Source	ZGSL request	OS	-
DFHZGSLT	CSECT (OCO)	ZGSL trace interpretation data	-	06
DFHZGTA	CSECT	ZC TMP table alter gate	-	06
DFHZGTAA	CSECT	ZGTA parameter list	OS	-
DFHZGTAM	Macro	ZGTA request	OS	-
DFHZGTAT	DSECT	ZGTA translate tables	-	06
DFHZGTI	CSECT	ZC TMP table inquire gate	-	06
DFHZGTIA	CSECT	ZGTI parameter list	OS	-
DFHZGTIC	CSECT	ZGTI create copybook	OS	-
DFHZGTIM	Macro	ZGTI request	OS	-
DFHZGTIT	DSECT	ZGTI translate tables	-	06
DFHZGTRT	DSECT	ZGTR translate tables	-	06
DFHZGUB	CSECT (OCO)	VTAM persistent sessions terminate	-	06
DFHZGUBA	Source	ZGUB parameter list	OS	-
DFHZGUBM	Source	ZGUB request	OS	-
DFHZGUBT	CSECT (OCO)	ZGUB trace interpretation data	-	06
DFHZGURD	CSECT (OCO)	VTAM persistent sessions URD table	OS	-
DFHZGXA	CSECT	LU6.2 extended attach security	-	06
DFHZGXAA	DSECT	ZGXA parameter list	OS	-
DFHZGXAM	Macro	ZGXA requests	OS	-
DFHZGXAT	CSECT	ZGXA trace interpretation data	OS	06
DFHZHPCH	Macro	Generate authorized path CHECK or CHECK macro	OS	-
DFHZHPDS	DSECT	ZCP call plist for initialization of SRB facility (HPO)	OS	-
DFHZHPRV	Macro	Generate authorized path RECEIVE or RECEIVE macro	OS	-
DFHZHPRX	CSECT	Authorized path SRB mode VTAM EXECRPL	OS	06
DFHZHPSD	Macro	Generate authorized path SEND or SEND macro	OS	-
DFHZHPSR	CSECT	Authorized path SRB requests	OS	06
DFHZINT	Source	Terminal control initialization	OS	-
DFHZISP	CSECT	Allocate/free/point	OS	06
DFHZIS1	CSECT	Prepare/SPR/commit/abend	OS	06
DFHZIS2	CSECT	IRC internal requests	OS	06
DFHZLEX	CSECT	LERAD exit	OS	06
DFHZLGX	CSECT	Logon exit	OS	06
DFHZLOC	CSECT	Locate	OS	06
DFHZLRP	CSECT	Logical record presentation	OS	06
DFHZLS1	CSECT	LU6.2 CNOS request transaction program	-	06
DFHZLS1M	Macro	LU6.2 CNOS request	OS	-
DFHZLTX	CSECT	LOSTERM exit	OS	06
DFHZMJM	Macro	NACP sense code table generation macro	OS	-
DFHZNAC	CSECT	Node abnormal condition program (NACP)	OS	06
DFHZNCA	CSECT	NACP message table generator	OS	-
DFHZNCE	CSECT	NACP interface to NEP	OS	-
DFHZNCM	Macro	NACP message table generation macro	OS	-
DFHZNCS	CSECT	Sense code analysis	OS	-
DFHZNCV	CSECT	VTAM return code analysis	OS	-
DFHZNEPI	Macro	NEP interface generator	04	-
DFHZNEPX	Source	Translated command-level default NEP	05	-
DFHZNEP0	CSECT	User-replaceable node error program	05	06
DFHZNSET	Other	SMP/E zone setter (used by cataloged procedures)	04	-
DFHZNSP	CSECT	VTAM services procedure error exit	OS	06

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Name	Type	Description	Library	
DFHZOPA	CSECT	Dynamic VTAM open	OS	06
DFHZOPN	CSECT	OPNDST	OS	06
DFHZOPX	CSECT	OPNDST exit	OS	06
DFHZPTDX	Sample	Autoinstall user exit - PL/I	P3	-
DFHZQUE	CSECT	Attach chain and queue subroutine	OS	06
DFHZRAC	CSECT	Receive-any completion	OS	06
DFHZRAQ	CSECT	Read ahead queuing	OS	06
DFHZRAR	CSECT	Read ahead retrieval	OS	06
DFHZRAS	CSECT	Receive-any slowdown processing	OS	06
DFHZRBDS	DSECT	LU6.2 application receive set buffer hdr	OS	-
DFHZRLP	CSECT	LU6.2 post-VTAM receive logic	OS	06
DFHZRLX	CSECT	LU6.2 receive exit program	OS	06
DFHZRPL	Source	TC build receive-any RPLs	OS	-
DFHZRQM	Macro	Add element to RPL completion queue	04	-
DFHZRRX	CSECT	Release request exit	OS	06
DFHZRSP	CSECT	Resync send program	OS	06
DFHZRST	CSECT	RESETSR	OS	06
DFHZRSY1	CSECT	VTAM LU6.1 resynchronization	-	06
DFHZRSY2	CSECT	VTAM LU6.1 resynchronization	-	06
DFHZRSY3	CSECT	VTAM LU6.1 resynchronization	-	06
DFHZRSY4	CSECT	VTAM LU6.1 resynchronization	-	06
DFHZRSY5	CSECT	VTAM LU6.1 resynchronization	-	06
DFHZRSY6	CSECT	VTAM LU6.1 resynchronization	-	06
DFHZRTRI	CSECT	VTAM LU6.1 resynchronization trace interpretation	-	06
DFHZRVL	CSECT	LU6.2 pre-VTAM receive logic	OS	06
DFHZRVS	CSECT	Receive specific	OS	06
DFHZRVX	CSECT	Receive specific exit	OS	06
DFHZSAX	CSECT	Send DFASY exit	OS	06
DFHZSCX	CSECT	Session control input exit	OS	06
DFHZSDA	CSECT	Send asynchronous command	OS	06
DFHZSDL	CSECT	LU6.2 send logic	OS	06
DFHZSDR	CSECT	Send response	OS	06
DFHZSDS	CSECT	Send DFSYN	OS	06
DFHZSDX	CSECT	Send DFSYN data exit	OS	06
DFHZSES	CSECT	SESSIONC	OS	06
DFHZSEX	CSECT	SESSIONC exit	OS	06
DFHZSHU	CSECT	Checks shutdown status for VTAM terminals	OS	06
DFHZSIM	CSECT	SIMLOGON	OS	06
DFHZSIX	CSECT	SIMLOGON exit	OS	06
DFHZSKR	CSECT	Command response	OS	06
DFHZSLDS	Symbolic	Send list data structure	04	-
DFHZSLS	CSECT	Set logon start	OS	06
DFHZSLX	CSECT	LU6.2 send exit program	OS	06
DFHZSSX	CSECT	Send DFSYN exit	OS	06
DFHZSTAM	Macro	DFHZSTAP interface	OS	-
DFHZSTAP	CSECT	Conversation state determination	OS	06
DFHZSTU	CSECT	Terminal control status change	OS	06
DFHZSUP	CSECT	Startup task	OS	06
DFHZSYN	CSECT	VTAM recovery module	OS	06
DFHZSYX	CSECT	SYNAD exit	OS	06
DFHZS1DS	DSECT	ZC SUBPOOL_TOKENs table	OS	-
DFHZTAX	CSECT	Turnaround exit	OS	06
DFHZTPX	CSECT	TPEND exit	OS	06

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Name	Type	Description	Library	
DFHZTR	Macro	ZCP trace macro	04	-
DFHZTRA	CSECT	VTAM trace module	OS	06
DFHZTSP	CSECT	Terminal sharing program	OS	06
DFHZUCT	CSECT	Uppercase translate	OS	06
DFHZUIX	CSECT	User input exit	OS	06
DFHZUSR	CSECT	LU6.2 conversation state machine	OS	06
DFHZUSRM	Macro	LU6.2 conversation state macro	OS	-
DFHZXCU	CSECT	VTAM XRF catch-up transaction	OS	06
DFHZXDUF	CSECT (OCO)	XRF ZCP queue SDUMP formatter	-	06
DFHZXPS	CSECT	VTAM persistent sessions APPC recovery	-	06
DFHZXQO	CSECT	XRF ZCP tracking queue organizer	OS	06
DFHZXQOS	Symbolic	DFHZXQO internal control blocks	OS	-
DFHZXRC	CSECT	XRF and Persistent sessions state data analysis	OS	06
DFHZXRE0	CSECT	VTAM reconnect transaction	OS	06
DFHZXRL	CSECT	Transaction routing - LU6.2 command processor, AOR	OS	06
DFHZXRPL	Macro	Clear RPL	OS	-
DFHZXRT	CSECT	Transaction routing - LU6.2 command processor, TOR	OS	06
DFHZXS	Macro	Interface to DFHZXST	OS	-
DFHZXST	CSECT	XRF ZCP session-state tracking	OS	06
DFHZXSTS	CSECT	SETLOGON routine	OS	06
DFH0AZBC	Sample	FEPI sample: CICS back-end application	05	-
DFH0AZBI	Sample	FEPI sample: IMS back-end application	05	-
DFH0AZPA	Sample	FEPI sample: SLU P pseudo-conversational program (Assembler)	05	-
DFH0AZPS	Sample	FEPI sample: SLU P one-out one-in program (Assembler)	05	-
DFH0AZQS	Sample	FEPI sample: STSN processing	05	-
DFH0AZTD	Sample	FEPI sample: 3270 data stream pass through	05	-
DFH0AZXS	Sample	FEPI sample: setup program (Assembler)	05	-
DFH0BAT1	Sample	Batch enabling sample BAT1 - disable transactions coordinator	C3	-
DFH0BAT2	Sample	Batch enabling sample BAT2 - inquire retained locks coordinator	C3	-
DFH0BAT3	Sample	Batch enabling sample BAT3 - force retained locks coordinator	C3	-
DFH0BAT4	Sample	Batch enabling sample BAT1 - disable transactions program	C3	-
DFH0BAT5	Sample	Batch enabling sample BAT2 - inquire retained locks program	C3	-
DFH0BAT6	Sample	Batch enabling sample BAT3 - force indoubt UOWs program	C3	-
DFH0BAT7	Sample	Batch enabling sample BAT2 - retry backout failures program	C3	-
DFH0BAT8	Sample	Batch enabling sample BAT3 - forcibly release locks program	C3	-
DFH0BCA	Sample	CUA communication area layout - COBOL	C3	-
DFH0BCR	Sample	CUA customer record layout - COBOL	C3	-
DFH0BC11	Sample	Batch enabling sample BAT1 - disable transactions TS queue	C3	-
DFH0BC12	Sample	Batch enabling sample BAT1 - disable transactions commarea	C3	-

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Name	Type	Description	Library	
DFH0BC21	Sample	Batch enabling sample BAT2 - inquire retained locks TS queue	C3	-
DFH0BC22	Sample	Batch enabling sample BAT2 - inquire retained locks commarea	C3	-
DFH0BC23	Sample	Batch enabling sample BAT2 - inquire retained locks map texts	C3	-
DFH0BC31	Sample	Batch enabling sample BAT3 - force retained locks TS queue	C3	-
DFH0BC32	Sample	Batch enabling sample BAT3 - force retained locks commarea	C3	-
DFH0BFKT	Sample	CUA variable function key layout - COBOL	C3	-
DFH0BFPD	Sample	CUA redefinition of file pull-down - COBOL	C3	-
DFH0BHP	Sample	CUA redefinition of help pop-up - COBOL	C3	-
DFH0BHPD	Sample	CUA redefinition of help pull-down - COBOL	C3	-
DFH0BHR	Sample	CUA help text TS queue layout - COBOL	C3	-
DFH0BHT	Sample	CUA help file key table - COBOL	C3	-
DFH0BLST	Sample	CUA redefinition of list base panel - COBOL	C3	-
DFH0BMSG	Sample	CUA application message table - COBOL	C3	-
DFH0BM1	Sample	Batch enabling sample BAT1 - disable transactions BMS mapset	05	-
DFH0BM1O	Sample	Batch enabling sample BAT1 - disable transactions BMS mapset	C3	-
DFH0BM2	Sample	Batch enabling sample BAT2 - inquire retained locks BMS mapset	05	-
DFH0BM2O	Sample	Batch enabling sample BAT2 - inquire retained locks BMS mapset	C3	-
DFH0BM3	Sample	Batch enabling sample BAT3 - force retained locks BMS mapset	05	-
DFH0BM3O	Sample	Batch enabling sample BAT3 - force retained locks BMS mapset	C3	-
DFH0BRT	Sample	CUA program routing control table - COBOL	C3	-
DFH0BTSQ	Sample	CUA TS queue details layout - COBOL	C3	-
DFH0BZCA	Sample	FEPI sample: system definition and customization (Assembler)	05	-
DFH0BZCC	Sample	FEPI sample: system definition and customization (C/370)	D2	-
DFH0BZCO	Sample	FEPI sample: system definition and customization (COBOL)	C3	-
DFH0BZCP	Sample	FEPI sample: system definition and customization (PL/I)	P3	-
DFH0BZMA	Sample	FEPI sample: messages & text (Assembler)	05	-
DFH0BZMC	Sample	FEPI sample: messages & text (C/370)	D2	-
DFH0BZMO	Sample	FEPI sample: messages & text (COBOL)	C3	-
DFH0BZMP	Sample	FEPI sample: messages & text (PL/I)	P3	-
DFH0BZ1O	Sample	FEPI sample: front-end terminal map (COBOL)	C3	-
DFH0BZ2O	Sample	FEPI sample: front-end terminal map (COBOL)	C3	-
DFH0BZ3A	Sample	FEPI sample: front-end terminal map (Assembler)	05	-
DFH0BZ4O	Sample	FEPI sample: front-end terminal map (COBOL)	C3	-
DFH0BZ5O	Sample	FEPI sample: front-end terminal map (COBOL)	C3	-
DFH0BZ6C	Sample	FEPI sample: front-end terminal map (C/370)	D2	-
DFH0BZ7P	Sample	FEPI sample: front-end terminal map (PL/I)	P3	-
DFH0BZ8A	Sample	FEPI sample: front-end terminal map	05	-
DFH0BZ9A	Sample	FEPI sample: front-end terminal map	05	-

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Name	Type	Description	Library	
DFH0CALL	Sample	Inquiry/update - COBOL	C3	-
DFH0CBDC	Sample	CSD backup program - COBOL	C3	-
DFH0CBRD	Sample	Sample bridge exit common area	C3	-
DFH0CBRE	Sample	Sample bridge exit	C3	-
DFH0CBRF	Sample	Sample bridge formatter	C3	-
DFH0CBRU	Sample	Sample bridge exit user area	C3	-
FH0CBRW	Sample	Browse - COBOL	C3	-
DFH0CCOM	Sample	Order entry queue print - COBOL	C3	-
DFH0CESD	Sample	Shutdown assist program - COBOL	C3	-
DFH0CFIL	Sample	Customer file (FILEA) record layout - COBOL	C3	-
DFH0CGAU	Sample		05	-
DFH0CGBU	Sample		05	-
DFH0CGCU	Sample		05	-
DFH0CGDU	Sample		05	-
DFH0CGKU	Sample		05	-
DFH0CGLU	Sample		05	-
DFH0CGPU	Sample		05	-
DFH0CLOG	Sample	Audit trail (log) record layout - COBOL	C3	-
DFH0CL86	Sample	Order entry queue record layout - COBOL	C3	-
DFH0CMA	Sample	Operator instructions map set - COBOL	05	-
DFH0CMB	Sample	Customer details map set - COBOL	05	-
DFH0CMC	Sample	File browse map set - COBOL	05	-
DFH0CMD	Sample	Low balance inquiry map set - COBOL	05	-
DFH0CMK	Sample	Order entry map set - COBOL	05	-
DFH0CML	Sample	Order report map set - COBOL	05	-
DFH0CMNU	Sample	Operator instructions - COBOL	C3	-
DFH0CMP	Sample	Keystroke overlap/look-aside query - map set - COBOL	05	-
DFH0CPKO	Sample	Keystroke overlap - COBOL	C3	-
DFH0CPLA	Sample	Look-aside query - COBOL	C3	-
DFH0CREN	Sample	Order entry - COBOL	C3	-
DFH0CREP	Sample	Low balance inquiry - COBOL	C3	-
DFH0CRFC	Sample	CSD cross-reference program - COBOL	C3	-
DFH0CXCC	Sample	Keystroke overlap - COBOL	C3	-
DFH0CZTK	Sample	FEPI sample: keystroke CONVERSE program (C/370)	D2	-
DFH0CZXS	Sample	FEPI sample: setup program (C/370)	D2	-
DFH0DCUS	Sample	CUA customer details file contents	09	-
DFH0DHLP	Sample	CUA help file contents	08	-
DFH0DLCC	Sample	CICS-DL/I program (CALL) - COBOL	C3	-
DFH0DLCE	Sample	CICS-DL/I program (EXEC) - COBOL	C3	-
DFH0FORC	Sample	DB2 formatting program - COBOL	C3	-
DFH0GMAP	Sample	Sample goodnight program map set	C3	-
DFH0GNIT	Sample	Sample goodnight transaction	C3	-
DFH0IZRI	Sample	FEPI sample: RDO data for back-end IMS	05	-
DFH0IZRQ	Sample	FEPI sample: RDM data for front-end CICS	05	-
DFH0JCUS	Other	JCL to create CUA customer details file	02	-
DFH0JHLP	Other	JCL to create CUA help file	02	-
DFH0MAB	Sample	CUA abend handling - map set - COBOL	05	-
DFH0MABT	Sample	CUA about the sample application pop-up - map set - COBOL	05	-
DFH0MBRW	Sample	CUA browse customer details, base panel - map set - COBOL	05	-
DFH0MDEL	Sample	CUA delete a customer record, base panel - map set - COBOL	05	-
DFH0MFPD	Sample	CUA file pull-down - map set - COBOL	05	-
DFH0MHLP	Sample	CUA help stub full-screen pop-up - map set - COBOL	05	-
DFH0MHP	Sample	CUA contextual help pop-up - map set - COBOL	05	-
DFH0MHPD	Sample	CUA help pull-down - map set - COBOL	05	-
DFH0MLST	Sample	CUA list processing, base panel - map set - COBOL	05	-
DFH0MNEW	Sample	CUA new customer record, base panel - map set - COBOL	05	-

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Name	Type	Description	Library	
DFH0MOPN	Sample	CUA file open pop-up - map set - COBOL	05	-
DFH0MPRT	Sample	CUA print pop-up - map set - COBOL	05	-
DFH0MSAS	Sample	CUA save changed customer record pop-up - map set - COBOL	05	-
DFH0MT1	Sample	CUA primary panel for sample application - map set - COBOL	05	-
DFH0MUPD	Sample	CUA update customer details, base panel - map set - COBOL	05	-
DFH0MZ1	Sample	FEPI sample: keystroke CONVERSE map (COBOL)	05	-
DFH0MZ2	Sample	FEPI sample: send/start & receive map (COBOL)	05	-
DFH0MZ3	Sample	FEPI sample: map for back-end CICS application (Assembler)	05	-
DFH0MZ4	Sample	FEPI sample: SLU P one-out one-in map (COBOL)	05	-
DFH0MZ5	Sample	FEPI sample: SLU P pseudo-conversational map (COBOL)	05	-
DFH0MZ6	Sample	FEPI sample: keystroke CONVERSE map (C/370)	05	-
DFH0MZ7	Sample	FEPI sample: keystroke CONVERSE map (PL/I)	05	-
DFH0MZ8	Sample	FEPI sample: SLU P one-out one-in map (Assembler)	05	-
DFH0MZ9	Sample	FEPI sample: SLU P pseudo-conversational map (Assembler)	05	-
DFH0PS	Sample	Keystroke overlap/look-aside query - partition set - COBOL	05	-
DFH0PZTK	Sample	FEPI sample: keystroke CONVERSE program (PL/I)	P3	-
DFH0SET	Sample	Menu map for sample application	05	-
DFH0SINX	Sample	Rebuild primer index from master file	C3	-
DFH0SIXR	Sample	Name index record for sample application	C3	-
DFH0SREC	Sample	Account file record for sample application	C3	-
DFH0STAT	Sample	Collect and print statistics - COBOL	C3	-
DFH0STM	Sample	Collect and print stats map set - COBOL	05	-
DFH0STS	Sample	Statistics sample mapset - report selection	05	-
DFH0S00	Sample	Online account menu sample program	C3	-
DFH0S01	Sample	File inquire for sample application	C3	-
DFH0S02	Sample	File update for sample application	C3	-
DFH0S03	Sample	Print customer record for sample application	C3	-
DFH0S04	Sample	Error routine for sample application	C3	-
DFH0VAB	Sample	CUA abend handler - COBOL	C3	-
DFH0VABT	Sample	CUA about pop-up handler - COBOL	C3	-
DFH0VBRW	Sample	CUA browse customer details processing - COBOL	C3	-
DFH0VDEL	Sample	CUA delete customer details processing - COBOL	C3	-
DFH0VDQ	Sample	CUA temporary-storage cleanup - COBOL	C3	-
DFH0VHLP	Sample	CUA help pop-up handler - COBOL	C3	-
DFH0VHP	Sample	CUA contextual help pop-up handler - COBOL	C3	-
DFH0VLIO	Sample	CUA help file handler - COBOL	C3	-
DFH0VLST	Sample	CUA list panel handler - COBOL	C3	-
DFH0VNEW	Sample	CUA new customer panel processing - COBOL	C3	-
DFH0VOL	Sample	CUA overlay handler - COBOL	C3	-
DFH0VOPN	Sample	CUA file open pop-up handler - COBOL	C3	-
DFH0VPRT	Sample	CUA print pop-up handler - COBOL	C3	-
DFH0VRIO	Sample	CUA customer detail file handler - COBOL	C3	-

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Name	Type	Description	Library	
DFH0VSAS	Sample	CUA save customer details pop-up handler - COBOL	C3	-
DFH0VTBL	Sample	CUA table router - COBOL	C3	-
DFH0VT1	Sample	CUA primary panel processing - COBOL	C3	-
DFH0VUPD	Sample	CUA update customer record processing - COBOL	C3	-
DFH0VZPA	Sample	FEPI sample: SLU P pseudo-conversational program (COBOL)	C3	-
DFH0VZPS	Sample	FEPI sample: SLU P one-out one-in program (COBOL)	C3	-
DFH0VZQS	Sample	FEPI sample: STSN handler (COBOL)	C3	-
DFH0VZTD	Sample	FEPI sample: 3270 data stream pass through (COBOL)	C3	-
DFH0VZTK	Sample	FEPI sample: keystroke CONVERSE program (COBOL)	C3	-
DFH0VZTR	Sample	FEPI sample: screen image RECEIVE & EXTRACT FIELD (COBOL)	C3	-
DFH0VZTS	Sample	FEPI sample: screen image SEND & START (COBOL)	C3	-
DFH0VZUC	Sample	FEPI sample: begin session handler (COBOL)	C3	-
DFH0VZUU	Sample	FEPI sample: end session handler (COBOL)	C3	-
DFH0VZUX	Sample	FEPI sample: monitor & unsolicited data handler (COBOL)	C3	-
DFH0VZXS	Sample	FEPI sample: setup program (COBOL)	C3	-
DFH2980	Symbolic	Special characters for 2980	C2	-
DFH2980	Symbolic	Special characters for 2980	P2	-
DFH99BC	Sample	Dynamic allocation - convert to binary target	05	06
DFH99BLD	Other	Dyn alloc - JCL to build sample program	02	-
DFH99CC	Sample	Dyn alloc - character and numeric string conversion	05	06
DFH99DY	Sample	Dyn alloc - issue SVC and analyze	05	06
DFH99FP	Sample	Dyn alloc - process function keyword	05	06
DFH99GI	Sample	Dyn alloc - format display and get input	05	06
DFH99KC	Sample	Dyn alloc - keyword value conversion	05	06
DFH99KH	Sample	Dyn alloc - list keywords for help	05	06
DFH99KO	Sample	Dyn alloc - process operator keywords	05	06
DFH99KR	Sample	Dyn alloc - convert returned value to keyword	05	06
DFH99LK	Sample	Dyn alloc - search key set for given token	05	06
DFH99M	Sample	Dyn alloc - macro	04	-
DFH99MAC	Sample	Dyn alloc - macro	05	-
DFH99ML	Sample	Dyn alloc - build message text from token list	05	06
DFH99MM	Sample	Dyn alloc - main control program	05	06
DFH99MP	Sample	Dyn alloc - message filing routine	05	06
DFH99MT	Sample	Dyn alloc - match abbreviation with keyword	05	06
DFH99RP	Sample	Dyn alloc - process returned values	05	06
DFH99SVC	Sample	Dyn alloc - SVC services	05	-
DFH99T	Sample	Dyn alloc - table of keywords	05	06
DFH99TK	Sample	Dyn alloc - tokenize input command	05	06
DFH99TX	Sample	Dyn alloc - text display routine	05	06
DFH99VH	Sample	Dyn alloc - list description for help	05	06
DFH$AALL	Sample	Inquiry/update	05	06

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Name	Type	Description	Library	
DFH$ABRW	Sample	Browse	05	06
DFH$ACOM	Sample	Order entry queue print	05	06
DFH$ADSP	Sample	XRF overseer - display status	05	06
DFH$AFIL	Sample	Customer file (FILEA) record layout	05	-
DFH$AGA	Sample	Generated version of DFH$AMA	05	06
DFH$AGB	Sample	Generated version of DFH$AMB	05	06
DFH$AGC	Sample	Generated version of DFH$AMC	05	06
DFH$AGCB	Sample	XRF overseer - set up RPL	05	06
DFH$AGD	Sample	Generated version of DFH$AMD	05	06
DFH$AGK	Sample	Generated version of DFH$AMK	05	06
DFH$AGL	Sample	Generated version of DFH$AML	05	06
DFH$ALOG	Sample	Audit trail (log) record layout	05	-
DFH$AL86	Sample	Order entry queue record layout	05	-
DFH$AMA	Sample	Operator instructions map set	05	-
DFH$AMB	Sample	Customer details map set	05	-
DFH$AMC	Sample	File browse map set	05	-
DFH$AMD	Sample	Low balance inquiry map set	05	-
DFH$AMK	Sample	Order entry map set	05	-
DFH$AML	Sample	Order report map set	05	-
DFH$AMNU	Sample	Operator instructions	05	06
DFH$AREN	Sample	Order entry	05	06
DFH$AREP	Sample	Low balance inquiry	05	06
DFH$ARES	Sample	XRF overseer - restart failed region	05	06
DFH$AXCC	Sample	EXCI batch client program (Assembler)	05	06
DFH$AXCS	Sample	EXCI batch server program (Assembler)	05	06
DFH$AXRO	Sample	XRF overseer program	05	06
DFH$BTCH	Sample	Batch test data for DFHIVPBT	05	-
DFH$CAT1	Sample	CLIST to create RACF profiles for CICS category 1 transactions	05	-
DFH$CAT2	Sample	CLIST to create RACF profiles for CICS category 2 transactions	05	-
DFH$CESD	Sample	Shutdown assist program	P3	-
DFH$CRFA	Sample	CSD cross-reference program	05	06
DFH$CRFP	Sample	CSD cross-reference program - PL/I	P3	-
DFH$CUS1	Sample	CSDUP invocation from TSO environment	05	06
DFH$DALL	Sample	Inquiry/update - C/370	D2	-
DFH$DBAN	Sample	Batch test data for DFHIVPDB (Assembler)	05	-
DFH$DBCB	Sample	Batch test data for DFHIVPDB (Cobol)	05	-
DFH$DBPL	Sample	Batch test data for DFHIVPDB (PL/I)	05	-
DFH$DBRW	Sample	Browse - C/370	D2	-
DFH$DB2T	Sample	DB2 table definitions for DFH$FORx	05	-
DFH$DCOM	Sample	Order entry queue print - C/370	D2	-
DFH$DCTD	Sample	DCT SDSCI entries	05	-
DFH$DCTR	Sample	DCT entries for basic facilities	05	-
DFH$DCTS	Sample	DCT entries for sample applications	05	-
DFH$DFIL	Sample	Customer file (FILEA) record layout -C/370	D2	-
DFH$DLAC	Sample	CICS-DL/I program using CALL interface	05	06
DFH$DLAE	Sample	CICS-DL/I program using EXEC DLI	05	06
DFH$DLPC	Sample	CICS-DL/I program (CALL) - PL/I	P3	-
DFH$DLPE	Sample	CICS-DL/I program (EXEC) - PL/I	P3	-
DFH$DL86	Sample	Order entry queue record layout - C/370	D2	-
DFH$DMA	Sample	Operator instructions map set - C/370	05	-
DFH$DMB	Sample	Customer details map set - C/370	05	-
DFH$DMC	Sample	File browse map set - C/370	05	-
DFH$DMD	Sample	Low balance inquiry map set - C/370	05	-

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Name	Type	Description	Library	
DFH$DMK	Sample	Order entry map set - C/370	05	-
DFH$DML	Sample	Order report map set - C/370	05	-
DFH$DMNU	Sample	Operator instructions - C/370	D2	-
DFH$DREN	Sample	Order entry - C/370	D2	-
DFH$DREP	Sample	Low balance inquiry - C/370	D2	-
DFH$DTLC	Sample	Shared Data Tables XDTLC exit program	05	-
DFH$DTAD	Sample	Shared data tables XDTAD exit program	05	-
DFH$DTRD	Sample	Shared data tables XDTRD exit program	05	-
DFH$DXCC	Sample	Batch Client Program (C/370)	D2	-
DFH$FAIN	Sample	Data for batch load of FILEA	05	-
DFH$FCBF	Sample	Sample XFCBFAIL exit program	05	-
DFH$FCBV	Sample	Sample XFCBOVER exit program	05	-
DFH$FCLD	Sample	Sample XFCLDEL exit program	05	-
DFH$FORA	Sample	DB2 formatting program	05	06
DFH$FORP	Sample	DB2 formatting program - PL/I	P3	-
DFH$GMAP	Sample	Sample goodnight transaction BMS map	05	-
DFH$ICIC	Sample	CICS-CICS or CICS-IMS conversation	05	06
DFH$IFBL	Sample	Remote file browse - local processing	05	06
DFH$IFBR	Sample	Remote file browse - remote processing	05	06
DFH$IGB	Sample	Generated version of DFH$IMB	05	06
DFH$IGC	Sample	Generated version of DFH$IMC	05	06
DFH$IGS	Sample	Generated version of DFH$IMS	05	06
DFH$IGX	Sample	Generated version of DFH$IMX	05	06
DFH$IG1	Sample	Generated version of DFH$IM1	05	06
DFH$IG2	Sample	Generated version of DFH$IM2	05	06
DFH$IMB	Sample	Remote file browse - map set	05	-
DFH$IMC	Sample	CICS-CICS or CICS-IMS conversation - map set	05	-
DFH$IMS	Sample	CICS-IMS conversation/demand paged output - map set	05	-
DFH$IMSN	Sample	CICS-IMS conversation	05	06
DFH$IMSO	Sample	CICS-IMS demand paged output	05	06
DFH$IMX	Sample	Local to remote temporary-storage queue transfer - map set	05	-
DFH$IM1	Sample	TS record retrieval - map set 1	05	-
DFH$IM2	Sample	TS record retrieval - map set 2	05	-
DFH$IQRD	Sample	TS record retrieval - local display	05	06
DFH$IQRL	Sample	TS record retrieval - local request	05	06
DFH$IQRR	Sample	TS record retrieval - remote request	05	06
DFH$IQXL	Sample	Local to remote temporary-storage queue transfer - local processing	05	06
DFH$IQXR	Sample	Local to remote temporary-storage queue transfer - remote processing	05	06
DFH$LDSP	Sample	Create FILEA data file	05	06
DFH$MCTD	Sample	MCT entry for DBCTL	05	-
DFH$MOLS	Sample	Offline processor of monitoring data	05	06
DFH$OFAR	Sample		05	-
DFH$PALL	Sample	Inquiry/update - PL/I	P3	-
DFH$PBRW	Sample	Browse - PL/I	P3	-
DFH$PCEX	Sample	XPCFTCH global user exit program	05	06
DFH$PCGA	Sample	Global work area for DFH$PCEX	05	-
DFH$PCOM	Sample	Order entry queue print - PL/I	P3	-
DFH$PCPI	Sample	Enabling program for DFH$PCEX and DFH$ZCAT	05	06
DFH$PCPL	Sample	DFH$PCEX global user exit invocation	05	06
DFH$PCTA	Sample	XPCTA user exit program	05	-
DFH$PDUM	Sample	Dummy main program for PL/I programs using CSD offline extract function	P3	-
DFH$PFIL	Sample	Customer file (FILEA) record layout - PL/I	P3	-

Table 109 (Page 89 of 90). CICS modules directory

Name	Type	Description	Library	
DFH$PLOG	Sample	Audit trail (log) record layout - PL/I	P3	-
DFH$PL86	Sample	Order entry queue record layout - PL/I	P3	-
DFH$PMA	Sample	Operator instructions map set - PL/I	05	-
DFH$PMB	Sample	Customer details map set - PL/I	05	-
DFH$PMC	Sample	File browse map set - PL/I	05	-
DFH$PMD	Sample	Low balance inquiry map set - PL/I	05	-
DFH$PMK	Sample	Order entry map set - PL/I	05	-
DFH$PML	Sample	Order report map set - PL/I	05	-
DFH$PMNU	Sample	Operator instructions - PL/I	P3	-
DFH$PMP	Sample	Keystroke overlap/look-aside query - map set - PL/I	05	-
DFH$PPKO	Sample	Keystroke overlap - PL/I	P3	-
DFH$PPLA	Sample	Look-aside query - PL/I	P3	-
DFH$PREN	Sample	Order entry - PL/I	P3	-
DFH$PREP	Sample	Low balance inquiry PL/I	P3	-
DFH$PS	Sample	Keystroke overlap/look-aside query - partition set - PL/I	05	-
DFH$PXCC	Sample	Batch client program (PL/I)	P3	-
DFH$RACF	Sample	RACF class descriptor table	05	-
DFH$SIPA	Other	System initialization parameters for use with AOR and default SIT	05	-
DFH$SIPD	Other	System initialization parameters for use with DOR and default SIT	05	-
DFH$SIPT	Other	System initialization parameters for use with TOR and default SIT	05	-
DFH$SIP1	Other	System initialization parameters for use by DFHIVPOL (online IVP)	05	-
DFH$SIP2	Other	System initialization parameters for use by DFHIVPBT (batch IVP)	05	-
DFH$SIP5	Other	System initialization parameters for use by DFHIVPDB (DBCTL IVP)	05	-
DFH$SQLT	Sample	Input for DB2 table load utility	05	-
DFH$STAS	Sample	DFH0STAT storage statistics subroutine	05	06
DFH$STCN	Sample	DFH0STAT time calculations subroutine	05	06
DFH$STED	Sample	Stagger end-of-day time for statistics	05	06
DFH$STER	Sample	PLT program to print recovery statistics on CICS emergency restart	05	06
DFH$STTB	Sample	Statistics sample user exit ID table	05	06
DFH$SXP1	Sample	Suppress message by number (user exit)	05	06
DFH$SXP2	Sample	Suppress message by destination route code	05	06
DFH$SXP3	Sample	Suppress message by transient data queue	05	06
DFH$SXP4	Sample	Reroute console message to transient data queue	05	06
DFH$SXP5	Sample	Reroute message from one transient data queue to another	05	06
DFH$SXP6	Sample	Reroute message from transient data queue to list of consoles	05	06
DFH$TCTS	Sample	TCT entries for sequential (CRLP) terminals	05	-
DFH$TDWT	Sample	Transient data write to terminal	05	06
DFH$UCHN	Other	SMP/E USERMOD to move LPA-eligible Chinese language feature modules into LPA library	05	-

Table 109 (Page 90 of 90). CICS modules directory

Name	Type	Description	Library	
DFH$UJPN	Other	SMP/E USERMOD to move LPA-eligible Japanese language feature modules into LPA library	05	-
DFH$UMOD	Other	SMP/E USERMOD to move LPA-eligible CICS modules into LPA library	05	-
DFH$WBAU	Sample	Web module	05	06
DFH$WBSA	Sample	Web module	05	06
DFH$WBSB	Sample	Web module	05	06
DFH$WBSC	Sample	Web module	05	06
DFH$WBSN	Sample	Web module	05	06
DFH$WBSR	Sample	Web module	05	06
DFH$WBST	Sample	Web module	05	06
DFH$WB1A	Sample	Web module	05	06
DFH$WB1C	Sample	Web module	D2	-
DFH$XDRQ	Sample		05	06
DFH$XRDS	Sample	XRF overseer control blocks	05	-
DFH$XTSE	Sample	XTSEREQ global user exit program	05	06
DFH$XZIQ	Sample	Sample XZIQUE global user exit program	05	06
DFH$ZCAT	Sample	Sample XZCATT global user exit program	05	06
DFH$ZCGA	Sample	Global work area for DFH$ZCAT	05	-
DLIUIB	DSECT	DL/I user interface block	C2	-
DLIUIB	DSECT	DL/I user interface block	P2	-
DLIUIB	DSECT	DL/I user interface block	D3	-
DLIUIB	Macro	DL/I user interface block	04	-
DFH99SVC	CSECT	Dyn alloc - SVC services	-	06
DSNCLI	CSECT	CICS-DB2 connect SQL language interface	-	06
DSNCPRMA	Macro	CICS-DB2 connect dynamic plan selection parmlist (Assembler)	04	-
DSNCPRMC	Macro	CICS-DB2 connect dynamic plan selection parmlist (COBOL)	C2	-
DSNCPRMP	Macro	CICS-DB2 connect dynamic plan selection parmlist (PL/I)	P2	-
DSNCRCT	Macro	CICS-DB2 connect RCT macro	04	-
DSNCUEXT	CSECT	CICS-DB2 connect dynamic plan selection	05	06
MEUKEYS	CSECT	MEU key definitions	15	-
MEULANG	CSECT	MEU language table	16	-
MEU00	CSECT	MEU MEU00x message set	14	-
MEU01	CSECT	MEU MEU01x message set	14	-
MEU02	CSECT	MEU MEU02x message set	14	-
MEU03	CSECT	MEU MEU03x message set	14	-
MEU04	CSECT	MEU MEU04x message set	14	-
MEU05	CSECT	MEU MEU05x message set	14	-
SRRC	Symbolic	SAA resource recovery pseudonyms for C	D3	-
SRRCOBOL	Symbolic	SAA resource recovery pseudonyms for COBOL	C2	-
SRRHASM	Symbolic	SAA resource recovery pseudonyms for assembler-language	04	-
SRRPLI	Symbolic	SAA pseudonym file for PL/I	P2	-

Chapter 105. CICS link-edit information

In CICS, various object modules are link-edited together to produce a number of load modules. There are two lists in this section. The first list shows the load modules and the object modules from which they are link-edited; the second list shows the object modules and the load modules for which they are link-edited.

Link-edit information is included in these lists for both the basic distribution tape and the Japanese language feature distribution tape. In each case, the information is based on the JCLIN data from the second file (RELFILE 1) on the distribution tape. For further details about the format of the distribution tapes, see the *CICS Transaction Server for OS/390 Program Directory*.

CICS load modules

Load module	Object module(s)
DFHACP	DFHACP
DFHAFMT	DFHAFMT
DFHAIIN	DFHAIIN1 DFHAIIN2
DFHAIIQ	DFHAIIQ
DFHAIP	DFHAICBP DFHCPI DFHEIP DFHEIPA
DFHAIRP	DFHAIRP
DFHAITM	DFHAITM
DFHALP	DFHALP
DFHALRC	DFHALRC
DFHAMP	DFHAMCSD DFHAMD2 DFHAMER DFHAMFC DFHAMGL DFHAMLM DFHAMPAB DFHAMPAD DFHAMPAP DFHAMPCH DFHAMPCO DFHAMPDF DFHAMPDI DFHAMPDL DFHAMPEN DFHAMPEX DFHAMPFI DFHAMPIL DFHAMPLO DFHAMPN DFHAMPVW DFHAMP00 DFHAMRDI DFHAMSN DFHAMST DFHAMTD DFHAMTP DFHAMXM
DFHAPAC	DFHAPAC
DFHAPATT	DFHAPATT
DFHAPDM	DFHAPDM DFHAPSM
DFHAPDN	DFHAPDN
DFHAPEP	DFHAPEX DFHSUEX
DFHAPIN	DFHAPIN
DFHAPIQ	DFHAPIQ
DFHAPJC	DFHAPJC
DFHAPLI	DFHAPLI1 DFHAPLI2 DFHAPLI3
DFHAPNT	DFHAPNT
DFHAPPG	DFHAPPG
DFHAPRC	DFHAPRC DFHDBP DFHUSBP
DFHAPRDR	DFHAPRDR
DFHAPRT	DFHAPRT
DFHAPSI	DFHAPSI
DFHAPSIP	DFHAPSIP
DFHAPSTL	DFHAPST DFHD2ST DFHSTFC DFHSTLK DFHSTLS DFHSTSZ DFHSTTD DFHSTTM DFHSTTR
DFHAPTI	DFHAPTI
DFHAPTIM	DFHAPTIM
DFHAPTIX	DFHAPTIX
DFHAPXM	DFHAPXM
DFHAPXME	DFHAPXME
DFHASV	DFHASV
DFHBMSMM	DFHBMSMM
DFHBMSUP	DFHBMSUP
DFHBRFM	DFHBRFM
DFHBRIC	DFHBRIC
DFHBRMS	DFHBRMS
DFHBRSP	DFHBRSP
DFHBRTC	DFHBRTC
DFHCCNV	DFHCCNV DFHCCNV2 DFHCNV01 DFHCNV02 DFHCNV03 DFHCNV04 DFHCNV05 DFHCNV06 DFHCNV07 DFHCNV08 DFHCNV09 DFHCNV10 DFHCNV11 DFHCNV12 DFHCNV13 DFHCNV14 DFHCNV15 DFHCNV16 DFHCNV17 DFHCNV18 DFHCNV19 DFHCNV20 DFHCNV21 DFHCNV22 DFHCNV23 DFHCNV24 DFHCNV25 DFHCNV26 DFHCNV27 DFHCNV28 DFHCNV29 DFHEAI DFHEAI0
DFHCCUTL	DFHCCUTL
DFHCEGN	DFHCEGN DFHEAI DFHEAI0
DFHCEID	DFHCEID DFHEAI DFHEAI0
DFHCESC	DFHCESC DFHEAI DFHEAI0 DFHSNSC
DFHCESD	DFHCESDP DFHEAI DFHEAI0
DFHCETRA	DFHCETRA DFHEAI DFHEAI0
DFHCETRB	DFHCETRB DFHEAI DFHEAI0
DFHCETRC	DFHCETRC DFHEAI DFHEAI0
DFHCETRD	DFHCETRD DFHEAI DFHEAI0
DFHCHS	DFHCHS DFHEAI DFHEAI0
DFHCICS	DFHCICS
DFHCLS3	DFHCLS3 DFHEAI DFHEAI0
DFHCLS4	DFHCLS4 DFHEAI DFHEAI0
DFHCLT1X	DFHCLT1X
DFHCLT1$	DFHCLT1$
DFHCLT2X	DFHCLT2X
DFHCLT3X	DFHCLT3X
DFHCLT4X	DFHCLT4X
DFHCMAC	DFHCMAC DFHEAI DFHEAI0
DFHCMCM	DFHCMCM
DFHCMP	DFHCMP
DFHCPIC	DFHCPARH DFHCPCAC DFHCPCAL DFHCPCBA DFHCPCBB DFHCPCBD DFHCPCBE DFHCPCBG DFHCPCBI DFHCPCBL DFHCPCBS DFHCPCBT DFHCPCCD DFHCPCCF DFHCPCDE DFHCPCEA DFHCPCEB DFHCPCEC DFHCPCED DFHCPCEE DFHCPCFL DFHCPCFS DFHCPCIC DFHCPCLC DFHCPCLM DFHCPCLR DFHCPCND DFHCPCNE DFHCPCN1 DFHCPCN2 DFHCPCN3 DFHCPCN4 DFHCPCN5 DFHCPCOJ DFHCPCPR DFHCPCRA DFHCPCRB DFHCPCRC DFHCPCRI DFHCPCRS DFHCPCRV DFHCPCRW DFHCPCSA DFHCPCSB DFHCPCSC DFHCPCSD DFHCPCSE DFHCPCSF DFHCPCSG DFHCPCSH DFHCPCSI DFHCPCSJ DFHCPCSK DFHCPCSL DFHCPCSM DFHCPCTE DFHCPSRH
DFHCPIN	DFHCPIN1 DFHCPIN2
DFHCPIRR	DFHCPIR
DFHCPLC	DFHCPLC
DFHCPLRR	DFHCPLRR
DFHCPSM	DFHEXMG5 DFHEXMS5
DFHCPY	DFHCPY
DFHCRC	DFHCRC
DFHCRLB	DFHCRLB
DFHCRNP	DFHCRNP
DFHCRQ	DFHCRQ
DFHCRR	DFHCRR
DFHCRS	DFHCRS
DFHCRSP	DFHCRSP
DFHCRT	DFHCRT
DFHCRU	DFHCRBU DFHCRERP DFHCRERS DFHCRIU DFHCRL DFHCR1U DFHCR2U
DFHCSA	DFHCSA DFHKELCL DFHKELRT DFHKERCD DFHKERER DFHKERRI DFHKESFM DFHKESGM
DFHCSDUP	DFHBAM51 DFHBAM52 DFHBAM55 DFHBAM56 DFHBEPB DFHCAPB DFHCUADD DFHCUALG

Load module	Object module(s)
	DFHCUALT DFHCUAPP DFHCUCAB DFHCUCB
	DFHCUCCB DFHCUCDB DFHCUCOG DFHCUCOM
	DFHCUCOP DFHCUCP DFHCUCS DFHCUCSE
	DFHCUCV DFHCUDEF DFHCUERA DFHCUFA
	DFHCUGA DFHCUINI DFHCULIS DFHCULOC
	DFHCUMD2 DFHCUMF1 DFHCUMF2 DFHCUMIG
	DFHCUMT DFHCUMTD DFHCUMWR DFHCUMXI
	DFHCUPRO DFHCUREM DFHCURUG DFHCUSER
	DFHCUSHL DFHCUVER DFHCUXRT DFHDMPB
	DFHDMPBA DFHDM01B DFHDM02B DFHDM03B
	DFHDM04B DFHDM05B DFHDM06B DFHDM08B
	DFHDM09B DFHDM10B DFHDM11B DFHDM12B
	DFHDM13B DFHDM15B DFHDM16B DFHDM17B
	DFHDM18B DFHDM19B DFHDM21B DFHDM22B
	DFHDM23B DFHPUPAB DFHPUPB DFHPUPDB
	DFHPUPXB DFHSPDBB DFHSPFIB DFHSPKCB
	DFHSPLMB DFHSPLSB DFHSPPCB DFHSPPNB
	DFHSPTCB DFHSPTDB DFHSPTIB DFHSPTNB
	DFHSPTYB DFHSPXMB
DFHCSVC	DFHCSVC
DFHCTRH	DFHCTRH
DFHCTRM	DFHCTRM
DFHCURDD	DFHCURDD
DFHCURDI	DFHCURDI
DFHCURDM	DFHCURDM
DFHCURDN	DFHCURDN
DFHCURDS	DFHCURDS
DFHCURDX	DFHCURDX
DFHCUS1	DFHCUS1
DFHCWTO	DFHCWTO
DFHCXCU	DFHCXCU
DFHDBAT	DFHDBAT
DFHDBCON	DFHDBCON DFHEAI DFHWLIST
DFHDBCR	DFHDBCR DFHDXSTM
DFHDBCT	DFHDBCT DFHDXSTM DFHEAI
DFHDBCX	DFHDBCTX DFHDXAX
DFHDBDE	DFHDBDE
DFHDBDI	DFHDBDI DFHEAI
DFHDBDSC	DFHDBDSC DFHEAI
DFHDBIE	DFHDBIE
DFHDBIK	DFHDBIK
DFHDBIQ	DFHDBIQ DFHEAI
DFHDBME	DFHABREV DFHDBME DFHEAI DFHWLIST
	DFHWORDS
DFHDBMOX	DFHDBMOX
DFHDBMP	DFHABREV DFHDBMP DFHDLIAI DFHEAI
	DFHWLIST DFHWORDS
DFHDBMS	DFHDBMS
DFHDBNE	DFHDBNE
DFHDBNK	DFHDBNK
DFHDBREX	DFHDBREX
DFHDBSPX	DFHDBSPX
DFHDBSSX	DFHDBSSX
DFHDBSTX	DFHDBSTX
DFHDBTI	DFHDBTI
DFHDBTOX	DFHDBTOX
DFHDBUEX	DFHDBUEX DFHEAI DFHEAI0
DFHDCP	DFHDCPR

Load module	Object module(s)
DFHDCT	DFHDCT
DFHDCTCE	DFHDCTCE
DFHDCTCL	DFHDCTCL
DFHDCTC1	DFHDCTC1
DFHDCTC2	DFHDCTC2
DFHDCTDA	DFHDCTDA
DFHDCTDL	DFHDCTDL
DFHDCTNS	DFHDCTNS
DFHDCTQA	DFHDCTQA
DFHDCTS5	DFHDCTS5
DFHDCTS6	DFHDCTS6
DFHDCTUR	DFHDCTUR
DFHDCT42	DFHDCT42
DFHDEDM	DFHDECOX DFHDEDM DFHDEIS DFHDEREX
	DFHDEST DFHDESV
DFHDIP	DFHDIP
DFHDIPDY	DFHDIPDY
DFHDKMR	DFHDKCR DFHDKMR
DFHDLI	DFHDLI
DFHDLIAI	DFHDLIAI
DFHDLIDP	DFHDLIDP
DFHDLIRP	DFHDLIRP
DFHDMP	DFHDMPC DFHDMPCA DFHDM01C DFHDM02C
	DFHDM03C DFHDM04C DFHDM05C DFHDM06C
	DFHDM08C DFHDM09C DFHDM10C DFHDM11C
	DFHDM13C DFHDM15C DFHDM16C DFHDM17C
	DFHDM18C DFHDM19C DFHDM21C DFHDM22C
	DFHDM23C
DFHDMRM	DFHDMRM
DFHDMSVC	DFHDMENS DFHDMSVC
DFHDSAUT	DFHDSAUT
DFHDSBA$	DFHDSBA$
DFHDSB1$	DFHDSB1$
DFHDSPEX	DFHDSPEX
DFHDTAM	DFHDTCF DFHDTCP DFHDTDA DFHDTDM
	DFHDTIX DFHDTRM DFHDTSR
DFHDTAOR	DFHDTPC DFHDTRC DFHDTRI DFHDTRR
DFHDTCV	DFHDTCV
DFHDTFOR	DFHDTCP DFHDTLA DFHDTLI DFHDTLX
	DFHDTRE DFHDTSS DFHDTST DFHDTUP
DFHDTINS	DFHDTINS
DFHDTSVC	DFHDTSVS DFHQSSS
DFHDTXS	DFHDTXS
DFHDUIO	DFHDUIO
DFHDUMPX	DFHDUMPX
DFHDUSVC	DFHDUSVC
DFHDU530	DFHAPTRA DFHAPTRB DFHAPTRC DFHAPTRD
	DFHAPTRE DFHAPTRF DFHAPTRG DFHAPTRI
	DFHAPTRJ DFHAPTRK DFHAPTRL DFHAPTRN
	DFHAPTRO DFHAPTRP DFHAPTRR DFHAPTRS
	DFHAPTRU DFHAPTRV DFHAPTRW DFHAPTRX
	DFHAPTRY DFHAPTR0 DFHAPTR2 DFHAPTR5
	DFHAPTR6 DFHAPTR7 DFHAPTR8 DFHAPTR9
	DFHBRTRI DFHCCTRI DFHCRTRI DFHC3TRI
	DFHDDTRI DFHDETRI DFHDKTRI DFHDMTRI
	DFHDSTRI DFHDUPH DFHDUPM DFHDUPP
	DFHDUPR DFHDUPS DFHDUTRI DFHD2TRI
	DFHEITT2 DFHEXTRI DFHFTTRI DFHJVTRI

