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Part III - IMS Version 8 Installation and Migration Supplement



Abstract

This section is not presented.

It is included for reference purposes only.

ALWAYS check with the IBM Support Center before installing as requirements may change.

- ▶ Preventive Service Planning (PSP) for IMS

IMS

This section is intended for reference purposes only, although it could be presented if needed. The information is believed accurate as of the time of its creation, however, the user should **ALWAYS** check with the support center for the latest installation, migration, and coexistence information.

Installation

IMS V8

★ Packaging and Installation

- OS/390 Standards
- SMP/E Installation
- New IMS libraries
- User Exits

★ Installation Verification Program (IVP)

★ Product Number and FMIDs



IMS

IMS V8 Packaging and Installation

Changes have been made to IMS packaging and installation procedures

- ▶ So that IMS conforms to OS/390 packaging and installation standards
 - Makes IMS have the same look and feel as other products
- ▶ Reduces need for customers to have IMS-specific installation-skilled staff

IMS

Benefits

IMS V8 packaging and installation

- ▶ Conform to OS/390 standards
 - Makes IMS have the same look and feel as other products
 - Minimizes the need for customers to have IMS-specific installation skilled staff

New sample jobs are provided

- ▶ DFSALA and DFSALB to install IMS in its own SMP/E environment
- ▶ Additional IVP sample jobs show how to
 - Define an IMSplex
 - Issue IMSplex commands using the Single Point of Control (SPOC)
 - Use the Syntax Checker

Other

- ▶ Line update maintenance for user exit routines
- ▶ Option to eliminate Fast Path IVP samples



IMS V8 contains some packaging and installations enhancements. The enhancements are listed here and will be discussed in detail later.

Packaging - INSTALL/IVP

INSTALL/IVP process has changed

- ▶ IMS V8 **INSTALL/IVP** dialog process has been eliminated
 - Is replaced by two things, **INSTALL** and **IVP**
 - 'B' series jobs and tasks **removed** from IVP dialog
 - See '**Attachment A**' for list of jobs and tasks
- ▶ IMS V8 **IVP** is only used to verify the installation

INSTALL process

- ▶ IMS V8 is installed using the SMP/E installation process
- ▶ **INSTALL** process is documented in the '**Program Directory**'

IVP process

- ▶ Verifies the installation using a sample IMS system



In prior IMS versions, the **INSTALL/IVP dialog** process consisted of two steps:

1. Installing the IMS product (INSTALL), and then
2. Verifying the installation using a sample IMS system (IVP)

In IMS V8, the **INSTALL/IVP dialog** process has been eliminated. The process is replaced by two things:

- a. An **INSTALL** process using the Program Directory, rather the **INSTALL** portion of the **INSTALL/IVP dialog** process.
- b. An **IVP** process which is used only to verify the installation using a sample IMS system (IVP).

The Program Directory for IMS Version 8 contains:

- Information on the jobs used to install IMS. Each job contains instructions for customization to your environment.
- The instructions for downloading the jobs as well as the run sequence is provided in the Program Directory.

The changes have been made to comply with OS/390 standards for packaging and installing products. As a result of the changes 'B' series jobs and tasks have been removed from the IVP. For example, the following 'B' series jobs have been removed from the IVP:

IV_B101J - Allocate SMP/E Data Sets
IV_B202J - Initialize SMP/E zones
IV_B303J - SMP/E Processing - System Services
IV_B340J - JOB - JCLIN for IMS Non-Sysgen Functions

For a complete list of the B series jobs and tasks that have been removed from the IVP, please refer to 'Attachment A'.

Packaging - SMP/E INSTALL

SMP/E jobs are separate/removed from the IVP

- ▶ Jobs are now documented in the Program Directory
 - Sample installation jobs function as replacements for INSTALL/IVP 'B' series jobs of previous IMS releases
- ▶ **INSTALL** jobs are in a new IMS V8 library - **SDFSBASE**
 - See '[Attachment B](#)' for list of installation jobs



A new IMS library (ADFSBASE distribution library/SDFSBASE target library) contains sample installation jobs to perform an IMS V8 installation. The sample jobs, replacements for the INSTALL/IVP 'B' series jobs, are customized by the installation to install all IMS FMIDs using SMP/E.

Installation - Two New Install Jobs

Optional, sample jobs are provided

- ▶ Samples on how to install IMS in its own SMP/E environment

JOB	DESCRIPTION
DFSALA	Allocate and initialize new CSI
DFSALB	Initialize CSI zones Allocate SMP/E data sets Build DDDEF entries for SMP/E

Note: **Recommend** using these jobs to install IMS in its own SMP/E zone.