Load module	Object module(s)
	DFHKETRI DFHLDTRI DFHLGTRI DFHLITRI DFHLMTRI DFHL2TI2 DFHL2TRI DFHMETRI DFHMNTRI DFHNQTRI DFHPATRI DFHPGTRI DFHRITRI DFHRMTRI DFHRTTRI DFHRTTR1 DFHSMTRI DFHSNTRI DFHSNXRT DFHSPTRI DFHSTTRI DFHSUTRI DFHTDTRI DFHTFTRI DFHTITRI DFHTMTRI DFHTRFFD DFHTRFFE DFHTRFPB DFHTRFPP DFHTRIB DFHTRTRI DFHTSITR DFHUSTRI DFHWBTRI DFHXMTRI DFHXSTRI DFHZCTRI DFHZCTR1 DFHZRTRI
DFHDXACH	DFHDXACH
DFHDXCU	DFHDXCU
DFHDYP	DFHDYP DFHEAI DFHEAI0
DFHD2CC	DFHD2CC DFHEAI DFHEAI0
DFHD2CM0	DFHD2CM0 DFHEAI DFHEAI0
DFHD2CM1	DFHD2CMP DFHD2CM1 DFHEAI DFHEAI0 DSNCLI
DFHD2CM2	DFHD2CM2 DFHEAI DFHEAI0
DFHD2CM3	DFHD2CM3 DFHEAI DFHEAI0
DFHD2EDF	DFHD2EDF DFHEAI DFHEAI0
DFHD2EX1	DFHD2EXS DFHD2EX1 DFHEAI DFHEAI0
DFHD2EX2	DFHD2EX2 DFHEAI DFHEAI0
DFHD2EX3	DFHD2EX3
DFHD2IN	DFHD2IN1 DFHD2IN2
DFHD2INI	DFHD2INI DFHEAI DFHEAI0
DFHD2MSB	DFHD2MSB
DFHD2RP	DFHD2RP
DFHD2STP	DFHD2STP DFHEAI DFHEAI0
DFHD2STR	DFHD2CNV DFHD2STR DFHEAI DFHEAI0 DFHWLIST
DFHD2TM	DFHD2TM
DFHEAI	DFHEAI
DFHEAI0	DFHEAI0
DFHEAP1$	DFHEAMAA DFHEAMEE DFHEAMPA DFHEAMSA DFHEAM02 DFHEAM07 DFHEAM08 DFHEAM11 DFHEIMOP DFHEXMAB DFHEXMAN DFHEXMG2 DFHEXMKW DFHEXMPE DFHEXMS2 DFHEXMTD DFHEXMTG DFHEXMXK DFHEXMXM DFHEXMXS DFHEXM01 DFHEXM05 DFHEXM06 DFHEXM09 DFHEXM12 DFHEXM13 DFHEXM15 DFHEXM16 DFHEXM25 DFHEXM27
DFHEBF	DFHEBF
DFHEBRCT	DFHEBRCT
DFHEBU	DFHEBU
DFHECI	DFHECI
DFHECID	DFHEAI DFHEAI0 DFHEIN01 DFHEIN02 DFHEIN03 DFHEIN11 DFHEIN12 DFHEIN13 DFHEIN16 DFHEIN19 DFHEIN20 DFHEIN21 DFHEIN22 DFHEIN23 DFHEIN26 DFHEIN27 DFHEIN28 DFHEIN50 DFHEIN51 DFHEIN52 DFHEIN53 DFHEIN54
DFHECIP	DFHEAI DFHEAI0 DFHEIN00
DFHECP1$	DFHECMAC DFHECMEE DFHECMPC DFHECMSC DFHECM02 DFHECM07 DFHECM08 DFHECM10 DFHECM11 DFHECM14 DFHECM17 DFHEIMOP DFHEXMAB DFHEXMAN DFHEXMG2 DFHEXMKW DFHEXMPE DFHEXMS2 DFHEXMTD DFHEXMTG DFHEXMXK DFHEXMXM DFHEXMXS DFHEXM01

Load module	Object module(s)
	DFHEXM05 DFHEXM06 DFHEXM09 DFHEXM12 DFHEXM13 DFHEXM15 DFHEXM16 DFHEXM18 DFHEXM25 DFHEXM27
DFHECSP	DFHEAI DFHEAI0 DFHEIN00
DFHEDAD	DFHEAI DFHEAI0 DFHEIN03 DFHEIN13 DFHEIN16 DFHEIN28 DFHESP01 DFHESP02 DFHESP11 DFHESP12 DFHESP19 DFHESP20 DFHESP21 DFHESP22 DFHESP23 DFHESP26 DFHESP27 DFHESP50 DFHESP51 DFHESP52 DFHESP53 DFHESP54 DFHESP55 DFHSPDBC DFHSPFIC DFHSPKCC DFHSPLMC DFHSPLSC DFHSPPCC DFHSPPNC DFHSPTCC DFHSPTDC DFHSPTIC DFHSPTNC DFHSPTYC DFHSPXMC
DFHEDAP	DFHEAI DFHEAI0 DFHESP00
DFHEDC	DFHEDC
DFHEDCP	DFHEDCP
DFHEDFBR	DFHEAI DFHEAI0 DFHEDFBR
DFHEDFD	DFHEAI DFHEAI0 DFHEDFCB DFHEDFCC DFHEDFCE DFHEDFCR DFHEDFCS DFHEDFCX DFHEDFD DFHEDFDL DFHEDFS DFHEDFU DFHEDFW
DFHEDFE	DFHEDFE
DFHEDFM	DFHEDFM
DFHEDFP	DFHEDFP
DFHEDFR	DFHEDFR
DFHEDFX	DFHEDFX
DFHEDI	DFHEDI
DFHEDP	DFHEDP
DFHEDP1$	DFHEDMAD DFHEDMEE DFHEDMPD DFHEDMSD DFHEDM02 DFHEDM07 DFHEDM08 DFHEDM10 DFHEDM11 DFHEDM14 DFHEDM17 DFHEIMOP DFHEXMAB DFHEXMAN DFHEXMG2 DFHEXMKW DFHEXMPE DFHEXMS2 DFHEXMTD DFHEXMTG DFHEXMXK DFHEXMXM DFHEXMXS DFHEXM01 DFHEXM05 DFHEXM06 DFHEXM09 DFHEXM12 DFHEXM13 DFHEXM15 DFHEXM16 DFHEXM18 DFHEXM25 DFHEXM27
DFHEEI	DFHEEI
DFHEEX	DFHEEX
DFHEFRM	DFHEFRM
DFHEGL	DFHEGL
DFHEIACQ	DFHEIACQ
DFHEICRE	DFHBEPC DFHCAPC DFHCUCAC DFHCUCDC DFHEICRE DFHPUPAC DFHPUPXC DFHSPDBE DFHSPFIE DFHSPKCE DFHSPLME DFHSPLSE DFHSPPCE DFHSPPNE DFHSPTCE DFHSPTDE DFHSPTIE DFHSPTNE DFHSPTYE DFHSPXME
DFHEIDLI	DFHEXMG1 DFHEXMS1
DFHEIDTI	DFHEIDTI
DFHEIFC	DFHEIFC
DFHEIGDS	DFHEIGDS
DFHEIGDX	DFHEXMG3 DFHEXMS3
DFHEIIC	DFHEIIC
DFHEIPRT	DFHEIPRT
DFHEIPSE	DFHEIPSE
DFHEIPSH	DFHEIPSH
DFHEIQDE	DFHEIQDE
DFHEIQDN	DFHEIQDN

Load module	Object module(s)
DFHEIQDS	DFHEIQDS
DFHEIQDU	DFHEIQDU
DFHEIQD2	DFHEIQD2
DFHEIQIR	DFHEIQIR
DFHEIQMS	DFHEIQMS
DFHEIQMT	DFHEIQMT
DFHEIQPF	DFHEIQPF
DFHEIQPN	DFHEIQPN
DFHEIQRQ	DFHEIQRQ
DFHEIQSA	DFHEIQSA
DFHEIQSC	DFHEIQSC
DFHEIQSJ	DFHEIQSJ
DFHEIQSK	DFHEIQSK
DFHEIQSL	DFHEIQSL
DFHEIQSM	DFHEIQSM
DFHEIQSP	DFHEIQSP
DFHEIQSQ	DFHEIQSQ
DFHEIQST	DFHEIQST
DFHEIQSV	DFHEIQSV
DFHEIQSX	DFHEIQSX
DFHEIQSZ	DFHEIQSZ
DFHEIQTM	DFHEIQTM
DFHEIQTR	DFHEIQTR
DFHEIQTS	DFHEIQTS
DFHEIQUE	DFHEIQUE DFHUEIQ
DFHEIQVT	DFHEIQVT
DFHEISP	DFHEISP
DFHEISR	DFHEISR DFHEITTR
DFHEITAB	DFHEITAB
DFHEITBS	DFHEITBS
DFHEITCU	DFHEITCU
DFHEITHG	DFHEITHG
DFHEITMT	DFHEITMT
DFHEITOT	DFHEITOT
DFHEITS	DFHEITS
DFHEITSP	DFHEITSP
DFHEITST	DFHEITST
DFHEITSZ	DFHEITSZ
DFHEIUOW	DFHEIUOW
DFHEJC	DFHEJC
DFHEKC	DFHEKC
DFHELII	DFHELII
DFHEMEX	DFHEMEX
DFHEMS	DFHEMS
DFHEMTA	DFHEAI DFHEAI0 DFHEMT00
DFHEMTD	DFHEAI DFHEAI0 DFHEIN03 DFHEIN13
	DFHEIN16 DFHEIN26 DFHEIN28 DFHEMT01
	DFHEMT02 DFHEMT11 DFHEMT12 DFHEMT19
	DFHEMT20 DFHEMT21 DFHEMT22 DFHEMT23
	DFHEMT27 DFHEMT50 DFHEMT51 DFHEMT52
	DFHEMT53 DFHEMT54 DFHEMT55 DFHEMT56
DFHEMTP	DFHEAI DFHEAI0 DFHEMT00
DFHEOP	DFHEOP
DFHEOTP	DFHEAI DFHEAI0 DFHEMT00
DFHEPC	DFHEPC
DFHEPP1$	DFHEIMOP DFHEPMAP DFHEPMEE DFHEPMPP
	DFHEPMSP DFHEPM02 DFHEPM07 DFHEPM08
	DFHEPM10 DFHEPM11 DFHEPM14 DFHEPM17

Load module	Object module(s)
	DFHEXMAB DFHEXMAN DFHEXMG2 DFHEXMKW
	DFHEXMPE DFHEXMS2 DFHEXMTD DFHEXMTG
	DFHEXMXK DFHEXMXM DFHEXMXS DFHEXM01
	DFHEXM05 DFHEXM06 DFHEXM09 DFHEXM12
	DFHEXM13 DFHEXM15 DFHEXM16 DFHEXM18
	DFHEXM25 DFHEXM27
DFHEPS	DFHEPS
DFHERM	DFHERM DFHTIEM
DFHERMRS	DFHERMRS
DFHERMSP	DFHERMSP
DFHESC	DFHESC
DFHESE	DFHESE
DFHESN	DFHESN
DFHESTP	DFHEAI DFHEAI0 DFHEMT00
DFHESZ	DFHESZ
DFHETC	DFHETC
DFHETD	DFHETD
DFHETL	DFHETL
DFHETR	DFHETR
DFHETRX	DFHETRX
DFHEXAI	DFHEXAI
DFHEXCI	DFHEXCI
DFHEXI	DFHEXI
DFHEXPI	DFHEXPI
DFHFCAT	DFHFCAT
DFHFCBD	DFHFCBD
DFHFCCA	DFHFCCA
DFHFCDN	DFHFCDN
DFHFCD2	DFHFCDTS DFHFCDTX
DFHFCES	DFHFCES
DFHFCFL	DFHFCFL
DFHFCFR	DFHFCFR
DFHFCFS	DFHFCFS DFHFCL DFHFCM DFHFCN
DFHFCIN	DFHFCIN1 DFHFCIN2
DFHFCIR	DFHFCIR
DFHFCLF	DFHFCLF
DFHFCLJ	DFHFCLJ
DFHFCMT	DFHFCMT
DFHFCNQ	DFHFCNQ
DFHFCOR	DFHEAI DFHEAI0 DFHFCOR
DFHFCQI	DFHFCQI
DFHFCQT	DFHEAI DFHEAI0 DFHFCQR DFHFCQS
	DFHFCQT
DFHFCQU	DFHFCQU
DFHFCQX	DFHFCQX
DFHFCRC	DFHFCRC
DFHFCRD	DFHEAI DFHEAI0 DFHFCRD
DFHFCRL	DFHFCRL
DFHFCRO	DFHFCRO
DFHFCRP	DFHFCRP
DFHFCRR	DFHFCRR
DFHFCRS	DFHFCRS
DFHFCRV	DFHFCRV
DFHFCSD	DFHFCSD
DFHFCST	DFHFCST
DFHFCT	DFHFCT
DFHFCTA1	DFHFCTA1
DFHFCTA2	DFHFCTA2

Load module	Object module(s)
DFHFCTC1	DFHFCTC1
DFHFCTC2	DFHFCTC2
DFHFCTDL	DFHFCTDL
DFHFCTDS	DFHFCTDS
DFHFCTDX	DFHFCTDX
DFHFCTMS	DFHFCTMS
DFHFCTNS	DFHFCTNS
DFHFCTT3	DFHFCTT3
DFHFCTT4	DFHFCTT4
DFHFCTT5	DFHFCTT5
DFHFCTT6	DFHFCTT6
DFHFCTT7	DFHFCTT7
DFHFCTT8	DFHFCTT8
DFHFCTT9	DFHFCTT9
DFHFCTUE	DFHFCTUE
DFHFCTUR	DFHFCTUR
DFHFCTW1	DFHFCTW1
DFHFCU	DFHFCU
DFHFCVS	DFHFCVR DFHFCVS
DFHFEP	DFHFEP
DFHGCAA	DFHGCAA
DFHGMM	DFHGMM
DFHGTCNV	DFHLGICV DFHLGIGT
DFHHPSVC	DFHHPSVC
DFHICP	DFHICP
DFHICRC	DFHICRC
DFHICXM	DFHICXM
DFHIIPA$	DFHIIPA$
DFHIIP1$	DFHIIP1$
DFHINDAP	DFHEAI DFHEAI0 DFHINDAP
DFHINDSP	DFHINDSP
DFHINDT	DFHEAI DFHEAI0 DFHINDT DFHWLIST
DFHINTRU	DFHEAI DFHEAI0 DFHINTRU
DFHIRP	DFHIRP DFHMVRMS
DFHIRP52	DFHIRP DFHMVRMS
DFHIRW10	DFHIRW10
DFHISP	DFHISP
DFHJCP	DFHJCP
DFHJUP	DFHJUP
DFHJVCVT	DFHELII DFHJVCV@
DFHKCP	DFHKCQ DFHXCP
DFHKCRP	DFHKCRP
DFHKCSC	DFHKCSC
DFHKCSP	DFHKCSP
DFHKESVC	DFHKESVC
DFHLDDMI	DFHLDDMI
DFHLDNT	DFHLDNT
DFHLDST	DFHLDST
DFHLDSVC	DFHLDSVC
DFHLGDM	DFHLGDM DFHLGGL DFHLGJN DFHLGLD
	DFHLGPA DFHLGSC DFHLGST DFHL2BA
	DFHL2BL1 DFHL2BL2 DFHL2BS1 DFHL2BS2
	DFHL2BS3 DFHL2BS4 DFHL2CB DFHL2CC
	DFHL2CHA DFHL2CHE DFHL2CHG DFHL2CHH
	DFHL2CHI DFHL2CHL DFHL2CHM DFHL2CHN
	DFHL2CHR DFHL2CHS DFHL2CH1 DFHL2CH2
	DFHL2CH3 DFHL2CH4 DFHL2CH5 DFHL2DM
	DFHL2HB DFHL2HSF DFHL2HSG DFHL2HSJ

Load module	Object module(s)
	DFHL2HS2 DFHL2HS3 DFHL2HS4 DFHL2HS5
	DFHL2HS6 DFHL2HS7 DFHL2HS8 DFHL2HS9
	DFHL2LB DFHL2MV DFHL2OFI DFHL2SLE
	DFHL2SLN DFHL2SL1 DFHL2SR DFHL2SR1
	DFHL2SR2 DFHL2SR3 DFHL2SR4 DFHL2SR5
	DFHL2VP1 DFHL2WF
DFHLGQC	DFHEAI DFHEAI0 DFHLGQC
DFHLGCNV	DFHLGILA DFHLGIMS DFHLGIPA DFHLGIPI
	DFHLGISM DFHLGSSI
DFHLIRET	DFHLIRET
DFHLPADY	DFHLPADY
DFHLSCU	DFHLSCU
DFHLTRC	DFHLTRC
DFHLUP	DFHCRRSY DFHEAI DFHEAI0
DFHMCPA$	DFHMCPA$
DFHMCPE$	DFHMCPE$
DFHMCP1$	DFHMCP1$
DFHMCTMA	DFHMCTMA
DFHMCTMB	DFHMCTMB
DFHMCTM1	DFHMCTM1
DFHMCTM2	DFHMCTM2
DFHMCTM3	DFHMCTM3
DFHMCTM4	DFHMCTM4
DFHMCTM6	DFHMCTM6
DFHMCTM7	DFHMCTM7
DFHMCTQM	DFHMCTQM
DFHMCT2$	DFHMCT2$
DFHMCX	DFHMCX
DFHMEBM	DFHMEBM
DFHMEBMX	DFHMEBM
DFHMET1C	DFHMEACC DFHMEAIC DFHMEAMC DFHMEAPC
	DFHMEBRC DFHMECAC DFHMECCC DFHMECEC
	DFHMECPC DFHMECRC DFHMEDBC DFHMEDDE
	DFHMEDME DFHMEDSE DFHMEDUC DFHMEDXC
	DFHMEERE DFHMEFCC DFHMEFEC DFHMEICC
	DFHMEINC DFHMEIRC DFHMEJCC DFHMEKCC
	DFHMEKEE DFHMELDE DFHMELGC DFHMELME
	DFHMEMCC DFHMEMEE DFHMEMNE DFHMEMUE
	DFHMENQE DFHMEPAE DFHMEPCC DFHMEPGC
	DFHMEPRC DFHMEPSC DFHMERDC DFHMERMC
	DFHMERSC DFHMERTC DFHMERUE DFHMESIC
	DFHMESKE DFHMESME DFHMESNC DFHMESRE
	DFHMESTC DFHMESZC DFHMETCC DFHMETDC
	DFHMETFC DFHMETIE DFHMETMC DFHMETOC
	DFHMETPC DFHMETRC DFHMETSC DFHMET1
	DFHMEUPE DFHMEUSC DFHMEWBC DFHMEXAE
	DFHMEXCE DFHMEXGC DFHMEXMC DFHMEXOE
	DFHMEXSC DFHMEZAC DFHMEZBC DFHMEZCC
	DFHMEZDC DFHMEZEC DFHMEZNC DFHME00C
DFHMET1E	DFHMEACE DFHMEAIE DFHMEAME DFHMEAPE
	DFHMEBRE DFHMECAE DFHMECCE DFHMECEE
	DFHMECPE DFHMECRE DFHMEDBE DFHMEDDE
	DFHMEDME DFHMEDSE DFHMEDUE DFHMEDXE
	DFHMEERE DFHMEFCE DFHMEFEE DFHMEICE
	DFHMEINE DFHMEIRE DFHMEJCE DFHMEKCE
	DFHMEKEE DFHMELDE DFHMELGE DFHMELME
	DFHMEMCE DFHMEMEE DFHMEMNE DFHMEMUE
	DFHMENQE DFHMEPAE DFHMEPCE DFHMEPGE

Load module	Object module(s)
	DFHMEPRE DFHMEPSE DFHMERDE DFHMERME
	DFHMERSE DFHMERTE DFHMERUE DFHMESIE
	DFHMESKE DFHMESME DFHMESNE DFHMESRE
	DFHMESTE DFHMESZE DFHMETCE DFHMETDE
	DFHMETFE DFHMETIE DFHMETME DFHMETOE
	DFHMETPE DFHMETRE DFHMETSE DFHMET1
	DFHMEUPE DFHMEUSE DFHMEWBE DFHMEXAE
	DFHMEXCE DFHMEXGE DFHMEXME DFHMEXOE
	DFHMEXSE DFHMEZAE DFHMEZBE DFHMEZCE
	DFHMEZDE DFHMEZEE DFHMEZNE DFHME00E
DFHMET1K	DFHMEACK DFHMEAIK DFHMEAMK DFHMEAPK
	DFHMEBRK DFHMECAK DFHMECCK DFHMECEK
	DFHMECPK DFHMECRK DFHMEDBK DFHMEDDE
	DFHMEDME DFHMEDSE DFHMEDUK DFHMEDXK
	DFHMEERE DFHMEFCK DFHMEFEK DFHMEICK
	DFHMEINK DFHMEIRK DFHMEJCK DFHMEKCK
	DFHMEKEE DFHMELDE DFHMELGK DFHMELME
	DFHMEMCK DFHMEMEE DFHMEMNE DFHMEMUE
	DFHMENQE DFHMEPAE DFHMEPCK DFHMEPGK
	DFHMEPRK DFHMEPSK DFHMERDK DFHMERMK
	DFHMERSK DFHMERTK DFHMERUE DFHMESIK
	DFHMESKE DFHMESME DFHMESNK DFHMESRE
	DFHMESTK DFHMESZK DFHMETCK DFHMETDK
	DFHMETFK DFHMETIE DFHMETMK DFHMETOK
	DFHMETPK DFHMETRK DFHMETSK DFHMET1
	DFHMEUPE DFHMEUSK DFHMEWBK DFHMEXAE
	DFHMEXCE DFHMEXGK DFHMEXMK DFHMEXOE
	DFHMEXSK DFHMEZAK DFHMEZBK DFHMEZCK
	DFHMEZDK DFHMEZEK DFHMEZNK DFHME00K
DFHMET2C	DFHMET2 DFHME00C DFHME70C DFHME71C
	DFHME72C
DFHMET2E	DFHMET2 DFHME00E DFHME70E DFHME71E
	DFHME72E
DFHMET2K	DFHMET2 DFHME00K DFHME70K DFHME71K
	DFHME72K
DFHMET3E	DFHMESTE DFHMET3 DFHME00E
DFHMET4E	DFHMEEXE DFHMET4 DFHME00E
DFHMET5C	DFHMEROC DFHMERPC DFHMERQC DFHMERRC
	DFHMET5 DFHME00C
DFHMET5E	DFHMEROE DFHMERPE DFHMERQE DFHMERRE
	DFHMET5 DFHME00E
DFHMET5K	DFHMEROK DFHMERPK DFHMERQK DFHMERRK
	DFHMET5 DFHME00K
DFHMET9C	DFHMET9 DFHME00C DFHME1UC
DFHMET9E	DFHMET9 DFHME00E DFHME1UE
DFHMET9K	DFHMET9 DFHME00K DFHME1UK
DFHMEU	DFHMEU
DFHMEUA	DFHMEUA DFHMEUC DFHMEUD DFHMEUE
	DFHMEUL DFHMEUP DFHMEUU
DFHMEUM	DFHMEUM
DFHMGP	DFHMGPME DFHMGP00
DFHMGT	DFHMGT
DFHMIRS	DFHDLIAI DFHEAI DFHEAI0 DFHMIRS
DFHML1	DFHML1
DFHMNDML	DFHMNDM DFHMNMN DFHMNNT DFHMNSR
	DFHMNST DFHMNSU DFHMNTI DFHMNUE
	DFHMNXM
DFHMNDUP	DFHMNDUP
DFHMNSVC	DFHMNSVC
DFHMROQP	DFHMROQP
DFHMSCAN	DFHMSCAN
DFHMSP	DFHMSP
DFHMVRMS	DFHMVRMS
DFHMXP	DFHEAI DFHEAI0 DFHMXP
DFHM32A$	DFHM32A$
DFHM321$	DFHM321$
DFHNQDM	DFHNQDM DFHNQED DFHNQIB DFHNQIE
	DFHNQNQ DFHNQST
DFHPAIO	DFHPAIO
DFHPASYL	DFHPASY
DFHPBPA$	DFHPBPA$
DFHPBP1$	DFHPBP1$
DFHPCP	DFHPCPG
DFHPCPC2	DFHPCPC2
DFHPD530	DFHAIDUF DFHAPDUF DFHAPTRA DFHAPTRB
	DFHAPTRC DFHAPTRD DFHAPTRE DFHAPTRF
	DFHAPTRG DFHAPTRI DFHAPTRJ DFHAPTRK
	DFHAPTRL DFHAPTRN DFHAPTRO DFHAPTRP
	DFHAPTRR DFHAPTRS DFHAPTRU DFHAPTRV
	DFHAPTRW DFHAPTRX DFHAPTRY DFHAPTR0
	DFHAPTR2 DFHAPTR5 DFHAPTR6 DFHAPTR7
	DFHAPTR8 DFHAPTR9 DFHAUDUF DFHBRDUF
	DFHBRTRI DFHCCDUF DFHCCTRI DFHCPDUF
	DFHCRTRI DFHCSDUF DFHC3TRI DFHDBDUF
	DFHDDDU DFHDDDUF DFHDDTRI DFHDEDUF
	DFHDETRI DFHDKDUF DFHDKTRI DFHDMDUF
	DFHDMTRI DFHDSDUF DFHDSTRI DFHDUDUF
	DFHDUF DFHDUFFT DFHDUFUT DFHDUTRI
	DFHD2DUF DFHD2TRI DFHEITT2 DFHERDUF
	DFHEXDUF DFHEXTRI DFHFCDUF DFHFRDUF
	DFHFTDUF DFHFTTRI DFHICDUF DFHIPDUF
	DFHJVTRI DFHKEDUF DFHKELOC DFHKETRI
	DFHLDDUF DFHLDTRI DFHLGDUF DFHLGTRI
	DFHLITRI DFHLMDUF DFHLMTRI DFHL2DU0
	DFHL2TI2 DFHL2TRI DFHMEDUF DFHMETRI
	DFHMNDUF DFHMNTRI DFHMRDUF DFHNQDUF
	DFHNQTRI DFHNXDUF DFHPADUF DFHPATRI
	DFHPDKW DFHPDX1 DFHPGDUF DFHPGTRI
	DFHPRDUF DFHPTDUF DFHRDDUF DFHRITRI
	DFHRMDUF DFHRMDU0 DFHRMDU2 DFHRMDU3
	DFHRMDU4 DFHRMTRI DFHRTTRI DFHRTTR1
	DFHSMDUF DFHSMTRI DFHSNTRI DFHSPTRI
	DFHSSDUF DFHSTDUF DFHSTTRI DFHSUDUF
	DFHSUTRI DFHSZDUF DFHTCDPF DFHTCDUF
	DFHTCSUM DFHTDDUF DFHTDTRI DFHTFTRI
	DFHTIDUF DFHTITRI DFHTMDUF DFHTMTRI
	DFHTRDUF DFHTRFFD DFHTRFFE DFHTRFPB
	DFHTRFPP DFHTRIB DFHTRTRI DFHTSDUC
	DFHTSDUF DFHTSDUS DFHTSITR DFHUEDUF
	DFHUSDUF DFHUSTRI DFHWBTRI DFHXMDUF
	DFHXMTRI DFHXRDUF DFHXSDUF DFHXSTRI
	DFHZCTRI DFHZCTR1 DFHZRTRI DFHZXDUF
DFHPEP	DFHEAI DFHEAI0 DFHPEP
DFHPGADX	DFHEAI DFHEAI0 DFHPGADX
DFHPGDM	DFHPGAI DFHPGAQ DFHPGDD DFHPGDM
	DFHPGEX DFHPGHM DFHPGIS DFHPGLD

Load module	Object module(s)
	DFHPGLE DFHPGLK DFHPGLU DFHPGPG
	DFHPGRE DFHPGST DFHPGUE DFHPGXE
	DFHPGXM
DFHPGRP	DFHPGRP
DFHPHN	DFHPHN
DFHPHP	DFHPHP
DFHPLTRM	DFHPLTRM
DFHPRCM	DFHPRCM
DFHPRFS	DFHPRFS
DFHPRIN	DFHPRIN1 DFHPRIN2
DFHPRK	DFHPRK
DFHPRPT	DFHPRPT
DFHPRRP	DFHPRRP
DFHPSIP	DFHPSIP
DFHPSP	DFHPSP DFHPSPCK DFHPSPDW DFHPSPSS
	DFHPSPST
DFHPSSVC	DFHPSSVC
DFHPUP	DFHPUPC DFHPUPDC DFHPUPXC
DFHP3270	DFHP3270
DFHQRY	DFHEAI DFHEAI0 DFHQRY
DFHRCEX	DFHEAI DFHEAI0 DFHRCEX
DFHRCT1$	DFHRCT1$
DFHRDJPN	DFHRDJPN
DFHRDTCL	DFHTCTCL
DFHRDTDL	DFHTCTDL
DFHRDTDX	DFHTCTDX
DFHRDTDY	DFHTCTDY
DFHRDTRR	DFHTCTRR
DFHRDTTC	DFHTCTTC
DFHRDTTP	DFHTCTTP
DFHRDTUR	DFHTCTUR
DFHRDT41	DFHTCT41
DFHRDT5$	DFHTCT5$
DFHREST	DFHEAI DFHEAI0 DFHREST
DFHRKB	DFHRKB
DFHRLRA$	DFHRLRA$
DFHRLR1$	DFHRLR1$
DFHRMSY	DFHEAI DFHEAI0 DFHRMSY
DFHRMUTL	DFHCUFA DFHCUGA DFHRMUTL
DFHRMXN3	DFHRMXN3
DFHRPAL	DFHRPAL
DFHRPAS	DFHEAI DFHEAI0 DFHRPAS
DFHRPC00	DFHEAI DFHEAI0 DFHRPC0A DFHRPC0B
	DFHRPC0D DFHRPC0E DFHRPC01 DFHRPC03
	DFHRPC04 DFHRPC05 DFHRPC06 DFHRPC08
	DFHRPC09 DFHRPC10 DFHRPC4C DFHRPC42
DFHRPDUF	DFHRPDUF
DFHRPMS	DFHEAI DFHEAI0 DFHRPMS
DFHRPRP	DFHRPCC DFHRPRP
DFHRPTRI	DFHRPALT DFHRPRPT DFHRPTRI
DFHRPTRU	DFHRPTRU
DFHRP0	DFHRP0
DFHRP0H	DFHRP0H
DFHRTC	DFHRTC
DFHRTE	DFHRTE
DFHRTSU	DFHRTSU
DFHRTY	DFHRTY
DFHSAIQ	DFHSAIQ

Load module	Object module(s)
DFHSCAA	DFHSCAA
DFHSFP	DFHEAI DFHEAI0 DFHSFP
DFHSIA1	DFHSIA1
DFHSIB1	DFHSIB1
DFHSIC1	DFHSIC1
DFHSID1	DFHSID1
DFHSIF1	DFHSIF1
DFHSIG1	DFHSIG1
DFHSIH1	DFHSIH1
DFHSII1	DFHSII1
DFHSIJ1	DFHSIJ1
DFHSIP	DFHCCCC DFHCCDM DFHCICS DFHDDBR
	DFHDDDI DFHDDDM DFHDDLO DFHDLXDF
	DFHDMDM DFHDMDS DFHDMEN DFHDMENF
	DFHDMIQ DFHDMWQ DFHDSAT DFHDSBR
	DFHDSCPX DFHDSCSA DFHDSDM DFHDSDS2
	DFHDSDS3 DFHDSDS4 DFHDSIT DFHDSKE
	DFHDSSM DFHDSSR DFHDSST DFHDSSTX
	DFHDSTCB DFHDSUE DFHDUDM DFHDUDT
	DFHDUDU DFHDUFT DFHDUSR DFHDUSU
	DFHDUTM DFHDUXD DFHDUXW DFHFCXDF
	DFHKEAR DFHKEDCL DFHKEDD DFHKEDRT
	DFHKEDS DFHKEEDA DFHKEGD DFHKEIN
	DFHKERCD DFHKERER DFHKERET DFHKERKE
	DFHKERPC DFHKERRI DFHKERRQ DFHKERRU
	DFHKERRX DFHKESCL DFHKESFM DFHKESGM
	DFHKESIP DFHKESRT DFHKESTX DFHKETA
	DFHKETAB DFHKETCB DFHKETI DFHKETIX
	DFHKEXM DFHLDDM DFHLDLD DFHLDLD1
	DFHLDLD2 DFHLDLD3 DFHLMDM DFHLMDS
	DFHLMIQ DFHLMLM DFHMEBU DFHMEDM
	DFHMEFO DFHMEIN DFHMEME DFHMESR
	DFHMEWS DFHMEWT DFHPADM DFHPAGP
	DFHPCXDF DFHRMCD DFHRMCD1 DFHRMCD2
	DFHRMCI2 DFHRMCI3 DFHRMCI4 DFHRMDM
	DFHRMLKQ DFHRMLK1 DFHRMLK2 DFHRMLK3
	DFHRMLK4 DFHRMLK5 DFHRMLN DFHRMLSD
	DFHRMLSF DFHRMLSO DFHRMLSP DFHRMLSS
	DFHRMLSU DFHRML1D DFHRMNM DFHRMNM1
	DFHRMNS1 DFHRMNS2 DFHRMOFI DFHRMRO
	DFHRMROO DFHRMROS DFHRMROU DFHRMROV
	DFHRMRO1 DFHRMRO2 DFHRMRO3 DFHRMRO4
	DFHRMR1D DFHRMR1E DFHRMR1K DFHRMR1S
	DFHRMSL DFHRMSLF DFHRMSLJ DFHRMSLL
	DFHRMSLO DFHRMSLV DFHRMSLW DFHRMSL1
	DFHRMSL2 DFHRMSL3 DFHRMSL4 DFHRMSL5
	DFHRMSL6 DFHRMSL7 DFHRMST DFHRMST1
	DFHRMUC DFHRMUO DFHRMUW DFHRMUWB
	DFHRMUWE DFHRMUWF DFHRMUWH DFHRMUWJ
	DFHRMUWL DFHRMUWN DFHRMUWP DFHRMUWQ
	DFHRMUWS DFHRMUWU DFHRMUWV DFHRMUWW
	DFHRMUW0 DFHRMUW1 DFHRMUW2 DFHRMUW3
	DFHRMU1C DFHRMU1D DFHRMU1E DFHRMU1F
	DFHRMU1G DFHRMU1J DFHRMU1K DFHRMU1L
	DFHRMU1N DFHRMU1Q DFHRMU1R DFHRMU1S
	DFHRMU1U DFHRMU1V DFHRMU1W DFHRMVP1
	DFHRMXNE DFHRMXN2 DFHRMXN4 DFHRMXN5
	DFHSAXDF DFHSMAD DFHSMAR DFHSMCK

Load module	Object module(s)
	DFHSMDM DFHSMGF DFHSMMCI DFHSMMC2
	DFHSMMF DFHSMMG DFHSMPP DFHSMPQ
	DFHSMSCP DFHSMSQ DFHSMSR DFHSMST
	DFHSMSU DFHSMSY DFHSMXDF DFHSUME
	DFHSUWT DFHTCXDF DFHTRDM DFHTRFT
	DFHTRPT DFHTRPX DFHTRSR DFHTRSU
	DFHTRXDF DFHXDXDF DFHXMAT DFHXMBD
	DFHXMBR DFHXMCL DFHXMCS DFHXMDD
	DFHXMDM DFHXMER DFHXMFD DFHXMIQ
	DFHXMLD DFHXMQC DFHXMQD DFHXMRP
	DFHXMSR DFHXMST DFHXMTA DFHXMXD
	DFHXMXE DFHXRF DFHXRXDF DFHXSAD
	DFHXSDM DFHXSEV DFHXSFL DFHXSIS
	DFHXSLU DFHXSPW DFHXSRC DFHXSXM
DFHSIPLT	DFHSIPLT DFHUEIQ
DFHSIT	DFHSIT DFHSIT$$
DFHSITCL	DFHSITCL
DFHSIT42	DFHSIT42
DFHSIT6$	DFHSIT6$
DFHSKP	DFHSKC DFHSKE DFHSKM
DFHSKTSK	DFHSKTSK
DFHSMSVC	DFHSMSVC
DFHSMTAB	DFHSMTAB
DFHSNLE	DFHSNLE
DFHSNLK	DFHSNLK
DFHSNMIG	DFHSNMIG
DFHSNNFY	DFHSNNFY
DFHSNP	DFHEAI DFHEAI0 DFHSNP
DFHSNPTO	DFHSNPTO
DFHSNSE	DFHSNSE
DFHSNSK	DFHSNSK
DFHSNUS	DFHSNAS DFHSNPU DFHSNSG DFHSNSU
	DFHSNTU DFHSNUS DFHSNXR
DFHSNVCL	DFHSNVCL
DFHSNVID	DFHSNVID
DFHSNVPR	DFHSNVPR
DFHSNVTO	DFHSNVTO
DFHSPP	DFHSPP
DFHSRP	DFHABAB DFHSRLI DFHSRP DFHSR1
DFHSRT	DFHSRT
DFHSRTYB	DFHSRTYB
DFHSRT1$	DFHSRT1$
DFHSSEN	DFHSSEN
DFHSSENK	DFHSSEN
DFHSSGC	DFHSSGC
DFHSSGCK	DFHSSGC
DFHSSIN	DFHSSIN DFHSSMGP
DFHSSINK	DFHSSIN DFHSSMGP
DFHSSMGT	DFHSSMGT
DFHSSWT	DFHSSWT DFHSSWTF DFHSSWTO
DFHSSWTK	DFHSSWT DFHSSWTF DFHSSWTO
DFHSTDML	DFHSTDM DFHSTST DFHSTTI DFHSTUE
DFHSTP	DFHSTP DFHWKP
DFHSTUP	DFHKEAR DFHKEDCL DFHKEDD DFHKEDRT
	DFHKEDS DFHKEEDA DFHKEGD DFHKEIN
	DFHKERCD DFHKERER DFHKERET DFHKERKE
	DFHKERPC DFHKERRI DFHKERRQ DFHKERRU
	DFHKERRX DFHKESCL DFHKESFM DFHKESGM
	DFHKESIP DFHKESRT DFHKESTX DFHKETA
	DFHKETB2 DFHKETCB DFHKETI DFHKETIX
	DFHKEXM DFHSTDBX DFHSTDEX DFHSTDSX
	DFHSTDUX DFHSTD2X DFHSTE15 DFHSTE35
	DFHSTIN DFHSTLDX DFHSTLGX DFHSTMNX
	DFHSTNQX DFHSTOT DFHSTPGX DFHSTRD
	DFHSTRMX DFHSTSMX DFHSTSTX DFHSTTQX
	DFHSTTSX DFHSTUDB DFHSTUDE DFHSTUDS
	DFHSTUDU DFHSTUD2 DFHSTULD DFHSTULG
	DFHSTUMN DFHSTUNQ DFHSTUPG DFHSTUP1
	DFHSTURM DFHSTURS DFHSTURX DFHSTUSM
	DFHSTUST DFHSTUTQ DFHSTUTS DFHSTUXC
	DFHSTUXM DFHSTU03 DFHSTU04 DFHSTU06
	DFHSTU08 DFHSTU09 DFHSTU14 DFHSTU16
	DFHSTU17 DFHSTU21 DFHSTU22 DFHSTWR
	DFHSTXCX DFHSTXMX DFHST03X DFHST04X
	DFHST06X DFHST08X DFHST09X DFHST14X
	DFHST16X DFHST17X DFHST21X DFHST22X
	DFHXRF
DFHSUSX	DFHSNXR DFHSUSX
DFHSUWT	DFHMEFO DFHSUWT
DFHSUZX	DFHSUZX
DFHSZATR	DFHSZATC DFHSZATR DFHSZRPW DFHSZRQW
	DFHSZRRT
DFHSZRMP	DFHSZBCL DFHSZBCS DFHSZBFT DFHSZBLO
	DFHSZBRS DFHSZBSI DFHSZBST DFHSZBUN
	DFHSZBUS DFHSZFRD DFHSZFSD DFHSZIDX
	DFHSZPCP DFHSZPDX DFHSZPID DFHSZPIX
	DFHSZPOA DFHSZPOD DFHSZPOR DFHSZPOX
	DFHSZPOY DFHSZPQS DFHSZPQX DFHSZPSB
	DFHSZPSC DFHSZPSD DFHSZPSH DFHSZPSQ
	DFHSZPSR DFHSZPSS DFHSZPSX DFHSZPTE
	DFHSZRCA DFHSZRCT DFHSZRDC DFHSZRDG
	DFHSZRDN DFHSZRDP DFHSZRDS DFHSZRDT
	DFHSZREQ DFHSZRFC DFHSZRGR DFHSZRIA
	DFHSZRIC DFHSZRID DFHSZRIF DFHSZRII
	DFHSZRIN DFHSZRIO DFHSZRIP DFHSZRIQ
	DFHSZRIS DFHSZRIT DFHSZRIW DFHSZRNC
	DFHSZRNO DFHSZRPM DFHSZRQR DFHSZRRD
	DFHSZRSC DFHSZRSE DFHSZRST DFHSZRTM
	DFHSZRXD DFHSZRZZ DFHSZSIP DFHSZVBN
	DFHSZVGF DFHSZVQS DFHSZVRA DFHSZVRI
	DFHSZVSC DFHSZVSL DFHSZVSQ DFHSZVSR
	DFHSZVSY DFHSZWSL DFHSZXDA DFHSZXFR
	DFHSZXLG DFHSZXLT DFHSZXNS DFHSZXPM
	DFHSZXRA DFHSZXSC DFHSZXTP DFHSZYLG
	DFHSZYQR DFHSZYRI DFHSZYSC DFHSZYSR
	DFHSZYSY DFHSZZAG DFHSZZFR DFHSZZNG
	DFHSZZRG DFHSZ2CP DFHSZ2DX DFHSZ2ID
	DFHSZ2IX DFHSZ2OA DFHSZ2OD DFHSZ2OR
	DFHSZ2OX DFHSZ2OY DFHSZ2PX DFHSZ2QS
	DFHSZ2QX DFHSZ2SB DFHSZ2SC DFHSZ2SD
	DFHSZ2SH DFHSZ2SQ DFHSZ2SR DFHSZ2SX
	DFHSZ2TE
DFHTACP	DFHTACP
DFHTAJP	DFHTAJP
DFHTBS	DFHTBSB DFHTBSBP DFHTBSD DFHTBSDP
	DFHTBSL DFHTBSQ DFHTBSQP DFHTBSR

Load module	Object module(s)
	DFHTBSRP DFHTBS00
DFHTBSS	DFHTBSLP DFHTBSS
DFHTCP	DFHTCP
DFHTCRP	DFHTCRP DFHTCRPC DFHTCRPL DFHTCRPS
	DFHTCRPU DFHZXQO
DFHTCTCL	DFHTCTCL
DFHTCTDL	DFHTCTDL
DFHTCTDX	DFHTCTDX
DFHTCTDY	DFHTCTDY
DFHTCTRR	DFHTCTRR
DFHTCTTC	DFHTCTTC
DFHTCTTP	DFHTCTTP
DFHTCTUR	DFHTCTUR
DFHTCT41	DFHTCT41
DFHTCT5$	DFHTCT5$
DFHTDP	DFHTDA DFHTDEXL DFHTDOC DFHTDX
DFHTDQ	DFHTDB
DFHTDRM	DFHTDRM
DFHTDRP	DFHTDRP
DFHTDTM	DFHTDTM
DFHTDXM	DFHTDXM
DFHTEP	DFHEAI DFHEAI0 DFHXTEP
DFHTEPT	DFHXTEPT
DFHTEPT3	DFHTEPT3
DFHTFBF	DFHZSUP
DFHTFIQ	DFHTFIQ
DFHTFP	DFHTFP
DFHTFRF	DFHTFRF
DFHTG530	DFHTRFPP DFHTRPRG
DFHTIDM	DFHTIDM DFHTISR
DFHTLTC1	DFHTLTC1
DFHTLTK2	DFHTLTK2
DFHTLTS1	DFHTLTS1
DFHTLTS2	DFHTLTS2
DFHTLTT	DFHTLTT
DFHTLTTF	DFHTLTTF
DFHTLTT1	DFHTLTT1
DFHTLTT2	DFHTLTT2
DFHTLTT3	DFHTLTT3
DFHTLTT4	DFHTLTT4
DFHTLTT5	DFHTLTT5
DFHTLTT6	DFHTLTT6
DFHTLTT7	DFHTLTT7
DFHTLTT8	DFHTLTT8
DFHTLTW1	DFHTLTW1
DFHTMP	DFHTMP01 DFHTMP02
DFHTON	DFHTON
DFHTONR	DFHTONR
DFHTOR	DFHTOACN DFHTOAPT DFHTOASE DFHTOATM
	DFHTOATY DFHTOBPS DFHTOCAN DFHTOCMT
	DFHTOLCR DFHTOLUI DFHTOR00 DFHTOUT1
	DFHTOUT2 DFHTRZCP DFHTRZIP DFHTRZPP
	DFHTRZXP DFHTRZYP DFHTRZZP
DFHTORP	DFHTORP
DFHTPPA$	DFHTPPA$
DFHTPP1$	DFHTPP1$
DFHTPQ	DFHTPQ
DFHTPR	DFHTPR

Load module	Object module(s)
DFHTPS	DFHTPS
DFHTRAO	DFHTRAO
DFHTRAP	DFHTRAP
DFHTREX	DFHTREX DFHXCDMP DFHXCTRP
DFHTRP	DFHTRP
DFHTR530	DFHAPTRA DFHAPTRB DFHAPTRC DFHAPTRD
	DFHAPTRE DFHAPTRF DFHAPTRG DFHAPTRI
	DFHAPTRJ DFHAPTRK DFHAPTRL DFHAPTRN
	DFHAPTRO DFHAPTRP DFHAPTRR DFHAPTRS
	DFHAPTRU DFHAPTRV DFHAPTRW DFHAPTRX
	DFHAPTRY DFHAPTR0 DFHAPTR2 DFHAPTR5
	DFHAPTR6 DFHAPTR7 DFHAPTR8 DFHAPTR9
	DFHBRTRI DFHCCTRI DFHCRTRI DFHC3TRI
	DFHDDTRI DFHDETRI DFHDKTRI DFHDMTRI
	DFHDSTRI DFHDUTRI DFHD2TRI DFHEITT2
	DFHEXTRI DFHFTTRI DFHJVTRI DFHKETRI
	DFHLDTRI DFHLGTRI DFHLITRI DFHLMTRI
	DFHL2TI2 DFHL2TRI DFHMETRI DFHMNTRI
	DFHNQTRI DFHPATRI DFHPGTRI DFHRITRI
	DFHRMTRI DFHRTTRI DFHRTTR1 DFHSMTRI
	DFHSNTRI DFHSNXRT DFHSPTRI DFHSTTRI
	DFHSUTRI DFHTDTRI DFHTFTRI DFHTITRI
	DFHTMTRI DFHTRFFD DFHTRFFE DFHTRIB
	DFHTRTRI DFHTSITR DFHUSTRI DFHWBTRI
	DFHXMTRI DFHXSTRI DFHZCTRI DFHZCTR1
	DFHZRTRI
DFHTSDML	AXMSC1 AXMSC2 DFHTSAM DFHTSBR
	DFHTSDM DFHTSPT DFHTSQR DFHTSRM
	DFHTSSH DFHTSSR DFHTSST DFHTSWQ
	DFHXQIF
DFHTSP	DFHTSP
DFHTST	DFHTST
DFHTSTDA	DFHTSTDA
DFHTSTDL	DFHTSTDL
DFHTSTNS	DFHTSTNS
DFHTSTR1	DFHTSTR1
DFHTT530	DFHABABT DFHAFMTT DFHAIINT DFHAIIQT
	DFHAIRPT DFHAITMT DFHAPACT DFHAPAPT
	DFHAPEXT DFHAPIQT DFHAPLIT DFHAPRDT
	DFHAPRTT DFHAPUET DFHAPXMT DFHASSUT
	DFHBRFMT DFHBRSPT DFHCCCCT DFHCDCON
	DFHCDEDT DFHCPCCT DFHCPINT DFHCPSPT
	DFHCRLBT DFHDDBRT DFHDDDIT DFHDDLOT
	DFHDEIST DFHDESST DFHDESVT DFHDKMRT
	DFHDMDMT DFHDMENT DFHDMIQT DFHDMWQT
	DFHDSATT DFHDSBRT DFHDSDST DFHDSITT
	DFHDSSRT DFHDUDDT DFHDUDTT DFHDUDUT
	DFHDUFTT DFHDUIOT DFHDUSRT DFHDUSUT
	DFHDUXFT DFHDUXWT DFHD2CCT DFHD2TMT
	DFHEIEIT DFHEISRT DFHFCATT DFHFCCAT
	DFHFCDNT DFHFCFLT DFHFCFRT DFHFCFST
	DFHFCINT DFHFCLJT DFHFCMTT DFHFCQIT
	DFHFCQRT DFHFCQST DFHFCQUT DFHFCRLT
	DFHFCRPT DFHFCRRT DFHFCSDT DFHFCSTT
	DFHFORM DFHICXMT DFHJCJCT DFHKCSCT
	DFHKEART DFHKEDDT DFHKEDST DFHKEGDT
	DFHKEINT DFHKETIT DFHKEXMT DFHLDLDT
	DFHLDSUT DFHLGBAT DFHLGCBT DFHLGCCT