- ▶ If IMS is installed without using the sample jobs
 - Make sure **ACCJCLIN** parameter is set in the IMS distribution zone **BEFORE** IMS is installed
 - This is one of the items accomplished by running DFSALB

IMS

Two new, optional jobs are provided to create a new SMP/E environment. The optional jobs, DFSALA and DFSALB, should be run if you intend to install IMS in its own SMP/E environment. We recommend that you run these jobs.

If you do not use these jobs and use another method to install IMS, be sure ACCJCLIN is set in the IMS distribution zone before IMS is installed. This is one of the things accomplished by running the DFSALB job.

Installation - Installing the FMIDs

Install FMID s using SMP/E RECEIVE, APPLY, ACCEPT

- ▶ Changes made to conform to packaging standards

Run jobs DFSRECV1 - DFSRECV8 (SMP/E RECEIVE)

- ▶ Run one job per FMID (See Attachment 'B')

Run DFSAPPLY job (SMP/E APPLY)

- ▶ Performs SMP/E APPLY CHECK, then APPLY
- ▶ Expect return code '04'
 - Conditions are resolved during SYSGEN
- ▶ Expect new warning messages GIM43401W and GIM44402W
 - Messages issued for return code '04'

Run DFSACCEPT job (SMP/E ACCEPT)

- ▶ Performs SMP/E ACCEPT CHECK, then ACCEPT
- ▶ Expect return code '04' if HIPERs or '00' if no HIPERs



As previously mentioned, all IMS V8 FMIDs are installed using SMP/E RECEIVE, APPLY, and ACCEPT processing. The change has been made to conform to the packaging standard of using SMP/E to install FMIDs (rather than using a dialog process).

Some APPLY jobs will receive a return code '04' because a target library relationship does not exist during the SMP/E installation of IMS. When an IMS SYSGEN is performed, the unresolved conditions (which resulted from jobs that received a return code '04' during APPLY processing) will be fixed. Two new warning messages, which are generated as a result of receiving a return code '04' during APPLY processing, are: GIM43401W and GIM44402W.

The existing IEW2454W message, which causes the return code '04' during bind, for ACCEPT processing will continue to be issued. IEW2454W may also be issued during APPLY processing when binding into SMPLTS. SMPLTS is the SMP/E data set used as a target load module library to maintain the base version of a load module that specifies a SYSLIB allocation in order to implicitly include modules.

Installation - DFSJCLIN

DFSJCLIN

- ▶ Was used to build non-SYSGEN elements/parts
 - IV_B340 and IV_B350J
- ▶ No longer provided as an IVP job
 - IVP 'B' series job eliminated

SMP/E GENERATE command

- ▶ Used to create JCL necessary to build non-SYSGEN parts
 - Dependent on ACCJCLIN being set up in distribution zone BEFORE processing FMIDs

Non-SYSGEN parts are created during SMP/E APPLY processing

- ▶ Inline (++)JCLIN) provided with FMIDs used by SMP/E to accomplish this



The IMS system generation process does not build a complete system. Some elements are built outside of the system generation process. These elements must be separately identified to SMP/E, and the target libraries loaded by means other than SYSGEN (e.g. SMP/E APPLY).

In IMS V7 and prior versions, DFSJCLIN could be used to create the non-sysgen elements of the IMS system. The DFSJCLIN member of the ADFSISRC distribution library was provided as the input for SMP/E JCLIN. DFSJCLIN could also be run as a job (which is the equivalent of IV_B340 and IV_B350J job in IMS V7) in order to populate the appropriate target libraries. The member DXRJCLIN in the ADXRSAMP distribution library performed a similar function for the IRLM. Members DFSJIRLT and DFSJIDLT of the ADFSISRC distribution library performed similar functions for RSR.

Starting with IMS V8, non-SYSGEN elements are created during SMP/E APPLY processing. The SMP/E GENERATE command can be issued to create the JCL necessary to build the non-SYSGEN elements with the elements actually being created during SMP/E APPLY processing.

A SYSMOD can be constructed with the JCLIN necessary for its elements to be installed. In this case, the SYSMOD contains a ++JCLIN statement. When processing such a SYSMOD, SMP/E processes the JCLIN as part of the installation of the SYSMOD. During APPLY processing, and before changing any target zone entry affected by the JCLIN, a copy of that entry is stored on the SMPSCDS data set. This data is used by SMP/E in case the SYSMOD has to be RESTORED. The target zone can then be brought back to the level it was at before the APPLY was run.