Load module	Object module(s)
	DFHLGGLT DFHLGJNT DFHLGLBT DFHLGLDT
	DFHLGMVT DFHLGPAT DFHLGSRT DFHLGSTT
	DFHLGWFT DFHLILIT DFHLMIQT DFHLMLMT
	DFHMEBMT DFHMEBUT DFHMEFOT DFHMEINT
	DFHMEMET DFHMESRT DFHMEWST DFHMEWTT
	DFHMNMNT DFHMNSRT DFHMNSUT DFHMNXMT
	DFHNQEDT DFHNQIBT DFHNQNQT DFHPAGPT
	DFHPAIOT DFHPASYT DFHPGAIT DFHPGAQT
	DFHPGDDT DFHPGEXT DFHPGHMT DFHPGIST
	DFHPGLDT DFHPGLET DFHPGLKT DFHPGLUT
	DFHPGPGT DFHPGRET DFHPGRPT DFHPGXET
	DFHPGXMT DFHPRCMT DFHPRFST DFHPRINU
	DFHPRPTT DFHPRRPT DFHRMCDT DFHRMDET
	DFHRMDMT DFHRMKDT DFHRMKPT DFHRMLKT
	DFHRMLNT DFHRMNMT DFHRMRET DFHRMROT
	DFHRMSLT DFHRMUWT DFHRMWTT DFHROINT
	DFHRTSUT DFHSAIQT DFHSMADT DFHSMAFT
	DFHSMART DFHSMCKT DFHSMGFT DFHSMMCT
	DFHSMNTT DFHSMPPT DFHSMPQT DFHSMSQT
	DFHSMSRT DFHSMSUT DFHSNUST DFHSNXRT
	DFHSRLIT DFHSTSTT DFHSUEXT DFHSUMET
	DFHSUSXT DFHSUWTT DFHSUZXT DFHTBSST
	DFHTDOCT DFHTDTDT DFHTDTMT DFHTDXMT
	DFHTFALT DFHTFBFT DFHTFIQT DFHTFRFT
	DFHTISRT DFHTONRT DFHTRFTT DFHTRPTT
	DFHTRSRT DFHTRSUT DFHTSAMT DFHTSBRT
	DFHTSICT DFHTSPTT DFHTSQRT DFHTSSBT
	DFHTSSHT DFHTSSRT DFHTSWQT DFHUEIQT
	DFHUSADT DFHUSDET DFHUSFLT DFHUSIST
	DFHUSTIT DFHUSXMT DFHWBIPT DFHWBSTT
	DFHWBTCT DFHWBWBT DFHXMATT DFHXMBDT
	DFHXMBRT DFHXMCLT DFHXMCST DFHXMDDT
	DFHXMDNT DFHXMERT DFHXMFDT DFHXMIQT
	DFHXMLDT DFHXMNTT DFHXMPPT DFHXMQCT
	DFHXMQDT DFHXMRPT DFHXMSRT DFHXMSUT
	DFHXMXDT DFHXMXET DFHXSADT DFHXSFLT
	DFHXSIDT DFHXSIST DFHXSLUT DFHXSPWT
	DFHXSRCT DFHXSSAT DFHXSSBT DFHXSSCT
	DFHXSSDT DFHXSSIT DFHXSXMT DFHZCN2T
	DFHZCUTT DFHZGAIT DFHZGBMT DFHZGCAT
	DFHZGCCT DFHZGCHT DFHZGCNT DFHZGDAT
	DFHZGINT DFHZGPCT DFHZGPRT DFHZGRPT
	DFHZGSLT DFHZGTAT DFHZGTIT DFHZGTRT
	DFHZGUBT DFHZGXAT
DFHTU530	DFHAPTRA DFHAPTRB DFHAPTRC DFHAPTRD
	DFHAPTRE DFHAPTRF DFHAPTRG DFHAPTRI
	DFHAPTRJ DFHAPTRK DFHAPTRL DFHAPTRN
	DFHAPTRO DFHAPTRP DFHAPTRR DFHAPTRS
	DFHAPTRU DFHAPTRV DFHAPTRW DFHAPTRX
	DFHAPTRY DFHAPTR0 DFHAPTR2 DFHAPTR5
	DFHAPTR6 DFHAPTR7 DFHAPTR8 DFHAPTR9
	DFHBRTRI DFHCCTRI DFHCRTRI DFHC3TRI
	DFHDDTRI DFHDETRI DFHDKTRI DFHDMTRI
	DFHDSTRI DFHDUTRI DFHD2TRI DFHEITT2
	DFHEXTRI DFHFTTRI DFHJVTRI DFHKETRI
	DFHLDTRI DFHLGTRI DFHLITRI DFHLMTRI
	DFHL2TI2 DFHL2TRI DFHMETRI DFHMNTRI
	DFHNQTRI DFHPATRI DFHPGTRI DFHRITRI

Load module	Object module(s)
	DFHRMTRI DFHRTTRI DFHRTTR1 DFHSMTRI
	DFHSNTRI DFHSNXRT DFHSPTRI DFHSTTRI
	DFHSUTRI DFHTDTRI DFHTFTRI DFHTITRI
	DFHTMTRI DFHTRFFD DFHTRFFE DFHTRFPB
	DFHTRFPP DFHTRIB DFHTRPRA DFHTRTRI
	DFHTSITR DFHUSTRI DFHWBTRI DFHXMTRI
	DFHXSTRI DFHZCTRI DFHZCTR1 DFHZRTRI
DFHUCNV	DFHEAI DFHEAI0 DFHUCNV
DFHUEH	DFHUEH
DFHUEM	DFHTIEM DFHUEM
DFHUSDM	DFHUSAD DFHUSDE DFHUSDM DFHUSFL
	DFHUSIS DFHUSST DFHUSTI DFHUSXM
DFHWBA	DFHEAI DFHEAI0 DFHWBA
DFHWBADX	DFHEAI DFHEAI0 DFHWBADX
DFHWBAPI	DFHELII DFHWBAP@ DFHXCSTB
DFHWBA1	DFHEAI DFHEAI0 DFHWBA1
DFHWBC00	DFHEAI DFHEAI0 DFHWBC0B DFHWBC01
	DFHWBC03 DFHWBC04 DFHWBC09 DFHWBC42
DFHWBDUF	DFHWBDUF
DFHWBENV	DFHEAI DFHEAI0 DFHWBENV
DFHWBIMG	DFHEAI DFHEAI0 DFHWBIMG
DFHWBIP	DFHWBIP
DFHWBLT	DFHEAI DFHEAI0 DFHWBLT
DFHWBM	DFHEAI DFHEAI0 DFHWBM
DFHWBPA	DFHEAI DFHEAI0 DFHWBPA
DFHWBRP	DFHEAI DFHEAI0 DFHWBRP
DFHWBST	DFHWBST
DFHWBTC	DFHELII DFHWBTC DFHWBTC@
DFHWBTL	DFHEAI DFHEAI0 DFHWBRP DFHWBTL
DFHWBTRI	DFHTRIB DFHWBSTT DFHWBTRI DFHWBWBT
DFHWBTRU	DFHWBTRU
DFHWBTTA	DFHEAI DFHEAI0 DFHWBTTA
DFHWBWB	DFHWBCC@ DFHWBWB
DFHWB0	DFHWB0
DFHWB0H	DFHWB0H
DFHWOS	DFHWOS
DFHWOSA	DFHWOSA
DFHWOSB	DFHWOSB
DFHWSMS	DFHWCCS DFHWCGNT DFHWDATT DFHWDINA
	DFHWDISP DFHWDSRP DFHWDWAT DFHWLFRE
	DFHWLGET DFHWMG1 DFHWMI DFHWMMT
	DFHWMPG DFHWMP1 DFHWMQG DFHWMQH
	DFHWMQP DFHWMQS DFHWMRD DFHWMS20
	DFHWMWR DFHWSRTR DFHWSSOF DFHWSSR
	DFHWSSW DFHWSTI DFHWSTKV DFHWTRP
DFHWSSON	DFHWSSN1 DFHWSSN2 DFHWSSN3 DFHWSXPI
DFHWTI	DFHWTI
DFHXCEIX	DFHXCEIP DFHXCSTB
DFHXCI	DFHEXMG4 DFHEXMS4
DFHXCOPT	DFHXCOPT
DFHXCPRX	DFHXCDMP DFHXCPRH DFHXCTRI DFHXCTRP
	DFHXFQ
DFHXCSTB	DFHXCSTB
DFHXCSVC	DFHXCSVC
DFHXCTAB	DFHXCTAB
DFHXCTRA	DFHXCTRA
DFHXCURM	DFHXCURM
DFHXFP	DFHXFP

Load module	Object module(s)
DFHXFRM	DFHXFRM
DFHXFX	DFHXFX
DFHXIS	DFHXIS
DFHXLTTA	DFHXLTTA
DFHXLTTB	DFHXLTTB
DFHXLTTC	DFHXLTTC
DFHXLTTN	DFHXLTTN
DFHXLTW1	DFHXLTW1
DFHXMAB	DFHEAI DFHXMAB
DFHXMSG	DFHXMSG
DFHXQMN	AXMBF AXMER AXMEV AXMFL
	AXMHP AXMHS AXMLF AXMLK
	AXMMS AXMMSTAB AXMOP AXMOS
	AXMPG AXMRM AXMRS AXMSC1
	AXMTI AXMTK AXMTM AXMTR
	AXMVS AXMWH AXMWT AXMXM
	DFHXQBF DFHXQCF DFHXQCN DFHXQDF
	DFHXQIQ DFHXQMN DFHXQMS DFHXQOP
	DFHXQPR DFHXQRL DFHXQRQ DFHXQST
	DFHXQUL
DFHXRCP	DFHXRCP
DFHXRP	DFHWMS DFHXRA DFHXRB DFHXRC
	DFHXRE DFHXRF
DFHXRSP	DFHXRSP
DFHXSEAI	DFHXSEAI
DFHXSS	DFHXSSA DFHXSSB DFHXSSC DFHXSSD
	DFHXSSI
DFHXSWM	DFHXSWM
DFHXTCI	DFHXTCI
DFHXTENF	DFHXTENF
DFHXTP	DFHXTP
DFHZATA	DFHEAI DFHEAI0 DFHZATA
DFHZATD	DFHEAI DFHEAI0 DFHZATD
DFHZATDX	DFHEAI DFHEAI0 DFHZATDX
DFHZATDY	DFHEAI DFHEAI0 DFHZATDY
DFHZATMD	DFHEAI DFHEAI0 DFHZATMD
DFHZATMF	DFHEAI DFHEAI0 DFHZATMF
DFHZATR	DFHEAI DFHEAI0 DFHZATR
DFHZATS	DFHEAI DFHEAI0 DFHZATS
DFHZBAN	DFHZBAN
DFHZCA	DFHZACT DFHZCA DFHZFRE DFHZGET
	DFHZQUE DFHZRST
DFHZCB	DFHZATI DFHZCB DFHZDET DFHZHPSR
	DFHZLRP DFHZRAC DFHZRAS DFHZRVS
	DFHZRVX DFHZSDR DFHZSDS DFHZSDX
	DFHZSSX DFHZUIX
DFHZCC	DFHZARER DFHZARL DFHZARM DFHZARR
	DFHZARRA DFHZARRC DFHZARRF DFHZBKT
	DFHZCC DFHZCHS DFHZCNT DFHZCRT
	DFHZRLP DFHZRLX DFHZRVL DFHZSDL
	DFHZSLX DFHZSTAP DFHZUSR
DFHZCGRP	DFHZCGRP
DFHZCN1	DFHEAI DFHEAI0 DFHZCN1
DFHZCN2	DFHZCN2
DFHZCOVR	DFHEAI DFHEAI0 DFHZCOVR
DFHZCP	DFHSNSC DFHZARQ DFHZATT DFHZCNA
	DFHZCP DFHZDSP DFHZISP DFHZUCT
DFHZCQ	DFHBSIB3 DFHBSIZ1 DFHBSIZ3 DFHBSMIR
	DFHBSMPP DFHBSM61 DFHBSM62 DFHBSS
	DFHBSSA DFHBSSF DFHBSSS DFHBSSZ
	DFHBSSZG DFHBSSZI DFHBSSZL DFHBSSZM
	DFHBSSZP DFHBSSZR DFHBSSZS DFHBSSZ6
	DFHBST DFHBSTB DFHBSTBL DFHBSTB3
	DFHBSTC DFHBSTD DFHBSTE DFHBSTH
	DFHBSTI DFHBSTM DFHBSTO DFHBSTP3
	DFHBSTS DFHBSTT DFHBSTZ DFHBSTZA
	DFHBSTZB DFHBSTZC DFHBSTZE DFHBSTZL
	DFHBSTZO DFHBSTZP DFHBSTZR DFHBSTZS
	DFHBSTZV DFHBSTZZ DFHBSTZ1 DFHBSTZ2
	DFHBSTZ3 DFHBSZZ DFHBSZZS DFHBSZZV
	DFHZCQCH DFHZCQDL DFHZCQIN DFHZCQIQ
	DFHZCQIS DFHZCQRS DFHZCQRT DFHZCQ00
DFHZCSTP	DFHZCSTP
DFHZCT1	DFHEAI DFHEAI0 DFHZCT1
DFHZCUT	DFHSNSC DFHZCUT
DFHZCW	DFHZCW DFHZERH DFHZEV1 DFHZEV2
DFHZCX	DFHZABD DFHZAND DFHZCNR DFHZCX
	DFHZIS1 DFHZIS2 DFHZLOC DFHZSTU
DFHZCXR	DFHZCXR DFHZTSP DFHZXRL DFHZXRT
DFHZCY	DFHZASX DFHZBLX DFHZCY DFHZDST
	DFHZLEX DFHZLGX DFHZLTX DFHZNSP
	DFHZOPA DFHZRRX DFHZRSY1 DFHZRSY2
	DFHZRSY3 DFHZRSY4 DFHZRSY5 DFHZRSY6
	DFHZSAX DFHZSCX DFHZSDA DFHZSES
	DFHZSEX DFHZSHU DFHZSIM DFHZSIX
	DFHZSKR DFHZSLS DFHZSYN DFHZSYX
	DFHZTPX DFHZTRA DFHZXPS DFHZXRC
DFHZCZ	DFHZCLS DFHZCLX DFHZCRQ DFHZCZ
	DFHZEMW DFHZOPN DFHZOPX DFHZRAQ
	DFHZRAR DFHZTAX
DFHZGAI	DFHZGAI
DFHZGBM	DFHZGBM
DFHZGCA	DFHZGCA
DFHZGCC	DFHZGCC
DFHZGCH	DFHZGCH
DFHZGCN	DFHZGCN
DFHZGDA	DFHZGDA
DFHZGIN	DFHZGIN
DFHZGPC	DFHZCPLR DFHZGPC
DFHZGPR	DFHZGPR
DFHZGRP	DFHZGRP
DFHZGSL	DFHZGSL
DFHZGTA	DFHZGTA
DFHZGTI	DFHZGTI
DFHZGUB	DFHZGUB
DFHZGXA	DFHZGXA
DFHZHPRX	DFHZHPRX
DFHZLS1	DFHEAI DFHEAI0 DFHZLS1
DFHZNAC	DFHZNAC
DFHZNEP	DFHEAI DFHEAI0 DFHZNEP0
DFHZRSP	DFHZRSP
DFHZXCU	DFHEAI DFHEAI0 DFHSNXR DFHZXCU
DFHZXRE	DFHZXRE0
DFHZXST	DFHZXST DFHZXSTS
DFH99	DFHEAI DFHEAI0 DFH99BC DFH99CC
	DFH99DY DFH99FP DFH99GI DFH99KC

Load module	Object module(s)
	DFH99KH DFH99KO DFH99KR DFH99LK
	DFH99ML DFH99MM DFH99MP DFH99MT
	DFH99RP DFH99T DFH99TK DFH99TX
	DFH99VH
DFH99SVC	DFH99SVC
DFH$AALL	DFHEAI DFHEAI0 DFH$AALL
DFH$ABRW	DFHEAI DFHEAI0 DFH$ABRW
DFH$ACOM	DFHEAI DFHEAI0 DFH$ACOM
DFH$AGA	DFH$AGA
DFH$AGB	DFH$AGB
DFH$AGC	DFH$AGC
DFH$AGD	DFH$AGD
DFH$AGK	DFH$AGK
DFH$AGL	DFH$AGL
DFH$AMNU	DFHEAI DFHEAI0 DFH$AMNU
DFH$AREN	DFHEAI DFHEAI0 DFH$AREN
DFH$AREP	DFHEAI DFHEAI0 DFH$AREP
DFH$AXCC	DFHXCSTB DFH$AXCC
DFH$AXCS	DFHEAI DFHEAI0 DFH$AXCS
DFH$AXRO	DFH$ADSP DFH$AGCB DFH$ARES DFH$AXRO
DFH$CRFA	DFHEXAI DFH$CRFA
DFH$CUS1	DFH$CUS1
DFH$DLAC	DFHDLIAI DFHEAI DFHEAI0 DFH$DLAC
DFH$DLAE	DFHEAI DFHEAI0 DFH$DLAE
DFH$FORA	DFHEXAI DFH$FORA
DFH$ICIC	DFHEAI DFHEAI0 DFH$ICIC
DFH$IFBL	DFHEAI DFHEAI0 DFH$IFBL
DFH$IFBR	DFHEAI DFHEAI0 DFH$IFBR
DFH$IGB	DFH$IGB
DFH$IGC	DFH$IGC
DFH$IGS	DFH$IGS
DFH$IGX	DFH$IGX
DFH$IG1	DFH$IG1
DFH$IG2	DFH$IG2
DFH$IMSN	DFHEAI DFHEAI0 DFH$IMSN
DFH$IMSO	DFHEAI DFHEAI0 DFH$IMSO
DFH$IQRD	DFHEAI DFHEAI0 DFH$IQRD
DFH$IQRL	DFHEAI DFHEAI0 DFH$IQRL
DFH$IQRR	DFHEAI DFHEAI0 DFH$IQRR
DFH$IQXL	DFHEAI DFHEAI0 DFH$IQXL
DFH$IQXR	DFHEAI DFHEAI0 DFH$IQXR
DFH$LDSP	DFH$LDSP
DFH$MOLS	DFH$MOLS
DFH$PCEX	DFH$PCEX
DFH$PCPI	DFHEAI DFHEAI0 DFH$PCPI
DFH$PCPL	DFHEAI DFHEAI0 DFH$PCPL
DFH$STAS	DFHEAI DFHEAI0 DFH$STAS
DFH$STCN	DFHEAI DFHEAI0 DFH$STCN
DFH$STED	DFHEAI DFHEAI0 DFH$STED
DFH$STER	DFHEAI DFHEAI0 DFH$STER
DFH$STTB	DFH$STTB
DFH$SXP1	DFH$SXP1
DFH$SXP2	DFH$SXP2
DFH$SXP3	DFH$SXP3
DFH$SXP4	DFH$SXP4
DFH$SXP5	DFH$SXP5
DFH$SXP6	DFH$SXP6
DFH$TDWT	DFHEAI DFHEAI0 DFH$TDWT
DFH$WBAU	DFHEAI DFHEAI0 DFH$WBAU
DFH$WBSA	DFHEAI DFHEAI0 DFH$WBSA
DFH$WBSB	DFHEAI DFHEAI0 DFH$WBSB
DFH$WBSC	DFHEAI DFHEAI0 DFH$WBSC
DFH$WBSN	DFHEAI DFHEAI0 DFH$WBSN
DFH$WBSR	DFHEAI DFHEAI0 DFH$WBSR
DFH$WBST	DFHEAI DFHEAI0 DFH$WBST
DFH$WB1A	DFHEAI DFHEAI0 DFH$WB1A
DFH$XDRQ	DFH$XDRQ
DFH$XTSE	DFHEAI DFHEAI0 DFH$XTSE
DFH$XZIQ	DFH$XZIQ
DFH$ZCAT	DFH$ZCAT

CICS object modules

Object module	Load module(s)
DFHABAB	DFHSRP
DFHABABT	DFHTT530
DFHABREV	DFHDBME DFHDBMP
DFHACP	DFHACP
DFHAFMT	DFHAFMT
DFHAFMTT	DFHTT530
DFHAICBP	DFHAIP
DFHAIDUF	DFHPD530
DFHAIINT	DFHTT530
DFHAIIN1	DFHAIIN
DFHAIIN2	DFHAIIN
DFHAIIQ	DFHAIIQ
DFHAIIQT	DFHTT530
DFHAIRP	DFHAIRP
DFHAIRPT	DFHTT530
DFHAITM	DFHAITM
DFHAITMT	DFHTT530
DFHALP	DFHALP
DFHALRC	DFHALRC
DFHAMCSD	DFHAMP
DFHAMD2	DFHAMP
DFHAMER	DFHAMP
DFHAMFC	DFHAMP
DFHAMGL	DFHAMP
DFHAMLM	DFHAMP
DFHAMPAB	DFHAMP
DFHAMPAD	DFHAMP
DFHAMPAP	DFHAMP
DFHAMPCH	DFHAMP
DFHAMPCO	DFHAMP
DFHAMPDF	DFHAMP
DFHAMPDI	DFHAMP
DFHAMPDL	DFHAMP
DFHAMPEN	DFHAMP
DFHAMPEX	DFHAMP
DFHAMPFI	DFHAMP
DFHAMPIL	DFHAMP
DFHAMPLO	DFHAMP
DFHAMPN	DFHAMP
DFHAMPVW	DFHAMP
DFHAMP00	DFHAMP
DFHAMRDI	DFHAMP
DFHAMSN	DFHAMP
DFHAMST	DFHAMP
DFHAMTD	DFHAMP
DFHAMTP	DFHAMP
DFHAMXM	DFHAMP
DFHAPAC	DFHAPAC
DFHAPACT	DFHTT530
DFHAPAPT	DFHTT530
DFHAPATT	DFHAPATT
DFHAPDM	DFHAPDM
DFHAPDN	DFHAPDN
DFHAPDUF	DFHPD530
DFHAPEX	DFHAPEP
DFHAPEXT	DFHTT530
DFHAPIN	DFHAPIN
DFHAPIQ	DFHAPIQ
DFHAPIQT	DFHTT530
DFHAPJC	DFHAPJC
DFHAPLIT	DFHTT530
DFHAPLI1	DFHAPLI
DFHAPLI2	DFHAPLI
DFHAPLI3	DFHAPLI
DFHAPNT	DFHAPNT
DFHAPPG	DFHAPPG
DFHAPRC	DFHAPRC
DFHAPRDR	DFHAPRDR
DFHAPRDT	DFHTT530
DFHAPRT	DFHAPRT
DFHAPRTT	DFHTT530
DFHAPSI	DFHAPSI
DFHAPSIP	DFHAPSIP
DFHAPSM	DFHAPDM
DFHAPST	DFHAPSTL
DFHAPTI	DFHAPTI
DFHAPTIM	DFHAPTIM
DFHAPTIX	DFHAPTIX
DFHAPTRA	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRB	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRC	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRD	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRE	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRF	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRG	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRH	TROLP
DFHAPTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRJ	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRK	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRL	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRN	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRO	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRP	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRR	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRS	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRU	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530

Object module	Load module(s)
DFHAPTRV	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRW	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRX	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTRY	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTR0	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTR2	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTR5	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTR6	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTR7	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTR8	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPTR9	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHAPUET	DFHTT530
DFHAPXM	DFHAPXM
DFHAPXME	DFHAPXME
DFHAPXMT	DFHTT530
DFHASSUT	DFHTT530
DFHASV	DFHASV
DFHAUDUF	DFHPD530
DFHBAM51	DFHCSDUP
DFHBAM52	DFHCSDUP
DFHBAM55	DFHCSDUP
DFHBAM56	DFHCSDUP
DFHBEPB	DFHCSDUP
DFHBEPC	DFHEICRE
DFHBMSMM	DFHBMSMM
DFHBMSUP	DFHBMSUP
DFHBRDUF	DFHPD530
DFHBRFM	DFHBRFM
DFHBRFMT	DFHTT530
DFHBRIC	DFHBRIC
DFHBRMS	DFHBRMS
DFHBRSP	DFHBRSP
DFHBRSPT	DFHTT530
DFHBRTC	DFHBRTC
DFHBRTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHBSIB3	DFHZCQ
DFHBSIZ1	DFHZCQ
DFHBSIZ3	DFHZCQ
DFHBSMIR	DFHZCQ
DFHBSMPP	DFHZCQ
DFHBSM61	DFHZCQ
DFHBSM62	DFHZCQ
DFHBSS	DFHZCQ
DFHBSSA	DFHZCQ
DFHBSSF	DFHZCQ
DFHBSSS	DFHZCQ

Object module	Load module(s)
DFHBSSZ	DFHZCQ
DFHBSSZG	DFHZCQ
DFHBSSZI	DFHZCQ
DFHBSSZL	DFHZCQ
DFHBSSZM	DFHZCQ
DFHBSSZP	DFHZCQ
DFHBSSZR	DFHZCQ
DFHBSSZS	DFHZCQ
DFHBSSZ6	DFHZCQ
DFHBST	DFHZCQ
DFHBSTB	DFHZCQ
DFHBSTBL	DFHZCQ
DFHBSTB3	DFHZCQ
DFHBSTC	DFHZCQ
DFHBSTD	DFHZCQ
DFHBSTE	DFHZCQ
DFHBSTH	DFHZCQ
DFHBSTI	DFHZCQ
DFHBSTM	DFHZCQ
DFHBSTO	DFHZCQ
DFHBSTP3	DFHZCQ
DFHBSTS	DFHZCQ
DFHBSTT	DFHZCQ
DFHBSTZ	DFHZCQ
DFHBSTZA	DFHZCQ
DFHBSTZB	DFHZCQ
DFHBSTZC	DFHZCQ
DFHBSTZE	DFHZCQ
DFHBSTZL	DFHZCQ
DFHBSTZO	DFHZCQ
DFHBSTZP	DFHZCQ
DFHBSTZR	DFHZCQ
DFHBSTZS	DFHZCQ
DFHBSTZV	DFHZCQ
DFHBSTZZ	DFHZCQ
DFHBSTZ1	DFHZCQ
DFHBSTZ2	DFHZCQ
DFHBSTZ3	DFHZCQ
DFHBSZZ	DFHZCQ
DFHBSZZS	DFHZCQ
DFHBSZZV	DFHZCQ
DFHCAPB	DFHCSDUP
DFHCAPC	DFHEICRE
DFHCCCC	DFHSIP
DFHCCCCT	DFHTT530
DFHCCDM	DFHSIP
DFHCCDUF	DFHPD530
DFHCCNV	DFHCCNV
DFHCCNV2	DFHCCNV
DFHCCTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHCCUTL	DFHCCUTL
DFHCDCON	DFHTT530
DFHCDEDT	DFHTT530
DFHCEGN	DFHCEGN
DFHCEID	DFHCEID
DFHCESC	DFHCESC
DFHCESDP	DFHCESD

Object module	Load module(s)
DFHCETRA	DFHCETRA
DFHCETRB	DFHCETRB
DFHCETRC	DFHCETRC
DFHCETRD	DFHCETRD
DFHCHS	DFHCHS
DFHCICS	DFHCICS DFHSIP
DFHCLS3	DFHCLS3
DFHCLS4	DFHCLS4
DFHCLT1X	DFHCLT1X
DFHCLT1$	DFHCLT1$
DFHCLT2X	DFHCLT2X
DFHCLT3X	DFHCLT3X
DFHCLT4X	DFHCLT4X
DFHCMAC	DFHCMAC
DFHCMCM	DFHCMCM
DFHCMP	DFHCMP
DFHCNV01	DFHCCNV
DFHCNV02	DFHCCNV
DFHCNV03	DFHCCNV
DFHCNV04	DFHCCNV
DFHCNV05	DFHCCNV
DFHCNV06	DFHCCNV
DFHCNV07	DFHCCNV
DFHCNV08	DFHCCNV
DFHCNV09	DFHCCNV
DFHCNV10	DFHCCNV
DFHCNV11	DFHCCNV
DFHCNV12	DFHCCNV
DFHCNV13	DFHCCNV
DFHCNV14	DFHCCNV
DFHCNV15	DFHCCNV
DFHCNV16	DFHCCNV
DFHCNV17	DFHCCNV
DFHCNV18	DFHCCNV
DFHCNV19	DFHCCNV
DFHCNV20	DFHCCNV
DFHCNV21	DFHCCNV
DFHCNV22	DFHCCNV
DFHCNV23	DFHCCNV
DFHCNV24	DFHCCNV
DFHCNV25	DFHCCNV
DFHCNV26	DFHCCNV
DFHCNV27	DFHCCNV
DFHCNV28	DFHCCNV
DFHCNV29	DFHCCNV
DFHCPARH	DFHCPIC
DFHCPCAC	DFHCPIC
DFHCPCAL	DFHCPIC
DFHCPCBA	DFHCPIC
DFHCPCBB	DFHCPIC
DFHCPCBD	DFHCPIC
DFHCPCBE	DFHCPIC
DFHCPCBG	DFHCPIC
DFHCPCBI	DFHCPIC
DFHCPCBL	DFHCPIC
DFHCPCBS	DFHCPIC
DFHCPCBT	DFHCPIC
DFHCPCCD	DFHCPIC

Object module	Load module(s)
DFHCPCCF	DFHCPIC
DFHCPCCT	DFHTT530
DFHCPCDE	DFHCPIC
DFHCPCEA	DFHCPIC
DFHCPCEB	DFHCPIC
DFHCPCEC	DFHCPIC
DFHCPCED	DFHCPIC
DFHCPCEE	DFHCPIC
DFHCPCFL	DFHCPIC
DFHCPCFS	DFHCPIC
DFHCPCIC	DFHCPIC
DFHCPCLC	DFHCPIC
DFHCPCLM	DFHCPIC
DFHCPCLR	DFHCPIC
DFHCPCND	DFHCPIC
DFHCPCNE	DFHCPIC
DFHCPCN1	DFHCPIC
DFHCPCN2	DFHCPIC
DFHCPCN3	DFHCPIC
DFHCPCN4	DFHCPIC
DFHCPCN5	DFHCPIC
DFHCPCOJ	DFHCPIC
DFHCPCPR	DFHCPIC
DFHCPCRA	DFHCPIC
DFHCPCRB	DFHCPIC
DFHCPCRC	DFHCPIC
DFHCPCRI	DFHCPIC
DFHCPCRS	DFHCPIC
DFHCPCRV	DFHCPIC
DFHCPCRW	DFHCPIC
DFHCPCSA	DFHCPIC
DFHCPCSB	DFHCPIC
DFHCPCSC	DFHCPIC
DFHCPCSD	DFHCPIC
DFHCPCSE	DFHCPIC
DFHCPCSF	DFHCPIC
DFHCPCSG	DFHCPIC
DFHCPCSH	DFHCPIC
DFHCPCSI	DFHCPIC
DFHCPCSJ	DFHCPIC
DFHCPCSK	DFHCPIC
DFHCPCSL	DFHCPIC
DFHCPCSM	DFHCPIC
DFHCPCTE	DFHCPIC
DFHCPDUF	DFHPD530
DFHCPI	DFHAIP
DFHCPINT	DFHTT530
DFHCPIN1	DFHCPIN
DFHCPIN2	DFHCPIN
DFHCPIR	DFHCPIRR
DFHCPLC	DFHCPLC
DFHCPLRR	DFHCPLRR
DFHCPSPT	DFHTT530
DFHCPSRH	DFHCPIC
DFHCPY	DFHCPY
DFHCRBU	DFHCRU
DFHCRC	DFHCRC
DFHCRERP	DFHCRU

Object module	Load module(s)
DFHCRERS	DFHCRU
DFHCRIU	DFHCRU
DFHCRL	DFHCRU
DFHCRLB	DFHCRLB
DFHCRLBT	DFHTT530
DFHCRNP	DFHCRNP
DFHCRQ	DFHCRQ
DFHCRR	DFHCRR
DFHCRRSY	DFHLUP
DFHCRS	DFHCRS
DFHCRSP	DFHCRSP
DFHCRT	DFHCRT
DFHCRTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHCR1U	DFHCRU
DFHCR2U	DFHCRU
DFHCSA	DFHCSA
DFHCSDUF	DFHPD530
DFHCSVC	DFHCSVC
DFHCTRH	DFHCTRH
DFHCTRM	DFHCTRM
DFHCUADD	DFHCSDUP
DFHCUALG	DFHCSDUP
DFHCUALT	DFHCSDUP
DFHCUAPP	DFHCSDUP
DFHCUCAB	DFHCSDUP
DFHCUCAC	DFHEICRE
DFHCUCB	DFHCSDUP
DFHCUCCB	DFHCSDUP
DFHCUCDB	DFHCSDUP
DFHCUCDC	DFHEICRE
DFHCUCOG	DFHCSDUP
DFHCUCOM	DFHCSDUP
DFHCUCOP	DFHCSDUP
DFHCUCP	DFHCSDUP
DFHCUCS	DFHCSDUP
DFHCUCSE	DFHCSDUP
DFHCUCV	DFHCSDUP
DFHCUDEF	DFHCSDUP
DFHCUERA	DFHCSDUP
DFHCUFA	DFHCSDUP DFHRMUTL
DFHCUGA	DFHCSDUP DFHRMUTL
DFHCUINI	DFHCSDUP
DFHCULIS	DFHCSDUP
DFHCULOC	DFHCSDUP
DFHCUMD2	DFHCSDUP
DFHCUMF1	DFHCSDUP
DFHCUMF2	DFHCSDUP
DFHCUMIG	DFHCSDUP
DFHCUMT	DFHCSDUP
DFHCUMTD	DFHCSDUP
DFHCUMWR	DFHCSDUP
DFHCUMXI	DFHCSDUP
DFHCUPRO	DFHCSDUP
DFHCURDD	DFHCURDD
DFHCURDI	DFHCURDI
DFHCURDM	DFHCURDM
DFHCURDN	DFHCURDN

Object module	Load module(s)
DFHCURDS	DFHCURDS
DFHCURDX	DFHCURDX
DFHCUREM	DFHCSDUP
DFHCURUG	DFHCSDUP
DFHCUSER	DFHCSDUP
DFHCUSHL	DFHCSDUP
DFHCUS1	DFHCUS1
DFHCUVER	DFHCSDUP
DFHCUXRT	DFHCSDUP
DFHCWTO	DFHCWTO
DFHCXCU	DFHCXCU
DFHC3TRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHDBAT	DFHDBAT
DFHDBCON	DFHDBCON
DFHDBCR	DFHDBCR
DFHDBCT	DFHDBCT
DFHDBCTX	DFHDBCX
DFHDBDE	DFHDBDE
DFHDBDI	DFHDBDI
DFHDBDSC	DFHDBDSC
DFHDBDUF	DFHPD530
DFHDBIE	DFHDBIE
DFHDBIK	DFHDBIK
DFHDBIQ	DFHDBIQ
DFHDBME	DFHDBME
DFHDBMOX	DFHDBMOX
DFHDBMP	DFHDBMP
DFHDBMS	DFHDBMS
DFHDBNE	DFHDBNE
DFHDBNK	DFHDBNK
DFHDBP	DFHAPRC
DFHDBREX	DFHDBREX
DFHDBSPX	DFHDBSPX
DFHDBSSX	DFHDBSSX
DFHDBSTX	DFHDBSTX
DFHDBTI	DFHDBTI
DFHDBTOX	DFHDBTOX
DFHDBUEX	DFHDBUEX
DFHDCPR	DFHDCP
DFHDCT	DFHDCT
DFHDCTCE	DFHDCTCE
DFHDCTCL	DFHDCTCL
DFHDCTC1	DFHDCTC1
DFHDCTC2	DFHDCTC2
DFHDCTDA	DFHDCTDA
DFHDCTDL	DFHDCTDL
DFHDCTNS	DFHDCTNS
DFHDCTQA	DFHDCTQA
DFHDCTS5	DFHDCTS5
DFHDCTS6	DFHDCTS6
DFHDCTUR	DFHDCTUR
DFHDCT42	DFHDCT42
DFHDDBR	DFHSIP
DFHDDBRT	DFHTT530
DFHDDDI	DFHSIP
DFHDDDIT	DFHTT530
DFHDDDM	DFHSIP

Object module	Load module(s)
DFHDDDU	DFHPD530
DFHDDDUF	DFHPD530
DFHDDLO	DFHSIP
DFHDDLOT	DFHTT530
DFHDDTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHDECOX	DFHDEDM
DFHDEDM	DFHDEDM
DFHDEDUF	DFHPD530
DFHDEIS	DFHDEDM
DFHDEIST	DFHTT530
DFHDEREX	DFHDEDM
DFHDESST	DFHTT530
DFHDEST	DFHDEDM
DFHDESV	DFHDEDM
DFHDESVT	DFHTT530
DFHDETRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHDIP	DFHDIP
DFHDIPDY	DFHDIPDY
DFHDKCR	DFHDKMR
DFHDKDUF	DFHPD530
DFHDKMR	DFHDKMR
DFHDKMRT	DFHTT530
DFHDKTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHDLI	DFHDLI
DFHDLIAI	DFHDBMP DFHDLIAI DFHMIRS DFH$DLAC
DFHDLIDP	DFHDLIDP
DFHDLIRP	DFHDLIRP
DFHDLXDF	DFHSIP
DFHDMDM	DFHSIP
DFHDMDMT	DFHTT530
DFHDMDS	DFHSIP
DFHDMDUF	DFHPD530
DFHDMEN	DFHSIP
DFHDMENF	DFHSIP
DFHDMENS	DFHDMSVC
DFHDMENT	DFHTT530
DFHDMIQ	DFHSIP
DFHDMIQT	DFHTT530
DFHDMPB	DFHCSDUP
DFHDMPBA	DFHCSDUP
DFHDMPC	DFHDMP
DFHDMPCA	DFHDMP
DFHDMRM	DFHDMRM
DFHDMSVC	DFHDMSVC
DFHDMTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHDMWQ	DFHSIP
DFHDMWQT	DFHTT530
DFHDM01B	DFHCSDUP
DFHDM01C	DFHDMP
DFHDM02B	DFHCSDUP
DFHDM02C	DFHDMP
DFHDM03B	DFHCSDUP
DFHDM03C	DFHDMP
DFHDM04B	DFHCSDUP
DFHDM04C	DFHDMP
DFHDM05B	DFHCSDUP
DFHDM05C	DFHDMP
DFHDM06B	DFHCSDUP
DFHDM06C	DFHDMP
DFHDM08B	DFHCSDUP
DFHDM08C	DFHDMP
DFHDM09B	DFHCSDUP
DFHDM09C	DFHDMP
DFHDM10B	DFHCSDUP
DFHDM10C	DFHDMP
DFHDM11B	DFHCSDUP
DFHDM11C	DFHDMP
DFHDM12B	DFHCSDUP
DFHDM13B	DFHCSDUP
DFHDM13C	DFHDMP
DFHDM15B	DFHCSDUP
DFHDM15C	DFHDMP
DFHDM16B	DFHCSDUP
DFHDM16C	DFHDMP
DFHDM17B	DFHCSDUP
DFHDM17C	DFHDMP
DFHDM18B	DFHCSDUP
DFHDM18C	DFHDMP
DFHDM19B	DFHCSDUP
DFHDM19C	DFHDMP
DFHDM21B	DFHCSDUP
DFHDM21C	DFHDMP
DFHDM22B	DFHCSDUP
DFHDM22C	DFHDMP
DFHDM23B	DFHCSDUP
DFHDM23C	DFHDMP
DFHDSAT	DFHSIP
DFHDSATT	DFHTT530
DFHDSAUT	DFHDSAUT
DFHDSBA$	DFHDSBA$
DFHDSBR	DFHSIP
DFHDSBRT	DFHTT530
DFHDSB1$	DFHDSB1$
DFHDSCPX	DFHSIP
DFHDSCSA	DFHSIP
DFHDSDM	DFHSIP
DFHDSDST	DFHTT530
DFHDSDS2	DFHSIP
DFHDSDS3	DFHSIP
DFHDSDS4	DFHSIP
DFHDSDUF	DFHPD530
DFHDSIT	DFHSIP
DFHDSITT	DFHTT530
DFHDSKE	DFHSIP
DFHDSPEX	DFHDSPEX
DFHDSSM	DFHSIP
DFHDSSR	DFHSIP
DFHDSSRT	DFHTT530
DFHDSST	DFHSIP
DFHDSSTX	DFHSIP
DFHDSTCB	DFHSIP
DFHDSTRI	DFHDU530 TROLP DFHPD530 DFHTR530

Object module	Load module(s)
	DFHTU530
DFHDSUE	DFHSIP
DFHDTCF	DFHDTAM
DFHDTCP	DFHDTAM DFHDTFOR
DFHDTCV	DFHDTCV
DFHDTDA	DFHDTAM
DFHDTDM	DFHDTAM
DFHDTINS	DFHDTINS
DFHDTIX	DFHDTAM
DFHDTLA	DFHDTFOR
DFHDTLI	DFHDTFOR
DFHDTLX	DFHDTFOR
DFHDTPC	DFHDTAOR
DFHDTRC	DFHDTAOR
DFHDTRE	DFHDTFOR
DFHDTRI	DFHDTAOR
DFHDTRM	DFHDTAM
DFHDTRR	DFHDTAOR
DFHDTSR	DFHDTAM
DFHDTSS	DFHDTFOR
DFHDTST	DFHDTFOR
DFHDTSVS	DFHDTSVC
DFHDTUP	DFHDTFOR
DFHDTXS	DFHDTXS
DFHDUDDT	DFHTT530
DFHDUDM	DFHSIP
DFHDUDT	DFHSIP
DFHDUDTT	DFHTT530
DFHDUDU	DFHSIP
DFHDUDUF	DFHPD530
DFHDUDUT	DFHTT530
DFHDUF	DFHPD530
DFHDUFFT	DFHPD530
DFHDUFT	DFHSIP
DFHDUFTT	DFHTT530
DFHDUFUT	DFHPD530
DFHDUIO	DFHDUIO
DFHDUIOT	DFHTT530
DFHDUMPX	DFHDUMPX
DFHDUPH	DFHDU530
DFHDUPM	DFHDU530
DFHDUPP	DFHDU530
DFHDUPR	DFHDU530
DFHDUPS	DFHDU530
DFHDUSR	DFHSIP
DFHDUSRT	DFHTT530
DFHDUSU	DFHSIP
DFHDUSUT	DFHTT530
DFHDUSVC	DFHDUSVC
DFHDUTM	DFHSIP
DFHDUTRI	DFHDU530 TROLP DFHPD530 DFHTR530
	DFHTU530
DFHDUXD	DFHSIP
DFHDUXFT	DFHTT530
DFHDUXW	DFHSIP
DFHDUXWT	DFHTT530
DFHDXACH	DFHDXACH
DFHDXAX	DFHDBCX

Object module	Load module(s)
DFHDXCU	DFHDXCU
DFHDXSTM	DFHDBCR DFHDBCT
DFHDYP	DFHDYP
DFHD2CC	DFHD2CC
DFHD2CCT	DFHTT530
DFHD2CMP	DFHD2CM1
DFHD2CM0	DFHD2CM0
DFHD2CM1	DFHD2CM1
DFHD2CM2	DFHD2CM2
DFHD2CM3	DFHD2CM3
DFHD2CNV	DFHD2STR
DFHD2DUF	DFHPD530
DFHD2EDF	DFHD2EDF
DFHD2EXS	DFHD2EX1
DFHD2EX1	DFHD2EX1
DFHD2EX2	DFHD2EX2
DFHD2EX3	DFHD2EX3
DFHD2INI	DFHD2INI
DFHD2IN1	DFHD2IN
DFHD2IN2	DFHD2IN
DFHD2MSB	DFHD2MSB
DFHD2RP	DFHD2RP
DFHD2ST	DFHAPSTL
DFHD2STP	DFHD2STP
DFHD2STR	DFHD2STR
DFHD2TM	DFHD2TM
DFHD2TMT	DFHTT530
DFHD2TRI	DFHDU530 TROLP DFHPD530 DFHTR530
	DFHTU530
DFHEAI	TINADMOD WDBBRK CAUCAFBE CAUCAFB1
	CAUCAFB2 CAUCAFFE CAUCAFF1 CAUCAFF2
	CAUCAFF3 CAUCAFF4 CAUCAFF5 CAUCAFF6
	CAUCAFF7 DFHCCNV DFHCEGN DFHCEID
	DFHCESC DFHCESD DFHCETRA DFHCETRB
	DFHCETRC DFHCETRD DFHCHS DFHCLS3
	DFHCLS4 DFHCMAC DSNCUEXT DFHDBCON
	DFHDBCT DFHDBDI DFHDBDSC DFHDBIQ
	DFHDBME DFHDBMP DFHDBUEX INADEXIT
	DFHDYP DFHD2CC DFHD2CM0 DFHD2CM1
	DFHD2CM2 DFHD2CM3 DFHD2EDF DFHD2EX1
	DFHD2EX2 DFHD2INI DFHD2STP DFHD2STR
	DFHEAI DFHECID DFHECIP DFHECSP
	DFHEDAD DFHEDAP DFHEDFBR DFHEDFD
	DFHEMTA DFHEMTD DFHEMTP DFHEOTP
	DFHESTP DFHFCOR DFHFCQT DFHFCRD
	WDBINAD DFHINDAP DFHINDT DFHINTRU
	DFHLGQC TROLP DFHLUP DFHMIRS
	CAUMSGCS DFHMXP DFHPEP DFHPGADX
	DFHQRY DFHRCEX DFHREST DFHRMSY
	DFHRPAS DFHRPC00 DFHRPMS DFHSFP
	DFHSNP DCUTD2B DFHTEP DCUTEXT1
	DCUTEXT2 DCUTEXT3 DCUTFUNC DCUTHELP
	DCUTH2B DCUTINP DCUTMAIN DCUTNUM
	DCUTOUTP DCUTSHOW DCUTSUBR DCUTTTAB
	DFHUCNV DFHWBA DFHWBADX DFHWBA1
	DFHWBC00 DFHWBENV DFHWBIMG DFHWBLT
	DFHWBM DFHWBPA DFHWBRP DFHWBTL
	DFHWBTTA DFHXMAB DFHZATA DFHZATD

Object module	Load module(s)
	DFHZATDX DFHZATDY DFHZATMD DFHZATMF
	DFHZATR DFHZATS DFHZCN1 DFHZCOVR
	DFHZCT1 DFHZLS1 DFHZNEP DFHZXCU
	DFH99 DFH$AALL DFH$ABRW DFH$ACOM
	DFH$AMNU DFH$AREN DFH$AREP DFH$AXCS
	DFH$DLAC DFH$DLAE DFH$ICIC DFH$IFBL
	DFH$IFBR DFH$IMSN DFH$IMSO DFH$IQRD
	DFH$IQRL DFH$IQRR DFH$IQXL DFH$IQXR
	DFH$PCPI DFH$PCPL DFH$STAS DFH$STCN
	DFH$STED DFH$STER DFH$TDWT DFH$WBAU
	DFH$WBSA DFH$WBSB DFH$WBSC DFH$WBSN
	DFH$WBSR DFH$WBST DFH$WB1A DFH$XTSE
DFHEAI0	TINADMOD WDBBRK CAUCAFBE CAUCAFB1
	CAUCAFB2 CAUCAFFE CAUCAFF1 CAUCAFF2
	CAUCAFF3 CAUCAFF4 CAUCAFF5 CAUCAFF6
	CAUCAFF7 DFHCCNV DFHCEGN DFHCEID
	DFHCESC DFHCESD DFHCETRA DFHCETRB
	DFHCETRC DFHCETRD DFHCHS DFHCLS3
	DFHCLS4 DFHCMAC DSNCUEXT DFHDBUEX
	INADEXIT DFHDYP DFHD2CC DFHD2CM0
	DFHD2CM1 DFHD2CM2 DFHD2CM3 DFHD2EDF
	DFHD2EX1 DFHD2EX2 DFHD2INI DFHD2STP
	DFHD2STR DFHEAI0 DFHECID DFHECIP
	DFHECSP DFHEDAD DFHEDAP DFHEDFBR
	DFHEDFD DFHEMTA DFHEMTD DFHEMTP
	DFHEOTP DFHESTP DFHFCOR DFHFCQT
	DFHFCRD WDBINAD DFHINDAP DFHINDT
	DFHINTRU DFHLGQC TROLP DFHLUP
	DFHMIRS CAUMSGCS DFHMXP DFHPEP
	DFHPGADX DFHQRY DFHRCEX DFHREST
	DFHRMSY DFHRPAS DFHRPC00 DFHRPMS
	DFHSFP DFHSNP DCUTD2B DFHTEP
	DCUTEXT1 DCUTEXT2 DCUTEXT3 DCUTFUNC
	DCUTHELP DCUTH2B DCUTINP DCUTMAIN
	DCUTNUM DCUTOUTP DCUTSHOW DCUTSUBR
	DCUTTTAB DFHUCNV DFHWBA DFHWBADX
	DFHWBA1 DFHWBC00 DFHWBENV DFHWBIMG
	DFHWBLT DFHWBM DFHWBPA DFHWBRP
	DFHWBTL DFHWBTTA DFHZATA DFHZATD
	DFHZATDX DFHZATDY DFHZATMD DFHZATMF
	DFHZATR DFHZATS DFHZCN1 DFHZCOVR
	DFHZCT1 DFHZLS1 DFHZNEP DFHZXCU
	DFH99 DFH$AALL DFH$ABRW DFH$ACOM
	DFH$AMNU DFH$AREN DFH$AREP DFH$AXCS
	DFH$DLAC DFH$DLAE DFH$ICIC DFH$IFBL
	DFH$IFBR DFH$IMSN DFH$IMSO DFH$IQRD
	DFH$IQRL DFH$IQRR DFH$IQXL DFH$IQXR
	DFH$PCPI DFH$PCPL DFH$STAS DFH$STCN
	DFH$STED DFH$STER DFH$TDWT DFH$WBAU
	DFH$WBSA DFH$WBSB DFH$WBSC DFH$WBSN
	DFH$WBSR DFH$WBST DFH$WB1A DFH$XTSE
DFHEAMAA	DFHEAP1$
DFHEAMEE	DFHEAP1$
DFHEAMPA	DFHEAP1$
DFHEAMSA	DFHEAP1$
DFHEAM02	DFHEAP1$
DFHEAM07	DFHEAP1$
DFHEAM08	DFHEAP1$

Object module	Load module(s)
DFHEAM11	DFHEAP1$
DFHEBF	DFHEBF
DFHEBRCT	DFHEBRCT
DFHEBU	DFHEBU
DFHECI	DFHECI
DFHECMAC	DFHECP1$
DFHECMEE	DFHECP1$
DFHECMPC	DFHECP1$
DFHECMSC	DFHECP1$
DFHECM02	DFHECP1$
DFHECM07	DFHECP1$
DFHECM08	DFHECP1$
DFHECM10	DFHECP1$
DFHECM11	DFHECP1$
DFHECM14	DFHECP1$
DFHECM17	DFHECP1$
DFHEDC	DFHEDC
DFHEDCP	DFHEDCP
DFHEDFBR	DFHEDFBR
DFHEDFCB	DFHEDFD
DFHEDFCC	DFHEDFD
DFHEDFCE	DFHEDFD
DFHEDFCR	DFHEDFD
DFHEDFCS	DFHEDFD
DFHEDFCX	DFHEDFD
DFHEDFD	DFHEDFD
DFHEDFDL	DFHEDFD
DFHEDFE	DFHEDFE
DFHEDFM	DFHEDFM
DFHEDFP	DFHEDFP
DFHEDFR	DFHEDFR
DFHEDFS	DFHEDFD
DFHEDFU	DFHEDFD
DFHEDFW	DFHEDFD
DFHEDFX	DFHEDFX
DFHEDI	DFHEDI
DFHEDMAD	DFHEDP1$
DFHEDMEE	DFHEDP1$
DFHEDMPD	DFHEDP1$
DFHEDMSD	DFHEDP1$
DFHEDM02	DFHEDP1$
DFHEDM07	DFHEDP1$
DFHEDM08	DFHEDP1$
DFHEDM10	DFHEDP1$
DFHEDM11	DFHEDP1$
DFHEDM14	DFHEDP1$
DFHEDM17	DFHEDP1$
DFHEDP	DFHEDP
DFHEEI	DFHEEI
DFHEEX	DFHEEX
DFHEFRM	DFHEFRM
DFHEGL	DFHEGL
DFHEIACQ	DFHEIACQ
DFHEICRE	DFHEICRE
DFHEIDTI	DFHEIDTI
DFHEIEIT	DFHTT530
DFHEIFC	DFHEIFC
DFHEIGDS	DFHEIGDS

Object module	Load module(s)
DFHEIIC	DFHEIIC
DFHEIMOP	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEIN00	DFHECIP DFHECSP
DFHEIN01	DFHECID
DFHEIN02	DFHECID
DFHEIN03	DFHECID DFHEDAD DFHEMTD
DFHEIN11	DFHECID
DFHEIN12	DFHECID
DFHEIN13	DFHECID DFHEDAD DFHEMTD
DFHEIN16	DFHECID DFHEDAD DFHEMTD
DFHEIN19	DFHECID
DFHEIN20	DFHECID
DFHEIN21	DFHECID
DFHEIN22	DFHECID
DFHEIN23	DFHECID
DFHEIN26	DFHECID DFHEMTD
DFHEIN27	DFHECID
DFHEIN28	DFHECID DFHEDAD DFHEMTD
DFHEIN50	DFHECID
DFHEIN51	DFHECID
DFHEIN52	DFHECID
DFHEIN53	DFHECID
DFHEIN54	DFHECID
DFHEIP	DFHAIP
DFHEIPA	DFHAIP
DFHEIPRT	DFHEIPRT
DFHEIPSE	DFHEIPSE
DFHEIPSH	DFHEIPSH
DFHEIQDE	DFHEIQDE
DFHEIQDN	DFHEIQDN
DFHEIQDS	DFHEIQDS
DFHEIQDU	DFHEIQDU
DFHEIQD2	DFHEIQD2
DFHEIQIR	DFHEIQIR
DFHEIQMS	DFHEIQMS
DFHEIQMT	DFHEIQMT
DFHEIQPF	DFHEIQPF
DFHEIQPN	DFHEIQPN
DFHEIQRQ	DFHEIQRQ
DFHEIQSA	DFHEIQSA
DFHEIQSC	DFHEIQSC
DFHEIQSJ	DFHEIQSJ
DFHEIQSK	DFHEIQSK
DFHEIQSL	DFHEIQSL
DFHEIQSM	DFHEIQSM
DFHEIQSP	DFHEIQSP
DFHEIQSQ	DFHEIQSQ
DFHEIQST	DFHEIQST
DFHEIQSV	DFHEIQSV
DFHEIQSX	DFHEIQSX
DFHEIQSZ	DFHEIQSZ
DFHEIQTM	DFHEIQTM
DFHEIQTR	DFHEIQTR
DFHEIQTS	DFHEIQTS
DFHEIQUE	DFHEIQUE
DFHEIQVT	DFHEIQVT
DFHEISP	DFHEISP
DFHEISR	DFHEISR

Object module	Load module(s)
DFHEISRT	DFHTT530
DFHEITAB	DFHEITAB
DFHEITBS	DFHEITBS
DFHEITCU	DFHEITCU
DFHEITHG	DFHEITHG
DFHEITMT	DFHEITMT
DFHEITOT	DFHEITOT
DFHEITS	DFHEITS
DFHEITSP	DFHEITSP
DFHEITST	DFHEITST
DFHEITSZ	DFHEITSZ
DFHEITTR	DFHEISR
DFHEITT2	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHEIUOW	DFHEIUOW
DFHEJC	DFHEJC
DFHEKC	DFHEKC
DFHELII	DFHELII DFHJVCVT DFHWBAPI DFHWBTC
DFHEMEX	DFHEMEX
DFHEMS	DFHEMS
DFHEMT00	DFHEMTA DFHEMTP DFHEOTP DFHESTP
DFHEMT01	DFHEMTD
DFHEMT02	DFHEMTD
DFHEMT11	DFHEMTD
DFHEMT12	DFHEMTD
DFHEMT19	DFHEMTD
DFHEMT20	DFHEMTD
DFHEMT21	DFHEMTD
DFHEMT22	DFHEMTD
DFHEMT23	DFHEMTD
DFHEMT27	DFHEMTD
DFHEMT50	DFHEMTD
DFHEMT51	DFHEMTD
DFHEMT52	DFHEMTD
DFHEMT53	DFHEMTD
DFHEMT54	DFHEMTD
DFHEMT55	DFHEMTD
DFHEMT56	DFHEMTD
DFHEOP	DFHEOP
DFHEPC	DFHEPC
DFHEPMAP	DFHEPP1$
DFHEPMEE	DFHEPP1$
DFHEPMPP	DFHEPP1$
DFHEPMSP	DFHEPP1$
DFHEPM02	DFHEPP1$
DFHEPM07	DFHEPP1$
DFHEPM08	DFHEPP1$
DFHEPM10	DFHEPP1$
DFHEPM11	DFHEPP1$
DFHEPM14	DFHEPP1$
DFHEPM17	DFHEPP1$
DFHEPS	DFHEPS
DFHERDUF	DFHPD530
DFHERM	DFHERM
DFHERMRS	DFHERMRS
DFHERMSP	DFHERMSP
DFHESC	DFHESC
DFHESE	DFHESE

Object module	Load module(s)
DFHESN	DFHESN
DFHESP00	DFHEDAP
DFHESP01	DFHEDAD
DFHESP02	DFHEDAD
DFHESP11	DFHEDAD
DFHESP12	DFHEDAD
DFHESP19	DFHEDAD
DFHESP20	DFHEDAD
DFHESP21	DFHEDAD
DFHESP22	DFHEDAD
DFHESP23	DFHEDAD
DFHESP26	DFHEDAD
DFHESP27	DFHEDAD
DFHESP50	DFHEDAD
DFHESP51	DFHEDAD
DFHESP52	DFHEDAD
DFHESP53	DFHEDAD
DFHESP54	DFHEDAD
DFHESP55	DFHEDAD
DFHESZ	DFHESZ
DFHETC	DFHETC
DFHETD	DFHETD
DFHETL	DFHETL
DFHETR	DFHETR
DFHETRX	DFHETRX
DFHEXAI	DFHEXAI DFH$CRFA DFH$FORA
DFHEXCI	DFHEXCI
DFHEXDUF	DFHPD530
DFHEXI	DFHEXI
DFHEXMAB	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXMAN	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXMG1	DFHEIDLI
DFHEXMG2	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXMG3	DFHEIGDX
DFHEXMG4	DFHXCI
DFHEXMG5	DFHCPSM
DFHEXMKW	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXMPE	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXMS1	DFHEIDLI
DFHEXMS2	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXMS3	DFHEIGDX
DFHEXMS4	DFHXCI
DFHEXMS5	DFHCPSM
DFHEXMTD	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXMTG	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXMXK	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXMXM	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXMXS	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXM01	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXM05	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXM06	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXM09	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXM12	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXM13	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXM15	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXM16	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXM18	DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXM25	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$

Object module	Load module(s)
DFHEXM27	DFHEAP1$ DFHECP1$ DFHEDP1$ DFHEPP1$
DFHEXPI	DFHEXPI
DFHEXTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHFCAT	DFHFCAT
DFHFCATT	DFHTT530
DFHFCBD	DFHFCBD
DFHFCCA	DFHFCCA
DFHFCCAT	DFHTT530
DFHFCDN	DFHFCDN
DFHFCDNT	DFHTT530
DFHFCDTS	DFHFCD2
DFHFCDTX	DFHFCD2
DFHFCDUF	DFHPD530
DFHFCES	DFHFCES
DFHFCFL	DFHFCFL
DFHFCFLT	DFHTT530
DFHFCFR	DFHFCFR
DFHFCFRT	DFHTT530
DFHFCFS	DFHFCFS
DFHFCFST	DFHTT530
DFHFCINT	DFHTT530
DFHFCIN1	DFHFCIN
DFHFCIN2	DFHFCIN
DFHFCIR	DFHFCIR
DFHFCL	DFHFCFS
DFHFCLF	DFHFCLF
DFHFCLJ	DFHFCLJ
DFHFCLJT	DFHTT530
DFHFCM	DFHFCFS
DFHFCMT	DFHFCMT
DFHFCMTT	DFHTT530
DFHFCN	DFHFCFS
DFHFCNQ	DFHFCNQ
DFHFCOR	DFHFCOR
DFHFCQI	DFHFCQI
DFHFCQIT	DFHTT530
DFHFCQR	DFHFCQT
DFHFCQRT	DFHTT530
DFHFCQS	DFHFCQT
DFHFCQST	DFHTT530
DFHFCQT	DFHFCQT
DFHFCQU	DFHFCQU
DFHFCQUT	DFHTT530
DFHFCQX	DFHFCQX
DFHFCRC	DFHFCRC
DFHFCRD	DFHFCRD
DFHFCRL	DFHFCRL
DFHFCRLT	DFHTT530
DFHFCRO	DFHFCRO
DFHFCRP	DFHFCRP
DFHFCRPT	DFHTT530
DFHFCRR	DFHFCRR
DFHFCRRT	DFHTT530
DFHFCRS	DFHFCRS
DFHFCRV	DFHFCRV
DFHFCSD	DFHFCSD
DFHFCSDT	DFHTT530

Object module	Load module(s)
DFHFCST	DFHFCST
DFHFCSTT	DFHTT530
DFHFCT	DFHFCT
DFHFCTA1	DFHFCTA1
DFHFCTA2	DFHFCTA2
DFHFCTC1	DFHFCTC1
DFHFCTC2	DFHFCTC2
DFHFCTDL	DFHFCTDL
DFHFCTDS	DFHFCTDS
DFHFCTDX	DFHFCTDX
DFHFCTMS	DFHFCTMS
DFHFCTNS	DFHFCTNS
DFHFCTT3	DFHFCTT3
DFHFCTT4	DFHFCTT4
DFHFCTT5	DFHFCTT5
DFHFCTT6	DFHFCTT6
DFHFCTT7	DFHFCTT7
DFHFCTT8	DFHFCTT8
DFHFCTT9	DFHFCTT9
DFHFCTUE	DFHFCTUE
DFHFCTUR	DFHFCTUR
DFHFCTW1	DFHFCTW1
DFHFCU	DFHFCU
DFHFCVR	DFHFCVS
DFHFCVS	DFHFCVS
DFHFCXDF	DFHSIP
DFHFEP	DFHFEP
DFHFORM	DFHTT530
DFHFRDUF	DFHPD530
DFHFTDUF	DFHPD530
DFHFTTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHGCAA	DFHGCAA
DFHGMM	DFHGMM
DFHHPSVC	DFHHPSVC
DFHICDUF	DFHPD530
DFHICP	DFHICP
DFHICRC	DFHICRC
DFHICXM	DFHICXM
DFHICXMT	DFHTT530
DFHIIPA$	DFHIIPA$
DFHIIP1$	DFHIIP1$
DFHINDAP	DFHINDAP
DFHINDSP	DFHINDSP
DFHINDT	DFHINDT
DFHINTRU	DFHINTRU
DFHIPDUF	DFHPD530
DFHIRP	DFHIRP DFHIRP52
DFHIRW10	DFHIRW10
DFHISP	DFHISP
DFHJCJCT	DFHTT530
DFHJCP	DFHJCP
DFHJUP	DFHJUP
DFHJVCV@	DFHJVCVT
DFHJVTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHKCQ	DFHKCP
DFHKCRP	DFHKCRP

Object module	Load module(s)
DFHKCSC	DFHKCSC
DFHKCSCT	DFHTT530
DFHKCSP	DFHKCSP
DFHKEAR	DFHSIP DFHSTUP
DFHKEART	DFHTT530
DFHKEDCL	DFHSIP DFHSTUP
DFHKEDD	DFHSIP DFHSTUP
DFHKEDDT	DFHTT530
DFHKEDRT	DFHSIP DFHSTUP
DFHKEDS	DFHSIP DFHSTUP
DFHKEDST	DFHTT530
DFHKEDUF	DFHPD530
DFHKEEDA	DFHSIP DFHSTUP
DFHKEGD	DFHSIP DFHSTUP
DFHKEGDT	DFHTT530
DFHKEIN	DFHSIP DFHSTUP
DFHKEINT	DFHTT530
DFHKELCL	DFHCSA
DFHKELOC	DFHPD530
DFHKELRT	DFHCSA
DFHKERCD	DFHCSA DFHSIP DFHSTUP
DFHKERER	DFHCSA DFHSIP DFHSTUP
DFHKERET	DFHSIP DFHSTUP
DFHKERKE	DFHSIP DFHSTUP
DFHKERPC	DFHSIP DFHSTUP
DFHKERRI	DFHCSA DFHSIP DFHSTUP
DFHKERRQ	DFHSIP DFHSTUP
DFHKERRU	DFHSIP DFHSTUP
DFHKERRX	DFHSIP DFHSTUP
DFHKESCL	DFHSIP DFHSTUP
DFHKESFM	DFHCSA DFHSIP DFHSTUP
DFHKESGM	DFHCSA DFHSIP DFHSTUP
DFHKESIP	DFHSIP DFHSTUP
DFHKESRT	DFHSIP DFHSTUP
DFHKESTX	DFHSIP DFHSTUP
DFHKESVC	DFHKESVC
DFHKETA	DFHSIP DFHSTUP
DFHKETAB	DFHSIP
DFHKETB2	DFHSTUP
DFHKETCB	DFHSIP DFHSTUP
DFHKETI	DFHSIP DFHSTUP
DFHKETIT	DFHTT530
DFHKETIX	DFHSIP DFHSTUP
DFHKETRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHKEXM	DFHSIP DFHSTUP
DFHKEXMT	DFHTT530
DFHLDDM	DFHSIP
DFHLDDMI	DFHLDDMI
DFHLDDUF	DFHPD530
DFHLDLD	DFHSIP
DFHLDLDT	DFHTT530
DFHLDLD1	DFHSIP
DFHLDLD2	DFHSIP
DFHLDLD3	DFHSIP
DFHLDNT	DFHLDNT
DFHLDST	DFHLDST
DFHLDSUT	DFHTT530

Object module	Load module(s)
DFHLDSVC	DFHLDSVC
DFHLDTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHLGBAT	DFHTT530
DFHLGCBT	DFHTT530
DFHLGCCT	DFHTT530
DFHLGDM	DFHLGDM
DFHLGDUF	DFHPD530
DFHLGGL	DFHLGDM
DFHLGGLT	DFHTT530
DFHLGICV	DFHGTCNV
DFHLGIGT	DFHGTCNV
DFHLGILA	DFHLGCNV
DFHLGIMS	DFHLGCNV
DFHLGIPA	DFHLGCNV
DFHLGIPI	DFHLGCNV
DFHLGISM	DFHLGCNV
DFHLGJN	DFHLGDM
DFHLGJNT	DFHTT530
DFHLGLBT	DFHTT530
DFHLGLD	DFHLGDM
DFHLGLDT	DFHTT530
DFHLGMVT	DFHTT530
DFHLGPA	DFHLGDM
DFHLGPAT	DFHTT530
DFHLGQC	DFHLGQC
DFHLGSC	DFHLGDM
DFHLGSRT	DFHTT530
DFHLGSSI	DFHLG530
DFHLGST	DFHLGDM
DFHLGSTT	DFHTT530
DFHLGTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHLGWFT	DFHTT530
DFHLILIT	DFHTT530
DFHLIRET	DFHLIRET
DFHLITRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHLMDM	DFHSIP
DFHLMDS	DFHSIP
DFHLMDUF	DFHPD530
DFHLMIQ	DFHSIP
DFHLMIQT	DFHTT530
DFHLMLM	DFHSIP
DFHLMLMT	DFHTT530
DFHLMTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHLPADY	DFHLPADY
DFHLSCU	DFHLSCU
DFHLTRC	DFHLTRC
DFHL2BA	DFHLGDM
DFHL2BL1	DFHLGDM
DFHL2BL2	DFHLGDM
DFHL2BS1	DFHLGDM
DFHL2BS2	DFHLGDM
DFHL2BS3	DFHLGDM
DFHL2BS4	DFHLGDM
DFHL2CB	DFHLGDM
DFHL2CC	DFHLGDM
DFHL2CHA	DFHLGDM
DFHL2CHE	DFHLGDM
DFHL2CHG	DFHLGDM
DFHL2CHH	DFHLGDM
DFHL2CHI	DFHLGDM
DFHL2CHL	DFHLGDM
DFHL2CHM	DFHLGDM
DFHL2CHN	DFHLGDM
DFHL2CHR	DFHLGDM
DFHL2CHS	DFHLGDM
DFHL2CH1	DFHLGDM
DFHL2CH2	DFHLGDM
DFHL2CH3	DFHLGDM
DFHL2CH4	DFHLGDM
DFHL2CH5	DFHLGDM
DFHL2DM	DFHLGDM
DFHL2DU0	DFHPD530
DFHL2HB	DFHLGDM
DFHL2HSF	DFHLGDM
DFHL2HSG	DFHLGDM
DFHL2HSJ	DFHLGDM
DFHL2HS2	DFHLGDM
DFHL2HS3	DFHLGDM
DFHL2HS4	DFHLGDM
DFHL2HS5	DFHLGDM
DFHL2HS6	DFHLGDM
DFHL2HS7	DFHLGDM
DFHL2HS8	DFHLGDM
DFHL2HS9	DFHLGDM
DFHL2LB	DFHLGDM
DFHL2MV	DFHLGDM
DFHL2OFI	DFHLGDM
DFHL2SLE	DFHLGDM
DFHL2SLN	DFHLGDM
DFHL2SL1	DFHLGDM
DFHL2SR	DFHLGDM
DFHL2SR1	DFHLGDM
DFHL2SR2	DFHLGDM
DFHL2SR3	DFHLGDM
DFHL2SR4	DFHLGDM
DFHL2SR5	DFHLGDM
DFHL2TI2	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHL2TRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHL2VP1	DFHLGDM
DFHL2WF	DFHLGDM
DFHMCPA$	DFHMCPA$
DFHMCPE$	DFHMCPE$
DFHMCP1$	DFHMCP1$
DFHMCTMA	DFHMCTMA
DFHMCTMB	DFHMCTMB
DFHMCTM1	DFHMCTM1
DFHMCTM2	DFHMCTM2
DFHMCTM3	DFHMCTM3
DFHMCTM4	DFHMCTM4
DFHMCTM6	DFHMCTM6

Object module	Load module(s)
DFHMCTM7	DFHMCTM7
DFHMCTQM	DFHMCTQM
DFHMCT2$	DFHMCT2$
DFHMCX	DFHMCX
DFHMEACC	DFHMET1C
DFHMEACE	DFHMET1E
DFHMEACK	DFHMET1K
DFHMEAIC	DFHMET1C
DFHMEAIE	DFHMET1E
DFHMEAIK	DFHMET1K
DFHMEAMC	DFHMET1C
DFHMEAME	DFHMET1E
DFHMEAMK	DFHMET1K
DFHMEAPC	DFHMET1C
DFHMEAPE	DFHMET1E
DFHMEAPK	DFHMET1K
DFHMEBM	DFHMEBM DFHMEBMX
DFHMEBMT	DFHTT530
DFHMEBRC	DFHMET1C
DFHMEBRE	DFHMET1E
DFHMEBRK	DFHMET1K
DFHMEBU	DFHSIP
DFHMEBUT	DFHTT530
DFHMECAC	DFHMET1C
DFHMECAE	DFHMET1E
DFHMECAK	DFHMET1K
DFHMECCC	DFHMET1C
DFHMECCE	DFHMET1E
DFHMECCK	DFHMET1K
DFHMECEC	DFHMET1C
DFHMECEE	DFHMET1E
DFHMECEK	DFHMET1K
DFHMECPC	DFHMET1C
DFHMECPE	DFHMET1E
DFHMECPK	DFHMET1K
DFHMECRC	DFHMET1C
DFHMECRE	DFHMET1E
DFHMECRK	DFHMET1K
DFHMEDBC	DFHMET1C
DFHMEDBE	DFHMET1E
DFHMEDBK	DFHMET1K
DFHMEDDE	DFHMET1C DFHMET1E DFHMET1K
DFHMEDM	DFHSIP
DFHMEDME	DFHMET1C DFHMET1E DFHMET1K
DFHMEDSE	DFHMET1C DFHMET1E DFHMET1K
DFHMEDUC	DFHMET1C
DFHMEDUE	DFHMET1E
DFHMEDUF	DFHPD530
DFHMEDUK	DFHMET1K
DFHMEDXC	DFHMET1C
DFHMEDXE	DFHMET1E
DFHMEDXK	DFHMET1K
DFHMEERE	DFHMET1C DFHMET1E DFHMET1K
DFHMEEXE	DFHMET4E
DFHMEFCC	DFHMET1C
DFHMEFCE	DFHMET1E
DFHMEFCK	DFHMET1K
DFHMEFEC	DFHMET1C
DFHMEFEE	DFHMET1E
DFHMEFEK	DFHMET1K
DFHMEFO	DFHSIP DFHSUWT
DFHMEFOT	DFHTT530
DFHMEICC	DFHMET1C
DFHMEICE	DFHMET1E
DFHMEICK	DFHMET1K
DFHMEIN	DFHSIP
DFHMEINC	DFHMET1C
DFHMEINE	DFHMET1E
DFHMEINK	DFHMET1K
DFHMEINT	DFHTT530
DFHMEIRC	DFHMET1C
DFHMEIRE	DFHMET1E
DFHMEIRK	DFHMET1K
DFHMEJCC	DFHMET1C
DFHMEJCE	DFHMET1E
DFHMEJCK	DFHMET1K
DFHMEKCC	DFHMET1C
DFHMEKCE	DFHMET1E
DFHMEKCK	DFHMET1K
DFHMEKEE	DFHMET1C DFHMET1E DFHMET1K
DFHMELDE	DFHMET1C DFHMET1E DFHMET1K
DFHMELGC	DFHMET1C
DFHMELGE	DFHMET1E
DFHMELGK	DFHMET1K
DFHMELME	DFHMET1C DFHMET1E DFHMET1K
DFHMEMCC	DFHMET1C
DFHMEMCE	DFHMET1E
DFHMEMCK	DFHMET1K
DFHMEME	DFHSIP
DFHMEMEE	DFHMET1C DFHMET1E DFHMET1K
DFHMEMET	DFHTT530
DFHMEMNE	DFHMET1C DFHMET1E DFHMET1K
DFHMEMUE	DFHMET1C DFHMET1E DFHMET1K
DFHMENQE	DFHMET1C DFHMET1E DFHMET1K
DFHMEPAE	DFHMET1C DFHMET1E DFHMET1K
DFHMEPCC	DFHMET1C
DFHMEPCE	DFHMET1E
DFHMEPCK	DFHMET1K
DFHMEPGC	DFHMET1C
DFHMEPGE	DFHMET1E
DFHMEPGK	DFHMET1K
DFHMEPRC	DFHMET1C
DFHMEPRE	DFHMET1E
DFHMEPRK	DFHMET1K
DFHMEPSC	DFHMET1C
DFHMEPSE	DFHMET1E
DFHMEPSK	DFHMET1K
DFHMERDC	DFHMET1C
DFHMERDE	DFHMET1E
DFHMERDK	DFHMET1K
DFHMERMC	DFHMET1C
DFHMERME	DFHMET1E
DFHMERMK	DFHMET1K
DFHMEROC	DFHMET5C
DFHMEROE	DFHMET5E
DFHMEROK	DFHMET5K

Object module	Load module(s)
DFHMERPC	DFHMET5C
DFHMERPE	DFHMET5E
DFHMERPK	DFHMET5K
DFHMERQC	DFHMET5C
DFHMERQE	DFHMET5E
DFHMERQK	DFHMET5K
DFHMERRC	DFHMET5C
DFHMERRE	DFHMET5E
DFHMERRK	DFHMET5K
DFHMERSC	DFHMET1C
DFHMERSE	DFHMET1E
DFHMERSK	DFHMET1K
DFHMERTC	DFHMET1C
DFHMERTE	DFHMET1E
DFHMERTK	DFHMET1K
DFHMERUE	DFHMET1C DFHMET1E DFHMET1K
DFHMESIC	DFHMET1C
DFHMESIE	DFHMET1E
DFHMESIK	DFHMET1K
DFHMESKE	DFHMET1C DFHMET1E DFHMET1K
DFHMESME	DFHMET1C DFHMET1E DFHMET1K
DFHMESNC	DFHMET1C
DFHMESNE	DFHMET1E
DFHMESNK	DFHMET1K
DFHMESR	DFHSIP
DFHMESRE	DFHMET1C DFHMET1E DFHMET1K
DFHMESRT	DFHTT530
DFHMESTC	DFHMET1C
DFHMESTE	DFHMET1E DFHMET3E
DFHMESTK	DFHMET1K
DFHMESZC	DFHMET1C
DFHMESZE	DFHMET1E
DFHMESZK	DFHMET1K
DFHMETCC	DFHMET1C
DFHMETCE	DFHMET1E
DFHMETCK	DFHMET1K
DFHMETDC	DFHMET1C
DFHMETDE	DFHMET1E
DFHMETDK	DFHMET1K
DFHMETFC	DFHMET1C
DFHMETFE	DFHMET1E
DFHMETFK	DFHMET1K
DFHMETIE	DFHMET1C DFHMET1E DFHMET1K
DFHMETMC	DFHMET1C
DFHMETME	DFHMET1E
DFHMETMK	DFHMET1K
DFHMETOC	DFHMET1C
DFHMETOE	DFHMET1E
DFHMETOK	DFHMET1K
DFHMETPC	DFHMET1C
DFHMETPE	DFHMET1E
DFHMETPK	DFHMET1K
DFHMETRC	DFHMET1C
DFHMETRE	DFHMET1E
DFHMETRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHMETRK	DFHMET1K
DFHMETSC	DFHMET1C

Object module	Load module(s)
DFHMETSE	DFHMET1E
DFHMETSK	DFHMET1K
DFHMET1	DFHMET1C DFHMET1E DFHMET1K
DFHMET2	DFHMET2C DFHMET2E DFHMET2K
DFHMET3	DFHMET3E
DFHMET4	DFHMET4E
DFHMET5	DFHMET5C DFHMET5E DFHMET5K
DFHMET9	DFHMET9C DFHMET9E DFHMET9K
DFHMEU	DFHMEU
DFHMEUA	DFHMEUA
DFHMEUC	DFHMEUA
DFHMEUD	DFHMEUA
DFHMEUE	DFHMEUA
DFHMEUL	DFHMEUA
DFHMEUM	DFHMEUM
DFHMEUP	DFHMEUA
DFHMEUPE	DFHMET1C DFHMET1E DFHMET1K
DFHMEUSC	DFHMET1C
DFHMEUSE	DFHMET1E
DFHMEUSK	DFHMET1K
DFHMEUU	DFHMEUA
DFHMEWBC	DFHMET1C
DFHMEWBE	DFHMET1E
DFHMEWBK	DFHMET1K
DFHMEWS	DFHSIP
DFHMEWST	DFHTT530
DFHMEWT	DFHSIP
DFHMEWTT	DFHTT530
DFHMEXAE	DFHMET1C DFHMET1E DFHMET1K
DFHMEXCE	DFHMET1C DFHMET1E DFHMET1K
DFHMEXGC	DFHMET1C
DFHMEXGE	DFHMET1E
DFHMEXGK	DFHMET1K
DFHMEXMC	DFHMET1C
DFHMEXME	DFHMET1E
DFHMEXMK	DFHMET1K
DFHMEXOE	DFHMET1C DFHMET1E DFHMET1K
DFHMEXSC	DFHMET1C
DFHMEXSE	DFHMET1E
DFHMEXSK	DFHMET1K
DFHMEZAC	DFHMET1C
DFHMEZAE	DFHMET1E
DFHMEZAK	DFHMET1K
DFHMEZBC	DFHMET1C
DFHMEZBE	DFHMET1E
DFHMEZBK	DFHMET1K
DFHMEZCC	DFHMET1C
DFHMEZCE	DFHMET1E
DFHMEZCK	DFHMET1K
DFHMEZDC	DFHMET1C
DFHMEZDE	DFHMET1E
DFHMEZDK	DFHMET1K
DFHMEZEC	DFHMET1C
DFHMEZEE	DFHMET1E
DFHMEZEK	DFHMET1K
DFHMEZNC	DFHMET1C
DFHMEZNE	DFHMET1E
DFHMEZNK	DFHMET1K

Object module	Load module(s)
DFHME00C	DFHMET1C DFHMET2C DFHMET5C DFHMET9C
DFHME00E	DFHMET1E DFHMET2E DFHMET3E DFHMET4E DFHMET5E DFHMET9E
DFHME00K	DFHMET1K DFHMET2K DFHMET5K DFHMET9K
DFHME1UC	DFHMET9C
DFHME1UE	DFHMET9E
DFHME1UK	DFHMET9K
DFHME70C	DFHMET2C
DFHME70E	DFHMET2E
DFHME70K	DFHMET2K
DFHME71C	DFHMET2C
DFHME71E	DFHMET2E
DFHME71K	DFHMET2K
DFHME72C	DFHMET2C
DFHME72E	DFHMET2E
DFHME72K	DFHMET2K
DFHMGPME	DFHMGP
DFHMGP00	DFHMGP
DFHMGT	DFHMGT
DFHMIRS	DFHMIRS
DFHML1	DFHML1
DFHMNDM	DFHMNDML
DFHMNDUF	DFHPD530
DFHMNDUP	DFHMNDUP
DFHMNMN	DFHMNDML
DFHMNMNT	DFHTT530
DFHMNNT	DFHMNDML
DFHMNSR	DFHMNDML
DFHMNSRT	DFHTT530
DFHMNST	DFHMNDML
DFHMNSU	DFHMNDML
DFHMNSUT	DFHTT530
DFHMNSVC	DFHMNSVC
DFHMNTI	DFHMNDML
DFHMNTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHMNUE	DFHMNDML
DFHMNXM	DFHMNDML
DFHMNXMT	DFHTT530
DFHMRDUF	DFHPD530
DFHMROQP	DFHMROQP
DFHMSCAN	DFHMSCAN
DFHMSP	DFHMSP
DFHMVRMS	DFHIRP DFHIRP52 DFHMVRMS
DFHMXP	DFHMXP
DFHM32A$	DFHM32A$
DFHM321$	DFHM321$
DFHNQDM	DFHNQDM
DFHNQDUF	DFHPD530
DFHNQED	DFHNQDM
DFHNQEDT	DFHTT530
DFHNQIB	DFHNQDM
DFHNQIBT	DFHTT530
DFHNQIE	DFHNQDM
DFHNQNQ	DFHNQDM
DFHNQNQT	DFHTT530
DFHNQST	DFHNQDM
DFHNQTRI	DFHDU530 TROLP DFHPD530 DFHTR530

Object module	Load module(s)
	DFHTU530
DFHNXDUF	DFHPD530
DFHPADM	DFHSIP
DFHPADUF	DFHPD530
DFHPAGP	DFHSIP
DFHPAGPT	DFHTT530
DFHPAIO	DFHPAIO
DFHPAIOT	DFHTT530
DFHPASY	DFHPASYL
DFHPASYT	DFHTT530
DFHPATRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHPBPA$	DFHPBPA$
DFHPBP1$	DFHPBP1$
DFHPCPC2	DFHPCPC2
DFHPCPG	DFHPCP
DFHPCXDF	DFHSIP
DFHPDKW	DFHPD530
DFHPDX1	DFHPD530
DFHPEP	DFHPEP
DFHPGADX	DFHPGADX
DFHPGAI	DFHPGDM
DFHPGAIT	DFHTT530
DFHPGAQ	DFHPGDM
DFHPGAQT	DFHTT530
DFHPGDD	DFHPGDM
DFHPGDDT	DFHTT530
DFHPGDM	DFHPGDM
DFHPGDUF	DFHPD530
DFHPGEX	DFHPGDM
DFHPGEXT	DFHTT530
DFHPGHM	DFHPGDM
DFHPGHMT	DFHTT530
DFHPGIS	DFHPGDM
DFHPGIST	DFHTT530
DFHPGLD	DFHPGDM
DFHPGLDT	DFHTT530
DFHPGLE	DFHPGDM
DFHPGLET	DFHTT530
DFHPGLK	DFHPGDM
DFHPGLKT	DFHTT530
DFHPGLU	DFHPGDM
DFHPGLUT	DFHTT530
DFHPGPG	DFHPGDM
DFHPGPGT	DFHTT530
DFHPGRE	DFHPGDM
DFHPGRET	DFHTT530
DFHPGRP	DFHPGRP
DFHPGRPT	DFHTT530
DFHPGST	DFHPGDM
DFHPGTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHPGUE	DFHPGDU
DFHPGXE	DFHPGDM
DFHPGXET	DFHTT530
DFHPGXM	DFHPGDM
DFHPGXMT	DFHTT530
DFHPHN	DFHPHN

Object module	Load module(s)
DFHPHP	DFHPHP
DFHPLTRM	DFHPLTRM
DFHPRCM	DFHPRCM
DFHPRCMT	DFHTT530
DFHPRDUF	DFHPD530
DFHPRFS	DFHPRFS
DFHPRFST	DFHTT530
DFHPRINU	DFHTT530
DFHPRIN1	DFHPRIN
DFHPRIN2	DFHPRIN
DFHPRK	DFHPRK
DFHPRPT	DFHPRPT
DFHPRPTT	DFHTT530
DFHPRRP	DFHPRRP
DFHPRRPT	DFHTT530
DFHPSIP	DFHPSIP
DFHPSP	DFHPSP
DFHPSPCK	DFHPSP
DFHPSPDW	DFHPSP
DFHPSPSS	DFHPSP
DFHPSPST	DFHPSP
DFHPSSVC	DFHPSSVC
DFHPTDUF	DFHPD530
DFHPUPAB	DFHCSDUP
DFHPUPAC	DFHEICRE
DFHPUPB	DFHCSDUP
DFHPUPC	DFHPUP
DFHPUPDB	DFHCSDUP
DFHPUPDC	DFHPUP
DFHPUPXB	DFHCSDUP
DFHPUPXC	DFHEICRE DFHPUP
DFHP3270	DFHP3270
DFHQRY	DFHQRY
DFHQSSS	DFHDTSVC
DFHRCEX	DFHRCEX
DFHRCT1$	DFHRCT1$
DFHRDDUF	DFHPD530
DFHRDJPN	DFHRDJPN
DFHREST	DFHREST
DFHRITRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHRKB	DFHRKB
DFHRLRA$	DFHRLRA$
DFHRLR1$	DFHRLR1$
DFHRMCD	DFHSIP
DFHRMCDT	DFHTT530
DFHRMCD1	DFHSIP
DFHRMCD2	DFHSIP
DFHRMCI2	DFHSIP
DFHRMCI3	DFHSIP
DFHRMCI4	DFHSIP
DFHRMDET	DFHTT530
DFHRMDM	DFHSIP
DFHRMDMT	DFHTT530
DFHRMDUF	DFHPD530
DFHRMDU0	DFHPD530
DFHRMDU2	DFHPD530
DFHRMDU3	DFHPD530

Object module	Load module(s)
DFHRMDU4	DFHPD530
DFHRMKDT	DFHTT530
DFHRMKPT	DFHTT530
DFHRMLKQ	DFHSIP
DFHRMLKT	DFHTT530
DFHRMLK1	DFHSIP
DFHRMLK2	DFHSIP
DFHRMLK3	DFHSIP
DFHRMLK4	DFHSIP
DFHRMLK5	DFHSIP
DFHRMLN	DFHSIP
DFHRMLNT	DFHTT530
DFHRMLSD	DFHSIP
DFHRMLSF	DFHSIP
DFHRMLSO	DFHSIP
DFHRMLSP	DFHSIP
DFHRMLSS	DFHSIP
DFHRMLSU	DFHSIP
DFHRML1D	DFHSIP
DFHRMNM	DFHSIP
DFHRMNMT	DFHTT530
DFHRMNM1	DFHSIP
DFHRMNS1	DFHSIP
DFHRMNS2	DFHSIP
DFHRMOFI	DFHSIP
DFHRMRET	DFHTT530
DFHRMRO	DFHSIP
DFHRMROO	DFHSIP
DFHRMROS	DFHSIP
DFHRMROT	DFHTT530
DFHRMROU	DFHSIP
DFHRMROV	DFHSIP
DFHRMRO1	DFHSIP
DFHRMRO2	DFHSIP
DFHRMRO3	DFHSIP
DFHRMRO4	DFHSIP
DFHRMR1D	DFHSIP
DFHRMR1E	DFHSIP
DFHRMR1K	DFHSIP
DFHRMR1S	DFHSIP
DFHRMSL	DFHSIP
DFHRMSLF	DFHSIP
DFHRMSLJ	DFHSIP
DFHRMSLL	DFHSIP
DFHRMSLO	DFHSIP
DFHRMSLT	DFHTT530
DFHRMSLV	DFHSIP
DFHRMSLW	DFHSIP
DFHRMSL1	DFHSIP
DFHRMSL2	DFHSIP
DFHRMSL3	DFHSIP
DFHRMSL4	DFHSIP
DFHRMSL5	DFHSIP
DFHRMSL6	DFHSIP
DFHRMSL7	DFHSIP
DFHRMST	DFHSIP
DFHRMST1	DFHSIP
DFHRMSY	DFHRMSY

Object module	Load module(s)
DFHRMTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHRMUC	DFHSIP
DFHRMUO	DFHSIP
DFHRMUTL	DFHRMUTL
DFHRMUW	DFHSIP
DFHRMUWB	DFHSIP
DFHRMUWE	DFHSIP
DFHRMUWF	DFHSIP
DFHRMUWH	DFHSIP
DFHRMUWJ	DFHSIP
DFHRMUWL	DFHSIP
DFHRMUWN	DFHSIP
DFHRMUWP	DFHSIP
DFHRMUWQ	DFHSIP
DFHRMUWS	DFHSIP
DFHRMUWT	DFHTT530
DFHRMUWU	DFHSIP
DFHRMUWV	DFHSIP
DFHRMUWW	DFHSIP
DFHRMUW0	DFHSIP
DFHRMUW1	DFHSIP
DFHRMUW2	DFHSIP
DFHRMUW3	DFHSIP
DFHRMU1C	DFHSIP
DFHRMU1D	DFHSIP
DFHRMU1E	DFHSIP
DFHRMU1F	DFHSIP
DFHRMU1G	DFHSIP
DFHRMU1J	DFHSIP
DFHRMU1K	DFHSIP
DFHRMU1L	DFHSIP
DFHRMU1N	DFHSIP
DFHRMU1Q	DFHSIP
DFHRMU1R	DFHSIP
DFHRMU1S	DFHSIP
DFHRMU1U	DFHSIP
DFHRMU1V	DFHSIP
DFHRMU1W	DFHSIP
DFHRMVP1	DFHSIP
DFHRMWTT	DFHTT530
DFHRMXNE	DFHSIP
DFHRMXN2	DFHSIP
DFHRMXN3	DFHRMXN3
DFHRMXN4	DFHSIP
DFHRMXN5	DFHSIP
DFHROINT	DFHTT530
DFHRPAL	DFHRPAL
DFHRPALT	DFHRPTRI
DFHRPAS	DFHRPAS
DFHRPCC	DFHRPRP
DFHRPC0A	DFHRPC00
DFHRPC0B	DFHRPC00
DFHRPC0D	DFHRPC00
DFHRPC0E	DFHRPC00
DFHRPC01	DFHRPC00
DFHRPC03	DFHRPC00
DFHRPC04	DFHRPC00

Object module	Load module(s)
DFHRPC05	DFHRPC00
DFHRPC06	DFHRPC00
DFHRPC08	DFHRPC00
DFHRPC09	DFHRPC00
DFHRPC10	DFHRPC00
DFHRPC4C	DFHRPC00
DFHRPC42	DFHRPC00
DFHRPDUF	DFHRPDUF
DFHRPMS	DFHRPMS
DFHRPRP	DFHRPRP
DFHRPRPT	DFHRPTRI
DFHRPTRI	DFHRPTRI
DFHRPTRU	DFHRPTRU
DFHRP0	DFHRP0
DFHRP0H	DFHRP0H
DFHRTC	DFHRTC
DFHRTE	DFHRTE
DFHRTSU	DFHRTSU
DFHRTSUT	DFHTT530
DFHRTTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHRTTR1	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHRTY	DFHRTY
DFHSAIQ	DFHSAIQ
DFHSAIQT	DFHTT530
DFHSAXDF	DFHSIP
DFHSCAA	DFHSCAA
DFHSFP	DFHSFP
DFHSIA1	DFHSIA1
DFHSIB1	DFHSIB1
DFHSIC1	DFHSIC1
DFHSID1	DFHSID1
DFHSIF1	DFHSIF1
DFHSIG1	DFHSIG1
DFHSIH1	DFHSIH1
DFHSII1	DFHSII1
DFHSIJ1	DFHSIJ1
DFHSIPLT	DFHSIPLT
DFHSIT	DFHSIT
DFHSITCL	DFHSITCL
DFHSIT42	DFHSIT42
DFHSIT6$	DFHSIT6$
DFHSIT$$	DFHSIT
DFHSKC	DFHSKP
DFHSKE	DFHSKP
DFHSKM	DFHSKP
DFHSKTSK	DFHSKTSK
DFHSMAD	DFHSIP
DFHSMADT	DFHTT530
DFHSMAFT	DFHTT530
DFHSMAR	DFHSIP
DFHSMART	DFHTT530
DFHSMCK	DFHSIP
DFHSMCKT	DFHTT530
DFHSMDM	DFHSIP
DFHSMDUF	DFHPD530
DFHSMGF	DFHSIP

Object module	Load module(s)
DFHSMGFT	DFHTT530
DFHSMMCI	DFHSIP
DFHSMMCT	DFHTT530
DFHSMMC2	DFHSIP
DFHSMMF	DFHSIP
DFHSMMG	DFHSIP
DFHSMNTT	DFHTT530
DFHSMPP	DFHSIP
DFHSMPPT	DFHTT530
DFHSMPQ	DFHSIP
DFHSMPQT	DFHTT530
DFHSMSCP	DFHSIP
DFHSMSQ	DFHSIP
DFHSMSQT	DFHTT530
DFHSMSR	DFHSIP
DFHSMSRT	DFHTT530
DFHSMST	DFHSIP
DFHSMSU	DFHSIP
DFHSMSUT	DFHTT530
DFHSMSVC	DFHSMSVC
DFHSMSY	DFHSIP
DFHSMTAB	DFHSMTAB
DFHSMTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHSMXDF	DFHSIP
DFHSNAS	DFHSNUS
DFHSNLE	DFHSNLE
DFHSNLK	DFHSNLK
DFHSNMIG	DFHSNMIG
DFHSNNFY	DFHSNNFY
DFHSNP	DFHSNP
DFHSNPTO	DFHSNPTO
DFHSNPU	DFHSNUS
DFHSNSC	DFHCESC DFHZCP DFHZCUT
DFHSNSE	DFHSNSE
DFHSNSG	DFHSNUS
DFHSNSK	DFHSNSK
DFHSNSU	DFHSNUS
DFHSNTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHSNTU	DFHSNUS
DFHSNUS	DFHSNUS
DFHSNUST	DFHTT530
DFHSNVCL	DFHSNVCL
DFHSNVID	DFHSNVID
DFHSNVPR	DFHSNVPR
DFHSNVTO	DFHSNVTO
DFHSNXR	DFHSNUS DFHSUSX DFHZXCU
DFHSNXRT	DFHDU530 DFHTR530 DFHTT530 DFHTU530
DFHSPDBB	DFHCSDUP
DFHSPDBC	DFHEDAD
DFHSPDBE	DFHEICRE
DFHSPFIB	DFHCSDUP
DFHSPFIC	DFHEDAD
DFHSPFIE	DFHEICRE
DFHSPKCB	DFHCSDUP
DFHSPKCC	DFHEDAD
DFHSPKCE	DFHEICRE

Object module	Load module(s)
DFHSPLMB	DFHCSDUP
DFHSPLMC	DFHEDAD
DFHSPLME	DFHEICRE
DFHSPLSB	DFHCSDUP
DFHSPLSC	DFHEDAD
DFHSPLSE	DFHEICRE
DFHSPP	DFHSPP
DFHSPPCB	DFHCSDUP
DFHSPPCC	DFHEDAD
DFHSPPCE	DFHEICRE
DFHSPPNB	DFHCSDUP
DFHSPPNC	DFHEDAD
DFHSPPNE	DFHEICRE
DFHSPTCB	DFHCSDUP
DFHSPTCC	DFHEDAD
DFHSPTCE	DFHEICRE
DFHSPTDB	DFHCSDUP
DFHSPTDC	DFHEDAD
DFHSPTDE	DFHEICRE
DFHSPTIB	DFHCSDUP
DFHSPTIC	DFHEDAD
DFHSPTIE	DFHEICRE
DFHSPTNB	DFHCSDUP
DFHSPTNC	DFHEDAD
DFHSPTNE	DFHEICRE
DFHSPTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHSPTYB	DFHCSDUP
DFHSPTYC	DFHEDAD
DFHSPTYE	DFHEICRE
DFHSPXMB	DFHCSDUP
DFHSPXMC	DFHEDAD
DFHSPXME	DFHEICRE
DFHSRLI	DFHSRP
DFHSRLIT	DFHTT530
DFHSRP	DFHSRP
DFHSRT	DFHSRT
DFHSRTYB	DFHSRTYB
DFHSRT1$	DFHSRT1$
DFHSR1	DFHSRP
DFHSSDUF	DFHPD530
DFHSSEN	DFHSSEN DFHSSENK
DFHSSGC	DFHSSGC DFHSSGCK
DFHSSIN	DFHSSIN DFHSSINK
DFHSSMGP	DFHSSIN DFHSSINK
DFHSSMGT	DFHSSMGT
DFHSSWT	DFHSSWT DFHSSWTK
DFHSSWTF	DFHSSWT DFHSSWTK
DFHSSWTO	DFHSSWT DFHSSWTK
DFHSTDBX	DFHSTUP
DFHSTDEX	DFHSTUP
DFHSTDM	DFHSTDML
DFHSTDSX	DFHSTUP
DFHSTDUF	DFHPD530
DFHSTDUX	DFHSTUP
DFHSTD2X	DFHSTUP
DFHSTE15	DFHSTUP
DFHSTE35	DFHSTUP

Object module	Load module(s)
DFHSTFC	DFHAPSTL
DFHSTIN	DFHSTUP
DFHSTLDX	DFHSTUP
DFHSTLGX	DFHSTUP
DFHSTLK	DFHAPSTL
DFHSTLS	DFHAPSTL
DFHSTMNX	DFHSTUP
DFHSTNQX	DFHSTUP
DFHSTOT	DFHSTUP
DFHSTP	DFHSTP
DFHSTPGX	DFHSTUP
DFHSTRD	DFHSTUP
DFHSTRMX	DFHSTUP
DFHSTSMX	DFHSTUP
DFHSTST	DFHSTDML
DFHSTSTT	DFHTT530
DFHSTSTX	DFHSTUP
DFHSTSZ	DFHAPSTL
DFHSTTD	DFHAPSTL
DFHSTTI	DFHSTDML
DFHSTTM	DFHAPSTL
DFHSTTQX	DFHSTUP
DFHSTTR	DFHAPSTL
DFHSTTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHSTTSX	DFHSTUP
DFHSTUDB	DFHSTUP
DFHSTUDE	DFHSTUP
DFHSTUDS	DFHSTUP
DFHSTUDU	DFHSTUP
DFHSTUD2	DFHSTUP
DFHSTUE	DFHSTDML
DFHSTULD	DFHSTUP
DFHSTULG	DFHSTUP
DFHSTUMN	DFHSTUP
DFHSTUNQ	DFHSTUP
DFHSTUPG	DFHSTUP
DFHSTUP1	DFHSTUP
DFHSTURM	DFHSTUP
DFHSTURS	DFHSTUP
DFHSTURX	DFHSTUP
DFHSTUSM	DFHSTUP
DFHSTUST	DFHSTUP
DFHSTUTQ	DFHSTUP
DFHSTUTS	DFHSTUP
DFHSTUXC	DFHSTUP
DFHSTUXM	DFHSTUP
DFHSTU03	DFHSTUP
DFHSTU04	DFHSTUP
DFHSTU06	DFHSTUP
DFHSTU08	DFHSTUP
DFHSTU09	DFHSTUP
DFHSTU14	DFHSTUP
DFHSTU16	DFHSTUP
DFHSTU17	DFHSTUP
DFHSTU21	DFHSTUP
DFHSTU22	DFHSTUP
DFHSTWR	DFHSTUP

Object module	Load module(s)
DFHSTXCX	DFHSTUP
DFHSTXMX	DFHSTUP
DFHST03X	DFHSTUP
DFHST04X	DFHSTUP
DFHST06X	DFHSTUP
DFHST08X	DFHSTUP
DFHST09X	DFHSTUP
DFHST14X	DFHSTUP
DFHST16X	DFHSTUP
DFHST17X	DFHSTUP
DFHST21X	DFHSTUP
DFHST22X	DFHSTUP
DFHSUDUF	DFHPD530
DFHSUEX	DFHAPEP
DFHSUEXT	DFHTT530
DFHSUME	DFHSIP
DFHSUMET	DFHTT530
DFHSUSX	DFHSUSX
DFHSUSXT	DFHTT530
DFHSUTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHSUWT	DFHSIP DFHSUWT
DFHSUWTT	DFHTT530
DFHSUZX	DFHSUZX
DFHSUZXT	DFHTT530
DFHSZATC	DFHSZATR
DFHSZATR	DFHSZATR
DFHSZBCL	DFHSZRMP
DFHSZBCS	DFHSZRMP
DFHSZBFT	DFHSZRMP
DFHSZBLO	DFHSZRMP
DFHSZBRS	DFHSZRMP
DFHSZBSI	DFHSZRMP
DFHSZBST	DFHSZRMP
DFHSZBUN	DFHSZRMP
DFHSZBUS	DFHSZRMP
DFHSZDUF	DFHPD530
DFHSZFRD	DFHSZRMP
DFHSZFSD	DFHSZRMP
DFHSZIDX	DFHSZRMP
DFHSZPCP	DFHSZRMP
DFHSZPDX	DFHSZRMP
DFHSZPID	DFHSZRMP
DFHSZPIX	DFHSZRMP
DFHSZPOA	DFHSZRMP
DFHSZPOD	DFHSZRMP
DFHSZPOR	DFHSZRMP
DFHSZPOX	DFHSZRMP
DFHSZPOY	DFHSZRMP
DFHSZPQS	DFHSZRMP
DFHSZPQX	DFHSZRMP
DFHSZPSB	DFHSZRMP
DFHSZPSC	DFHSZRMP
DFHSZPSD	DFHSZRMP
DFHSZPSH	DFHSZRMP
DFHSZPSQ	DFHSZRMP
DFHSZPSR	DFHSZRMP
DFHSZPSS	DFHSZRMP

Object module	Load module(s)
DFHSZPSX	DFHSZRMP
DFHSZPTE	DFHSZRMP
DFHSZRCA	DFHSZRMP
DFHSZRCT	DFHSZRMP
DFHSZRDC	DFHSZRMP
DFHSZRDG	DFHSZRMP
DFHSZRDN	DFHSZRMP
DFHSZRDP	DFHSZRMP
DFHSZRDS	DFHSZRMP
DFHSZRDT	DFHSZRMP
DFHSZREQ	DFHSZRMP
DFHSZRFC	DFHSZRMP
DFHSZRGR	DFHSZRMP
DFHSZRIA	DFHSZRMP
DFHSZRIC	DFHSZRMP
DFHSZRID	DFHSZRMP
DFHSZRIF	DFHSZRMP
DFHSZRII	DFHSZRMP
DFHSZRIN	DFHSZRMP
DFHSZRIO	DFHSZRMP
DFHSZRIP	DFHSZRMP
DFHSZRIQ	DFHSZRMP
DFHSZRIS	DFHSZRMP
DFHSZRIT	DFHSZRMP
DFHSZRIW	DFHSZRMP
DFHSZRNC	DFHSZRMP
DFHSZRNO	DFHSZRMP
DFHSZRPM	DFHSZRMP
DFHSZRPW	DFHSZATR
DFHSZRQR	DFHSZRMP
DFHSZRQW	DFHSZATR
DFHSZRRD	DFHSZRMP
DFHSZRRT	DFHSZATR
DFHSZRSC	DFHSZRMP
DFHSZRSE	DFHSZRMP
DFHSZRST	DFHSZRMP
DFHSZRTM	DFHSZRMP
DFHSZRXD	DFHSZRMP
DFHSZRZZ	DFHSZRMP
DFHSZSIP	DFHSZRMP
DFHSZVBN	DFHSZRMP
DFHSZVGF	DFHSZRMP
DFHSZVQS	DFHSZRMP
DFHSZVRA	DFHSZRMP
DFHSZVRI	DFHSZRMP
DFHSZVSC	DFHSZRMP
DFHSZVSL	DFHSZRMP
DFHSZVSQ	DFHSZRMP
DFHSZVSR	DFHSZRMP
DFHSZVSY	DFHSZRMP
DFHSZWSL	DFHSZRMP
DFHSZXDA	DFHSZRMP
DFHSZXFR	DFHSZRMP
DFHSZXLG	DFHSZRMP
DFHSZXLT	DFHSZRMP
DFHSZXNS	DFHSZRMP
DFHSZXPM	DFHSZRMP
DFHSZXRA	DFHSZRMP
DFHSZXSC	DFHSZRMP
DFHSZXTP	DFHSZRMP
DFHSZYLG	DFHSZRMP
DFHSZYQR	DFHSZRMP
DFHSZYRI	DFHSZRMP
DFHSZYSC	DFHSZRMP
DFHSZYSR	DFHSZRMP
DFHSZYSY	DFHSZRMP
DFHSZZAG	DFHSZRMP
DFHSZZFR	DFHSZRMP
DFHSZZNG	DFHSZRMP
DFHSZZRG	DFHSZRMP
DFHSZ2CP	DFHSZRMP
DFHSZ2DX	DFHSZRMP
DFHSZ2ID	DFHSZRMP
DFHSZ2IX	DFHSZRMP
DFHSZ2OA	DFHSZRMP
DFHSZ2OD	DFHSZRMP
DFHSZ2OR	DFHSZRMP
DFHSZ2OX	DFHSZRMP
DFHSZ2OY	DFHSZRMP
DFHSZ2PX	DFHSZRMP
DFHSZ2QS	DFHSZRMP
DFHSZ2QX	DFHSZRMP
DFHSZ2SB	DFHSZRMP
DFHSZ2SC	DFHSZRMP
DFHSZ2SD	DFHSZRMP
DFHSZ2SH	DFHSZRMP
DFHSZ2SQ	DFHSZRMP
DFHSZ2SR	DFHSZRMP
DFHSZ2SX	DFHSZRMP
DFHSZ2TE	DFHSZRMP
DFHTACP	DFHTACP
DFHTAJP	DFHTAJP
DFHTBSB	DFHTBS
DFHTBSBP	DFHTBS
DFHTBSD	DFHTBS
DFHTBSDP	DFHTBS
DFHTBSL	DFHTBS
DFHTBSLP	DFHTBSS
DFHTBSQ	DFHTBS
DFHTBSQP	DFHTBS
DFHTBSR	DFHTBS
DFHTBSRP	DFHTBS
DFHTBSS	DFHTBSS
DFHTBSST	DFHTT530
DFHTBS00	DFHTBS
DFHTCDPF	DFHPD530
DFHTCDUF	DFHPD530
DFHTCP	DFHTCP
DFHTCRP	DFHTCRP
DFHTCRPC	DFHTCRP
DFHTCRPL	DFHTCRP
DFHTCRPS	DFHTCRP
DFHTCRPU	DFHTCRP
DFHTCSUM	DFHPD530
DFHTCTCL	DFHRDTCL DFHTCTCL
DFHTCTDL	DFHRDTDL DFHTCTDL

Object module	Load module(s)
DFHTCTDX	DFHRDTDX DFHTCTDX
DFHTCTDY	DFHRDTDY DFHTCTDY
DFHTCTRR	DFHRDTRR DFHTCTRR
DFHTCTTC	DFHRDTTC DFHTCTTC
DFHTCTTP	DFHRDTTP DFHTCTTP
DFHTCTUR	DFHRDTUR DFHTCTUR
DFHTCT41	DFHRDT41 DFHTCT41
DFHTCT5$	DFHRDT5$ DFHTCT5$
DFHTCXDF	DFHSIP
DFHTDA	DFHTDP
DFHTDB	DFHTDQ
DFHTDDUF	DFHPD530
DFHTDEXL	DFHTDP
DFHTDOC	DFHTDP
DFHTDOCT	DFHTT530
DFHTDRM	DFHTDRM
DFHTDRP	DFHTDRP
DFHTDTDT	DFHTT530
DFHTDTM	DFHTDTM
DFHTDTMT	DFHTT530
DFHTDTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHTDX	DFHTDP
DFHTDXM	DFHTDXM
DFHTDXMT	DFHTT530
DFHTEPT3	DFHTEPT3
DFHTFALT	DFHTT530
DFHTFBFT	DFHTT530
DFHTFIQ	DFHTFIQ
DFHTFIQT	DFHTT530
DFHTFP	DFHTFP
DFHTFRF	DFHTFRF
DFHTFRFT	DFHTT530
DFHTFTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHTIDM	DFHTIDM
DFHTIDUF	DFHPD530
DFHTIEM	DFHERM DFHUEM
DFHTISR	DFHTIDM
DFHTISRT	DFHTT530
DFHTITRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHTLTC1	DFHTLTC1
DFHTLTK2	DFHTLTK2
DFHTLTS1	DFHTLTS1
DFHTLTS2	DFHTLTS2
DFHTLTT	DFHTLTT
DFHTLTTF	DFHTLTTF
DFHTLTT1	DFHTLTT1
DFHTLTT2	DFHTLTT2
DFHTLTT3	DFHTLTT3
DFHTLTT4	DFHTLTT4
DFHTLTT5	DFHTLTT5
DFHTLTT6	DFHTLTT6
DFHTLTT7	DFHTLTT7
DFHTLTT8	DFHTLTT8
DFHTLTW1	DFHTLTW1
DFHTMDUF	DFHPD530

Object module	Load module(s)
DFHTMP01	DFHTMP
DFHTMP02	DFHTMP
DFHTMTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHTOACN	DFHTOR
DFHTOAPT	DFHTOR
DFHTOASE	DFHTOR
DFHTOATM	DFHTOR
DFHTOATY	DFHTOR
DFHTOBPS	DFHTOR
DFHTOCAN	DFHTOR
DFHTOCMT	DFHTOR
DFHTOLCR	DFHTOR
DFHTOLUI	DFHTOR
DFHTON	DFHTON
DFHTONR	DFHTONR
DFHTONRT	DFHTT530
DFHTORP	DFHTORP
DFHTOR00	DFHTOR
DFHTOUT1	DFHTOR
DFHTOUT2	DFHTOR
DFHTPPA$	DFHTPPA$
DFHTPP1$	DFHTPP1$
DFHTPQ	DFHTPQ
DFHTPR	DFHTPR
DFHTPS	DFHTPS
DFHTRAO	DFHTRAO
DFHTRAP	DFHTRAP
DFHTRDM	DFHSIP
DFHTRDUF	DFHPD530
DFHTREX	DFHTREX
DFHTRFFD	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHTRFFE	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHTRFPB	DFHDU530 TROLP DFHPD530 DFHTU530
DFHTRFPP	DFHDU530 TROLP DFHPD530 DFHTG530 DFHTU530
DFHTRFT	DFHSIP
DFHTRFTT	DFHTT530
DFHTRIB	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530 DFHWBTRI
DFHTRP	DFHTRP
DFHTRPRA	DFHTU530
DFHTRPRG	DFHTG530
DFHTRPT	DFHSIP
DFHTRPTT	DFHTT530
DFHTRPX	DFHSIP
DFHTRSR	DFHSIP
DFHTRSRT	DFHTT530
DFHTRSU	DFHSIP
DFHTRSUT	DFHTT530
DFHTRTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHTRXDF	DFHSIP
DFHTRZCP	DFHTOR
DFHTRZIP	DFHTOR
DFHTRZPP	DFHTOR

Object module	Load module(s)
DFHTRZXP	DFHTOR
DFHTRZYP	DFHTOR
DFHTRZZP	DFHTOR
DFHTSAM	DFHTSDML
DFHTSAMT	DFHTT530
DFHTSBR	DFHTSDML
DFHTSBRT	DFHTT530
DFHTSDM	DFHTSDML
DFHTSDUC	DFHPD530
DFHTSDUF	DFHPD530
DFHTSDUS	DFHPD530
DFHTSICT	DFHTT530
DFHTSITR	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHTSP	DFHTSP
DFHTSPT	DFHTSDML
DFHTSPTT	DFHTT530
DFHTSQR	DFHTSDML
DFHTSQRT	DFHTT530
DFHTSRM	DFHTSDML
DFHTSSBT	DFHTT530
DFHTSSH	DFHTSDML
DFHTSSHT	DFHTT530
DFHTSSR	DFHTSDML
DFHTSSRT	DFHTT530
DFHTSST	DFHTSDML
DFHTST	DFHTST
DFHTSTDA	DFHTSTDA
DFHTSTDL	DFHTSTDL
DFHTSTNS	DFHTSTNS
DFHTSTR1	DFHTSTR1
DFHTSWQ	DFHTSDML
DFHTSWQT	DFHTT530
DFHUCNV	DFHUCNV
DFHUEDUF	DFHPD530
DFHUEH	DFHUEH
DFHUEIQ	DFHEIQUE DFHSIPLT
DFHUEIQT	DFHTT530
DFHUEM	DFHUEM
DFHUSAD	DFHUSDM
DFHUSADT	DFHTT530
DFHUSBP	DFHAPRC
DFHUSDE	DFHUSDM
DFHUSDET	DFHTT530
DFHUSDM	DFHUSDM
DFHUSDUF	DFHPD530
DFHUSFL	DFHUSDM
DFHUSFLT	DFHTT530
DFHUSIS	DFHUSDM
DFHUSIST	DFHTT530
DFHUSST	DFHUSDM
DFHUSTI	DFHUSDM
DFHUSTIT	DFHTT530
DFHUSTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHUSXM	DFHUSDM
DFHUSXMT	DFHTT530
DFHWBA	DFHWBA

Object module	Load module(s)
DFHWBADX	DFHWBADX
DFHWBAP@	DFHWBAPI
DFHWBA1	DFHWBA1
DFHWBCC@	DFHWBWB
DFHWBC0B	DFHWBC00
DFHWBC01	DFHWBC00
DFHWBC03	DFHWBC00
DFHWBC04	DFHWBC00
DFHWBC09	DFHWBC00
DFHWBC42	DFHWBC00
DFHWBDUF	DFHWBDUF
DFHWBENV	DFHWBENV
DFHWBIMG	DFHWBIMG
DFHWBIP	DFHWBIP
DFHWBIPT	DFHTT530
DFHWBLT	DFHWBLT
DFHWBM	DFHWBM
DFHWBPA	DFHWBPA
DFHWBRP	DFHWBRP DFHWBTL
DFHWBST	DFHWBST
DFHWBSTT	DFHTT530 DFHWBTRI
DFHWBTC	DFHWBTC
DFHWBTC@	DFHWBTC
DFHWBTCT	DFHTT530
DFHWBTL	DFHWBTL
DFHWBTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530 DFHWBTRI
DFHWBTRU	DFHWBTRU
DFHWBTTA	DFHWBTTA
DFHWBWB	DFHWBWB
DFHWBWBT	DFHTT530 DFHWBTRI
DFHWB0	DFHWB0
DFHWB0H	DFHWB0H
DFHWCCS	DFHWSMS
DFHWCGNT	DFHWSMS
DFHWDATT	DFHWSMS
DFHWDINA	DFHWSMS
DFHWDISP	DFHWSMS
DFHWDSRP	DFHWSMS
DFHWDWAT	DFHWSMS
DFHWKP	DFHSTP
DFHWLFRE	DFHWSMS
DFHWLGET	DFHWSMS
DFHWLIST	DFHDBCON DFHDBME DFHDBMP DFHD2STR DFHINDT
DFHWMG1	DFHWSMS
DFHWMI	DFHWSMS
DFHWMMT	DFHWSMS
DFHWMPG	DFHWSMS
DFHWMP1	DFHWSMS
DFHWMQG	DFHWSMS
DFHWMQH	DFHWSMS
DFHWMQP	DFHWSMS
DFHWMQS	DFHWSMS
DFHWMRD	DFHWSMS
DFHWMS	DFHXRP
DFHWMS20	DFHWSMS
DFHWMWR	DFHWSMS

Object module	Load module(s)
DFHWORDS	DFHDBME DFHDBMP
DFHWOS	DFHWOS
DFHWOSA	DFHWOSA
DFHWOSB	DFHWOSB
DFHWSRTR	DFHWSMS
DFHWSSN1	DFHWSSON
DFHWSSN2	DFHWSSON
DFHWSSN3	DFHWSSON
DFHWSSOF	DFHWSMS
DFHWSSR	DFHWSMS
DFHWSSW	DFHWSMS
DFHWSTI	DFHWSMS
DFHWSTKV	DFHWSMS
DFHWSXPI	DFHWSSON
DFHWTI	DFHWTI
DFHWTRP	DFHWSMS
DFHXCDMP	DFHTREX DFHXCPRX
DFHXCEIP	DFHXCEIX
DFHXCOPT	DFHXCOPT
DFHXCP	DFHKCP
DFHXCPRH	DFHXCPRX
DFHXCSTB	DFHWBAPI DFHXCEIX DFHXCSTB DFH$AXCC
DFHXCSVC	DFHXCSVC
DFHXCTAB	DFHXCTAB
DFHXCTRA	DFHXCTRA
DFHXCTRI	DFHXCPRX
DFHXCTRP	DFHTREX DFHXCPRX
DFHXCURM	DFHXCURM
DFHXDXDF	DFHSIP
DFHXFP	DFHXFP
DFHXFQ	DFHXCPRX
DFHXFRM	DFHXFRM
DFHXFX	DFHXFX
DFHXIS	DFHXIS
DFHXLTTA	DFHXLTTA
DFHXLTTB	DFHXLTTB
DFHXLTTC	DFHXLTTC
DFHXLTTN	DFHXLTTN
DFHXLTW1	DFHXLTW1
DFHXMAB	DFHXMAB
DFHXMAT	DFHSIP
DFHXMATT	DFHTT530
DFHXMBD	DFHSIP
DFHXMBDT	DFHTT530
DFHXMBR	DFHSIP
DFHXMBRT	DFHTT530
DFHXMCL	DFHSIP
DFHXMCLT	DFHTT530
DFHXMCS	DFHSIP
DFHXMCST	DFHTT530
DFHXMDD	DFHSIP
DFHXMDDT	DFHTT530
DFHXMDM	DFHSIP
DFHXMDNT	DFHTT530
DFHXMDUF	DFHPD530
DFHXMER	DFHSIP
DFHXMERT	DFHTT530
DFHXMFD	DFHSIP
DFHXMFDT	DFHTT530
DFHXMIQ	DFHSIP
DFHXMIQT	DFHTT530
DFHXMLD	DFHSIP
DFHXMLDT	DFHTT530
DFHXMNTT	DFHTT530
DFHXMPPT	DFHTT530
DFHXMQC	DFHSIP
DFHXMQCT	DFHTT530
DFHXMQD	DFHSIP
DFHXMQDT	DFHTT530
DFHXMRP	DFHSIP
DFHXMRPT	DFHTT530
DFHXMSG	DFHXMSG
DFHXMSR	DFHSIP
DFHXMSRT	DFHTT530
DFHXMST	DFHSIP
DFHXMSUT	DFHTT530
DFHXMTA	DFHSIP
DFHXMTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHXMXD	DFHSIP
DFHXMXDT	DFHTT530
DFHXMXE	DFHSIP
DFHXMXET	DFHTT530
DFHXQBF	DFHXQMN
DFHXQCF	DFHXQMN
DFHXQCN	DFHXQMN
DFHXQDF	DFHXQMN
DFHXQIF	DFHTSDML
DFHXQIQ	DFHXQMN
DFHXQMN	DFHXQMN
DFHXQMS	DFHXQMN
DFHXQOP	DFHXQMN
DFHXQPR	DFHXQMN
DFHXQRL	DFHXQMN
DFHXQRQ	DFHXQMN
DFHXQST	DFHXQMN
DFHXQUL	DFHXQMN
DFHXRA	DFHXRP
DFHXRB	DFHXRP
DFHXRC	DFHXRP
DFHXRCP	DFHXRCP
DFHXRDUF	DFHPD530
DFHXRE	DFHXRP
DFHXRF	DFHSIP DFHSTUP DFHXRP
DFHXRSP	DFHXRSP
DFHXRXDF	DFHSIP
DFHXSAD	DFHSIP
DFHXSADT	DFHTT530
DFHXSDM	DFHSIP
DFHXSDUF	DFHPD530
DFHXSEAI	DFHXSEAI
DFHXSEV	DFHSIP
DFHXSFL	DFHSIP
DFHXSFLT	DFHTT530
DFHXSIDT	DFHTT530
DFHXSIS	DFHSIP

Object module	Load module(s)
DFHXSIST	DFHTT530
DFHXSLU	DFHSIP
DFHXSLUT	DFHTT530
DFHXSPW	DFHSIP
DFHXSPWT	DFHTT530
DFHXSRC	DFHSIP
DFHXSRCT	DFHTT530
DFHXSSA	DFHXSS
DFHXSSAT	DFHTT530
DFHXSSB	DFHXSS
DFHXSSBT	DFHTT530
DFHXSSC	DFHXSS
DFHXSSCT	DFHTT530
DFHXSSD	DFHXSS
DFHXSSDT	DFHTT530
DFHXSSI	DFHXSS
DFHXSSIT	DFHTT530
DFHXSTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHXSWM	DFHXSWM
DFHXSXM	DFHSIP
DFHXSXMT	DFHTT530
DFHXTCI	DFHXTCI
DFHXTENF	DFHXTENF
DFHXTEP	DFHTEP
DFHXTEPT	DFHTEPT
DFHXTP	DFHXTP
DFHZABD	DFHZCX
DFHZACT	DFHZCA
DFHZAND	DFHZCX
DFHZARER	DFHZCC
DFHZARL	DFHZCC
DFHZARM	DFHZCC
DFHZARQ	DFHZCP
DFHZARR	DFHZCC
DFHZARRA	DFHZCC
DFHZARRC	DFHZCC
DFHZARRF	DFHZCC
DFHZASX	DFHZCY
DFHZATA	DFHZATA
DFHZATD	DFHZATD
DFHZATDX	DFHZATDX
DFHZATDY	DFHZATDY
DFHZATI	DFHZCB
DFHZATMD	DFHZATMD
DFHZATMF	DFHZATMF
DFHZATR	DFHZATR
DFHZATS	DFHZATS
DFHZATT	DFHZCP
DFHZBAN	DFHZBAN
DFHZBKT	DFHZCC
DFHZBLX	DFHZCY
DFHZCA	DFHZCA
DFHZCB	DFHZCB
DFHZCC	DFHZCC
DFHZCGRP	DFHZCGRP
DFHZCHS	DFHZCC
DFHZCLS	DFHZCZ

Object module	Load module(s)
DFHZCLX	DFHZCZ
DFHZCNA	DFHZCP
DFHZCNR	DFHZCX
DFHZCNT	DFHZCC
DFHZCN1	DFHZCN1
DFHZCN2	DFHZCN2
DFHZCN2T	DFHTT530
DFHZCOVR	DFHZCOVR
DFHZCP	DFHZCP
DFHZCPLR	DFHZGPC
DFHZCQCH	DFHZCQ
DFHZCQDL	DFHZCQ
DFHZCQIN	DFHZCQ
DFHZCQIQ	DFHZCQ
DFHZCQIS	DFHZCQ
DFHZCQRS	DFHZCQ
DFHZCQRT	DFHZCQ
DFHZCQ00	DFHZCQ
DFHZCRQ	DFHZCZ
DFHZCRT	DFHZCC
DFHZCSTP	DFHZCSTP
DFHZCTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHZCTR1	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHZCT1	DFHZCT1
DFHZCUT	DFHZCUT
DFHZCUTT	DFHTT530
DFHZCW	DFHZCW
DFHZCX	DFHZCX
DFHZCXR	DFHZCXR
DFHZCY	DFHZCY
DFHZCZ	DFHZCZ
DFHZDET	DFHZCB
DFHZDSP	DFHZCP
DFHZDST	DFHZCY
DFHZEMW	DFHZCZ
DFHZERH	DFHZCW
DFHZEV1	DFHZCW
DFHZEV2	DFHZCW
DFHZFRE	DFHZCA
DFHZGAI	DFHZGAI
DFHZGAIT	DFHTT530
DFHZGBM	DFHZGBM
DFHZGBMT	DFHTT530
DFHZGCA	DFHZGCA
DFHZGCAT	DFHTT530
DFHZGCC	DFHZGCC
DFHZGCCT	DFHTT530
DFHZGCH	DFHZGCH
DFHZGCHT	DFHTT530
DFHZGCN	DFHZGCN
DFHZGCNT	DFHTT530
DFHZGDA	DFHZGDA
DFHZGDAT	DFHTT530
DFHZGET	DFHZCA
DFHZGIN	DFHZGIN
DFHZGINT	DFHTT530

Object module	Load module(s)
DFHZGPC	DFHZGPC
DFHZGPCT	DFHTT530
DFHZGPR	DFHZGPR
DFHZGPRT	DFHTT530
DFHZGRP	DFHZGRP
DFHZGRPT	DFHTT530
DFHZGSL	DFHZGSL
DFHZGSLT	DFHTT530
DFHZGTA	DFHZGTA
DFHZGTAT	DFHTT530
DFHZGTI	DFHZGTI
DFHZGTIT	DFHTT530
DFHZGTRT	DFHTT530
DFHZGUB	DFHZGUB
DFHZGUBT	DFHTT530
DFHZGXA	DFHZGXA
DFHZGXAT	DFHTT530
DFHZHPRX	DFHZHPRX
DFHZHPSR	DFHZCB
DFHZISP	DFHZCP
DFHZIS1	DFHZCX
DFHZIS2	DFHZCX
DFHZLEX	DFHZCY
DFHZLGX	DFHZCY
DFHZLOC	DFHZCX
DFHZLRP	DFHZCB
DFHZLS1	DFHZLS1
DFHZLTX	DFHZCY
DFHZNAC	DFHZNAC
DFHZNEP0	DFHZNEP
DFHZNSP	DFHZCY
DFHZOPA	DFHZCY
DFHZOPN	DFHZCZ
DFHZOPX	DFHZCZ
DFHZQUE	DFHZCA
DFHZRAC	DFHZCB
DFHZRAQ	DFHZCZ
DFHZRAR	DFHZCZ
DFHZRAS	DFHZCB
DFHZRLP	DFHZCC
DFHZRLX	DFHZCC
DFHZRRX	DFHZCY
DFHZRSP	DFHZRSP
DFHZRST	DFHZCA
DFHZRSY1	DFHZCY
DFHZRSY2	DFHZCY
DFHZRSY3	DFHZCY
DFHZRSY4	DFHZCY
DFHZRSY5	DFHZCY
DFHZRSY6	DFHZCY
DFHZRTRI	DFHDU530 TROLP DFHPD530 DFHTR530 DFHTU530
DFHZRVL	DFHZCC
DFHZRVS	DFHZCB
DFHZRVX	DFHZCB
DFHZSAX	DFHZCY
DFHZSCX	DFHZCY
DFHZSDA	DFHZCY
DFHZSDL	DFHZCC
DFHZSDR	DFHZCB
DFHZSDS	DFHZCB
DFHZSDX	DFHZCB
DFHZSES	DFHZCY
DFHZSEX	DFHZCY
DFHZSHU	DFHZCY
DFHZSIM	DFHZCY
DFHZSIX	DFHZCY
DFHZSKR	DFHZCY
DFHZSLS	DFHZCY
DFHZSLX	DFHZCC
DFHZSSX	DFHZCB
DFHZSTAP	DFHZCC
DFHZSTU	DFHZCX
DFHZSUP	DFHTFBF
DFHZSYN	DFHZCY
DFHZSYX	DFHZCY
DFHZTAX	DFHZCZ
DFHZTPX	DFHZCY
DFHZTRA	DFHZCY
DFHZTSP	DFHZCXR
DFHZUCT	DFHZCP
DFHZUIX	DFHZCB
DFHZUSR	DFHZCC
DFHZXCU	DFHZXCU
DFHZXDUF	DFHPD530
DFHZXPS	DFHZCY
DFHZXQO	DFHTCRP
DFHZXRC	DFHZCY
DFHZXRE0	DFHZXRE
DFHZXRL	DFHZCXR
DFHZXRT	DFHZCXR
DFHZXST	DFHZXST
DFHZXSTS	DFHZXST
DFH99BC	DFH99
DFH99CC	DFH99
DFH99DY	DFH99
DFH99FP	DFH99
DFH99GI	DFH99
DFH99KC	DFH99
DFH99KH	DFH99
DFH99KO	DFH99
DFH99KR	DFH99
DFH99LK	DFH99
DFH99ML	DFH99
DFH99MM	DFH99
DFH99MP	DFH99
DFH99MT	DFH99
DFH99RP	DFH99
DFH99SVC	DFH99SVC
DFH99T	DFH99
DFH99TK	DFH99
DFH99TX	DFH99
DFH99VH	DFH99
DFH$AALL	DFH$AALL
DFH$ABRW	DFH$ABRW
DFH$ACOM	DFH$ACOM

Object module	Load module(s)
DFH$ADSP	DFH$AXRO
DFH$AGA	DFH$AGA
DFH$AGB	DFH$AGB
DFH$AGC	DFH$AGC
DFH$AGCB	DFH$AXRO
DFH$AGD	DFH$AGD
DFH$AGK	DFH$AGK
DFH$AGL	DFH$AGL
DFH$AMNU	DFH$AMNU
DFH$AREN	DFH$AREN
DFH$AREP	DFH$AREP
DFH$ARES	DFH$AXRO
DFH$AXCC	DFH$AXCC
DFH$AXCS	DFH$AXCS
DFH$AXRO	DFH$AXRO
DFH$CRFA	DFH$CRFA
DFH$CUS1	DFH$CUS1
DFH$DLAC	DFH$DLAC
DFH$DLAE	DFH$DLAE
DFH$FORA	DFH$FORA
DFH$ICIC	DFH$ICIC
DFH$IFBL	DFH$IFBL
DFH$IFBR	DFH$IFBR
DFH$IGB	DFH$IGB
DFH$IGC	DFH$IGC
DFH$IGS	DFH$IGS
DFH$IGX	DFH$IGX
DFH$IG1	DFH$IG1
DFH$IG2	DFH$IG2
DFH$IMSN	DFH$IMSN
DFH$IMSO	DFH$IMSO
DFH$IQRD	DFH$IQRD
DFH$IQRL	DFH$IQRL
DFH$IQRR	DFH$IQRR
DFH$IQXL	DFH$IQXL
DFH$IQXR	DFH$IQXR
DFH$LDSP	DFH$LDSP
DFH$MOLS	DFH$MOLS
DFH$PCEX	DFH$PCEX
DFH$PCPI	DFH$PCPI
DFH$PCPL	DFH$PCPL
DFH$STAS	DFH$STAS
DFH$STCN	DFH$STCN
DFH$STED	DFH$STED
DFH$STER	DFH$STER
DFH$STTB	DFH$STTB
DFH$SXP1	DFH$SXP1
DFH$SXP2	DFH$SXP2
DFH$SXP3	DFH$SXP3
DFH$SXP4	DFH$SXP4
DFH$SXP5	DFH$SXP5
DFH$SXP6	DFH$SXP6
DFH$TDWT	DFH$TDWT
DFH$WBAU	DFH$WBAU
DFH$WBSA	DFH$WBSA
DFH$WBSB	DFH$WBSB
DFH$WBSC	DFH$WBSC
DFH$WBSN	DFH$WBSN
DFH$WBSR	DFH$WBSR
DFH$WBST	DFH$WBST
DFH$WB1A	DFH$WB1A
DFH$XDRQ	DFH$XDRQ
DFH$XTSE	DFH$XTSE
DFH$XZIQ	DFH$XZIQ
DFH$ZCAT	DFH$ZCAT

Chapter 106. CICS executable modules

The following list shows, for each module:

1. The name of the module
2. Its entry points
3. Callers of the module
4. A brief description of the module
5. Where the module returns to. This information is omitted where the module returns to its caller (the normal situation).

In general, this list is restricted to non-OCO modules. In the few cases where OCO modules are included, no design details are given.

DFHACP

Entry points: DFHACPNA

Called by: DFHAPRM, DFHAPXME

Description: The abnormal condition program writes a message to the terminal and to the CSMT destination if a transaction abends or cannot be started. Subject to tests on the type of terminal, DFHACP invokes DFHMGP to output the message. It calls DFHPEP and, depending on the result, may disable the transaction. For each error, there is an entry in a table which contains the number of the message to be written to the principal facility (terminal) and the number of the message to be written to CSMT. If, in either case, there is no message, zero is entered.

The main subroutines of DFHACP are:

```
ABCSMTWT - Write to CSMT
ACPCALMG - Use DFHMGP to output a message
ACPCLPEP - Invoke DFHPEP
ACPFENTY - Identify message for terminal
TERMERR  - Terminal error.
```

DFHAICBP

Entry points: DFHAICB

Called by: User application program

Description: The application interface control block program acts both as a control block and, for compatibility with early releases of CICS/VS, as executable code. DFHAICBP provides addressability between application programs and CICS entry points, namely those of the EXEC interface and the common programming interface. DFHAICBP is link-edited with the EXEC interface programs (DFHEIP and DFHEIPA), and the common programming interface program (DFHCPI) to form the application interface program (DFHAIP) load module.

DFHALP

Entry points: DFHALPNA

Called by: DFHCRQ, DFHCRS, DFHICP, DFHTPQ, DFHTPR, DFHTPS, DFHZATI, DFHZISP, DFHZNAC, DFHZTSP

Description: The terminal allocation program contains the logic to allocate TCTTE resources to requesting transactions. The request operates in a multiple exchange between the requesting transaction and terminal control. DFHALP passes a SCHEDULE request to terminal control as an ATI terminal control, then responds with an AVAIL command. The requests are represented by AIDs (AID chain manipulations being performed by calls to DFHALP). For LU6.2, DFHALP issues a terminal control allocate mode name macro.

DFHAMP

Entry points: DFHAMPNA

Called by: DFHEIP, DFHSII1

Description: The allocation management program is invoked by the CEDA transaction. It analyzes commands and calls the definition file management program, DFHDMP, to process changes to records in the CSD. For the INSTALL command, DFHAMP also calls program manager, transaction manager, and DFHSPP. DFHPUP is called to convert data between address list format and the CSD record format.

DFHAPJC

Entry points: DFHAPJCN

Called by: User

Description: The AP domain journal control gate service module handles WRITE_JOURNAL_DATA calls made by the user exit's XPI. It gets a TCA if the task doesn't currently have one, and also a JCA. If the task already has a JCA, this is stacked. It then copies the parameter list passed in the domain call, to the JCA, and then issues one of four journal writes, depending on the request. Finally the return code from the JC write is copied into the domain parameter list, and the JCA and TCA are released if they were obtained by DFHAPJC.

DFHAPSIP

Entry points: DFHSIPNA

Called by: DFHAPDM

Description: The main AP domain initialization program provides DFHWTO support and common subroutines used by DFHSIA1 through DFHSIJ1. In sequence, DFHAPSIP performs the following functions:

- **Defines the AP domain subpools**
- **Acquires the SIT address**
- **Passes control to the DFHSIA1, DFHSIB1, and so on.**

The main subroutines of DFHAPSIP are:

```
CHKRLVLR - Check release level
OVERLSUP - Overlay supervisor
SIGETCOR - Storage allocation
SILOADR  - Program loader
SIPCONS  - Console WRITE.
```

DFHAPST

Entry points: DFHAPST

Called by: DFHEIP, DFHSTST

Description: The supervisory statistics program within the AP domain accepts a request for and then supervises the copying/resetting of statistics counters in the AP domain by calling the appropriate DFHSTxx modules to access the counters.

This module is called when:

- Statistics domain is collecting INTERVAL statistics and calls this module to pass it copies of and to reset all statistics in AP domain. This module then sequentially calls all of the DFHSTxx modules to do the copying and resetting.
- A CEMT PERFORM STATISTICS command results in a call to the statistics domain which then makes an appropriate call to this module to pass it copies of the requested statistics. This module then calls the DFHSTxx modules required to do the copying.
- An EXEC CICS COLLECT STATISTICS command results in a call to this module which then calls the DFHSTxx module required to pass copies of the statistics back to the application program.

Thus, this module is called only by the statistics domain or by DFHEIP.

This module provides two functions:

COLLECT_STATISTICS collects statistics for all resources in the AP domain and calls the statistics domain to write them out to the SMF data set.

COLLECT_RESOURCE_STATS collects statistics for the named resource type (optionally qualified by the resource identifier) and either copies them to a buffer available through the API, or causes them to be written to the SMF data set.

DFHAPTD

Entry points: DFHAPTD

Called by: DFHETD, DFHTDA, DFHTDB, ME domain

Description: DFHAPTD handles DFHTDTDM macro requests; as such, it provides the transient data gate into the AP domain. DFHTDTDM macro requests are routed from DFHAPTD to DFHTDP using the corresponding DFHTD CTYPE requests.

DFHAPTI

Entry points: DFHAPTI

Called by: the timer domain to handle NOTIFY calls for the application domain.

Description: The DFHAPTO module looks at the token passed by the timer domain and resumes either the DFHAPTI or DFHAPTIX module, as appropriate.

DFHAPTIM

Entry points: DFHAPTIM

Called by: runs as a system task attached by the DFHSII1 module.

Description: The DFHAPTIM module is part of the interval control mechanism. When it first gets control, it suspends itself to wait for an interval control ICE to expire. Interval control uses the timer domain to handle time intervals. When the timer domain detects the expiry of an interval control related interval, it calls the DFHAPTI module, which in turn resumes the DFHAPTIM module. The DFHAPTIM module then makes an "expiry analysis" call to the DFHICP module, which processes any expired ICEs. On return, the DFHAPTIM module suspends itself again to wait for the next ICE to expire.

DFHAPTIX

Entry points: DFHAPTIX

Called by: runs as a system task attached by the DFHSII1 module.

Description: The DFHAPTIX module is part of the interval control mechanism. When it first gets control, it tells the timer domain that it wants to be told every time it is midnight. It then suspends itself to wait for the next midnight. When that occurs, the timer domain calls the DFHAPTI module, which resumes the DFHAPTIX module, which in turn calls the DFHICP module to do midnight processing.

DFHASV

Entry points: DFHASVNA

Called by: DFHCSVC

Description: DFHASV is one of the modules that run under the CICS type 3 SVC. On entry to DFHASV, register 0 contains one of the following request codes:

```
  0 - Paging request
  8 - SRB termination
  9 - HPO initialization
 24 - Monitoring services
 64 - Authorize general purpose subtask TCB
 80 - Issue SDUMP
136 - Bind AP domain.
```

DFHBSIB3

Entry points: DFHBSIB3

Called by: DFHTBSxx

Description: DFHBSIB3 adds BMS 3270 support to a TCT table entry.

DFHBSIZ1

Entry points: DFHBSIZ1

Called by: DFHTBSxx

Description: DFHBSIZ1 adds SCS support to a TCT table entry.

DFHBSIZ3

Entry points: DFHBSIZ3

Called by: DFHTBSxx

Description: DFHBSIZ3 adds DFHZCP 3270 support to a TCT table entry.

DFHBSMIR

Entry points: DFHBSMIR

Called by: DFHTBSxx

Description: DFHBSMIR builds a TCT table entry for a session.

DFHBSMPP

Entry points: DFHBSMPP

Called by: DFHTBSxx

Description: DFHBSMPP builds a TCT table entry for a pipeline pool entry.

DFHBSM61

Entry points: DFHBSM61

Called by: DFHTBSxx

Description: DFHBSM61 builds sessions for an LU6.2 mode group.

DFHBSM62

Entry points: DFHBSM62

Called by: DFHTBSxx

Description: DFHBSM62 builds the mode entry for an LU6.2 mode group.

DFHBSS

Entry points: DFHBSS

Called by: DFHTBSxx

Description: DFHBSS adds a new connection (system entry) to a CICS system.

DFHBSSA

Entry points: DFHBSSA

Called by: DFHTBSxx

Description: DFHBSSA initializes DFHKCP support in a new TCT system entry.

DFHBSSF

Entry points: DFHBSSF

Called by: DFHTBSxx

Description: DFHBSSF initializes the statistics counters in a new TCT system entry.

DFHBSSS

Entry points: DFHBSSS

Called by: DFHTBSxx

Description: DFHBSSS builds security support for a new TCT system entry.

DFHBSSZ

Entry points: DFHBSSZ

Called by: DFHTBSxx

Description: DFHBSSZ builds VTAM interface support for a new TCT system entry.

DFHBSSZB

Entry points: DFHBSSZB

Called by: DFHTBSxx

Description: DFHBSSZB adds a new batch interregion connection to a CICS system.

DFHBSSZG

Entry points: DFHBSSZG

Called by: DFHTBSxx

Description: DFHBSSZG adds a new advanced program-to-program communication (APPC) single-session connection to a CICS system.

DFHBSSZI

Entry points: DFHBSSZI

Called by: DFHTBSxx

Description: DFHBSSZI adds an indirect terminal control system table entry to a CICS system.

DFHBSSZL

Entry points: DFHBSSZL

Called by: DFHTBSxx

Description: DFHBSSZL adds a local terminal control system table entry to a CICS system.

DFHBSSZM

Entry points: DFHBSSZM

Called by: DFHTBSxx

Description: DFHBSSZM introduces a new connection (system) to ZCP.

DFHBSSZP

Entry points: DFHBSSZP

Called by: DFHTBSxx

Description: DFHBSSZP builds an advanced program-to-program communication (APPC) parallel-session connection to a CICS system.

DFHBSSZR

Entry points: DFHBSSZR

Called by: DFHTBSxx

Description: DFHBSSZR builds an MRO session entry.

DFHBSSZS

Entry points: DFHBSSZS

Called by: DFHTBSxx

Description: DFHBSSZS builds an advanced program-to-program communication (APPC) session entry.

DFHBSSZ6

Entry points: DFHBSSZ6

Called by: DFHTBSxx

Description: DFHBSSZ6 builds an LU6.1 connection entry.

DFHBST

Entry points: DFHBST

Called by: DFHTBSxx

Description: DFHBST performs TCTTE initialization common to terminals, pipeline pool entries, and sessions for IRC and ISC.

DFHBSTB

Entry points: DFHBSTB

Called by: DFHTBSxx

Description: DFHBSTB adds support for BMS to a new TCT terminal or session entry.

DFHBSTBL

Entry points: DFHBSTBL

Called by: DFHTBSxx

Description: DFHBSTBL adds support for logical device components (LDCs).

DFHBSTB3

Entry points: DFHBSTB3

Called by: DFHTBSxx

Description: DFHBSTB3 adds partition support to a new TCT terminal or session entry.

DFHBSTC

Entry points: DFHBSTC

Called by: DFHTBSxx

Description: DFHBSTC performs those operations that are executed after the installation of a terminal.

DFHBSTD

Entry points: DFHBSTD

Called by: DFHTBSxx

Description: DFHBSTD adds data interchange program (DFHDIP) support for a new TCT table entry.

DFHBSTE

Entry points: DFHBSTE

Called by: DFHTBSxx

Description: DFHBSTE adds EXEC diagnostic facility (EDF) support for a new TCT table entry.

DFHBSTH

Entry points: DFHBSTH

Called by: DFHTBSxx

Description: DFHBSTH initializes EXEC interface fields for a new TCT table entry.

DFHBSTI

Entry points: DFHBSTI

Called by: DFHTBSxx

Description: DFHBSTI adds interval control program (DFHICP) support for a new TCT table entry.

DFHBSTM

Entry points: DFHBSTM

Called by: DFHTBSxx

Description: DFHBSTM adds message generation program (DFHMGP) support for a new TCT table entry.

DFHBSTO

Entry points: DFHBSTO

Called by: DFHTBSxx

Description: DFHBSTO is the spooler builder.

DFHBSTP3

Entry points: DFHBSTP3

Called by: DFHTBSxx

Description: DFHBST adds 3270-copy support for a new TCT table entry.

DFHBSTS

Entry points: DFHBSTS

Called by: DFHTBSxx

Description: DFHBSTS adds signon program (DFHSNP) support for a new TCT table entry.

DFHBSTT

Entry points: DFHBSTT

Called by: DFHTBSxx

Description: DFHBSTT adds task control program (DFHKCP) support for a new TCT table entry.

DFHBSTZ

Entry points: DFHBSTZ

Called by: DFHTBSxx

Description: DFHBSTZ builds a session or terminal resource.

DFHBSTZA

Entry points: DFHBSTZA

Called by: DFHTBSxx

Description: DFHBSTZA adds DFHZCP activity scan support to a new TCT terminal or session entry.

DFHBSTZB

Entry points: DFHBSTZB

Called by: DFHTBSxx

Description: DFHBSTZB appends or deletes a BIND image for a TCT terminal or session entry.

DFHBSTZC

Entry points: DFHBSTZC

Called by: DFHTBSxx

Description: DFHBSTZC adds a single-session LU6.2 system as an advanced program-to-program communication (APPC) terminal.

DFHBSTZE

Entry points: DFHBSTZE

Called by: DFHTBSxx

Description: DFHBSTZE sets error message writer fields for a new TCT table entry.

DFHBSTZH

Entry points: DFHBSTZH

Called by: DFHTBSxx

Description: DFHBSTZH adds an interregion (IRC) batch session to a CICS system.

DFHBSTZL

Entry points: DFHBSTZL

Called by: DFHTBSxx

Description: DFHBSTZL adds logical device code support to a new TCT terminal or session entry.

DFHBSTZO

Entry points: DFHBSTZO

Called by: DFHTBSxx

Description: DFHBSTZO adds an MVS console to a CICS system.

DFHBSTZP

Entry points: DFHBSTZP

Called by: DFHTBSxx

Description: DFHBSTZP adds a pipeline pool entry to a CICS system.

DFHBSTZR

Entry points: DFHBSTZR

Called by: DFHTBSxx

Description: DFHBSTZR adds an interregion (IRC) session to a CICS system.

DFHBSTZS

Entry points: DFHBSTZS

Called by: DFHTBSxx

Description: DFHBSTZS adds an advanced program-to-program communication (APPC) session to the terminal control program.

DFHBSTZV

Entry points: DFHBSTZV

Called by: DFHTBSxx

Description: DFHBSTZV adds the parts of a terminal or session TCT table entry that are special to VTAM and IRC.

DFHBSTZZ

Entry points: DFHBSTZZ

Called by: DFHTBSxx

Description: DFHBSTZZ adds a non-APPC session to the TCT. (APPC is advanced program-to-program communication.)

DFHBSTZ1

Entry points: DFHBSTZ1

Called by: DFHTBSxx

Description: DFHBSTZ1 adds support for a remote terminal to a CICS system.

DFHBSTZ2

Entry points: DFHBSTZ2

Called by: DFHTBSxx

Description: DFHBSTZ2 adds support for a remote advanced program-to-program communication (APPC) connection.

DFHBSTZ3

Entry points: DFHBSTZ3

Called by: DFHTBSxx

Description: DFHBSTZ3 adds a 3270 to the TCT.

DFHBSXGS

Entry points: DFHBSXGS

Called by: DFHBSMIR, DFHZTSP

Description: DFHBSXGS generates a unique session name for an LU6.2 TCTTE.

DFHBSZZ

Entry points: DFHBSZZ

Called by: DFHTBSxx

Description: DFHBSZZ adds a terminal or session to the TCT.

DFHBSZZS

Entry points: DFHBSZZS

Called by: DFHTBSxx

Description: DFHBSZZS adds a new session to LU6.2 support.

DFHBSZZV

Entry points: DFHBSZZV

Called by: DFHTBSxx

Description: DFHBSZZV adds a VTAM terminal or session to the TCT.

DFHCAPB

Entry points: DFHCAPNA

Called by: DFHTCRP

Description: DFHCAPB processes command analysis for VTAM terminal definitions contained in a load module table DFHRDTxx for TCT migration.

DFHCCNV

Entry points: DFHCCNV

Called by: DFHCHS, DFHMIRS

Description: DFHCCNV provides conversion of user data from ASCII to EBCDIC and from EBCDIC to ASCII for function-shipped requests from CICS OS/2 users. It is called from either the LU2 remote server program DFHCHS or the mirror program DFHMIRS, for EXEC CICS requests and replies originating from the identified server or mirror. For any function-shipped request it is invoked twice, once on the inbound side and once on the outbound path. DFHCCNV is passed the EXEC CICS parameter list by its caller. On the request side, this occurs after DFHCHS or DFHMIRS has called transformer 2 but before DFHEIP is invoked. On the response side, this occurs after DFHEIP returns to DFHCHS or DFHMIRS but before transformer 3 is invoked. External reference is made to a pregenerated CICS OS/2 conversion table, DFHCNV.

DFHCMP

Entry points: DFHCMPNA

Called by: DFHETR

Description: The CICS monitoring compatibility module is invoked by the old event monitoring point of EXEC CICS ENTER TRACEID to interface to the monitoring domain.

DFHCPY

Entry points: DFHCPYNA

Called by: DFHPRK

Description: The 3270 copy program (transaction CSCY) causes data to be copied from screen to printer in a (VTAM) 3270 system. DFHCPY is invoked by DFHPRK (only if the 3270 has the copy feature) and issues a DFHTC TYPE=COPY macro to the printer. DFHCPY then initiates DFHRKB.

DFHCRC

Entry points: DFHCRCNA

Called by: MVS

Description: The interregion abnormal exit module is a CICS module that contains an ESTAE exit to terminate interregion communication in abnormal conditions. DFHCRC issues a CLEAR request to the interregion SVC.

DFHCRNP

Entry points: DFHCRNNA

Called by: DFHCRSP, dispatcher

Description: DFHCRNP, the connection manager (transaction CSNC), controls IRC connections. It establishes and breaks these connections and processes inbound requests to attach tasks (for example, mirror) to communicate with connected systems.

DFHCRQ

Entry points: DFHCRQNA

Called by: transaction CRSQ

Description: The remote schedule page program is invoked periodically to delete requests to attach a transaction on a remotely owned terminal if those requests have been outstanding for more than the ATI purge delay interval.

DFHCRR

Entry points: DFHCRRNA

Called by: DFHCRNP

Description: The interregion session recovery program performs session recovery on behalf of primary or secondary IRC sessions.

DFHCRS

Entry points: DFHCRSNA

Called by: transaction CRSR

Description: The remote scheduler program builds and ships AIDs for automatic transaction initiation when the terminal is in a remote address space. It receives requests to schedule an AID shipped to it from a remote address space.

DFHCRSP

Entry points: DFHCRSNA

Called by: DFHEIP, DFHSIJ1

Description: The interregion communication startup module can be invoked, either at system initialization or by a CEMT request, in order to make the CICS address space available for communication by other address spaces. DFHCRSP issues a logon request to the interregion communication SVC routine and attaches transaction CSNC (DFHCRNP).

DFHCRT

Entry points: DFHCRTNA

Called by: transaction CXRT

Description: DFHCRT is the relay program used when a transaction attempts to allocate a conversation to a remote advanced program-to-program (APPC) terminal.

DFHCSA

Entry points: DFHCSANA

Called by: Not applicable

Description: The DFHCSA module contains the common system area (CSA) and CSA optional features list, the queue control area (QCA) and, for HPO systems, the SRB interface control area.

DFHCSDUP

Entry points: DFHCUCNA

Called by: MVS

Description: The CSD utility program is an offline program that provides services for the CSD. The utility command processor (DFHCUCP) validates commands and invokes the appropriate routine to execute the requested function. DFHCSDUP calls DFHDMP to access the CSD.

DFHCSSC

Entry points: DFHCSSNA

Called by: DFHSIJ1, DFHSNSN, DFHSUSN, DFHTCRP, DFHZCUT

Description: DFHCSSC, the signon time-out program, is invoked as a system task by DFHSIJ1 and DFHTCRP to perform XRF takeover sign-off time-out processing. It is invoked elsewhere as the CSSC transaction for time-out processing of the following:

- **Terminals signed on with the TIMEOUT option**
- **Entries in the internally managed signon table (SNT)**
- **Entries in the local userid tables (LUITs).**

The CSSC transaction is scheduled when task termination determines that a time-out is necessary. When DFHCSSC is executed, it examines all signed-on terminals, all entries in the SNT managed by DFHTMP, and all entries in the LUITs. It signs off or deletes expired entries as appropriate, and then reschedules itself to perform later time-outs if required.

DFHCSVC

Entry points: DFHCSVC

Called by: MVS

Description: This module is a type 3 SVC that passes control to the various required routines, dependent on the parameter passed to it. On a first request for a particular function, it loads the required module and puts its address in the AFCB and then branches to that code. Further calls result in the address in the AFCB being branched to.

Returns to: Type 3 SVC

DFHCUCAB

Entry points: DFHCUCA

Called by: DFHCAPB

Description: The resource definition online command analyzer interprets a VTAM resource definition in command form and produces a parameter list.

DFHCUCB

Entry points: DFHCUCB

Called by: DFHCUCP

Description: The resource definition online command builder receives commands and transforms them to a format for use by the command processors.

DFHCUCCB

Entry points: DFHCUCC

Called by: DFHCAPB

Description: This program extracts a single entry from a loaded RDT table containing VTAM resource definitions for TCT migration.

DFHCUCDB

Entry points: DFHCUCD

Called by: DFHCAPB

Description: The resource definition online command default values program modifies the parameter list produced by DFHCUCAB by inserting the default values.

DFHCWTO

Entry points: DFHCWTNA

Called by: CWTO transaction

Description: The console write-to-operator module is a CICS-supplied transaction that allows an operator to send a message to the console operator. DFHCWTO issues SVC 35 (WTO) to pass the message to the operator's console.

DFHDBAT

Entry points: AENTRY

Called by: DFHERM, IMS database resource adapter (DRA).

Description: This program provides a mapping between the external architectures of CICS (the resource manager interface (RMI) and of DBCTL (the database resource adapter (DRA)). Both are independently defined and different. DFHDBAT is part of the support for the CICS-DBCTL interface and runs in an application program environment. DFHDBAT is invoked by a DFHRMCAL request through the CICS RMI. The RMI supplies DFHDBAT with a parameter list from which DFHDBAT constructs the DRA INIT, DRA TERM, and DRA THREAD parameter lists. It must also transform the DRA parameter list back, after a DL/I call to the format expected by CICS. Thus, DFHDBAT is also referred to as the CICS-DBCTL adapter-transformer.

DFHDBCON

Entry points: DFHDBCON

Called by: DFHDBME

Description: This program issues a CICS-DBCTL interface connection request to the CICS-DBCTL adapter-transformer, DFHDBAT. DFHDBCON is part of the support for the CICS-DBCTL interface and runs in an application program environment.

DFHDBCR

Entry points: DFHDBCR

Called by: DFHSII1 via attach

Description: DFHDBCR is the CICS/DBCTL XRF tracking program. DFHDBCR runs in an alternate CICS system during the tracking phase. DFHDBCR receives messages from the active CICS system regarding the state of the connection to DBCTL, and drives the XXDFB and XXDTO exits and takes appropriate action.

DFHDBCT

Entry points: DFHDBCT

Called by: DFHDBCTX, DFHDBAT

Description: This program processes any elements placed on the CICS-DBCTL control work element (CWE) chain. DFHDBCT is part of the support for the CICS-DBCTL interface and runs in an application program environment. It is invoked when the CICS-DBCTL connection program, DFHDBCON, attempts to connect to DBCTL. The program then issues a wait. The DFHDBCT program is posted whenever an element is placed on the CWE chain.

DFHDBCTX

Entry points: DFHDBCTX

Called by: DFHDBAT

Description: This program notifies the CICS-DBCTL control transaction of changes in the state of the CICS-DBCTL interface. DFHDBCTX is part of the support for the CICS-DBCTL interface. It does not run in a CICS environment and thus does not use any CICS services. This exit is invoked by the DBCTL adapter on behalf of the DBCTL DRA.

DFHDBDI

Entry points: DFHDBDI

Called by: DFHDBCT

Description: This program disables the CICS-DBCTL adapter program and cleans up the storage used by the CICS-DBCTL interface programs. DFHDBDI is part of the support for the CICS-DBCTL interface and runs in an application program environment. DFHDBDI is invoked by the CICS/VS DBCTL control program, DFHDBCT, just before it terminates.

DFHDBDSC

Entry points: DFHDBDSC

Called by: DFHDBCT, DFHDBME

Description: This program issues a CICS-DBCTL interface disconnection request to the CICS-DBCTL adapter-transformer. DFHDBDSC is part of the support for the CICS-DBCTL interface and runs in an application program environment.

DFHDBIQ

Entry points: DFHDBIQ

Called by: CDBI transaction

Description: This program is the CDBI CICS-supplied transaction. Its function is to inquire on the current status of the CICS-DBCTL interface. DFHDBIQ is part of the support for the CICS-DBCTL interface.

DFHDBME

Entry points: DFHDBME

Called by: CDBC transaction

Description: This program is the CDBC CICS-supplied transaction. Its function is to provide a front end for making certain changes to the status of the CICS-DBCTL interface. DFHDBME is part of the support for the CICS-DBCTL interface.

DFHDBMOX

Entry points: DFHDBMOX

Called by: DFHDBAT

Description: This program outputs monitoring information supplied by DBCTL to the monitoring domain, using monitoring domain services. The information is supplied by DBCTL when it has processed a PSB schedule request and a thread termination request. This exit forms part of the support for the CICS-DBCTL interface. It runs in a CICS application environment. This exit is invoked by the CICS-DBCTL adapter.

DFHDBP

Entry points: DFHDBPNA

Called by: DFHAPRC

Description: This program invokes DWE processors when a UOW backs out.

DFHDBREX

Entry points: DFHDBREX

Called by: DFHDBAT

Description: This program is the CICS-DBCTL resume exit. The resume exit is driven whenever the adapter or the DRA requires to resume a task which they have suspended. This exit forms part of the support for the CICS-DBCTL interface. It does not run in a CICS environment and thus cannot use CICS services.

DFHDBSPX

Entry points: DFHDBSPX

Called by: DFHDBAT

Description: This program is the CICS-DBCTL suspend exit. The suspend exit is driven whenever the adapter or the DRA requires to suspend a task. DFHDBSPX forms part of the support for the CICS-DBCTL interface. It runs in a CICS application environment.

DFHDBSSX

Entry points: DFHDBSSX

Called by: DFHDBAT

Description: DFHDBSSX is the CICS/DBCTL status exit. In the event of a DRA thread failure, DFHDBSSX is called to transfer ownership of PCB

storage to CICS. When the task ends, DFHDBSSX is called to release this storage.

DFHDBSTX

Entry points: DFHDBSTX

Called by: DFHDBAT

Description: This program is the CICS-DBCTL statistics exit. The exit outputs CICS-DBCTL session termination statistics to the statistics domain. DFHDBSTX forms part of the support for the CICS-DBCTL interface. It runs in a CICS application environment, but it can also be invoked during CICS orderly termination. This exit is invoked by the CICS-DBCTL adapter.

DFHDBTOX

Entry points: DFHDBTOX

Called by: DFHDBAT

Description: This program is the CICS-DBCTL token exit. The function of this exit is to provide the CICS-DBCTL adapter with task tokens for tasks that have not been through the DBCTL call processor ,DFHDLIDP, or the DBCTL connection program, DFHDBCON, or the DBCTL disconnection program, DFHDBDSC, where task tokens are usually generated. DFHDBTOX forms part of the support for the CICS-DBCTL interface. It runs in a CICS application environment. This exit is invoked by the CICS-DBCTL adapter.

DFHDBUEX

Entry points: DFHDBUEX

Called by: DFHDBCT, DFHDBDSC

Description: DFHDBUEX is the user-replaceable CICS-DBCTL exit program. It is invoked whenever CICS successfully connects to DBCTL and whenever CICS disconnects from DBCTL. DFHDBUEX forms part of the support for the CICS-DBCTL interface. It runs in a CICS application environment.

DFHDCP

Entry points: DFHDCPNA

Called by: DFHDC macro, DFHEDC

Description: DFHDCP translates DFHDC macro requests for a transaction dump to DU domain TRANSACTION_DUMP calls.

DFHDES

Entry points: DFHDESNA

Called by: DFHZEV1, DFHZEV2, DFHZOPN

Description: DFHDES performs data encryption and bind-time security.

DFHDIP

Entry points: DFHDIPNA

Called by: DFHACP, DFHDI macro, DFHEDI, DFHKCP, DFHMCP, DFHTOM, DFHZEMW, DFHZRSP, DFHZSUP

Description: The data interchange program acts as a function manager when transactions want to communicate with batch devices using SNA support. DFHDIP builds and receives FMHs, which control the data set selection and function currently being performed by the batch device.

The main subroutines of DFHDIP are:

```
DESTCHEK - Destination change
D1ABORTE - Abort
D1CONRTE - Continue
D1ENDRTE - End
D1INARTE - Transaction attach
D1INPRTE - Input
D1NOTRTE - Note
D1QUERTE - Query.
```

DFHDLI

Entry points: DFHDLINA

Called by: User application, DFHMIRS, DFHSPP

Description: DFHDLI is the DL/I call router program. It decides which call processor is to be used for the request: DBCTL or REMOTE. It then invokes the appropriate processor: DFHDLIDP or DFHDLIRP.

DFHDLIAI

Entry points: ASMTDLI, CBLTDLI, PLITDLI

Called by: User application using DL/I CALL interface

Description: This module is used by the CICS-DL/I interface. It is link-edited with the application program to provide D/I communication between the application and the CICS-DL/I interface routine DFHDLI. Calls for DL/I to the ASMTDLI, CBLTDLI, or PLITDLI entry points are resolved by this processor.

DFHDLIDP

Entry points: DFHDLIDP

Called by: DFHDLI

Description: DFHDLIDP is the DBCTL call processor. It services DL/I calls for PSBs that are owned by a DBCTL subsystem, and invokes the DL/I task-related user exit (adapter) to interface with DBCTL.

DFHDLIRP

Entry points: DFHDLIRP

Called by: DFHDLI

Description: DFHDLIRP is the remote call processor. It services DL/I calls that are function-shipped to another CICS system.

DFHDMP

Entry points: DFHDMPNA

Called by: DFHAMP, DFHCSDUP

Description: The definition file management program handles physical changes to the CSD. The main processes in DFHDMP are:

```
BUILDKWA (DM16)  - Build key work area
CONNECT (DM01)   - CONNECT
CREATSET (DM11)  - Create SET
DELETE (DM05)    - DELETE
DISCONN (DM02)   - DISCONNECT
ENDBRO (DM10)    - End BROWSE
ERASESET (DM12)  - Delete SET
GETNEXT (DM09)   - Get next record
LOCK (DM06)      - LOCK
QUERYSET (DM13)  - QUERYSET
READ (DM04)      - Read CSD control records
RELSEKWA (DM17)  - Free key work area
SETBRO (DM08)    - Set browse
UNLOCK (DM06)    - UNLOCK
WRITE (DM03)     - WRITE.
```

DFHDRPG

Entry points: DFHDRPNA

Called by: DFHEIP

Description: DFHDRPG is the EXEC interface processor for EXEC DLI commands for database sharing. It receives the parameters of the command and from them builds a list that is appropriate to call DFHDRPE, the program request handler. On return from DFHDRPE, the status code in the PCB is examined. For some codes, an MVS abend is executed; the other codes are passed back to the application program.

DFHDSBA$, DFHDSB1$

Entry points: DFHDSBNA

Called by: DFHPBP

Description: The data stream build program produces the final device-dependent data stream for each page of BMS output. It is invoked only for processing data streams that are not in 3270 format. DFHDSB removes blanks from the ends of lines, converts logical new-line characters into the device-dependent equivalents (adding idle characters where necessary), and inserts horizontal and vertical tab characters if supported.

DFHDU530

Entry points: DFHDUPNA

Called by: MVS

Description: The dump utility program formats and prints transaction dumps from a CICS transaction dump data set (DFHDMPA or DFHDMPB). The transaction dumps are written to the data set by the dump domain. They contain information about the state of a particular transaction at the time of a transaction abend or user-requested dump.

DFHDXACH

Entry points: DFHDXACH

Called by: DFHDBCR, DFHDBCT

Description: DFHDXACH is a stub that is also MVS-attached, and which branches to an input address.

DFHDXSTM

Entry points: DFHDXSTM

Called by: DFHDBCT, DFHDBCR

Description: DFHDXSTM is used to attach, detach, and inquire on MVS subtasks attached by DFHDBCR and DFHDBCT.

DFHDYP

Entry points: DFHDYP

Called by: DFHAPRT

Description: This is the system-provided (default) dynamic routing program invoked from the CICS relay program (DFHAPRT) when a remote transaction is defined as being dynamic.

DFHEAI

Entry points: DFHEI1

Called by: User application

Description: This is a stub that is link-edited with an assembler-language application program to provide communication with DFHEIP. The command-language translator turns each EXEC CICS command into a call statement. The external entry point invoked by the call is resolved to an entry point in this stub. The address of the entry point in DFHEIP (DFHEIPCN) is found through a chain of system and CICS control blocks.

DFHEAI0

Entry points: DFHEAI0

Called by: User application

Description: This is a stub that is link-edited with an assembler-language application program to provide communication with DFHEIPA, part of the EXEC interface layer, for the prolog and epilog calls generated by the command-language translator in the application program. The external entry point invoked by the calls is resolved to an entry point in this stub. The address of the entry point in DFHEIPA (DFHEIPAN) is found using a chain of system and CICS control blocks.

DFHEAP1$

Entry points: PREPROC

Description: The assembler-language translator module performs the following functions:

- **Runs offline.**
- **Takes on an input file.**
- **Produces an output or listing file.**
- **Gives a return code according to the highest severity of the message produced:**

  ```
   0 - no message
   4 - warning
   8 - error
  12 - severe error
  16 - translator failure.
  ```

- **Replaces CICS commands by invocations of the DFHECALL macro, and inserts invocations of DFHEIENT, DFHEIRET, DFHEISTG, and DFHEIEND macros at appropriate places.**

- Inserts diagnostics resulting from errors in commands, as comments in the output program that are not listed on the listing file.

DFHEBF

Entry points: DFHEBFNA

Called by: DFHEIP

Description: DFHEBF is the EXEC interface processor for the field edit built-in function, DEEDIT.

DFHEBU

Entry points: DFHEBUNA

Called by: DFHETL, DFHETC

Description: The EXEC function management header (FMH) construction module is called by DFHETC when a SEND or CONVERSE command is being processed, and ATTACH function management headers have to be built and concatenated ahead of user data.

DFHECI

Entry points: DFHEI1

Called by: User application

Description: This is a link-edit stub similar to DFHEAI, except that it is used for COBOL application programs.

DFHECID

Entry points: DFHEIN01

Called by: DFHECIP

Description: The command interpreter module analyzes CECI commands, and manages its displays. It uses the EXEC interface to invoke other CICS functions.

DFHECIP

Entry points: DFHEIN00

Called by: CECI transaction

Description: The command interpreter program performs preliminary validation and initialization for the CECI transaction, and links to DFHECID.

DFHECP1$

Entry points: PREPROC

Description: The COBOL translator module performs the following functions:

- **Runs offline.**
- **Takes on an input file.**
- **Produces an output or listing file.**
- **Gives a return code according to the highest severity of the message produced:**

```
 0 - no message
 4 - warning
 8 - error
12 - severe error
16 - translator failure.
```

- **Inserts DFHEIBLK and COMMAREA declarations in the LINKAGE section.**
- **Inserts the EIB definition in the LINKAGE section.**
- **Inserts the DIB definition (for DL/I HLPI) in the WORKING_STORAGE section.**
- **In the PROCEDURE DIVISION, the translator inserts a USING clause in the DIVISION statement, and replaces all CICS and DL/I commands by COBOL CALL statements.**
- **Inserts diagnostics resulting from any errors in commands, as messages in the translator listing file.**

DFHEDAD

Entry points: DFHESP01

Called by: DFHEDAP

Description: The resource definition online (RDO) transactions module analyzes the commands, and manages the displays for CEDA, CEDB, and CEDC. It uses the EXEC interface.

DFHEDAP

Entry points: DFHESP00

Called by: CEDA, CEDB, CEDC transaction

Description: The resource definition online (RDO) transactions program performs preliminary validation and initialization for CEDA, and links to DFHEDAD.

Returns to: DFHEIP

DFHEDC

Entry points: DFHEDCNA

Called by: DFHEIP

Description: DFHEDC is the EXEC interface processor for dump commands.

DFHEDFBR

Entry points: DFHEDFBR

Called by: CEBR transaction, DFHEDFD

Description: The temporary-storage browse transaction browses, copies, or deletes entries in a temporary-storage queue. It interprets commands and PF key actions.

DFHEDFD

Entry points: DFHEDFD

Called by: DFHEDFP

Description: The EDF display program is invoked from DFHEDFP to analyze and display the current status of the user program. DFHEDFD stores control information about a temporary-storage message queue and uses BMS to format the display screen. DFHEDFD interfaces with other CICS control programs using the EXEC interface.

DFHEDFM

Description: The EDF map set contains BMS maps used by DFHEDFD to format the EDF display.

DFHEDFP

Entry points: DFHEDFNA

Called by: transaction CEDF

Description: The EDF main program is the control program for EDF. DFHEDFP can be invoked in one of two ways:

1. Directly from the EDF display terminal by entering the CEDF transaction identification
2. By pressing the user-defined PF key.

DFHEDFP is also attached by DFHEDFX as the main program of the EDF task.

DFHEDFR

Entry points: DFHEDFNA

Called by: Not applicable

Description: The EDF response table contains a description of the exception responses for each EXEC command and the abend codes associated with error responses. DFHEDFR is used by DFHEDFD to interpret the responses obtained from an EXEC command.

DFHEDFX

Entry points: DFHEDFNA

Called by: DFHACP, DFHEIP, program manager

Description: The EDF task switch program is invoked from DFHACP, DFHEIP, or program manager when a program is running in debug mode. DFHEDFX suspends the user task and attaches the debugging task, passing it information about the user task in the TWA of the debugging task.

DFHEDI

Entry points: DFHEDINA

Called by: DFHEIP

Description: DFHEDI is the EXEC interface processor for data interchange commands.

DFHEDP

Entry points: DFHEDPNA

Called by: DFHERM

Description: DFHEDP converts command-level DL/I statements into a call parameter list acceptable to DL/I. In addition, it provides 31-bit application support by moving segment I/O areas above and below the 16MB line as required.

DFHEDP1$

Entry points: PREPROC

Description: The C/370 translator module performs the following functions:

- Runs offline.
- Takes on an input file.
- Produces an output or listing file.
- Gives a return code according to the highest severity of the message produced:

```
 0 - no message
 4 - warning
 8 - error
12 - severe error
16 - translator failure.
```

- Inserts the EIB definition at the head of the translated output.
- If the DLI translator option is specified, inserts the DIB definition
- Replaces all CICS and DL/I commands in the input program by function calls (dfhexec) in the output program.
- Inserts diagnostics from any errors in commands, as messages on the translator listing file.

DFHEEI

Entry points: DFHEEINA

Called by: DFHEIP

Description: DFHEEI is the EXEC interface processor for DFHEIP ADDRESS, ASSIGN, PUSH, POP, and HANDLE commands.

DFHEEX

Entry points: DFHEEXNA

Called by: DFHETC

Description: The EXEC function management header (FMH) extraction module is called by DFHETC when a RECEIVE or CONVERSE command is being processed, and when data has to be extracted from ATTACH function management headers.

DFHEFRM

Entry points: DFHEFRM

Called by: DFHDBP, DFHSPP

Description: DFHEFRM is the EXEC interface file control syncpoint processor. At syncpoint commit or rollback time, DFHEFRM deletes the FFLE entries that were created by DFHFCEI for the task.

DFHEGL

Entry points: DFHEGLNA

Called by: DFHEIP

Description: DFHEGL is the EXEC interface processor for unmapped LU6.2 commands.

DFHEIIC

Entry points: DFHEICNA

Called by: DFHEIP

Description: DFHEIIC is the EXEC interface processor for interval control commands.

DFHEIDTI

Entry points: DFHEIDTI

Called by: DFHEIP

Description: DFHEIDTI is the EXEC interface processor for ASKTIME and FORMATTIME.

DFHEIDTI updates the time and date fields in the EIB and certain time fields in the CSA, and returns the current time, or date, to the application.

DFHEIP

Entry points: DFHEIPNA

Called by: application programs

Description: DFHEIP is the main EXEC interface module. See Chapter 33, "EXEC interface" on page 241 for further information.

DFHEIPA

Entry points: DFHEIPAN

Called by: DFHEAI0

Description: DFHEIPA is part of the EXEC interface layer. It acquires and partially initializes the DFHEISTG dynamic storage when called from the DFHEIENT macro in an assembler-language application program. It frees this storage when called from the DFHEIRET macro.

DFHEIFC

Entry points: DFHEIFC

Called by: DFHEIP

Description: DFHEIFC is the file control EXEC interface module, providing an interface between DFHEIP and file control. It locates the AFCTE, and performs the security check. For a remote file, DFHEIFC passes the request to a transformer, which then ships the request to the other system. For a local file, DFHEIFC converts the EXEC argument list to an FCFR parameter list (as defined by the DFHFCFRA DSECT) and calls DFHFCFR, the file control file request handler. After the request completes, DFHEIFC builds return code information in the EIB.

DFHEISR

Entry points: DFHEISR

Called by: DFHEDI, DFHEGL, DFHEIQMS, DFHEMS, DFHEOP, DFHETC, DFHETL, DFHTDB, DFHXFFC, DFHXFX

Description: DFHEISR obtains buffers and copies data for the calling EXEC interface modules, at the location and in the storage key required by the application.

DFHEJC

Entry points: DFHEJCNA

Called by: DFHEIP

Description: DFHEJC is the EXEC interface processor for journaling commands.

DFHEKC

Entry points: DFHEKCNA

Called by: DFHEIP

Description: DFHEKC is the EXEC interface processor for task control commands.

DFHELII

Entry points: DFHEI1

Called by: User application

Description: This is a link-edit stub similar to DFHEAI, except that it is used for C/370 application programs.

DFHEMS

Entry points: DFHEMSNA

Called by: DFHEIP

Description: DFHEMS is the EXEC interface processor for BMS commands.

DFHEMTA

Entry points: DFHEMT00

Called by: User application

Description: The master terminal programmed interface program is a special version of DFHEMTP that a user application can link to for master terminal services.

DFHEMTD

Entry points: DFHEMT01

Called by: DFHEMTA, DFHEMTP, DFHEOTP, DFHESTP

Description: The master terminal module analyzes the commands, and manages displays for CEMT, CEOT, and CEST transactions. It uses the EXEC interface.

DFHEMTP

Entry points: DFHEMT00

Called by: CEMT transaction

Description: The master terminal program performs preliminary validation and initialization for the CEMT transaction, and links to DFHEMTD.

DFHEOTP

Entry points: DFHEMT00

Called by: CEOT transaction

Description: The master terminal program performs preliminary validation and initialization for the CEOT transaction, and links to DFHEMTD.

DFHEPC

Entry points: DFHEPCNA

Called by: DFHEIP

Description: DFHEPC is the EXEC interface processor for program control commands.

DFHEPI

Entry points: DFHEI1

Called by: User application

Description: This is a link-edit stub similar to DFHEAI, except that it is used for PL/I application programs.

DFHEPP1$

Entry points: PREPROC

Description: The PL/I translator module performs the following functions:

- **Runs offline.**
- **Takes on an input file.**
- **Produces an output or listing file.**
- **Gives a return code according to the highest severity of the message produced:**

```
 0 - no message
 4 - warning
 8 - error
12 - severe error
16 - translator failure.
```

- **If the input program is a MAIN procedure, inserts DFHEIPTR as the first parameter on the PROCEDURE statement to address the EIB. The translator also inserts declarations of the EIB and certain temporary variables.**
- **Replaces all CICS and DL/I commands in the input program by CALL statements in the output program.**
- **Inserts diagnostics from any errors in commands, as messages on the translator listing file.**

DFHEPS

Entry points: DFHEPSNA

Called by: DFHEIP

Description: DFHEPS is the link between DFHEIP and the JES interface program, DFHPSP.

DFHERM

Entry points: DFHERMNA

Called by: DFHEIP

Description: DFHERM is called by DFHEIP on behalf of the other components of CICS to manage the connection between CICS and non-CICS products.

DFHESC

Entry points: DFHESCNA

Called by: DFHEIP

Description: DFHESC is the EXEC interface processor for storage control commands.

DFHEISP

Entry points: DFHESPNA

Called by: DFHEIP

Description: DFHEISP is the EXEC interface processor for syncpoint commands.

DFHESTP

Entry points: DFHEMT00

Called by: CEST transaction

Description: The master terminal program performs preliminary validation and initialization for the CEST transaction, and links to DFHEMTD.

DFHETC

Entry points: DFHETCNA

Called by: DFHEIP

Description: DFHETC is the EXEC interface processor for terminal control commands.

DFHETD

Entry points: DFHETDNA

Called by: DFHEIP

Description: DFHETD is the EXEC interface processor for transient data commands. The EXEC requests are routed from DFHETD to DFHTDP using the corresponding DFHTD CTYPE requests.

DFHETL

Entry points: DFHETLNA

Called by: DFHETC

Description: DFHETL is the EXEC interface processor for mapped LU6.2 commands.

DFHETR

Entry points: DFHETRNA

Called by: DFHEIP

Description: DFHETR is the EXEC interface processor for trace commands.

DFHETS

Entry points: DFHETSNA

Called by: DFHEIP

Description: DFHETS is the EXEC interface processor for temporary-storage commands.

DFHEXI

Entry points: DFHEXINA

Called by: DFHZARQ

Description: The exceptional input program is invoked from DFHZCP when unexpected input is received from a VTAM 3270 terminal that has a task attached. DFHEXI checks whether the input is the result of a 3270 print function key being pressed; if so, DFHEXI issues a DFHTC TYPE=PRINT macro, and then unlocks the keyboard; in any case, DFHEXI then passes control back to DFHZCP.

DFHFCAT

Entry points: DFHFCAT

Called by: DFHFCDN, DFHFCN

Description: DFHFCAT processes inquire and update requests on the state of the backup while open (BWO) attributes in the ICF catalog for VSAM data sets, and inquires on the quiesce state in the ICF catalog.

DFHFCBD

Entry points: DFHFCBD

Called by: DFHFCFR

Description: DFHFCBD handles BDAM file control requests except for OPEN and CLOSE.

DFHFCDN

Entry points: DFHFCDN

Called by: DFHAMFC, DFHAMPFI, DFHEIQDN, DFHEIQDS, DFHFCLF, DFHFCMT, DFHFCN, DFHFCRC, DFHFCRO, DFHFCRD, DFHFCRP

Description: DFHFCDN builds data set name blocks at cold start or in response to CEDA requests. It also examines or modifies data set name blocks in response to EXEC CICS INQUIRE or EXEC CICS SET commands.

DFHFCDTS

Entry points: DFHFCDTS

Called by: DFHFCFR

Description: DFHFCDTS processes file control requests to access data table records for READ-ONLY requests against CICS-maintained tables, and for all record requests against user-maintained tables. It calls data table services to retrieve or modify table records, calls DFHFCVS to retrieve data from the VSAM source data set if it is not in the table, and calls DFHFCDTX to function ship requests that cannot be satisfied by sharing.

DFHFCFR

Entry points: DFHFCFR

Called by: DFHAPLI, DFHAPSM, DFHDTLX, DFHDMPCA, DFHEIFC, DFHERM, DFHFCDTS, DFHFCFR, DFHFCFS, DFHFCRC, DFHFCRP, DFHUEH

Description: DFHFCFR is the central module in the file control component. It handles file control requests issued by DFHFCEI (requests from application programs), or by other CICS modules (internal file control requests). DFHFCFR ensures that the file is both opened and enabled, acquires an FRTE as necessary, performs request validity checking, and then routes the request to the appropriate access-method dependent module (DFHFCBD for BDAM, DFHFCVS for non-RLS VSAM and also for update or browse requests against a CICS-maintained data table, DFHFCRS for RLS VSAM, and DFHFCDTS for all other data table requests).

DFHFCFS

Entry points: DFHFCFS

Called by: DFHAMFC, DFHDMPCA, DFHDMRM, DFHDTLX, DFHEIQDS, DFHFCDTS, DFHFCFR, DFHFCLF, DFHFCQU, DFHFCRC, DFHFCRD, DFHFCRU, DFHFCSD, DFHFCU, DFHFCVS

Description: DFHFCFS changes the state of a file. It invokes DFHFCN to open, or close, files.

DFHFCL

Entry points: DFHFCLNA

Called by: DFHFCN

Description: DFHFCL is a file control program that is link-edited into DFHFCFS. DFHFCL builds and deletes VSAM LSR pools. It is called by DFHFCN with a parameter list that specifies the pool number (1 through 8) and the action to be taken (build or delete).

DFHFCM

Entry points: DFHFCMNA

Called by: DFHFCFS

Description: DFHFCM is a file control program that is link-edited into DFHFCFS. When records are added via a VSAM path, DFHFCM is called to open the base associated with the path.

DFHFCMT

Entry points: DFHFCMT

Called by: DFHAFMT, DFHAMFC, DFHAMPFI, DFHDMPCA, DFHEDFX, DFHEIQDS

Description: DFHFCMT builds file control table entries in response to CEDA commands. It also examines or modifies FCT entries in response to EXEC CICS INQUIRE or EXEC CICS SET commands.

DFHFCN

Entry points: DFHFCNNA

Called by: DFHFCFS

Description: DFHFCN is a file control program that is link-edited into DFHFCFS. DFHFCN opens and closes files. If a file has not been allocated, DFHFCN allocates it, and frees it on closure.

DFHFCRL

Entry points: DFHFCRL

Called by: DFHAMFC

Description: DFHFCRL modifies SHRCTL blocks (describing VSAM LSR pools) in response to CEDA requests.

DFHFCRP

Entry points: DFHFCRP

Called by: DFHFCIN2

Description: The file control restart program builds the file control environment and initializes file control.

DFHFCSD

Entry points: DFHFCSD

Called by: DFHSTP

Description: DFHFCSD is called during CICS controlled shutdown processing to close all open files managed by CICS file control.

DFHFCST

Entry points: DFHFCST

Called by: DFHSTFC, DFHSTLS

Description: DFHFCST is called to collect or reset file or LSRPOOL statistics on request from DFHSTFC or DFHSTLS.

DFHFCU

Entry points: DFHFCUNA

Called by: CSFU transaction

Description: DFHFCU issues an OPEN for files specified in the file control table (FCT). This program examines the FCT, and calls DFHFCFS to open all specified files.

DFHFCVR

Entry points: DFHFCVR, UPADEXIT

Called by: DFHFCBD, DFHFCFR, DFHFCVR, DFHFCVS, VSAM

Description: DFHFCVR is a file control program that is link-edited into DFHFCVS. It handles requests to VSAM, and also contains the VSAM UPAD exit.

DFHFCVS

Entry points: DFHFCVS

Called by: DFHFCDTS, DFHFCFR

Description: DFHFCVS handles requests for file control services made against VSAM files. These services include:

- **Communication with files defined in the file control table**
- **Logging of changes to these files by DFHFCJL and the log manager.**
- **Syncpoint services.**

DFHFDP

Entry points: DFHFDPNA

Called by: DFHFD macro

Description: DFHFDP translates DFHFD macro requests for a system dump to DU domain SYSTEM_DUMP calls.

DFHFEP

Entry points: DFHFEPNA

Called by: CSFE transaction

Description: The FE terminal test program can be used to send a complete character set to a terminal or to echo input or to turn tracing on or off. This program is an application program and does not exit to any other CICS modules. However it does use CICS facilities.

DFHGMM

Entry points: DFHGMMNA

Called by: DFHKCP

Description: The "good morning" program is invoked by the CSGM system transaction to write a "good morning" message to VTAM logical units when a satisfactory OPNDST has occurred (and if the message has been requested in the TCT TYPE=TERMINAL entry).

DFHHPSVC

Entry points: IGCnnn

Called by: DFHZHPSR (via an SVC call)

Description: This is a type 6 SVC module used only on MVS. Its sole purpose is to cause MVS to dispatch an SRB. DFHHPSVC provides part of the CICS high performance option (HPO) code, and is invoked only if HPO is in use. In the entry point name, nnn is the number of the SVC.

Returns to: MVS

DFHICP

Entry points: DFHICPNA

Called by: DFHEIIC, DFHIC macro

Description: The interval control program is used for time management and has two main functions:

1. **Services DFHIC macros under the control of a requesting task's TCA**
2. **Detects the expiration of time-dependent events, as defined in ICEs.**

The main subroutines of DFHICP are:

```
ICCANCLN - Cancel a time-ordered request
ICEXPANL - Time expiration analysis
ICGTIMEN - Current time of day
ICGTTTDM - Data retrieval
ICICECRN - Build basic ICE
ICPCTSN  - Task initiation
ICPOSTN  - Signal expiration of a specified time
ICRESETN - Time of day clock reset support
ICSCHEDN - ICE schedule
ICWAITN  - Delay processing of a task.
```

DFHIIPA$, DFHIIP1$

Entry points: DFHIIPNA

Called by: DFHMCP

Description: The non-3270 input mapping program performs all BMS input mapping functions for all devices except the 3270. On exit from the module, the input data has been mapped into a newly acquired TIOA that is returned to the application program and is then addressable using BMS DSECTs in the application.

The main subsections of DFHIIP are:

```
IIMID  - GETMAINs TIOA to return to user, and maps
         page buffer into it using specified map.
IIREAD - Reads input data, issuing DFHTC or DFHDI
         requests to get data from the terminal.
IISCAN - Scans data stream for device-dependent
         control characters and creates page
         buffer.
```

DFHIRP

Entry points: DFHIRPNA

Called by: DFHCRC, DFHCRNP, DFHCRSP, DFHDRPD, DFHDRPE, DFHDRPF, DFHSRP, DFHSTP, DFHZCX

Description: The interregion communication program is used to pass data from one region to

another in the same CEC. The programs being run in the regions are usually CICS programs, but DFHIRP does not assume this.

DFHIRW10

Entry points: As defined in interest ladder[9]

Called by: DFHIRP, DFHXMP

Description: The interregion work exit delivers work to the IRC control task (CSNC). DFHIRW10 is called whenever DFHIRP or DFHXMP has work to deliver to a system that logged on with DFHIRW10 as its interregion work exit. This module checks whether the work being delivered to the target system requires that work be enqueued on CSNC; if so, it enqueues the work and posts CSNC. DFHIRW10 is invoked in access register (AR) mode and user key.

DFHISP

Entry points: DFHISPNA

Called by: DFHDLI, DFHEIP, DFHEIFC

Description: The intersystem communication program is invoked when a request to access resource has to be shipped to a remote system (through ISC or MRO).

The requests passed to DFHISP are:

- File control
- Interval control
- Temporary storage
- Transient data
- DL/I.

DFHISP controls the acquisition, use, and freeing of a session to the remote system, and invokes DFHXFP or DFHXFX to process requests and replies. Two user exits are provided in DFHISP: XISCONA can be used to control the queuing of requests from DFHISP to allocate intersystems sessions, and XISLCLQ can be used to override the LOCALQ option of the transaction attributes. XISCONA is invoked for any function-shipping requests that cannot be processed immediately. XISLCLQ is provided to support the local queuing of function-shipped START NOCHECK requests when the link to the remote system is out of service. If a START NOCHECK request is queued, DFHISP starts the CMPX transaction when the link is brought in to service.

DFHJCP

Entry points: DFHJCPNA

Called by: DFHEJC, DFHJC macro

Description: The journal control program (DFHJCP) either processes a request to get a JCA control block, or has been called to write to a journal. In the latter case it examines the information in the JCA that is passed with the request and decides whether to call the recovery manager or the log manager based on whether it finds journalname DFHLOG in the JCA or not. There are three separate calls to the DFHLGGL gate of the log manager: one for a write, a put or a wait request. The same is true for the recovery manager calls, which use the DFHRMRE gate. In addition there is a call to this gate for requests which have keypoint record data with them.

When control returns from either of these domains, the domain's outcome is mapped onto a valid return code which is put into the JCA before control returns back to the calling program

DFHJUP

Entry points: DFHJUPNA

Called by: MVS

Description: The journal print utility program examines, selects, and displays data in QSAM data sets, such as the CICS and IMS logs. Data selection is controlled by input parameters, and an optional user exit. DFHJUP provides access to the MVS log streams via the SUBSYS keyword in the JCL.

DFHKCP

Entry points: DFHKCPNA

Called by: DFHEKC, DFHKC macro

Description: This is a startup routine that passes control to either DFHXCP or DFHXCPC. It also deals with some ENQ and DEQ calls.

DFHKCQ

Entry points: DFHKCQNA

Called by: DFHXCPC

Description: DFHKCQ processes DFHKC INITIALIZE, REPLACE, WAITINIT, and DISCARD macro calls to the transaction manager.

DFHKCRP

Entry points: DFHKCRP

Called by: DFHKCP (attaches DFHKCRP as a CICS task)

Description: DFHKCRP is the task control restart program.

DFHKCSC

Entry points: DFHKCSC

Called by: DFHKCQ

Description: This module forms part of the transaction manager. It provides the QUERY_TRANSACTION and QUERY_PROFILE functions for use in determining whether the transaction or profile specified on a DISCARD TRANSACTION or DISCARD PROFILE command respectively can validly be discarded. For the QUERY_TRANSACTION function, DFHKCSC examines the ICE chain, the AID chains, and the

[9] **Interest ladder**: ladder within DFHIRW10 that expresses interest in all types of MRO work.

SIT, looking for references to the transaction that is the subject of the DISCARD. For the QUERY_PROFILE function, DFHKCSC examines the PCT for a reference to the profile that is the subject of the DISCARD.

DFHKCSP

Entry points: DFHKCSPA, DFHKCSPI, DFHKCSPD, DFHKCSPF, DFHKCSPP

Description: The task SRB control program is part of the high performance option (HPO) code available on CICS on MVS. It runs in SRB mode and resides in protected storage.

DFHLIP

Entry points: DFHLINA

Called by: DFHEDFX, DFHEIP, DFHPCPS, DFHSIJ1, DFHSTP

Description: The language interface program acts as a single point of contact between CICS and AD/Cycle Language Environment/370, and also between CICS and the language environments for VS COBOL II and C/370. To invoke a Run-Time Language Interface (RTLI) or Extended Run-Time Language Interface (ERTLI) function, the requesting module calls DFHLIP by issuing a DFHCEE FUNCTION= macro. DFHLIP performs all the interface work with the language, including the handling of any errors.

The interface functions driven by DFHLIP and the modules that call DFHLIP for those functions are as follows. An asterisk (*) after a function name shows that the function call is handled entirely within DFHLIP itself, and control remains in DFHLIP upon successful completion of the thread initialization function.

Unless otherwise indicated, each function is used for all three environments. Where alternative function names are given, the name applicable to Language Environment/370 is used in the requesting module’s DFHCEE macro call regardless of the language environment.

```
DFHEDFX - Determine working storage
                  (Language Environment/370)
          OR Working storage locate
                  (VS COBOL II and C/370)
DFHEIP  - Perform GOTO
                  (Language Environment/370 only)
DFHPCPS - Establish ownership type
                  (Language Environment/370)
          OR Determine program type
                  (VS COBOL II and C/370)
        - Thread initialization
        - Run-unit initialization *
        - Run-unit begin invocation *
                  (Language Environment/370 only)
        - Run-unit end invocation
                  (Language Environment/370 only)
        - Run-unit termination
        - Thread termination
DFHSIJ1 - Partition initialization
DFHSTP  - Partition termination.
```

DFHLUP

Entry points: DFHLUPNA

Description: DFHLUP is the LU6.2 services manager. It initializes and shuts down a network, and resynchronizes flows.

DFHMCPA$, DFHMCPE$, DFHMCP1$

Entry points: DFHMCPNA

Called by: DFHBMS macro, DFHEMS

Description: The mapping control program processes DFHBMS macro requests and completes the processing of a logical message when a task terminates without issuing a DFHBMS TYPE=PAGEOUT. DFHMCP’s main function is to analyze DFHBMS requests and to pass control to the appropriate modules. Other functions include the loading of maps and partition sets, and scheduling of output messages transmitted by temporary storage.

The main subsections of DFHMCP are:

```
MCPCPO   - Completes logical message build message
           control record for temporary storage
MCPDWEXT - DWE processing, invoked by DFHKCP to
           complete BMS processing at application
           termination
MCPINPT  - Handles all input requests
MCPIN    - TYPE=IN (EXEC CICS RECEIVE MAP)
MCPMAPLO - Loads map set and locates map
MCPPGBLD - TYPE=PAGEBLD|TEXTBLD (EXEC SEND TEXT)
MCPPGOUT - TYPE=PAGEOUT (EXEC CICS SEND PAGE)
MCPPURGE - TYPE=PURGE (EXEC CICS PURGE MESSAGE)
MCPROUTE - TYPE=ROUTE (EXEC CICS ROUTE).
```

DFHMCX

Entry points: DFHMCXNA

Called by: DFHMCP

Description: DFHMCX is the BMS fast path module for standard and full-function BMS, and the program for minimum BMS support. It is called by DFHMCP if the request satisfies one of the following conditions:

- It is a noncumulative direct terminal send map or receive map issued by a command-level program.
- It is for a 3270 display or an LU3 printer which does not support outboard formatting. If the terminal supports partitions, it is in the base state.
- The CSPQ transaction has been started.
- The message disposition has not changed.

DFHMGP

Entry points: DFHMGPNA

Called by: DFHACP, DFHCRQ, DFHCRT, DFHEOP, DFHFEP, DFHRTC, DFHRTE, DFHZEMW, DFHZERH, DFHZIS1, DFHZTSP, DFHZXRL

Description: The message generation program provides an interface for sending CICS messages to the terminal end user.

DFHMGT

Entry points: DFHMGTNA

Called by: DFHMGP

Description: The message prototype control table, or message generation table, consists of a series of copybooks, DFHMGTnn, each of which contains up to 100 messages that are issued by DFHMGP.

DFHMIRS

Entry points: DFHMIRNA

Called by: Task initiation

Description: The mirror program is invoked when a request to access a resource is received from a remote ISC system or from a remote MRO system. DFHMIRS may be thought of as returning the answer to the requesting actions of DFHISP. It is DFHMIRS that controls the receipt of requests and transmission of replies.

DFHMIRS processes requests from:

- MRO-connected systems
- LU6.1 connected systems
- LU6.2 sync level 1 connected systems
- LU6.2 sync level 2 connected systems.

The input to DFHMIRS consists of a TCTTE representing the session between CICS and its session partner, and a TIOA containing the function shipping request.

The TIOA is passed to DFHXFP (transformer 2) for conversion of the request from transmission format to the parameter list format required for DFHEIP or DFHDLI. If the data requires conversion (transaction CPMI), an EXEC CICS LINK is used to link to the data conversion program DFHCCNV, passing a COMMAREA that contains the EXEC CICS parameter list for the request where applicable. DFHMIRS then passes the request to DFHEIP or DFHDLI for execution.

On return from DFHEIP or DFHDLI the data conversion program is called to convert the reply (if applicable), and then the transformer program DFHXFP (transformer 3) is called to convert the reply parameter list to transmission format. DFHMIRS then determines the DFC to send with the reply and transmits the reply to the requesting system. If the mirror task has modified protected resources, it continues receiving requests and transmitting replies until a syncpoint request is received from the remote system.

A mirror task on an IRC link suspends itself on completion of a request and it is then available for use by any other MRO function-shipped request. The dispatcher terminates the mirror task if it is not reused within ten seconds.

DFHML1

Entry points: DFHML1NA

Called by: DFHMCP, DFHPBP

Description: The SCSPRT logical unit type 1 output mapping routine is called by DFHPBP to build a page of data stream from a chain of map and application data structure copies. The data contains only features that the TTP says are supported by the target terminal. This routine is called when NLEOM is specified for 3270 printers or LU3 printers.

The main subsections of DFHML1 are:

```
ML1SPACE - Calculate space for chaining and mapping
ML1FMCA  - Format the chains that describe the maps
ML1PF    - Process map fields.
```

DFHMROQP

Entry points: DFHMRONA

Called by: DFHCRNP, DFHCRSP

Description: The MRO work queue enable/disable program is invoked by the DFHMROQM macro for ENABLE and DISABLE requests (other requests are processed by an inline expansion). DFHMROQP is called by DFHCRSP to enable the MRO work queues when starting interregion communication, and by either DFHCRSP or DFHCRNP to disable the work queues when stopping interregion communication. MRO work queues are used to deliver work to the IRC control task (CSNC).

DFHMSP

Entry points: DFHMSPNA

Called by: CMSG transaction

Description: The message switching program routes a message entered at the terminal to one or more operator-defined terminals or to other operators. DFHMSP can be used in conversational mode to process operands entered from separate input operations. In this case the operands already processed are preserved in temporary storage.

The main sections and subroutines of DFHMSP are:

```
MSBMSRT  - Check for complete operands
MSCNVRS  - Issue conversational response
MSCONTIN - Process conversational response
MSMSG4   - MSG operand
MSNTRY   - Process operands
MSROUTE  - Route operand.
```

DFHMXP

Entry points: DFHMXPNA

Called by: Automatic transaction initiation

Description: The local queuing shipper provides the means of transferring to a remote system a START request that has been temporarily deferred by use of the local queuing option.

DFHM32A$, DFHM321$

Entry points: DFHM32NA

Called by: DFHMCP, DFHPBP

Description: For a BMS output request, the 3270 mapping program generates the appropriate data stream for a 3270 device, and returns control to DFHPBP which invokes the DFHTPP module to send the data to the appropriate destination, which is either to the direct terminal, or to temporary storage, or back to the caller. For a BMS input request, the data stream from a 3270 device is examined and mapped into a user application TIOA format.

The main subsections of DFHM32 are:

```
BMFMHTST - Create beginning of 3270 data stream
           (FMH cursor positioning)
BMMID    - Input mapping
BMMMS    - Merge maps (output mapping)
M32PF    - Process field.
```

DFHPBPA$, DFHPBP1$

Entry points: DFHPBPNA

Called by: DFHMCP

Description: The page and text build program positions maps or text, including header or trailer maps or text, within a page of output. For non-3270 devices, the module creates a page buffer containing the user's data which is then passed to DFHDSB to produce a device-dependent data stream. When mapping, this includes merging the data supplied by the application with the constant data included in the map. For 3270 devices, copies of the maps and application-supplied data for a page are chained together, to be processed by module DFHM32, to produce a 3270 data stream. The page and text build program creates dummy maps, and chains them in the same way for 3270 text building. For LU1 printers with extended attributes, copies of the maps and application-supplied data for a page are chained together, to be processed by module DFHML1 to produce an SCS data stream. The page and text build program creates dummy maps, and chains them in the same way for text building. After the maps have been processed by DFHDSB, DFHM32, or DFHML1, DFHPBP calls DFHTPP to write them out.

The main subroutines of DFHPBP are:

```
PBDOUTPT - Mapping/text build complete, decide whether to
           call data stream generator and which one
           (DFHDSB or DFHM32).  Return to caller (DFHMCP).
PBD00005 - Main control logic, request analysis.
PBD01000 - Map placement logic (3270 and non-3270 mapping).
PBD01130 - Non-3270 mapping.
PBD10000 - Pageout routine.
PBD11000 - Modify field positions within map (used by 3270
           and non-3270 mapping).
PBD20000 - Text processing (3270 and non-3270).
PBD30000 - 3270 mapping.
PBFMHBLD - Build FMH if FMHPARM specified (non-3270 text
           and map processing).
```

DFHPD530

Entry points: DFHPD530

Called by: MVS IPCS program

Description: DFHPD530 uns as an exit from the MVS IPCS program. It formats an MVS system dump (SDUMP) using the IPCS service routines to extract data and print output, including interpreted trace.

DFHPEP

Entry points: DFHPEPNA

Called by: DFHACP

Description: The program error program is CICS-supplied and establishes a base register, establishes addressability to the COMMAREA passed from DFHACP using a DFHPC CTYPE=LINK_URM macro call, and returns control to DFHACP. DFHPEP can be modified by the user to perform further recovery operations.

DFHPHP

Entry points: DFHPHPNA

Called by: DFHMCP, DFHTOM

Description: The partition handling program has one entry point, and starts with a branch table that passes control to the required routine according to the request.

The main routines of DFHPHP are:

```
PHPPSI - Loads a partition set
PHPPSC - Destroys any existing partitions and
         creates new partitions
PHPPIN - Extracts the AID, cursor position, and
         partition ID
PHPPXE - Activates the appropriate partition if
         data is received from an unexpected
         partition.
```

DFHPL1OI

Description: The PL/I interface module contains the following routines:

```
DFHPL1N      - Initial entry point for PL/I
                 programs under CICS
DFHPL1I      - CICS macro service interface
DFHPL1C      - Set the CSA address
IBMBOCLA/B/C - Startup routines for open/close functions.
```

DFHPRK

Entry points: DFHPRKNA

Called by: DFHZATT

Description: The 3270 print key program (transaction CSPK) is invoked when, under VTAM, the 3270 program access key designated as the print key is pressed and no task is attached to the terminal. If the 3270 hardware copy feature is present, DFHPRK attaches task CSCY to the printer designated in the TCTTE, and DFHCPY is executed. If the copy feature is not present, DFHPRK executes a DFHTC TYPE=PRINT macro.

DFHPSP

Entry points: DFHPSPNA

Called by: DFHEPS

Description: DFHPSP is the system spooling interface control module.

DFHPSPDW

Entry points: DFHPSPDW

Called by: DFHSPP

Description: DFHPSPDW is the system spooling interface DWE.

DFHPSPSS

Entry points: DFHPSPSS

Called by: DFHPSP

Description: The system spooling JES interface subtask module attaches a subtask to check whether a writer name and a token have been supplied. It opens and closes JES data sets, reads a record, and writes a record.

DFHPSPST

Entry points: DFHPSPST

Called by: DFHPSPSS

Description: DFHPSPST is the system spooling JES interface control module.

DFHPSSVC

Entry points: DFHPSSNA

Called by: DFHPSPSS, DFHPSPST

Description: DFHPSSVC is the system spooling interface module that retrieves a data set name for a given external writer name, dynamically allocates it, and returns its DDNAME.

DFHPUP

Entry points: DFHPUPNA

Called by: DFHAMP, DFHCSDUP

Description: The parameter utility program transforms the definition data of the CSD. In the CSD, the data is held in a compacted form and each field is self-identifying. Elsewhere in the processing, these fields are handled in parameterized form, using an argument address list. It also serves to transform the resource definition to the original high-level command.

DFHP3270

Entry points: DFHP32NA

Called by: CSPP transaction, DFHTCP, DFHZCP

Description: The 3270 print program prints 3270 data received from a screen on a 3270 printer. The data is compressed where possible and then transmitted to the printer.

DFHQRY

Entry points: DFHQRY

Called by: DFHALP, DFHTCTI, DFHZATT

Description: The query transaction (DFHQRY) sends a READ PARTITION QUERY structured field to a 3270, analyzes the response, and completes information in the corresponding TCTTE. DFHQRY can be attached by DFHALP, DFHTCTI, or DFHZATT.

DFHRCEX

Entry points: DFHRCEX

Called by: DFHFCBP, DFHTCBP, DFHUSBP

Description: DFHRCEX enables the global user exits for emergency restart processing.

DFHRKB

Entry points: DFHRKBNA

Called by: DFHCPY

Description: The release 3270 keyboard program is initiated by DFHCPY to release a 3270 keyboard. It does this by issuing a DFHTC TYPE=WRITE macro that sends a 3270 write control character.

DFHREST

Entry points: DFHREST

Called by: DFHXMTA

Description: The transaction restart program, DFHREST, is a user-replaceable module that helps you to determine whether or not a transaction is restarted. The default DFHREST module requests a transaction restart under certain conditions; for example, for a program isolation deadlock, one of the tasks is backed out and automatically restarted, and the other is allowed to complete its update.

DFHRLRA$, DFHRLR1$

Entry points: DFHRLRNA

Called by: DFHMCP

Description: The route list resolution program builds a terminal type parameter (TTP) control block for each type of terminal for which a message is to be built. A TTP is acquired for each terminal type in the user route list and the direct terminal if there is one.

The main subsections of DFHRLR are:

```
RLRALL   - Routing with ROUTE=ALL specified in
           application
RLRLIST  - Routing with route list specified in
           application
RLROPCL  - Routing with OPCLASS= specified in
           application
RLRRTEBY - Nonrouting, non-LDC device (that is
           direct terminal)
RLR3601  - Nonrouting LDC device.
```

DFHRMSY

Entry points: DFHRMSNA

Called by: DFHERMSP, DFHERMRS

Description: The purpose of task-related user exit resynchronization is to resolve any in-doubt LUWs. Task-related user exit resynchronization is called by DFHERMRS during execution of the RESYNC command to restore the CICS end of the thread that was interrupted by the failure of the connection with the resource manager.

It is also called by DFHERMSP when a wait is unshunted and requires RMI resynchronization with a resource manager.

DFHRTC

Entry points: DFHRTCNA

Called by: CSSF transaction

Description: The CSSF transaction is invoked on the remote system when a CRTE routing session is

to be canceled. CSSF runs the CRTE cancel command processor, DFHRTC, to sign off the user and terminate the extended routing session. DFHRTC calls DFHSUSN to sign off the surrogate.

DFHRTE

Entry points: DFHRTENA

Called by: transaction CRTE, DFHSNTU

Description: The transaction routing program establishes a transaction routing session with a remote region specified by the user. Subsequent input is analyzed by DFHRTE, the transaction code extracted, and a request issued to DFHZTSP to route the transaction to the required system.

DFHSFP

Entry points: DFHSFP

Called by: CESF trans.

Description: The sign-off program signs off the user who invoked the CESF transaction.

DFHSIA1

Entry points: DFHSIANA

Called by: DFHAPSIP

Description: The DFHSIA1 system initialization program loads and initializes the CSA.

DFHSIB1

Entry points: DFHSIBNA

Called by: DFHAPSIP

Description: The DFHSIB1 system initialization program loads the CICS nucleus.

DFHSIC1

Entry points: DFHSICNA

Called by: DFHAPSIP

Description: The DFHSIC1 system initialization program initializes the transaction manager and the storage manager domain's macro compatibility interface, acquires a TCA for LIFO functions during initialization, initializes user exits, and processes the START parameter.

DFHSID1

Entry points: DFHSIDNA

Called by: DFHAPSIP

Description: The DFHSID1 system initialization program performs the following functions:

- Adds storage subpools for transient data use
- Allocates storage for transient data control blocks:
  - TDST
  - MBCA, MBCBs, and MQCBs, I/O buffers if required
  - MRCA, ACBs, MRCBs, and RPLs
- Creates the DCTE and SDSCI for CXRF.

DFHSIF1

Entry points: DFHSIFNA

Called by: DFHAPSIP

Description: The DFHSIF1 system initialization program initializes terminal control. DFHSIF1:

- Opens the VTAM ACB
- Builds hash-table entries for non-VTAM terminals
- Constructs a DFHZCP module list in the TCT prefix
- Initializes the attach tables.

DFHSIG1

Entry points: DFHSIGNA

Called by: DFHAPSIP

Description: The DFHSIG1 system initialization program opens the dump data set.

DFHSIH1

Entry points: DFHSIHNA

Called by: DFHAPSIP

Description: The DFHSIH1 system initialization program:

- Loads the DBCTL call processor (DFHDLIDP)
- Loads the remote DBCTL call processor (DFHDLIRP) if necessary
- Attaches the TCP task.

DFHSII1

Entry points: DFHSIINA

Called by: DFHAPSIP

Description: The DFHSII1 system initialization program establishes AP domain recovery routines in DFHSRP and calls DFHICRC to initialise Interval Control services. It attaches the CPLT transaction to run the first stage PLTPI programs, the CSTP transaction (the TCP task) and a system transaction to run the rest of AP initialization (the III task). The rest of DFHSII1, running as the III task:

- Starts XRF control transactions if required
- Attaches the CICS restart tasks to run in parallel:
  - Security interface
  - Transient data
  - Terminal control
  - Program control
  - Task control
  - File control
  - Common programming interface (CPI)
  - Partner resource manager
  - Object recovery
  - Autoinstall terminal model manager
- Waits for the restart tasks to complete
- Processes the GRPLIST parameter

DFHSIJ1

Entry points: DFHSIJNA

Called by: DFHAPSIP

Description: DFHSIJ1 is the last to be executed in the process of system initialization. It issues the message ‘CONTROL IS BEING GIVEN TO CICS’ and passes control back to DFHAPSIP. DFHSIJ1:

- Links to DFHCRSP, if IRCSTRT=YES is specified as a system initialization parameter, to start up the interregion communication session
- Links to DFHPSIP to enable the system spooling interface
- Enables the DL/I high-level programming interface by acquiring an exit program block and addressing DFHEDP
- Enables AUTOINSTALL
- Links to the second-stage PLT programs listed in DFHPLT, then deletes this table
- Issues a DFHLDLDM SET_OPTIONS call to instruct the loader domain to write all outstanding program definitions to the catalogs.

DFHSIP

Entry points: DFHKESIP

Called by: MVS

Description: DFHSIP initializes CICS and also contains code for the following domains:

- Kernel (KE)
- Domain manager (DM)
- Dispatcher (DS)
- Dump (DU)
- Global catalog (GC)
- Local catalog (LC)
- Loader (LD)
- Lock manager (LM)
- Message (ME)
- Parameter manager (PA)
- Storage manager (SM)
- Trace (TR).

DFHSKP

Entry points: DFHSKMNA, DFHSKC, DFHSKE

Called by: MVS, DFHFCL, DFHFCM, DFHFCN, DFHPSPSS, DFHSTP, DFHXSMX

Description: DFHSKP consists of these modules, which are link-edited together:

```
DFHSKM - subtask manager
DFHSKC - subtask control program
DFHSKE - subtask execution program.
```

DFHSKM calls and, if necessary, attaches DFHSKC to process the created work queue element (WQE). DFHSKM also causes termination of the subtask when requested, and handles DWE processing and task cancel requests. DFHSKC starts an operating system subtask, DFHSKE, and waits for its completion. DFHSKE processes WQEs, looking at in-progress and waiting queues on a first-in, first-out basis. DFHSKE intercepts program checks and operating system abends.

DFHSMSCP

Entry points: DFHSMSCP

Called by: DFHSC macro

Description: The storage control program is called as a result of DFHSC GETMAIN and FREEMAIN macro requests issued from CICS modules.

DFHSNAT

Entry points: DFHSNAT

Called by: DFHCRNP, DFHZISP, DFHZSUP (via DFHSUSN)

Description: The attach-time signon/sign off interface program provides support for the signon and sign off of LU6.2 sessions.

DFHSNNFY

Entry points: DFHSNNFY

Called by: IRRDPR10

Description: The CICS segment notify exit is called by RACF whenever a change is made to a user’s CICS segment in the RACF database.

DFHSNMIG

Entry points: DFHSNMIG

Called by: MVS

Description: The signon table migration utility program produces a CLIST file containing ADDUSER and ALTUSER commands that provide RACF with all the user attributes for each user entry in the signon table (SNT). This CLIST file is run by a TSO user to migrate the user information to RACF.

DFHSNP

Entry points: DFHSNP

Called by: CESN transaction

Description: The signon program is called in response to a CESN signon request. DFHSNP interprets the signon parameters, prompts the operator for more parameters if needed, and passes the values to the security manager for verification.

DFHSNSN

Entry points: DFHSNSN

Called by: DFHCSSC, DFHSNAT (via DFHSUSN)

Description: The optimized signon/sign off interface program provides a mechanism for optimizing calls to the security manager. It achieves this optimization using the signon table (SNT).

DFHSNVCL

Entry points: DFHSNVCL

Called by: IRRDPR02

Description: The OPCLASS validation exit is called by RACF to validate the operands of the OPCLASS subparameter of the CICS parameter in the ADDUSER or ALTUSER TSO commands. DFHSNVCL checks whether the operands are in the range 1 through 24.

DFHSNVID

Entry points: DFHSNVID

Called by: IRRDPR02

Description: The OPIDENT validation exit is called by RACF to validate the operand of the OPIDENT subparameter of the CICS parameter in the ADDUSER or ALTUSER TSO commands.

DFHSNVPR

Entry points: DFHSNVPR

Called by: IRRDPR02

Description: The OPPRTY validation exit is called by RACF to validate the operand of the OPPRTY subparameter of the CICS parameter in the ADDUSER or ALTUSER TSO commands. DFHSNVPR checks whether the operand is in the range 0 through 255.

DFHSNVTO

Entry points: DFHSNVTO

Called by: IRRDPR02

Description: The TIMEOUT validation exit is called by RACF to validate the operand of the TIMEOUT subparameter of the CICS parameter in the ADDUSER or ALTUSER TSO commands. DFHSNVTO checks whether the operand is in the range 1 through 60.

DFHSPP

Entry points: DFHSPPNA

Called by: DFHESP, DFHSP macro

Description: The syncpoint program is invoked during a user-specified syncpoint (by a DFHSP macro) or at task termination. For a rollback request only, DFHSPP calls DFHDBP to restore recoverable resources. It scans the DWE chain invoking the appropriate DWE processors, and performs the necessary syncpoint logging. It dequeues all resources enqueued by the transaction. DFHSPP processes any DWEs connected with the resource manager, and processes the RESYNC command.

The main subroutines of DFHSPP are:

```
SPP00005 - Write DWE log data
SPP02020 - Build a DWE chain that can be logged
SPP03000 - End.
```

DFHSRLI

Entry points: DFHSRLI

Called by: DFHSRP

Description: DFHSRLI is called during recovery processing after a system abend has occurred, to build the SRP_ERROR_DATA block and pass control to the XSRAB global user exit.

DFHSRP

Entry points: DFHSRPNA

Called by: AP domain recovery routines

Description: The system recovery program deals with program check interrupts, system abends, and runaway tasks in the AP domain. For a program check, DFHSRP abends the task with abend code ASRA. For a system abend, DFHSRP searches the SRT for the abend code that has arisen and, if a match is found, calls DFHSRLI to invoke the XSRAB global user exit (if active). Afterwards, DFHSRP can either abend CICS or attempt to keep it running with only the faulty task abended (ASRB). For a runaway task, DFHSRP abends the task with abend code AICA.

DFHSSEN

Entry points: DFHSSEN

Called by: MVS subsystem interface

Description: The subsystem end-of-memory routine is invoked by the MVS subsystem interface at all end-of-task (EOT) and end-of-memory (EOM) events when the CICS subsystem has been initialized by module DFHSSIN. It cleans up any subsystem control blocks owned by the terminating CICS region.

DFHSSGC

Entry points: DFHSSGC

Called by: DFHCSVC, DFHSSEN (through the subsystem interface)

Description: The subsystem generic connect routine records the existence of active CICS address spaces. When the first CICS address space becomes active in an MVS image, DFHSSGC enables the subsystem broadcast facility of MVS console management. When the last CICS address space becomes inactive in an MVS image, it disables the broadcast facility.

DFHSSIN

Entry points: DFHSSIN

Called by: MVS master scheduler initialization

Description: The CICS subsystem initialization routine reads subsystem parameters from SYS1.PARMLIB, and creates a subsystem vector table (SSVT) for the CICS subsystem. DFHSSIN loads modules DFHSSEN, DFHSSGC, and DFHSSWT into MVS common storage, and saves their addresses in the SSVT.

DFHSSMGP

Entry points: DFHSSMGP

Called by: DFHSSIN

Description: The subsystem interface message program provides message formatting support for the subsystem interface routines, analogous to DFHMGP within CICS. (Neither DFHMGP nor the message domain can be used in this environment because CICS is not active.)

DFHSSMGT

Entry points: DFHSSMNA

Called by: DFHSSMGP

Description: The subsystem interface message table contains the text of messages that are issued by DFHSSMGP.

DFHSSWT

Entry points: DFHSSWTA

Called by: MVS console support

Description: The subsystem interface WTO router is invoked for all MVS console messages when the console message broadcast facility has been enabled by DFHSSGC. DFHSSWT routes DFH messages to DFHSSWTO, and routes MODIFY command text to DFHSSWTF.

DFHSSWTF

Entry points: DFHSSWTF

Called by: DFHSSWT

Description: This module suppresses signon passwords that are supplied on CESN transactions entered through MODIFY commands on an MVS console. Any passwords are replaced by eight asterisks.

DFHSSWTO

Entry points: DFHSSWTO

Called by: DFHSSWT

Description: This module inserts the CICS region's applid into all DFH messages issued under a CICS TCB whose applid can be determined.

DFHSTDT

Entry points: DFHSTDT

Called by: DFHAPST

Description: This module is called by DFHAPST to collect or reset dynamic transaction backout statistics. Statistics are written to the SMF data set or made available on the API according to the type of request.

DFHSTFC

Entry points: DFHSTFC

Called by: DFHAPST

Description: This module is called by DFHAPST to collect or reset file control statistics. Statistics are written to the SMF data set or made available on the API according to the type of request.

DFHSTIB

Entry points: DFHSTIB

Called by: DFHAPST

Description: This module and called by DFHAPST to collect or reset IRC batch system connected statistics. Statistics are written to the SMF data set or made available on the API according to the type of request.

DFHSTJC

Entry points: DFHSTJC

Called by: DFHAPST

Description: This module is called by DFHAPST to collect or reset journal control statistics. Statistics are written to the SMF data set or made available on the API according to the type of request.

DFHSTLK

Entry points: DFHSTLK

Called by: DFHAPST

Description: This module is called by DFHAPST to collect or reset ISC/IRC statistics. Statistics are written to the SMF data set or made available on the API according to the type of request.

DFHSTLS

Entry points: DFHSTLS

Called by: DFHAPST

Description: This module is called by DFHAPST to collect or reset LSRPOOL statistics. Statistics are written to the SMF data set or made available on the API according to the type of request.

DFHSTP

Entry points: DFHSTPNA

Called by: DFHEMTP

Description: The main function of the system termination program is to shut down CICS. In sequence, DFHSTP performs the following functions (according to options specified):

1. **Collects statistics now if immediate shutdown**
2. **Shuts down the resource managers**
3. **Terminates subsystem interface**
4. **Resumes suspended tasks**
5. **Executes the programs defined in the first part of DFHPLT**
6. **Rebuilds AIDs for paging sessions**
7. **Breaks the ICE and AID chains**
8. **Quiesces IRC**
9. **Executes the programs defined in the second part of DFHPLT**
10. **Closes all open files managed by CICS file control**
11. **Synchronize with Recovery Manager shutdown keypoint**
12. **Call WKP to catalog terminals and profiles**
13. **Terminate extra partition TD**
14. **Signs off from the CAVM**
15. **Terminates general-purpose subtasking facility**
16. **Calls the kernel to terminate the system.**

Returns to: MVS

DFHSTSZ

Entry points: DFHSTSZ

Called by: DFHAPST

Description: DFHSTSZ is called by DFHAPST to collect or reset FEPI statistics. Statistics are written to the SMF data set or made available on the API according to the type of request.

DFHSTTD

Entry points: DFHSTTD

Called by: DFHAPST

Description: DFHSTTD is called by DFHAPST to collect or reset transient data statistics. Statistics are written to the SMF data set or made available on the API according to the type of request.

DFHSTTM

Entry points: DFHSTTM

Called by: DFHAPST

Description: DFHSTTM is called by DFHAPST to collect or reset table manager statistics. Statistics are written to the SMF data set or made available on the API according to the type of request.

DFHSTTR

Entry points: DFHSTTR

Called by: DFHAPST

Description: DFHSTTR is called by DFHAPST to collect or reset terminal statistics. Statistics are written to the SMF data set or made available on the API according to the type of request.

DFHSTTS

Entry points: DFHSTTS

Called by: DFHAPST

Description: DFHSTTS is called by DFHAPST to collect or reset temporary-storage statistics. Statistics are written to the SMF data set or made available on the API according to the type of request.

DFHSUSN

Entry points: DFHSUSN

Called by: DFHACP, DFHBSTS, DFHCRNP, DFHCSSC, DFHEEI, DFHEIQST, DFHERM, DFHESN, DFHMGPME, DFHMGP00, DFHRTC, DFHSUSX, DFHTCTI, DFHTPQ, DFHTPR, DFHXSMN, DFHZCUT, DFHZEV1, DFHZEV2, DFHZISP, DFHZIS2, DFHZNAC, DFHZOPN, DFHZSUP, DFHZTSP, DFHZXCU

Description: DFHSUSN is used to create, destroy, and query the contents of a signon table element (SNTTE). It calls DFHSUSX to notify the XRF alternate system of the creation and destruction of SNTTEs. It also provides an interface for the creation and validation of encrypted passwords used in LU6.2 bind password processing.

DFHSUSX

Entry points: DFHSUSX

Called by: DFHTCRPU, DFHZXCU, DFHSUSN

Description: DFHSUSX provides tracking for SNTTEs. This module is responsible for:

- **Sending messages to an alternate system to reflect the current state of the SNTTEs in the active system**
- **Actioning an add or delete of an SNTTE in an alternate system, based on information tracked from another CICS system**
- **Making changes to the signed-on state in an alternate system, based on information tracked from another CICS system.**

Entry points: DFHSUWT

Called by: DFHMEME, DFHSUWT

Description: The DFHSUWT module provides the following support for executing MVS WTO and WTOR SVCs:

- **SEND support for Write To Operator (WTO)**
- **CONVERSE support for Write To Operator With Reply (WTOR).**

For further information about DFHSUWT, see Chapter 102, "WTO and WTOR" on page 709.

DFHSUZX

Entry points: DFHSUZX

Called by: DFHBSTZV, DFHEIQSC, DFHEIQST, DFHEIQTR

Description: The ZC trace controller is responsible for actioning set, cancel, and inquire requests for the CICS VTAM exit tracing facility. It sets or unsets the control flags and gets or releases the storage used by the DFHZETR function located in the ACB and RPL exits.

DFHTACP

Entry points: DFHTACNA

Called by: DFHTCP

Description: The terminal abnormal condition program is invoked by DFHTCP and performs the following functions:

- **Analyzes error codes in the TACLE**
- **Sends appropriate messages to the CSMT transient data destination (for terminal errors), or to the CSTL transient data destination (for logical errors)**
- **Invokes the user-supplied (or sample) terminal error program (DFHTEP)**
- **Takes the appropriate actions resulting from the defaults which may have been modified by the terminal error program.**

DFHTAJP

Entry points: DFHTAJNA

Description: The time adjustment program calls DFHICP to reset the CSA's time fields according to the host-supplied time-of-day. DFHTAJP then scans the ICE chain and adjusts the expiry time of

interval-controlled ICEs. Time-controlled ICEs are not adjusted but the ICE chain is reordered so that it is left in order by expiry time. Times held in the TCT and CSATCNDT are decreased, and negative times are made zero. Lastly, DFHTAJP writes a message.

DFHTBSB

Entry points: DFHTBSB

Called by: DFHZCQIS

Description: DFHTBSB adds a node to the control-block structure. It is called during the dynamic installation of TCT resources, and calls routines in the control block builder.

DFHTBSBP

Entry points: DFHTBSBP

Called by: DFHTBSB, DFHTBSBP

Description: DFHTBSBP is the recursive part of DFHTBSB.

DFHTBSD

Entry points: DFHTBSD

Called by: DFHZCQDL

Description: DFHTBSD deletes a node in a CICS terminal network.

DFHTBSDP

Entry points: DFHTBSDP

Called by: DFHTBSD, DFHTBSDP

Description: DFHTBSDP is the recursive part of DFHTBSD.

DFHTBSL

Entry points: DFHTBSL

Called by: DFHTBSR, DFHZCQCH

Description: DFHTBSL creates the recovery record for a node during the dynamic installation of a TCT table entry using the CEDA INSTALL command, for example, and calls routines in the control-block builder.

DFHTBSLP

Entry points: DFHTBSLP

Called by: DFHTBSL, DFHTBSLP, DFHTBSSP

Description: DFHTBSLP is the recursive part of DFHTBSL.

DFHTBSQ

Entry points: DFHTBSQ

Called by: DFHZCQIQ

Description: DFHTBSQ is called to retrieve the parameters that were supplied to a TCT table entry at build time.

DFHTBSQP

Entry points: DFHTBSQP

Called by: DFHTBSQ

Description: DFHTBSQP is called by DFHTBSQ to retrieve parameters that were supplied to a TCT table entry at build time.

DFHTBSR

Entry points: DFHTBSR

Called by: DFHZCQRS

Description: DFHTBSR takes a table-builder recovery record and re-creates the corresponding table entry. It is called during warm or emergency restart.

DFHTBSRP

Entry points: DFHTBSRP

Called by: DFHTBSR

Description: DFHTBSRP is called by DFHTBSR.

DFHTBSSP

Entry points: DFHTBSSP

Description: DFHTBSSP performs a commit or rollback action for a previous table-builder change according to the outcome of a logical unit of work. Each action is dequeued from a DWE.

DFHTBS00

Entry points: DFHTBS

Description: DFHTBS00 is the main routine for DFHTBS and holds the addresses of the modules used to build control blocks for the dynamic installation of TCT resources.

DFHTCBP

Entry points: DFHTCBNA

Description: The terminal control backout program restores TCTTEs and other ISC state data during emergency restart.

DFHTCP

Entry points: DFHTCPNA

Description: DFHTCP is the terminal control program. The terminal control task is attached during system initialization and remains until termination. DFHTCP manages all non-VTAM terminals, which involves:

- Ensuring that I/O operations are started when possible on the lines
- Analyzing completion information
- Attaching transactions when data is received from a terminal and no task is attached to that terminal
- Servicing terminal control requests from user transactions.

The modules and subsections of DFHTCP are:

```
DFHTCAM  - Terminal control TCAM device dependent
DFHTCCLC - Terminal control line control scan routine
DFHTCCOM - Terminal control common logic
DFHTCCSS - Terminal control start-stop common logic
DFHTCDEF - Terminal control symbol definition
```

```
DFHTCORS - Terminal control storage handling
DFHTCSAM - Terminal control sequential terminal
           device dependent
DFHTCTI  - Terminal control task initiation
DFHTCTRN - Terminal control translate tables.
```

DFHTCRP

Entry points: DFHTCRP

Description: DFHTCRP initializes and recovers terminal control definitions and protected messages. It is run as a task during CICS initialization.

DFHTCRPC

Entry points: DFHTCRPC

Called by: DFHZXQO

Description: DFHTCRPC is the XRF tracking interface for TCT contents. It is one of a set of routines called by DFHZXQO from the same CALL statement, the entry point address having been passed to DFHZXQO. This routine calls ZC RESTORE to add or delete a TCT entry based on information from another CICS system using the log, the catalog, or the XRF tracking queues.

DFHTCRPL

Entry points: DFHTCRPL

Called by: DFHTCRP

Description: DFHTCRPL installs TCT resources defined by the TCT macros.

DFHTCRPS

Entry points: DFHTCRPS

Called by: DFHZXQO

Description: DFHTCRPS is the XRF tracking interface for ZCP sessions. It is one of a set of routines called by DFHZXQO from the same CALL statement, the entry point address having been passed to DFHZXQO. This routine calls DFHZXST (through DFHZXS) to make changes to the session state.

DFHTCRPU

Entry points: DFHTCRPU

Called by: DFHZXQO

Description: DFHTCRPU is the XRF tracking interface for signon table elements (SNTTEs). It is one of a set of routines called by DFHZXQO from the same CALL statement, the entry point address having been passed to DFHZXQO. This routine calls DFHSUSX to add or delete tracked SNTTEs, and to make changes to the signed-on state.

DFHTDA

Entry points: DFHTDANA

Called by: DFHAKP, DFHAMCSD, DFHAPTD, DFHCRNP, DFHCRQ, DFHDBP, DFHEIQMS, DFHEIQSQ, DFHESE, DFHETD, DFHJCP, DFHMCP, DFHMGP00, DFHRCRP, DFHRUP, DFHSII1, DFHSTP, DFHSTTD, DFHTCAP, DFHTDRP, DFHTEPM, DFHTPQ, DFHTRP, DFHTSRP, DFHWKP, DFHZNAC

Description: DFHTDA, which is link-edited with RMODE(24), handles DFHTD macro requests. In particular:

- DFHTD TYPE=GET|PUT|PURGE requests are converted to the corresponding DFHTD CTYPE=GET|PUT|PURGE requests.
- DFHTD CTYPE=GET|PUT|PURGE requests for intrapartition queues are routed to DFHTDQ for further processing.
- All of the processing for DFHTD CTYPE=GET|PUT for extrapartition queues is done under the QR TCB.
- Much of the processing for DFHTD CTYPE=OPEN|CLOSE for extrapartition queues is done under the RO TCB.

CICS Transaction Server for OS/390 Release 3 uses QSAM GL|PL mode processing, unlike previous CICS releases which used QSAM GL|PM mode processing.

DFHTDB

Entry points: DFHTDBNA

Called by: DFHTDA

Description: DFHTDB, which is link-edited with RMODE(ANY), handles DFHTD macro requests for intrapartition queues. In particular, DFHTDB:

- Manages the input and output cursors for each queue
- Manages space on the intrapartition data set
- Initiates transactions when trigger levels are reached
- Manages the buffers; processing is done under the QR TCB
- Manages the strings; processing is done under the CO TCB.

DFHTDEXL

Entry points: EX11RTNE

Called by: QSAM

Description: DFHTDEXL contains the DCB abend exit routine used for extrapartition processing.

DFHTDP

Entry points: DFHTDANA

Called by: DFHAKP, DFHAMCSD, DFHAPTD, DFHCRNP, DFHCRQ, DFHDBP, DFHEIQMS, DFHEIQSQ, DFHESE, DFHETD, DFHMCP, DFHMGP00, DFHRCRP, DFHRUP, DFHSII1, DFHSTP, DFHSTTD, DFHTACP, DFHTDRP, DFHTEPM, DFHTPQ, DFHTRP, DFHTSRP, DFHWKP, DFHZNAC

Description: DFHTDP is a load module link-edited from object modules for DFHTDA, DFHTDEXL, and DFHTDX.

DFHTDQ

Entry points: DFHTDBNA

Called by: DFHTDA

Description: DFHTDQ is a load module link-edited from object modules for DFHTDB.

DFHTDRM

Entry points: DFHTDRM

Called by: DFHDBP

Description: DFHTDRM is the transient data recovery manager processor. If transient data has any outstanding resources, DFHTDRM is called at phase 1 syncpoint (or backout). For phase 1 syncpoint (or backout) requests, DFHTDRM issues a request to mainline transient data(DFHTDA) to reset any resources that have not yet been released.

DFHTDRP

Entry points: DFHTDRNA

Called by: DFHTDX

Description: DFHTDRP handles transient data recovery during CICS initialization. In particular, DFHTDRP:

- Adds the entries found in the DCT load module by calling the DFHTDTM gate.
- Restores input and output cursors for intrapartition queues on warm start; the cursors are recovered by DFHRUP on emergency restart
- Restores the CI state map on warm start
- Opens extrapartition queues
- Opens the intrapartition data set
- Recovers the CI state map on emergency restart.

DFHTDTM

Entry points: DFHTDTM

Called by: DFHALP, DFHEIQMS, DFHEIQSQ, DFHESE, DFHSZRPM, DFHTDRP

Description: DFHTDTM manages the entries in the destination control table. It is used to add, update and delete entries in this table and records images of each entry on the global catalog for use during a warm start or emergency restart. It allows table entries to be inquired upon.

DFHTDX

Entry points: DFHTDXNA

Called by: Task initiation

Description: DFHTDX is the initial program invoked by the transient data recovery task. It links to program DFHTDRP.

DFHTEP

Entry points: DFHTEPNA

Called by: DFHTACP

Description: The terminal error program is invoked by DFHTACP using a DFHPC CTYPE=LINK_URM macro. The sample DFHTEP (invoked only if there is no customer-supplied version) puts a terminal out of service if the number of terminal errors detected by DFHTACP exceeds default values contained in DFHTEP tables.

DFHTMP

Entry points: DFHTMPNA

Called by: DFHTM macro

Description: The table management program performs locates, adds, deletes, locks, and unlocks to entries in certain CICS tables. DFHTMP uses a hash table for these operations.

The main subroutines of DFHTMP are:

```
CHKTTC     - Check table type code
COMMIT     - Commit table changes
CRTCLE     - Create a change list element
CRTDWE     - Create deferred work element
DELDWE     - Cancel deferred work element
DEQALLDE   - Dequeue on directory element
DEQUEUE    - Dequeue on table modification
DYNHASH    - Dynamic re-hash
ENQDEQDE   - Enqueue/dequeue on directory element
ENQUEUE    - Enqueue on table modification
GET_STORAGE - Get storage from the CICS shared subpool
GET_TASK_STORAGE - Get task lifetime 31-bit storage
GET_TASK_STORAGE_COND - Get task lifetime 31-bit storage
                        (conditionally)
GET_STORAGE_FAILURE - Get storage failure routine
FREE_STORAGE - Release storage from the CICS shared subpool
FREE_TASK_STORAGE - Release task lifetime 31-bit storage
LOCATE_PREVIOUS_DE - Locate previous directory
             element in collating series
LOCATETE   - Locate a table/directory entry
LOCFDIRE   - Locate a free directory element
NOTERL     - Note Read Lock
SETABORD   - Set up alphabetic ordering pointer
             for a given table type
TMFINDLOCK - Find a read lock
TMPDWEEP   - Deferred work element processor
TMSETLOCK  - Set a read lock
TMUNLOCK   - Release a read lock
UNQUIES    - Unquiesce a directory element.
```

DFHTON

Entry points: DFHTONNA

Called by: DFHDBP, DFHSPP

Description: The terminal object resolution module is called by DFHDBP or DFHSPP during DWE processing for DFHTOR. It calls DFHTOR with end-LUW-cancel or end-LUW-commit code to perform cancel or commit of changes to TERMINAL, TYPETERM, CONNECTION, or SESSIONS definitions.

DFHTOR

Entry points: DFHTORNA

Called by: DFHAMP, DFHTON

Description: DFHTOR is the terminal object resolution program. DFHAMP calls DFHTOR for a TERMINAL, TYPETERM, CONNECTION, or SESSIONS object in a CICS system definition (CSD) file that is being installed, or when DFHAMP encounters an end-of-group. DFHTOR processes the objects and passes them to the terminal control builder program (DFHZCQ). The DFHTON entry is used for DWE processing.

DFHTORP

Entry points: DFHTORNA

Called by: DFHSII1

Description: DFHTORP is the terminal object recovery program. It is called during CICS initialization to purge TYPETERM and model terminal definitions from the catalog on a cold start, and to recover these definitions on an emergency restart.

DFHTPPA$, DFHTPP1$

Entry points: DFHTPPNA

Called by: DFHDSB, DFHM32

Description: The terminal page processor program handles DFHBMS TYPE=OUT, STORE, and RETURN requests. If OUT, DFHTPP sends the complete page using DFHTC macro requests; if STORE, the page is sent to temporary storage; and if RETURN, no output operation takes place but the page is returned to the application program.

The main subroutines of DFHTPP are:

```
TPNODDS - TYPE=STORE (PAGING) requests
TPOUT   - TYPE=OUT (TERMINAL) requests (the macro
          DFHTOM is used by both DFHTPP and DFHTPR
          to handle output to terminals)
TPRETPG - TYPE=RETURN (SET) requests.
```

Returns to: DFHPBP

DFHTPQ

Entry points: DFHTPQNA

Called by: DFHICP, DFHMCP, DFHTCP

Description: The undelivered messages cleanup program is initiated periodically in order to cancel the delivery of BMS messages that have been placed in temporary storage, but have remained undelivered for an interval exceeding the purge delay time interval specified by the PRGDLAY system initialization parameter, if this has a nonzero value.

DFHTPR

Entry points: DFHTPRNA

Called by: DFHMCP, DFHTCP

Description: The terminal page retrieval program (transaction CSPG) is invoked:

- **By automatic transaction initiation as a result of a SCHEDULE issued by DFHTPS**
- **By a DFHPGLK LINK from DFHMCP, when CTRL=RETAIN or RELEASE on DFHBMS TYPE=PAGEOUT (RETAIN or RELEASE on SEND PAGE at command level)**
- **When CSPG or an operator paging command is entered at a terminal.**

If the message is autopaged, DFHTPR retrieves the pages of the message in order, transmits them to the terminal, and then purges the message. Otherwise DFHTPR runs pseudo-conversationally. All further input is passed to DFHTPR, until the message is purged explicitly or implicitly. If the input is a valid paging command (page retrieval, page copy, page purge, or page chaining), it is processed. It is rejected if explicit purge is required, or passed back to normal task initiation if automatic purge is allowed.

The main subsections of DFHTPR are:

```
DFHMSPUT - Send error message to terminal
TPENCCHN - Encode and execute page chain
TPENCCOP - Encode and execute page copy
TPENCPUR - Execute page purge
TPENCRET - Encode page retrieval
TPERETA  - Reset to autopaging
TPERETQ  - Page query
TPEXIT   - Exit from program
TPEXPUR  - Execute page purge
TPEXRET  - Execute page retrieval
TPTSGET  - Get MCR or page from temporary storage.
```

DFHTPS

Entry points: DFHTPSNA

Called by: DFHICP, DFHMCP

Description: The terminal page scheduling program (transaction CSPS) is invoked for each terminal type to which a BMS logical message built with TYPE=STORE is to be sent. For each terminal designated by the originating application program, DFHTPR is scheduled to display the first page of the logical message if the terminal is in paging status, or the complete message if it is in autopage status. DFHTPS contains the following major subsections, each dealing with a separate function:

- **DFHTPSNA—used when DFHTPS is invoked by automatic initiation on expiry of ICE, and as a result of an IC PUT request issued by DFHMCP (there is no associated terminal). This invocation schedules CSPG for terminals on this system, and schedules CSPS on the link to each remote system which owns terminals contained in the route list for the message (that is the function of TPS02000).**
- **TPS01000—used when DFHTPS is linked to from DFHMCP for direct paging requests to a terminal on a remote system. The task has a surrogate TCTTE as its primary facility, and owns a relay link connected to the terminal owning system. This section ships the pages of the message to the terminal-owning region, where it is re-created by the relay program (DFHAPRT) which issues BMS, STORE, TEXT, NOEDIT, and PAGEOUT requests.**
- **TPS02000—used when DFHTPS is scheduled by TPS01000 to run against the link to a remote system. This routine ships the logical message to the remote system and deletes the terminals on the remote system from the terminal list in the original message control record. (TPS03000 receives the information at the remote system.)**
- **TPS03000—used when DFHTPS is invoked by an ATTACH request from a remote system (that is, originated by TPS01000 or TPS02000). This routine receives the shipped logical message and issues BMS ROUTE, TEXTBLD, NOEDIT, and PAGEOUT requests to re-create the logical message on the terminal-owning region.**

DFHTPS contains the following subroutine:

- **TPSSHIPM—ships a complete logical message.**

DFHTRAP

Entry points: DFHTRANA

Called by: DFHTRPT

Description: The FE global trap/trace exit is provided for diagnostic use only under the guidance of service personnel.

DFHTR530/AMDUSREF

Entry points: DFHTRPRG

Called by: IPCS

Description: The CICS GTF trace formatting routine is invoked by IPCS processing of the GTFTRACE keyword when a CICS entry (USR F6C, format ID X'EF') is encountered. For each entry, it writes a line containing the job name and then formats the entry in the same form as DFHTU530 does for an auxiliary trace print. AMDUSREF is defined as an alias for DFHTR530 because IPCS looks for a program called AMDUSRxx to format entries with format ID xx.

DFHTRP

Entry points: DFHTRPNA

Called by: Many AP domain modules

Description: The trace control program translates DFHTR, DFHTRACE, and DFHLFM macro requests to write trace entries into TR domain TRACE_PUT requests. DFHTRP collects the data required in the trace for the specified trace ID into a standard layout and issues the TRACE_PUT call. For requests to change the various trace flags that control tracing, DFHTRP issues KEDD format calls to the kernel domain.

DFHTRZCP

Entry points: DFHTRZCP

Called by: CEDA transaction, DFHTCRP, DFHTOR

Description: DFHTRZCP builds a terminal builder parameter set.

DFHTRZIP

Entry points: DFHTRZIP

Called by: CEDA transaction, DFHTCRP, DFHTOR

Description: DFHTRZIP builds a chain of builder parameter sets for sessions.

DFHTRZPP

Entry points: DFHTRZPP

Called by: CEDA transaction, DFHTCRP, DFHTOR

Description: DFHTRZPP builds a pool builder parameter set.

DFHTRZXP

Entry points: DFHTRZXP

Called by: CEDA transaction, DFHTCRP, DFHTOR

Description: DFHTRZXP builds a connection builder parameter set.

DFHTRZYP

Entry points: DFHTRZYP

Called by: CEDA transaction, DFHTCRP, DFHTOR

Description: DFHTRZYP builds a TYPETERM builder parameter set.

DFHTRZZP

Entry points: DFHTRZZP

Called by: CEDA transaction, DFHTCRP, DFHTOR

Description: DFHTRZZP merges a TYPETERM builder parameter set into a terminal builder parameter set.

DFHTSP

Entry points: DFHTSPNA

Called by: DFHACP, DFHAKP, DFHALP, DFHCRQ, DFHDBP, DFHDIP, DFHEDFP, DFHESE, DFHETS, DFHICP, DFHMCP, DFHMSP, DFHRTE, DFHSII1, DFHSTP, DFHTCBP, DFHTPP, DFHTPQ, DFHTPR, DFHTPS, DFHTSBP, DFHTSP, DFHTSRP, DFHZISP, DFHZRAQ, DFHZRAR, DFHZRSP

Description: The temporary-storage program services DFHTS requests. It maintains the tables, directories, and maps necessary to keep track of every temporary-storage record and of available space on the VSAM auxiliary storage or in main storage. The main subroutine of DFHTSP is DFHTSPAM, which manages auxiliary storage (including multiple buffers and strings).

DFHTU530

Entry points: DFHTRPRA

Called by: MVS

Description: The trace utility program formats and prints trace records stored on the auxiliary trace data set. This utility program is run as a separate job, and extracts selected trace entries as specified on parameter statements supplied as part of the input to the program.

DFHUCNV

Entry points: DFHUCNV

Called by: DFHCCNV

Description: DFHUCNV is a sample program for CICS OS/2 user data conversion. Users can write their own version of DFHUCNV to apply any conversion. If specified, a user-supplied conversion is applied before the standard conversion. DFHUCNV is invoked for each EXEC CICS request and reply that has resulted from a CICS OS/2 function shipping request and may require conversion of user data from ASCII to EBCDIC (inbound from CICS OS/2) or from EBCDIC to ASCII (outbound). DFHCCNV issues an EXEC CICS LINK to DFHUCNV before attempting any standard conversions. This allows a user program to convert data of type USERDATA, as defined in the CICS OS/2 conversion macros (DFHCNV).

The sample program obtains addressability to the COMMAREA passed to it, and checks that the

request is a temporary-storage (TS) request. Then it checks that DFHCCNV managed to locate a conversion template for the resource (a TS queue) with this name, and scans and checks the template using the supplied template pointer and length. If the check is successful, the program translates the user data field as appropriate.

DFHUEH

Entry points: DFHUEHNA

Called by: CICS management modules containing exit points

Description: The user exit handler is the link between an exit point in a CICS management module in the AP domain, and the user code. DFHUEH invokes in turn each started exit program for that exit point, passing a parameter list defined in the CICS management module.

DFHUEM

Entry points: DFHUEMNA

Called by: DFHEIP

Description: The EXEC interface processor for the ENABLE, DISABLE, and EXTRACT user exit commands.

DFHUSBP

Entry points: DFHUSBNA

Called by: DFHRCRP

Description: The user backout program sends records, journaled by the user to the system log, to a user exit during emergency restart. The records are extracted by DFHRUP from the restart data set. They may exist for any logical unit of work, whether in flight or not, depending on the JCRSTRID value specified when the record was written.

DFHWCCS

Entry points: DFHWCCS

Called by: Many CAVM modules

Description: DFHWCCS provides common services for the CAVM:

- MVS FREEMAIN
- MVS GETMAIN
- MVS POST
- Message or MVS ABEND
- Create CAVM process block.

Returns to: MVS abend, caller

DFHWCGNT

Entry points: DFHWCGNA

Description: DFHWCGNT is the entry point list for CAVM modules above the 16MB line.

DFHWDATT

Entry points: DFHWDATT

Called by: DFHWDINA, DFHWMG1, DFHWMP1, DFHWSXPI

Description: DFHWDATT creates the CAVM process.

DFHWDINA

Entry points: DFHWDINA

Called by: DFHWSRTR

Description: DFHWDINA attaches the initial CAVM process. It sets up lock tables, the dispatcher control area, the LIFO control area, and the dispatcher ESPIE and ESTAE exits.

Returns to: DFHWDISP

DFHWDISP

Entry points: DFHWDISP, DFHWDIND

Called by: DFHWDWAT, DFHWDINA

Description: DFHWDISP is the CAVM process dispatcher. It dispatches the next ready CAVM process, or waits for an external event. It dispatches the initial CAVM process.

Returns to: Dispatched process, caller of DFHWDINA

DFHWDSRP

Entry points: DFHWDSRP

Called by: DFHWDINA, CAVM program check/abend

Description: DFHWDSRP establishes the ESPIE/ESTAE CAVM process. It performs CAVM process error handling for processes with ESPIE or ESTAE routines.

DFHWDWAT

Entry points: DFHWDWAT

Called by: Many CAVM modules

Description: DFHWDWAT causes the current CAVM process to wait for specific events.

Returns to: DFHWDISP

DFHWKP

Entry points: DFHWKPNA

Called by: DFHSTP

Description: DFHWKP takes a warm keypoint at the normal termination of CICS. This program is part of the restart component.

DFHWLFRE

Entry points: DFHWLFRE

Called by: Many CAVM modules

Description: DFHWLFRE frees the LIFO stack entry for CAVM modules running above the 16MB line.

DFHWLGET

Entry points: DFHWLGET

Called by: Many CAVM modules

Description: DFHWLGET gets the LIFO stack entry for CAVM modules running above the 16MB line.

DFHWMG1

Entry points: DFHWMG1

Called by: DFHWMI, DFHWDISP, DFHWDSRP

Description: DFHWMG1 is the main module of the CAVM message manager GET MESSAGE service. It is called by DFHWMI to initialize service, and attach itself as a message-reader CAVM process; by DFHWDISP to run as a message-reader CAVM process that reads messages and stores them; and by DFHWDSRP to handle ESPIE/ESTAE exits for the message reader.

DFHWMI

Entry points: DFHWMI

Called by: DFHWSXPI

Description: DFHWMI allocates the CAVM message-manager communication area. It calls each of the main message-manager modules, which then initialize themselves.

DFHWMMT

Entry points: DFHWMMT

Called by: DFHWMRD, DFHWMWR

Description: DFHWMMT provides VSAM GET and PUT services for the CAVM message data set.

DFHWMPG

Entry points: DFHWMPG

Called by: DFHWMP1, DFHWMWR

Description: DFHWMPG copies message data into the buffer provided by the user of PUTMSG, PUTREQ, PUTRSP, and CAVM message-manager services. It provides an ESPIE routine to handle program checks occurring during the copying.

DFHWMP1

Entry points: DFHWMP1

Called by: DFHWMI, DFHWDISP, DFHWDSRP

Description: DFHWMP1 is the main module of the CAVM message-manager PUT MESSAGE service. It is called by DFHWMI to initialize service, and attach itself as a message-writer CAVM process; by DFHWDISP to run as a message-writer CAVM process that writes messages to the CAVM message data set; and by DFHWDSRP to handle ESPIE and ESTAE exits for the message writer.

DFHWMQG

Entry points: DFHWMQG

Called by: DFHWMS20

Description: DFHWMQG runs under the CICS TCB above the 16MB line. It processes GETMSG CAVM message-manager requests. It waits for a message to arrive, then copies from the main-memory message queue created by the CAVM message-reader process.

DFHWMQH

Entry points: DFHWMQH

Called by: DFHWMG1, DFHWMQG

Description: The CAVM message-manager message input queue handler locates or creates message-queue anchor blocks, and adds copies of messages read by the CAVM reader process to the main-memory message queues.

DFHWMQP

Entry points: DFHWMQP

Called by: DFHWMS20

Description: DFHWMQP runs under the CICS TCB above the 16MB line. It processes CAVM message-manager PUTMSG, PUTREQ, and PUTRSP requests; places the request in the appropriate queue; and posts the queue to awaken CAVM process to handle request, waits for completion, and returns response to the caller.

DFHWMQS

Entry points: DFHWMQS

Called by: DFHWMP1, DFHWMWR

Description: The CAVM message-manager message output queue handler provides services to select the next work item to process, and posts items complete.

DFHWMRD

Entry points: DFHWMRD

Called by: DFHWMG1

Description: The CAVM message-manager message read routine reads messages from the CAVM message data set, taking account of the position of the active write cursor, and creates message blocks for copies of messages that have been read.

DFHWMS

Entry points: DFHWMSNA

Called by: Users of CAVM message services

Description: The CAVM message-manager service interface routine runs under the CICS TCB above the 16MB line. It builds a dummy CAVM process block, so that subsequent modules can run in an XRF LIFO environment, and calls DFHWMS20 to process a request passed by the caller.

DFHWMS20

Entry points: DFHWMS20

Description: The CAVM message manager services interface selects the request type and passes requests to DFHWMQP (PUTMSG, PUTREQ, PUTRSP) or DFHWMQG (GETMSG).

DFHWMWR

Entry points: DFHWMWR

Called by: DFHWMP1

Description: The CAVM message-manager message write routine takes data from PUTMSG requests and

copies them into CI buffers to be written to the CAVM message data sets.

DFHWOS

Entry points: DFHWOSNA

Description: The overseer startup module loads DFHWOSA and passes control to it.

DFHWOSA

Entry points: DFHWOSNA

Called by: DFHWOS

Description: The overseer services initialization module processes control parameters, loads DFHWOSB, and sets up entry points for overseer services.

DFHWOSB

Entry points: DFHWOSNA

Called by: Overseer program

Description: The overseer service module processes requests from the overseer program which are issued by the DFHWOSM macro.

DFHWSRTR

Entry points: DFHWSMNA

Called by: DFHXRA, MVS after attach of new TCB

Description: The CAVM state-management request router and subtask entry point is the initial entry point for a CAVM task attached by DFHWSSN1 to process the CAVM SIGNON command. It calls DFHWSSN2 to continue the processing of the SIGNON request and, if it is accepted, calls DFHWDINA to attach the tick generator module DFHWSTI as the first and highest-priority CAVM process. It is called under the CICS TCB to queue the CAVM TAKEOVER command for processing by the CAVM task, and to initiate processing of the CAVM SIGNOFF command by detaching the CAVM task. DFHWSRTR is the initial entry point for MVS subtasks attached by the CAVM task to perform various functions, such as issuing requests for CSVC services, or formatting new CAVM data sets when they are used for the first time.

DFHWSSN1

Entry points: DFHWSSNA

Called by: DFHXRA

Description: DFHWSSN1 is the CAVM state management SIGNON initial entry point. The CICS task issues an MVS LINK, specifying load module DFHWSSON to perform a CAVM SIGNON request. DFHWSSN1 attaches the CAVM task to execute the request, waits to see if it is successful, detaches the task and, if it is not successful, reports the result to CICS.

DFHWSSN2

Entry points: DFHWSSN2

Called by: DFHWSRTR

Description: The CAVM state management SIGNON request handler is entered under the CAVM TCB to process a CAVM SIGNON request. It allocates storage for, and initializes, key CAVM control blocks, sets up DFHWSSOF as an ESTAE exit, calls DFHWSSN3 to OPEN the CAVM data sets, reads the state management record from the control data set, uses the JES inquire-job-status CSVC service provided by DFHWTI, and looks for surveillance signals from other CAVM users to check whether the environment is such that the requested SIGNON can be accepted. It prompts the operator for job status information if necessary. If SIGNON is accepted, it updates the state management record and status CIs to record that this job has signed on to the CAVM. When possible, it also cleans up out-of-date information in the CAVM data sets left behind by jobs that were unable to sign off properly before terminating.

DFHWSSN3

Entry points: DFHWSSN3

Called by: DFHWSSN2

Description: The CAVM state management data set initialization routine builds ACBs, and opens and validates the CAVM control and message data sets for CAVM SIGNON. It builds the reserve parameter list for serializing accesses to the control data set. If new CAVM data sets are being used for the first time, it attaches an MVS subtask to record relevant information in each data set's control interval, and to format the CIs needed by state management.

DFHWSSOF

Entry points: DFHWSSOF

Called by: MVS recovery/termination manager

Description: DFHWSSOF is the CAVM state management SIGNOFF request handler. During SIGNON processing, this module is established as an ESTAE exit for the CAVM task. It purges outstanding I/O requests, reads the state management record from the control data set, and searches it to see if this job has signed on to the CAVM. If so, it updates the status CI and state management record to indicate that the job has signed off. It makes the TAKEOVER message available to DFHWSRTR when an active system signs off after takeover has started.

DFHWSSR

Entry points: DFHWSSR

Called by: DFHWDISP

Description: The CAVM surveillance status reader runs as a process controlled by the XRF dispatcher, DFHWDISP. It reads the status CI of the partner system from the control data set or the message data set, generates internal CAVM events, and drives the NOTIFY exit when the partner's status changes, or its surveillance signals cease. For an alternate system, it monitors and records the time-of-day clock difference when the active system is running in a different CEC.

DFHWSSW

Entry points: DFHWSSW

Called by: DFHWDISP

Description: The CAVM surveillance status writer runs as a CAVM process controlled by the CAVM dispatcher, DFHWDISP. It writes a system’s current status to its status CI in the control data set, or the message data set, to make it available to its partner and to provide a surveillance signal; generates an internal CAVM event when a status write completes; and puts the current time-of-day clock reading in the status CI to permit DFHWSSR to deduce the time-of-day clock difference when the active system and the alternate system are running in different CECs.

DFHWSTI

Entry points: DFHWSTI

Called by: DFHWDISP

Description: The CAVM surveillance tick generator and CICS status monitor runs as a CAVM process controlled by the CAVM dispatcher DFHWDISP. It issues an MVS STIMER for the surveillance interval and, when this expires, generates an internal CAVM clock-tick event, calls the inquire-CICS-status exit, and schedules the surveillance status writer processes, to cause a surveillance signal reporting this system’s current status to be written to the control data set or the message data set.

DFHWSTKV

Entry points: DFHWSTKV

Called by: DFHWDISP

Description: The CAVM state management TAKEOVER request handler runs as a CAVM process controlled by the CAVM dispatcher DFHWDISP. When a new active SIGNON has been detected, it reads the state management record from the control data set and attaches an MVS subtask to invoke DFHWTI’s validate-CLT CSVC service. When a TAKEOVER command has been issued, it reads the state management record, validates the TAKEOVER request, and attaches an MVS subtask to use DFHWTI’s JES inquire-job-status service to determine the current state of the active system.

If the active system is still signed on to CAVM, it updates the state management record to indicate that a takeover is in progress, places the TAKEOVER message for the active system in the alternate system’s status, and attaches an MVS subtask to invoke DFHWTI’s TAKEOVER-initiate service.

After the active system has signed off (or terminated), it requests DFHWSSR to read the active system’s final status, quiesces surveillance processing, and updates the state management record and status CIs to indicate the stage reached by takeover. It then arranges for surveillance processing to be resumed in active mode. It attaches an MVS subtask to invoke DFHWTI’s process-CLT CSVC service if necessary.

When the active system has finally terminated, it updates the state management record to take its place as the new active system, generates internal CAVM events, and calls the NOTIFY exit to report the progress of the TAKEOVER request, including acceptability of the time-of-day clock reading. It terminates by returning to DFHWDISP.

DFHWSXPI

Entry points: DFHWSXPI

Called by: DFHWSTI

Description: The CAVM state management CAVM process initialization runs under the tick generator CAVM process towards the end of SIGNON. It attaches the TAKEOVER CAVM process (alternate systems only), two status writer CAVM processes, and two status reader CAVM processes, and then calls the CAVM message management initialization module.

DFHWTI

Entry points: DFHWTINA

Called by: DFHCSVC from: DFHWSSN2, DFHWSTKV, DFHZXSTS

Description: Takeover initiation is the primary function of this module, and is requested by CAVM state management at takeover to terminate the CICS active system issue commands in the CLT, and wait until the CICS active system terminates. Other XRF services provided by this module are to determine whether a job is running, to issue the operator commands for the overseer program, to issue MODIFY USERVAR to VTAM, to validate the CLT, and to process the CLT.

DFHWTRP

Entry points: DFHWTRP

Called by: Many CAVM modules

Description: DFHWTRP makes a trace entry in the CAVM main-memory trace table.

DFHXCP

Entry points: DFHXCPNA

Called by: DFHKCP

Description: DFHXCP processes DFHKC CANCEL, CHAP, RESUME, SUSPEND, and WAIT macro calls to the transaction manager.

DFHXCPC

Entry points: DFHXCPC

Called by: DFHKCP

Description: DFHXCPC processes DFHKC ATTACH, CHANGE, DEQ, DEQALL, ENQ, and SRB macro calls to the transaction manager. It receives DFHKC INITIALIZE, REPLACE, and WAITINIT macro calls to the transaction manager and passes them on to DFHKCQ.

DFHXCP1

Entry points: DFHXCP1

Called by: DFHXCPC

Description: DFHXCP1 finds a new range of free transaction numbers when the current range has been used up.

DFHXFP

Entry points: DFHXFPNA

Called by: DFHISP, DFHMIRS

Description: The online data transformation program takes data addressed from a parameter list (command-level or DL/I), and constructs an FMH suitable for transmission to a remote ISC or MRO system; DFHXFP also performs the reverse transformation.

DFHXFQ

Entry points: DFHXFQNA

Called by: DFHXEPRH

Description: The batch data transformation program executes in an EXCI region. DFHXFQ takes data addressed from a DPL parameter list and constructs an FMH suitable for passing to the online region; DFHXFQ also performs the reverse transformation.

DFHXFX

Entry points: DFHXFXNA

Called by: DFHISP, DFHMIRS

Description: DFHXFX performs the same logical transformations of function shipping requests as DFHXFP but in a manner that is optimized for the MRO environment. It is not used for the transformation of DL/I requests; these are processed by DFHXFP.

DFHXMP

Entry points: DFHXMPNA

Called by: DFHDRPE, DFHZCX

Description: The cross-memory program is invoked by a program call (PC) instruction and uses MVS cross-memory services to pass data from one subsystem to another within the same processing unit. The communicating subsystems are usually in CICS address spaces, but DFHXMP does not assume this.

DFHXRA

Entry points: DFHXRANA

Called by: DFHAPDM, DFHCSSC, DFHCXCU, DFHDBCR, DFHDBCT, DFHSIC1, DFHSII1, DFHSTP, DFHTCRP, DFHTDRP, DFHXRCP, DFHXRSP, DFHZNAC, DFHZOPN, DFHZSLS

Description: DFHXRA is the program that executes the DFHXR macro. It runs under the CICS TCB in AMODE(24). In general, it uses CICS macros to invoke other services. Exceptions are MVS LINK to DFHWSSON to sign on to the CAVM, and MVS LOAD and DELETE for DFHWSMS to sign off from the CAVM, and to initiate takeover. It invokes global user exit XXRSTAT, which can lead to the abend 208.

DFHXRB

Entry points: DFHXRBNA

Called by: DFHWDSRP, DFHWMQH, DFHWMRD, DFHWSSR, DFHWSTKV

Description: DFHXRB is the XRF notify exit program. Its address is passed to the CAVM when CICS signs on to the CAVM. It runs under the CAVM TCB in AMODE(31); reacts to events detected by various CAVM modules; and creates a queue of work elements (chained from XRWECHN) to be processed by DFHXRSP.

DFHXRC

Entry points: DFHXRCNA

Called by: DFHWSSN2, DFHWSTI

Description: DFHXRC is the CICS-status exit program. Its address is passed to the CAVM when CICS signs on to the CAVM. It runs under the CAVM TCB in AMODE(31), and returns the latest CICS-status data to be written to the state management data set.

DFHXRCP

Entry points: DFHXRCNA

Description: The XRF console communication task runs under the CICS TCB in AMODE(24). It processes MODIFY commands received by CICS during initialization of the alternate system. It initiates takeover, shuts down the active system, and manages trace and dump as required.

DFHXRE

Entry points: DFHXRENA

Called by: DFHPCP

Description: The XRF startup program is the entry point for the system task attached by DFHXRA. It links to DFHXRE, whichever module was indicated by DFHXRA.

DFHXRP

Entry points: DFHXRANA

Called by: Not applicable

Description: DFHXRP consists of six object modules link-edited together:

```
DFHXRA - XRF request processor
DFHXRB - XRF NOTIFY exit program
DFHXRC - XRF inquire status exit program
DFHXRE - XRF startup program
DFHXRF - XRF CAVM sign-off interface
DFHWMS - CAVM message manager service interface.
```

It is loaded by DFHSIB1.

DFHXRSP

Entry points: DFHXRSNA

Called by: DFHXRA

Description: DFHXRSP is the XRF surveillance program, which runs as a program under a CICS transaction. It runs under the CICS TCB in AMODE(31); processes the queue of work elements created by DFHXRB; attaches the catch-up transaction CXCU, initiates takeover, and shuts down CICS as required; and can issue abends 206 and 207.

DFHXSMN

Entry points: DFHXSMNA

Called by: DFHBSTS, DFHCRNP, DFHDLIDP, DFHDLIRP, DFHEDFP, DFHEIPSE, DFHSII1, DFHSUSN, DFHSUXS, DFHTACP, DFHZSUP

Description: The security manager is invoked by the DFHSEC macro, and provides an interface to the external security manager (ESM). DFHXSMN validates the parameters passed, then calls DFHXSMX as a general-purpose subroutine to invoke the ESM.

DFHXSMX

Entry points: DFHXSMNA

Called by: DFHXSMN

Description: DFHXSMX is the subroutine used by the security manager to invoke the external security manager (ESM). For resource checking, this routine first issues the MVS RACROUTE REQUEST=FASTAUTH macro, which calls the ESM in problem state. All other security functions require the caller to be in supervisor state. For these functions, and for a failed FASTAUTH call that requires logging, the CICS SVC is issued under a general purpose subtask, entered by the DFHSK macro, to shield the main CICS task from any imbedded waits that may occur in the ESM.

DFHXSS

Entry points: DFHXSSNA

Called by: DFHCSVC

Description: DFHXSS invokes the external security manager (ESM) for all functions that need to be invoked while authorized, except for the EXTRACT functions for which it passes control to DFHXSSB.

DFHXSSB

Entry points: DFHXSSB

Called by: DFHXSS

Description: This module extracts data from the ESM's database. DFHXSSB extracts userid-related data at signon time, and session key information at LU6.2 session bind time. It uses the MVS RACROUTE REQUEST=EXTRACT macro.

DFHXSWM

Entry points: DFHXSWM

Called by: DFHXSMN

Description: DFHXSWM passes and retrieves messages to and from the XRF alternate system to see if security initialization is required in the XRF environment.

DFHXTCI

Entry points: DFHXTCI

Description: DFHXTCI is the transaction invoked when the alternate system begins a takeover. It examines the TCT to locate the terminals with XRF backup sessions, and queues these TCTTEs to DFHZSES for the SESSIONC CONTROL=SWITCH command.

DFHXTP

Entry points: DFHXTPNA

Called by: DFHTPS, DFHZTSP, DFHZXRL, DFHZXRT

Description: The terminal sharing transformation program comprises four logical modules (known as transformers 1 through 4). DFHXTP transforms routing requests into the LU type 6 format for shipping to a remote CICS address space.

DFHZABD

Entry points: DFHZABD1

Called by: TC CTYPE= requests

Description: If a TC CTYPE request is issued when ZCP has been generated without VTAM support, DFHZABD is invoked to abend the transaction.

DFHZACT

Entry points: DFHZACT1

Called by: DFHZDSP

Description: The activate scan routine scans the four TCTTE activity queues: activate, log, wait, and NACP. DFHZACT scans the activate queue for request bits that may be set in the TCTTEs; for each request, DFHZACT calls the appropriate module. If no requests are outstanding, the TCTTE is removed from the queue. If the NACP queue is not empty, DFHZACT attaches DFHZNAC (if not already attached). Similarly, if the log queue is not empty, DFHZACT attaches DFHZRLG. DFHZACT scans the wait queue. If automatic resource definition is in the system, DFHZACT looks for any corresponding work elements. For each work element, DFHZATA is attached.

DFHZAIT

Entry points: DFHZAIT1

Called by: DFHSIF1

Description: The attach initialization tables routine initializes local tables used by the mainline task-attach routine, DFHZATT. DFHZAIT generates the page command table from information supplied by the system initialization table, modifying it for use by DFHZATT. DFHZAIT also initializes the transaction code delimiter table.

DFHZAND

Entry points: DFHZAND1

Called by: DFHZARQ

Description: The abend control block builder is used to assist in building the transaction abend block when an abend has occurred in an interconnected system. Its function is to extract the error sense bytes, and the diagnostic message sent by the other system, and to copy these into the block. As an initial step in its processing, DFHZAND acquires storage for the block itself.

DFHZARER

Entry points: DFHZARER

Called by: DFHZARL, DFHZARR, DFHZARRA

Description: DFHZARER tidies up after an LU6.2 protocol error or session failure has been detected. For some errors, it calls DFHZNAC.

DFHZARL

Entry points: DFHZARL1

Called by: DFHACP, DFHCPCBA, DFHCPCLC, DFHCRS, DFHEGL, DFHETL, DFHLUP, DFHXFP, DFHXTP, DFHZARL, DFHZARM, DFHZERH, DFHZISP, DFHZLUS, DFHZSUP, DFHZTSP, DFHZXRL, DFHZXRT

Description: DFHZARL is called via the DFHLUC macro, which passes the LU6.2 request in a parameter list mapped by the DFHLUCDS DSECT. If the request is for a remote APPC device, DFHZARL passes the parameter list to DFHZXRL for processing. (APPC is advanced program-to-program communication.) Otherwise, it examines the parameter list to determine the function required. Most functions are processed by DFHZARL. However, it calls the following modules as indicated:

```
DFHZARER - Protocol errors and exceptions
DFHZARR  - RECEIVE requests
DFHZARRA - FREE-STORE requests
DFHZERH  - Handling FMH7s and negative responses
DFHZISP  - ALLOCATE and FREE requests
DFHZRVL  - Receiving SNA indicators from VTAM
DFHZSDL  - Sending data to VTAM.
```

It also manages the logical receive buffer pointers TCTERBLA and TCTERBLL in a consistent manner with the physical receive buffer pointers TCTERBA and TCTERBDL, as (address, length) pairs.

DFHZARM

Entry points: DFHZARM1

Called by: DFHZARQ, DFHETL, DFHZISP

Description: DFHZARM handles DFHTC macros for LU6.2 sessions.

DFHZARQ

Entry points: DFHZARQ1

Called by: DFHETC, DFHTC macro

Description: The application request interface module analyzes the terminal control request from the application. For a VTAM terminal, it sets the appropriate flags and calls the required module or adds the TCTTE to the activate chain.

DFHZARR

Entry points: DFHZARR

Called by: DFHZARL

Description: DFHZARR controls the receive function for LU6.2 application requests. It calls DFHZARRC to decide what to process next, or whether it is necessary to call its inline subroutine DFHZARR1 to receive more data. Then it processes the returned item, and decides whether the receive is complete. If the receive is not complete, DFHZARR loops, calling DFHZARRC and processing the returned item, until enough data has been received. DFHZARR uses the inline subroutine DFHZARR0 and the DFHZARRA module to control various receive buffers. It also uses DFHZARRF to receive FMH7s and negative responses, DFHZUSR to control the conversation state, and the inline subroutine DFHZARR1 to handle the type of receive and how much data is to be received.

DFHZARR0 is responsible for updating the logical buffer pointers TCTERBLA and TCTERBLL, shifting up data in the LU6.2 receive buffer, and resetting associated indicators, for example, TCTECCDR in the TCTTE LUC extension.

DFHZARR1 is responsible for setting fields TCTEMINL and TCTEMAXL in the TCTTE LUC extension to inform DFHZRVL how much data to receive and whether the request is a receive immediate or a receive and wait. DFHZARR1 calls DFHZARR0 to shift up data in the LU6.2 receive buffer, and then calls DFHZRVL to receive RUs from VTAM by placing requests on the active chain.

DFHZARRA

Entry points: DFHZARRA

Called by: DFHZARL, DFHZARR

Description: DFHZARRA controls all functions concerned with the LU6.2 application receive buffer. These include GETMAIN and FREEMAIN of buffers, copying data into a buffer, and updating the pointer to the next free slot.

DFHZARRC

Entry points: DFHZARRC

Called by: DFHZARR

Description: DFHZARRC is responsible for examining what has been received from VTAM on a particular session (for example, data, PS headers, FMH7s, and indicators), and for deciding what should be processed next on behalf of the application. The result is returned to DFHZARR.

DFHZARRF

Entry points: DFHZARRF

Called by: DFHZARR

Description: DFHZARRF receives LU6.2 FMH7s and negative responses. It calls the DFHZARR0 subroutine to shift up data in the LU6.2 receive buffer, and then calls DFHZERH.

DFHZASX

Entry points: DFHZASX1

Called by: VTAM

Description: The asynchronous command exit module is called by VTAM if an asynchronous command is received. The only such commands are request shutdown, quiesce at end of chain, release quiesce, and signal. DFHZASX sets up the TCTTE appropriately and returns control to VTAM.

DFHZATA

Entry points: DFHZATA

Called by: DFHZACT

Description: The autoinstall program runs as the CATA transaction and performs operations necessary to INSTALL autoinstallable terminals. It requests information from a user program where appropriate.

DFHZATD

Entry points: DFHZATD

Called by: DFHZACT, DFHZNAC

Description: The autoinstall delete program runs as the CATD transaction and performs operations necessary to DELETE autoinstalled terminals. It requests information from a user program where appropriate.

DFHZATDX

Entry points: DFHZATDX

Called by: DFHZATA, DFHZATD

Description: DFHZATDX is the user program for autoinstall. It is called when:

- **An autoinstall INSTALL is in progress**
- **An autoinstall DELETE has just completed**
- **An autoinstall INSTALL has failed.**

For INSTALL, DFHZATDX selects a model name and the corresponding TRMIDNT to be used by the terminal control builder program (DFHTBSxx). This program can be used as a model for a user program.

DFHZATI

Entry points: DFHZATI1

Called by: DFHZACT

Description: The automatic task initiation module checks for stress conditions, calls DFHZSIM if the node is not in session, acquires an RPL if necessary, and issues a conditional DFHKC TYPE=AVAIL macro. DFHZATI initiates bid protocols to decide whether the LU is available.

DFHZATMD

Entry points: DFHZATMD

Called by: DFHZATMF

Description: This program deletes all remote terminal definitions that are flagged (by DFHZATMF) for deletion.

DFHZATMF

Entry points: DFHZATMF

Called by:

Description: This program flags remote terminals for Mass-deletion (by DFHZATMD). It is a part of the transaction routing component, and is started to flag all skeletons that have been unused for more than the terminal latency period for deletion.

DFHZATR

Entry points: DFHZATR

Called by: DFHZATR, DFHZXRE0

Description: The autoinstall restart program runs as the CATR transaction at CICS startup after the time period specified in the AIRDELAY parameter. DFHZATR scans all autoinstalled terminals, and causes the CATD transaction to be called to delete any autoinstalled terminals that have not been used during the AIRDELAY interval.

DFHZATS

Entry points: DFHZATS

Called by: DFHZTSP, DFHCRS

Description: The remote autoinstall program runs as the following four transactions:

CITS **The remote autoinstall function that is attached by DFHZTSP.**

CDTS **The remote delete function that is attached by DFHZTSP or DFHCRS.**

CFTS **The remote reset function that flags terminals for mass deletion after a CICS restart and is attached by DFHZTSP or DFHCRS.**

CMTS **The mass delete function of remote terminals that is attached by DFHZATS transaction CFTS if it finds any terminals for deletion.**

DFHZATT

Entry points: DFHZATT1

Called by: DFHZACT

Description: The task attach module checks for stress conditions, allocates an RPL if necessary, and determines the task to be attached either from the data, or from the TCTTE (if the previous transaction specified TRANID), or from the AID (for a 3270). DFHZATT also checks for paging commands (having been modified by DFHZAIT). Finally a conditional ATTACH is issued. The module is applicable for VTAM, SRL, and MVS console support.

DFHZBAN

Entry points: DFHZBAN

Called by: DFHZOPN

Description: The terminal control bind analysis program checks that a bind is valid and supportable and, if requested, sets the TCTTE information that supports the session parameters.

DFHZBKT

Entry points: DFHZBKT1

Called by: DFHZSDL, DFHZSLX, DFHZRLX, DFHZLUS

Description: DFHZBKT maintains the bracket state for LU6.2.

DFHZBLX

Entry points: DFHZBLX

Called by: DFHZSCX

Description: DFHZBLX is the part of of SCIP exit which processes LU6.2 binds. It matches a TCTTE to the BIND and schedules DFHZOPN to complete the BIND process. This module returns to VTAM.

DFHZCA

Entry points: DFHZCANA

Called by: See component submodules

Description: DFHZCA is the name of the load module created when the following modules are link-edited together:

```
DFHZACT  - Activate scan
DFHZFRE  - FREEMAIN request
DFHZGET  - GETMAIN request
DFHZQUE  - Chaining
DFHZRST  - RESETSR.
```

DFHZCB

Entry points: DFHZCBNA

Called by: See component submodules

Description: DFHZCB is the name of the load module created when the following modules are link-edited together:

```
DFHZATI  - Automatic task initiation
DFHZDET  - Task detach
DFHZHPSR - HPO send/receive
DFHZLRP  - Logical record presentation
DFHZRAC  - Receive-any completion
DFHZRAS  - Receive-any slowdown processing
DFHZRVS  - Receive specific
DFHZRVX  - Receive specific exit
DFHZSDR  - Send response
DFHZSDS  - Send DFSYN
DFHZSDX  - Send DFSYN data exit
DFHZSSX  - Send DFSYN exit
DFHZUIX  - User input exit.
```

DFHZCC

Entry points: DFHZCCNA

Called by: See component submodules

Description: DFHZCC is the name of the load module created when the following modules are link-edited together:

```
DFHZARER - LU6.2 protocol error and exception handler
DFHZARL  - LU6.2 application request logic
DFHZARM  - LU6.2 migration logic
DFHZARR  - LU6.2 application receive request logic
DFHZARRA - LU6.2 application receive buffer support
DFHZARRC - LU6.2 classify what next to receive
DFHZARRF - LU6.2 receive FMH7 and ER1
DFHZBKT  - LU6.2 bracket state machine
DFHZCHS  - LU6.2 chain state machine
DFHZCNT  - LU6.2 contention state machine
DFHZCRT  - LU6.2 RPL_B state machine
DFHZRLP  - LU6.2 post-VTAM receive logic
DFHZRLX  - LU6.2 receive exit program
DFHZRVL  - LU6.2 pre-VTAM receive logic
DFHZSDL  - LU6.2 send logic
DFHZSLX  - LU6.2 send exit program
DFHZSTAP - MRO or LU6.2 conversation state
           determination
DFHZUSR  - LU6.2 conversation state machine.
```

DFHZCHS

Entry points: DFHZCHS1

Called by: DFHZRLX, DFHZSDL, DFHZSLX

Description: DFHZCHS maintains the chain state for LU6.2.

DFHZCLS

Entry points: DFHZCLS1

Called by: DFHZACT

Description: The close destination module obtains an RPL if necessary, issues CLSDST to VTAM, and checks if it was accepted. The CLSDST exit handles the completion of the request. DFHZCLS performs a normal closedown procedure according to the LU type (for example, LU6 sends SBI and BIS). In the case of an abnormal closedown, DFHZCLS performs immediate termination, using CLSDST or TERMSESS commands. If the terminal was automatically defined, it is put out of service.

DFHZCLX

Entry points: DFHZCLX1

Called by: VTAM

Description: The close destination exit module receives control from VTAM when a CLSDST or TERMSESS request completes. If the CLSDST or TERMSESS was successful, DFHZCLX cleans up TCTTE and returns to VTAM; otherwise it enqueues the TCTTE to DFHZNAC and then returns to VTAM.

DFHZCNA

Entry points: DFHZCNA1

Called by: DFHZDSP

Description: The system console activity control program is responsible for CICS system requests. It performs the following functions:

- Shutdown—when all other access method terminals have been quiesced, quiesces console support, allowing CICS to terminate.
- Resume—resumes tasks waiting on read request when they are completed.
- Detach—releases all TIOAs associated with a completed task.
- Attach—passes the data associated with a MODIFY command (in a TIOA attached to a console TCTTE) to DFHZATT to create a task.
- ATI—determines whether a console TCTTE is available for automatic task initiation.

DFHZCNR

Entry points: DFHZCNR1

Called by: DFHZARQ

Description: The system console application request program performs READ, WRITE, and CONVERSE operations to an MVS system console that is used as a terminal.

DFHZCNT

Entry points: DFHZCNT1

Called by: DFHZLUS, DFHZRLX

Description: DFHZCNT maintains the contention state for LU6.2.

DFHZCP

Entry points: DFHZCPNA

Called by: See component submodules

Description: DFHZCP is the name of the load module created when the following modules are link-edited together:

```
DFHZARQ  - Application request handler
DFHZATT  - Attach routine
DFHZCNA  - System console activity control
DFHZDSP  - Dispatcher
DFHZISP  - Allocate/free/point routine
DFHZSUP  - Startup task
DFHZUCT  - 3270 uppercase translation.
```

DFHZCQ

Entry points: DFHZCQ

Called by: DFHAMTP, DFHCRS, DFHQRY, DFHTCRP, DFHWKP, DFHZATA, DFHZATD, DFHZTSP, DFHZXCU

Description: DFHZCQ is the control program for all requests for the dynamic add and delete of terminal control table entries. It is called by resource definition online (RDO) to:

- Cold start group lists
- Cold or warm start nonmigrated VTAM resources
- Dynamically install using the CEDA transaction.

The main subroutines of DFHZCQ are:

```
DFHZCQCH - Catalog a TCT element
DFHZCQDL - Delete
DFHZCQIN - Initialize DFHZCQ
DFHZCQIQ - Inquire about TCTTE
DFHZCQIS - Install TCTTE
DFHZCQIT - Add macro-generated TCTTE
DFHZCQRS - Restore ZC resource.
```

DFHZCQDL

Entry points: DFHZCQDL

Called by: DFHZCQ00, DFHZNAC, RDO

Description: DFHZCQDL dynamically deletes a TCT entry when the entry is quiesced. This module is part of DFHZCQ.

DFHZCQIN

Entry points: DFHZCQIN

Called by: DFHTCRP

Description: DFHZCQIN initializes DFHZCQ for all its operations. This module is part of DFHZCQ.

DFHZCQIQ

Entry points: DFHZCQIQ

Called by: DFHZTSP

Description: DFHZCQIQ obtains the parameters for a TCT resource and is called by DFHZTSP in the terminal-owning node as part of the process of shipping a TCT definition to a remote system. This module is part of DFHZCQ.

DFHZCQIS

Entry points: DFHZCQIS

Description: DFHZCQIS installs a TCTTE. If the resource already exists, the old resource is deleted.

DFHZCQIT

Entry points: DFHZCQIT

Description: DFHZCQIT adds a macro-generated TCTTE to a CICS system.

DFHZCQRS

Entry points: DFHZCQRS

Description: During emergency restart or warm start, DFHTCRP restores terminal control resources to the state they were in before the last shutdown of CICS, using the restart data set.

DFHZCRQ

Entry points: DFHZCRQ1

Called by: TC CTYPE requests

Description: The CTYPE request module analyzes DFHTC CTYPE commands, and calls or links to the appropriate send module.

DFHZCRT

Entry points: DFHZCRT1

Called by: DFHZACT, DFHZARL, DFHZFRE, DFHZNAC, DFHZRAC, DFHZRLP, DFHZRVL, DFHZSDL, DFHZSHU, DFHZSTU, DFHZTPX

Description: DFHZCRT maintains the RPL_B state for LU6.2.

DFHZCUT

Entry points: DFHZCUT

Called by: DFHCSSC, DFHLUP, DFHSNAT, DFHTCPLR

Description: DFHZCUT manages the persistent verification signed-on-from list, also known as the local userid table (LUIT). There is one LUIT per connection supporting persistent verification.

DFHZCW

Entry points: DFHZCWNA

Called by: See component submodules

Description: DFHZCW is the name of the load module created when the following modules are link-edited together:

```
DFHZERH  - LU6.2 error program
DFHZEV1  - LU6.2 BIND security
DFHZEV2  - LU6.2 BIND security
DFHZLUS  - LU6.2 session management program.
```

DFHZCX

Entry points: DFHZCXNA

Called by: See component submodules

Description: DFHZCX is the name of the load module created when the following modules are link-edited together:

```
DFHZABD  - Abend routine for incorrect requests
DFHZAND  - Build TACB before issuing PC abends
DFHZCNR  - System console application request
DFHZIS1  - ISC or IRC syncpoint
DFHZIS2  - IRC internal requests
DFHZLOC  - Locate TCTTE and ATI requests
DFHZSTU  - Terminal control status change.
```

DFHZCXR

Entry points: DFHZCXRA

Called by: See component submodules

Description: DFHZCXR is the generic name allocated to a composite module that is not called by any other code. It includes the following transaction-routing related modules:

```
DFHZTSP  - Terminal-sharing program
DFHZXRL  - Routes LU6.2 commands to TOR
DFHZXRT  - Receives LU6.2 commands from AOR.
```

DFHZCY

Entry points: DFHZCYNA

Called by: See component submodules

Description: DFHZCY is the name of the load module created when the following modules are link-edited together:

```
DFHZASX  - DFASY exit
DFHZDST  - SNA-ASCII translation
DFHZLEX  - LERAD exit
DFHZLGX  - LOGON exit
DFHZLTX  - LOSTERM exit
DFHZNSP  - Network services exit
DFHZOPA  - Open VTAM ACB
DFHZRRX  - Release request exit
DFHZRSY  - Resynchronization
DFHZSAX  - Send synchronous command exit
DFHZSCX  - SESSION control input exit
DFHZSDA  - Send synchronous command
DFHZSES  - SESSIONC
DFHZSEX  - SESSIONC exit
DFHZSHU  - Shutdown VTAM
DFHZSIM  - SIMLOGON
DFHZSIX  - SIMLOGON exit
DFHZSKR  - Send response to command
DFHZSLS  - Set logon start
DFHZSYN  - Handle CTYPE=SYNC or CTYPE=RECOVER request
DFHZSYX  - SYNAD exit
DFHZTPX  - TPEND exit
DFHZTRA  - Create ZCP or VIO trace requests
DFHZXRC  - XRF session state data analysis.
```

DFHZCZ

Entry points: DFHZCZNA

Called by: See component submodules

Description: DFHZCZ is the name of the load module created when the following modules are link-edited together:

```
DFHZCLS  - CLSDST
DFHZCLX  - CLSDST exit
DFHZCRQ  - Command request
DFHZEMW  - Error message writer
DFHZOPN  - OPNDST
DFHZOPX  - OPNDST exit
DFHZRAQ  - Read-ahead queuing
DFHZRAR  - Read-ahead retrieval
DFHZTAX  - Turnaround exit.
```

DFHZDET

Entry points: DFHZDET1

Called by: DFHZACT, DFHZISP

Description: The task detach module receives control when a detach request is issued by DFHZISP. If a WRITE is pending (deferred write or any write), the SEND routine is called. If the SEND cannot complete, the DETACH request is left on the activate queue. If requests are queued then DFHZACT drives DFHZDET when the operation is complete. If the node is in between bracket state, an end bracket is sent.

DFHZDSP

Entry points: DFHZDSP1

Called by: DFHSII1

Description: The dispatcher module handles the dispatching of modules for execution, and gives control to VTAM modules of ZCP using DFHZACT.

DFHZDST

Entry points: DFHZDST1

Called by: DFHZRVX, DFHZSDS

Description: The data stream translator module translates data between EBCDIC and ASCII code while that data is being sent and received on VTAM sessions.

DFHZEMW

Entry points: DFHZEMW1

Called by: DFHACP, DFHZDET, DFHZNAC, DFHZRAC

Description: The error message writer module handles all requests for error messages on VTAM supported terminals/LUs. According to the request flags, it:

- Sends a negative response
- Purges unprocessed inbound data until EOC or CANCEL is received
- Sends an error message.

DFHZERH

Entry points: DFHZERH1

Called by: DFHZARL, DFHZARRF

Description: DFHZERH handles the sending and receiving of LU6.2 FMH7s and negative responses. It also manages the logical receive buffer pointers TCTERBLA and TCTERBLL in a consistent manner with the physical receive buffer pointers TCTERBA and TCTERBDL, as (address, length) pairs.

DFHZEV1

Entry points: DFHZEV11

Description: DFHZEV1 is the LU6.2 bind-time security encryption validation program, part 1.

DFHZEV2

Entry points: DFHZEV21

Description: DFHZEV2 is the LU6.2 bind-time security encryption validation program, part 2.

DFHZFRE

Entry points: DFHZFRE1

Called by: DFHZACT, DFHZEMW, DFHZCLS, DFHZCLX

Description: The FREEMAIN module is used to free storage (RPLs, NIBs, bind areas, TIOAs, buffer lists, LUC send/receive buffers, and extract logon data) acquired by ZC modules. Some storage is also freed by other ZC modules.

DFHZGET

Entry points: DFHZGET1

Called by: DFHZACT, DFHZARL, DFHZATI, DFHZATT, DFHZCLS, DFHZISP, DFHZOPN, DFHZRAC, DFHZRST, DFHZRSY, DFHZRVL, DFHZRVS, DFHZSDA, DFHZSDL, DFHZSDR, DFHZSDS, DFHZSES, DFHZSKR

Description: The GETMAIN module is used to acquire an RPL, NIB, bind area, TIOA, buffer list, or LUC send/receive buffer. DFHZGET also sets up the dynamic NIB using the information in the NIB descriptor block. Normally, when a ZC module requires some of the above storage, it invokes DFHZGET to obtain the storage; if this is unsuccessful, it may queue the request, and then DFHZACT calls DFHZGET on behalf of the caller.

DFHZHPRX

Entry points: DFHZHPNA

Called by: DFHKCSP (via DFHZHPSR and DFHKCP)

Description: In authorized path SRB mode, DFHZHPRX issues VTAM EXECRPL.

DFHZHPSR

Entry points: DFHZHPS1

Called by: DFHZRVS, DFHZSDS

Description: DFHZHPSR is the SEND and RECEIVE module for the HPO environment.

DFHZISP

Entry points: DFHZISP1

Called by: DFHISP, DFHKCP

Description: The intersystem program services ISC requests to free, or point to, a particular TCTTE within a specified system, or to allocate a TCTTE within a specified system. DFHZISP also handles ATI requests, and checks for a terminal time-out.

DFHZIS1

Entry points: DFHZIS11

Description: DFHZIS1 handles the transmissions control CTYPE requests of Prepare, Syncpoint Request (SPR), Commit, and Abort. Each request is translated into the appropriate ISC/IRC action and is transmitted to the connected system.

DFHZIS2

Entry points: DFHZIS21

Called by: DFHZARQ, DFHZIS1

Description: The intersystem program provides services for CICS system code that wants to use intersystem or interregion (IRC) function requests:

RECEIVE
Is invoked when DFHCRNP gets input data as a result of a 'switch first' SVC request.

IOR
The IRC input/output routine. This interfaces with the IRC SVC in order to send data to the other end of the connection, or await data from there.

GETDATA
Is used to fetch input data into a TIOA.

DISCONNECT
Disconnects a given IRC link.

STOP
Quiesces interregion activity, either for connections to a given system, or for the whole of IRC.

LOGOFF
Issues a logoff request to the IRC SVC. This completes IRC activity for this CICS system.

OPERATIVE
Allows connections to be made to a given system.

RECABRT
processes input abend FMHs (FMH07).

DFHZLEX

Entry points: DFHZLEX1

Called by: VTAM

Description: The logical error address (LERAD) exit module receives control from VTAM when a logical error is detected. Logical errors are usually the result of an incorrectly defined terminal table.

DFHZLGX

Entry points: DFHZLGX1

Called by: VTAM

Description: The logon exit module receives control from VTAM when a terminal logs on to the network. DFHZLGX scans the CICS NIBs and, if a match is found, sets an OPNDST request in the corresponding TCTTE and places it on the activate queue. If no match is found, DFHZLGX defines a terminal automatically, if possible, by allocating an autodefine work element which holds the CINIT_RU. The work element is then queued for activate scan processing. Otherwise, a dummy TCTTE is placed on the NACP queue to write an error message.

DFHZLOC

Entry points: DFHZLOC1

Called by: DFHTC CTYPE=LOCATE

Description: The locate module provides two functions:

- Locates specific TCTTEs, TCTSEs, and SESSIONs in the TCT
- Locates LDC information.

DFHZLRP

Entry points: DFHZLRP1

Called by: DFHZARQ, DFHZSUP

Description: The logical record presentation module handles deblocking of input data. The delimiters that are recognized are new line (NL), interchange record separator (IRS), and transparent (TRN). One logical record is returned for each DFHTC TYPE=READ request.

DFHZLTX

Entry points: DFHZLTX1

Called by: VTAM

Description: The lost terminal (LOSTERM) exit module receives control when VTAM detects a loss of contact with a node. There are three possible return codes set by VTAM on entry to this routine:

node lost, recovery in progress
The terminal is placed out of service with no further action taken.

node lost, recovery successful
The TCTTE is queued to the NACP queue with a 'successful' error code set; NACP issues a CLSDST, schedules a SIMLOGON, and issues an information message.

node lost, no recovery or unsuccessful recovery
The TCTTE is queued to the NACP queue with an 'unsuccessful' error code set; NACP issues a CLSDST and also the appropriate message.

DFHZLUS

Entry points: DFHZLUS1

Description: DFHZLUS handles session management for LU6.2 sessions.

DFHZNAC

Entry points: DFHZNANA

Called by: DFHZACT

Description: The node abnormal condition program is attached by DFHZACT when an error in communication with a logical unit occurs. DFHZNAC performs the following functions:

- Analyzes abnormal conditions
- Sends appropriate messages to the CSNE transient data destination
- Invokes the user-supplied (or sample) node error program
- Takes the appropriate actions resulting from the defaults which may have been modified by the node error program.

DFHZNAC consists of the following copybooks:

```
DFHZNCA  - Primary error action table and exits
DFHZNCE  - Take action routine
DFHZNCS  - Sense decode routine
DFHZNCV  - VTAM return code routine.
```

DFHZNEP

Entry points: DFHZNENA

Called by: DFHZNAC

Description: The user-replaceable node error program provides:

- A general environment within which it is easy for users to add their own error processors
- Fundamental error recovery actions for a VTAM 3270 network
- The default NEP where the user selects a NEP at system initialization.

DFHZNSP

Entry points: DFHZNSP1

Called by: VTAM

Description: The network service program is invoked when VTAM detects a network service error; for example, when attempting to connect two nodes together, or when the link between two nodes is broken unexpectedly. This module receives control from the VTAM NSEXIT.

DFHZOPA

Entry points: DFHZOPA1

Called by: DFHEIQVT

Description: The open VTAM ACB module is invoked by DFHEIQVT when the master terminal command VTAM OPEN is issued. The ACB is opened and DFHZSLS is called to accept logon requests.

DFHZOPN

Entry points: DFHZOPN1

Called by: DFHZACT

Description: The open destination module acquires storage for an RPL and NIB and BIND areas if the TCTTE does not have these resources already, and sets up the BIND image if required. DFHZOPN then issues a VTAM OPNDST macro (or OPNSEC macro if secondary, to respond to an incoming BIND) to establish a session between CICS and the remote LU.

DFHZOPX

Entry points: DFHZOPX1

Called by: VTAM

Description: The open destination exit module receives control from VTAM on completion of the OPNDST macro in DFHZOPN. If the OPNDST was successful, it indicates in the TCTTE that SDT (start data transfer) is to be sent and checks whether a "good morning" message should be triggered. It then returns to VTAM.

DFHZQUE

Entry points: DFHZQUE1

Called by: All ZCP exits called by VTAM, DFHTCQUE macro

Description: The queue manipulation module processes all requests to add or remove a TCTTE to or from a ZCP activate queue. Additions to the activate queue made by mainline modules use compare-and-swap (CS), because an exit routine may also be adding to the queue asynchronously.

DFHZRAC

Entry points: DFHZRAC1

Called by: DFHZDSP

Description: The receive-any completion module processes the completion of receive-any requests, sets up the TIOA to be passed to attach, and reissues the RECEIVE_ANY macro.

DFHZRAQ

Entry points: DFHZRAQ1

Called by: DFHZARQ, DFHZSYN

Description: The read-ahead queuing module is used to save the inbound data stream in temporary storage when an interlock is caused by both the host and the terminal wanting to send data at the same time.

DFHZRAR

Entry points: DFHZRAR1

Called by: DFHZARQ

Description: The read-ahead retrieval module is called to retrieve data previously saved in temporary storage by DFHZRAQ.

DFHZRAS

Entry points: DFHZRAS1

Called by: DFHZRAC

Description: The receive-any slowdown processing module issues RECEIVE SPEC NQs on LU6.2 sessions for connections and modegroups for which there are ALLOCATE requests queued. This is only done on sessions considered most likely to lead to freeing a "flooding" situation that occurred when LU6.2 connections were reestablished after a failure.

DFHZRLG

Entry points: DFHZRLNA

Called by: DFHZACT

Description: The response logger program logs responses received for protected data sent to an APB. DFHZRLG processes TCTTEs on the log queue when attached by DFHZACT.

DFHZRLP

Entry points: DFHZRLP1

Called by: DFHZDSP

Description: DFHZRLP handles the completion of LU6.2 RECEIVE requests, using the receive RPL addressed by field TCTERPLB in the TCTTE LUC extension. It also manages the logical receive buffer pointers TCTERBLA and TCTERBLL in a consistent manner with the physical receive buffer pointers TCTERBA and TCTERBDL, as (address, length) pairs.

DFHZRLX

Entry points: DFHZRLX1

Called by: VTAM

Description: DFHZRLX is a VTAM exit routine that queues the completed RPL for (post-VTAM) processing by DFHZRLP.

DFHZRRX

Entry points: DFHZRRX1

Called by: VTAM

Description: The release request exit module receives control from VTAM when another application program has requested connection to a terminal currently connected to CICS. If the terminal is not busy, a CLSDST request is queued to the activate chain. Otherwise the release request indicator is set and the request is processed later by module DFHZDET.

DFHZRSP

Entry points: DFHZRSNA

Description: The resynchronization send program performs 3614-dependent actions and is also used to retransmit committed output messages. The message is retrieved from temporary storage if necessary.

DFHZRST

Entry points: DFHZRST1

Called by: DFHZACT, DFHZATI, DFHZCRQ, DFHZDET, DFHZEMW, DFHZERH, DFHZNAC, DFHZRAC, DFHZRSY, DFHZSTU

Description: The RESETSR module changes the mode of a session with a terminal and cancels unsatisfied RECEIVE requests. The mode that is set can be Continue Any (CA) or Continue Specific (CS) and RTYPE=DFSYN, DFASY, or RESP.

DFHZRSY

Entry points: DFHZRSY1

Called by: DFHZACT

Description: The resynchronize module resynchronizes CICS and other nodes of the network. DFHZRSY checks whether inbound and outbound sequence numbers are valid.

DFHZRVL

Entry points: DFHZRVL1

Called by: DFHZARL, DFHZARRL

Description: DFHZRVL processes RECEIVE commands for LU6.2 sessions, using the receive RPL (RPL_B) addressed by field TCTERPLB in the TCTTE LUC extension. The processing state of the receive RPL is held in the RPL_B state machine field TCTERPBS, also in the TCTTE LUC extension.

DFHZRVS

Entry points: DFHZRVS1

Called by: DFHZACT

Description: The receive specific module initiates a DFSYN receive specific to obtain the next logical record from a node when a user application issues a RECEIVE command.

DFHZRVX

Entry points: DFHZRVX1

Called by: VTAM

Description: The receive specific exit module receives control from VTAM when a receive specific is completed. If the data received is too long for the TIOA provided, the overlength data flag is turned on in the TCTTE and the TCTTE is put back on the activate chain. Otherwise, the response is checked and marked in the TCTTE. The data length is set in the TIOA and the FMH is removed.

DFHZSAX

Entry points: DFHZSAX1

Called by: VTAM

Description: The send DFASY exit module receives control from VTAM when an asynchronous command has completed. It places the TCTTE on the NACP queue if recovery is needed.

DFHZSCX

Entry points: DFHZSCX1

Called by: VTAM

Description: The SCIP exit module is entered whenever the following asynchronous commands are received:

- Non-LU6.2 BIND (as secondary)
- UNBIND (as secondary)
- STSN (as secondary)
- Clear (as secondary)
- SDT (as secondary)
- Request recovery (as primary).

The module correlates BINDs to a TCTTE and schedules DFHZOPN to complete the BIND process. For the other commands, it takes appropriate action and then schedules DFHZNAC using the NACP queue. This module calls DFHZBLX to process LU6.2 binds.

DFHZSDA

Entry points: DFHZSDA1

Called by: DFHZACT, DFHZSDS

Description: The send data flow asynchronous module handles asynchronous command requests. It ensures that an RPL is allocated, primes the RPL for the requested command, and issues the VTAM asynchronous send macro.

DFHZSDL

Entry points: DFHZSDL1

Called by: DFHZARL

Description: DFHZSDL processes SEND commands for LU6.2 sessions, using the RPL addressed by field TCTERPLA in the TCTTE.

DFHZSDR

Entry points: DFHZSDR1

Called by: DFHZACT, DFHZCRQ, DFHZDET, DFHZRVS, DFHZSDA, DFHZSDS

Description: The send response module sends responses to nodes when a synchronization request for a terminal is made and a response is outstanding from a previous operation. If errors occur during task initiation, this module is responsible for the negative response.

DFHZSDS

Entry points: DFHZSDS1

Called by: DFHZACT, DFHZARQ, DFHZATI, DFHZATT, DFHZDET

Description: The send data synchronous module sets up and issues the appropriate VTAM send macro for requests of “send data” or an SNA synchronous command.

DFHZSDX

Entry points: DFHZSDX1

Called by: VTAM

Description: The send data synchronous exit module receives control from VTAM when a SEND request is complete. It checks the RPL for successful completion of the message sent and takes appropriate action.

DFHZSES

Entry points: DFHZSES1

Called by: DFHZACT, DFHZRSY

Description: The session control module is entered whenever a session control command is requested by CICS. It sets up and issues the VTAM SESSIONC command.

DFHZSEX

Entry points: DFHZSEX1

Called by: VTAM

Description: The SESSIONC exit module receives control from VTAM when a SESSIONC command has completed. If the command was successful, it turns off the corresponding flags and enqueues the TCTTE on the activate chain. If the completion was not successful, the TCTTE is placed on the NACP queue for recovery processing.

DFHZSHU

Entry points: DFHZSHU1

Called by: DFHZDSP

Description: The close VTAM ACB module is invoked whenever CICS and VTAM are being uncoupled. This may be as a result of DFHZTPX being driven as the result of a VTAM halt command or the issue of the master terminal command SET VTAM,CLOSE|IMMCLOSE. The status of all sessions is checked and, when all are inactive, the ACB is closed.

DFHZSIM

Entry points: DFHZSIM1

Called by: DFHZACT

Description: The simulate logon module is entered to issue a VTAM SIMLOGON or REQSESS (if secondary) request to place a node in session without the operator having to logon. LU6.2 can be selected by mode name.

DFHZSIX

Entry points: DFHZSIX1

Called by: VTAM

Description: Whenever a SIMLOGON or REQSESS command has been completed, this exit routine is scheduled by VTAM. On successful completion, it turns off the SIMLOGON requested flag and enqueues the TCTTE or TCTME on the activate chain or, if NACP is required, for NACP processing.

DFHZSKR

Entry points: DFHZSKR1

Called by: DFHZACT

Description: The send command response module sends responses to VTAM commands including response to BIND, STSN, and SDT. A positive or negative response can be sent. The module is for secondary LU support only.

DFHZSLS

Entry points: DFHZSLS1

Called by: DFHZDSP, DFHZOPA

Description: The SETLOGON start module issues SETLOGON to cause VTAM to accept automatic logon requests, and issues the initial RECEIVE ANYs for RPLs in the receive-any pool. DFHZSLS also examines the SIT to determine whether autodefine is used. If it is, the appropriate system initialization parameters are copied to the TCT prefix.

DFHZSLX

Entry points: DFHZSLX1

Called by: VTAM

Description: DFHZSLX is a VTAM exit routine that handles the completion of LU6.2 SEND requests.

DFHZSSX

Entry points: DFHZSSX1

Called by: VTAM

Description: The send data flow synchronous exit module receives control when the send of a DFSYN command has been completed.

DFHZSTAP

Entry points: DFHZSTA1

Called by: DFHEGL, DFHETC, DFHETL

Description: DFHZSTAP determines the state of an MRO or LU6.2 conversation from an application viewpoint.

DFHZSTU

Entry points: DFHZSTU1

Called by: DFHTC CTYPE=STATUS, DFHEIQMT, DFHEIQSC, DFHEIQST

Description: DFHZSTU changes the status of TCTTEs and TCTSEs. It can change the following statuses:

- **Inservice**
- **Outservice**
- **Intlog | No intlog**

- Page | Autopage
- ATI | NATI.

DFHZSUP

Entry points: DFHZSUP1

Called by: DFHKCP

Description: The startup task module is the entry point for all terminal-related tasks. DFHZSUP performs the following functions:

- Sets up the TCTTE status
- Performs security checking
- Performs logging of the TCTTE status and input TIOA
- Performs PCT option checking
- Passes control to transaction program, for example, user application, DFHACP, DFHAPRT.

DFHZSYN

Entry points: DFHZSYN1

Called by: DFHDBP

Description: DFHZSYN handles CTYPE=SYNC and RECOVER requests. For protected message support, DFHSPP issues CTYPE=SYNC to clear protected messages. For RECOVER requests, DFHZSYN ensures that no further I/O is issued to that session, and that UNBIND flows.

DFHZSYX

Entry points: DFHZSYX1

Called by: VTAM

Description: The SYNAD exit module receives control from VTAM when a catastrophic error is encountered. DFHZSYX determines the type of error and the appropriate action to be taken, and schedules NACP using the NACP queue to complete the recovery processing.

DFHZTAX

Entry points: DFHZTAX1

Called by: VTAM

Description: The turnaround exit module is called by VTAM on completion of the SEND operation initiated by DFHZRVS in order to perform a turnaround in flip-flop protocol.

DFHZTPX

Entry points: DFHZTPX1

Called by: VTAM

Description: The TPEND exit module receives control when VTAM is terminating. It schedules a CLSDST for each active session if quick shutdown is required, and sets bits in the TCT prefix so that DFHZSHU is invoked.

DFHZTRA

Entry points: DFHZTRA1

Called by: DFHZACT, DFHZDET, DFHZRAC, DFHZRLP, DFHZRVS, DFHZSDL, DFHZSDR, DFHZSDS

Description: DFHZTRA creates VIO trace entries.

DFHZTSP

Entry points: DFHZTSP1

Called by: DFHAPRT, DFHISP, DFHRTE, DFHTPS, DFHZARQ, DFHZCQ, DFHZSUP

Description: The terminal sharing program acquires a TCTTE for a link to a remote CICS address space, and transfers request data to that space. DFHZTSP also receives requests from the remote address space.

DFHZUCT

Entry points: DFHZUCT1

Called by: DFHAPRT, DFHZARQ, DFHZCNA, DFHZRAC, DFHZRVX, DFHZSUP

Description: The uppercase translate module converts a VTAM 3270 data stream into uppercase.

DFHZUIX

Entry points: DFHZUIX1

Called by: DFHZACT, DFHZRAC, DFHZRVX

Description: The user input exit module is called directly (by DFHZRAC) or indirectly (by DFHZRVX via DFHZACT) to link to the user's XZCIN exit.

DFHZUSR

Entry points: DFHZUSR1

Called by: DFHACP, DFHETL, DFHZARER, DFHZARL, DFHZARM, DFHZARR, DFHZARRF, DFHZERH, DFHZOPX, DFHZSTAP, DFHZSUP, DFHZUSR, DFHZXRL, DFHZXRT

Description: DFHZUSR maintains the conversation state for LU6.2.

DFHZXCU

Entry points: DFHZXCU

Description: The VTAM XRF catch-up program is used to send messages that allow a new alternate system to catch up with the current state of the active system for:

- TCT contents
- Bound/unbound state of sessions.

The program is invoked when a new alternate system signs on.

DFHZXQO

Entry points: DFHZXQO

Called by: DFHTCRP, DFHZXST

Description: The XRF ZCP tracking queue organizer allows pending XRF tracking activity to be stored in a way that honors interdependencies, while allowing such requests to be met as soon as all their prerequisites are fulfilled. This component consists of a data structure and accessing program that uses the CICS catalog key structure to identify all the actions for a single resource and the dependencies between them. Actions are put into the structure on receipt in DFHTCRP, and removed by DFHTCRP and at the end of DFHZNAC processing for standby BIND and CLSDST completion. The structure is freed at the end of DFHTCRP tracking.

DFHZXRC

Entry points: DFHZXRC1

Called by: DFHZACT

Description: DFHZXRC analyzes the data received in response to the SESSIONC CONTROL=SWITCH command. It determines the state of the session at the point when it was switched, and initiates the necessary action to clean up and recover the session.

DFHZXRE0

Entry points: DFHZXRE0

Called by: System

Description: DFHZXRE0 runs the CXRE transaction to perform autoconnect and XRF reconnect processing. It also starts the acquire process for terminals with flag TCTEXRE set.

DFHZXRL

Entry points: DFHZXRL1

Called by: DFHZARL, DFHZISP

Description: DFHZXRL is executed in an application-owning region. It routes LU6.2 commands to the terminal-owning region.

DFHZXRT

Entry points: DFHZXRT1

Called by: DFHZTSP

Description: DFHZXRT executes in a terminal-owning region. It receives LU6.2 commands from the application-owning region, and issues them to an APPC device.

DFHZXST

Entry points: DFHZXST

Called by: DFHETC, DFHSIJ1, DFHTCRP, DFHTCRPS, DFHZNAC, DFHZOPA, DFHZXCU

Description: XRF ZCP session-state tracking is called by:

- DFHZNAC for BIND/UNBIND completion in the active system, and for standby-BIND and UNBIND in the alternate system
- DFHETC for logon data freed in the active system
- DFHTCRPS to handle a tracking message
- DFHTCRP to terminate session tracking
- DFHZXCU for BIND/UNBIND catch-up in the active system
- DFHSIJ1 and DFHZOPA to issue a SETLOGON START command.

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