New Sample Libraries

IMS V7

- ▶ IMS.ADFSSRC distribution library contains
 - IMS source code and samples (e.g. [user exit routines](#))
- ▶ A corresponding target library is **not** defined
 - By default, SMP/E used SMPSTS as the target library

IMS V8

- ▶ No longer uses the SMP/E default SMPSTS target library
 - A new [IMS.SDFSSRC](#) target library is used instead of SMPSTS
- ▶ Some samples have been moved from IMS.ADFSSRC distribution library to new IMS V8 libraries
 - [IMS.ADFSSMPL](#) distribution library
 - [IMS.SDFSSMPL](#) target library
 - See '[Attachment C](#)' for list of samples moved to new libraries



In IMS V7 IMS.ADFSSRC contains IMS source code and samples (samples such as: user exit routines, control block DSECTs, applications, jobs, etc.). A corresponding target library (such as IMS.SDFSSRC) is not defined in IMS V7 as the default SMP/E SMPSTS target library is used instead.

In IMS V8, several changes have been made:

- Some samples have been moved from the IMS.ADFSSRC distribution library to two new IMS V8 libraries:
 - IMS.ADFSSMPL**, the distribution library that contains samples (e.g. user exit routines)
 - IMS.SDFSSMPL**, the target library that contains samples (e.g. user exit routines)
- The default SMP/E SMPSTS target library is no longer used. A new target library, IMS.SDFSSRC, is defined as the target library.

'Attachment C' provides a list of the members contained in IMS.ADFSSMPL and IMS.SDFSSMPL libraries.

User Exits

User exits created as ++SRC (ASSEMBLER source) type elements/parts

- ▶ Allows line update during SMP/E service processing
 - As opposed to complete module replacement

Corresponding ++MOD parts (object code) are **NOT** shipped

- ▶ When IBM provides service, SMP/E is not automatically told to assemble and link the maintenance
 - If the customer creates MOD to LMOD relationships
 - SMP/E APPLY processing automatically assembles and binds user exits



User exits are created as ++SRC, ASSEMBLER source code) type parts. This allows maintenance to be applied by line update, as opposed to a complete replacement of the exit routine. The line update enhancement may simplify maintenance procedures for the customer.

Corresponding ++MOD parts (object code) are not shipped for user exit routines. When IBM provides service SMP/E does not automatically assemble and link the maintenance. This allows the customer to decide whether or not this should be done. If the customer creates the MOD to LMOD relationship, then SMP/E APPLY processing will automatically assemble and bind user exits.

New samples provided to support V8 enhancements

- ▶ **OM, RM, SCI, SPOC sample**
 - Define IMSplex
 - Start / Stop IMSplex
 - Single Point of Control (SPOC) demo
 - General use
 - New IMS commands sample
 - Classic (or current) IMS commands sample
- ▶ **Syntax Checker sample**
 - Converts IMS.PROCLIB(**DFSPBxxx**) startup parms from IMS V7 to IMS V8

Changes

- ▶ Panels updated (i.e. removed panels on installing FMIDs)
- ▶ Variables removed
- ▶ IVP provides option to have (or not have) Fast Path included in samples

As with prior versions of IMS, new IVP samples have been included to support IMS V8 functions.. New IVP samples are provided for the following:

- Operations Manager (OM), Resource Manager (RM), Structured Call Interface (SCI), and the Single Point of Control (SPOC)

New IVP samples jobs show how to define an IMSplex, start an IMSplex, and stop an IMSplex.

The IVP also provides sample jobs for using the Single Point of Control (SPOC). Included are samples that issue the

- ▶ New IMS commands (IMSplex commands) that may only be issued through the SPOC (or an equivalent).
- ▶ Classic, or existing IMS commands, that may be issued through the SPOC (or an equivalent).

- Syntax Checker

The IVP has been updated to include a sample job for the Syntax Checker. The Syntax Checker can read a DFSPBxxx member of IMS.PROCLIB for an IMS V7 system and use the V7 keywords and parameter specifications as input to an IMS V8 DFSPBxxx member of the PROCLIB for IMS V8. Syntax Checker can identify the new and/or obsolete keywords between versions This facility can be useful when migrating to a new version of IMS.

The IVP that ships with IMS V8 also provides an option to allow the customer to decide whether or not Fast Path samples are to be included.

IMS V8

Program Number 5655-C56



FMID HMK8800 - System Services
IVP
Database Recovery Control (DBRC)
Logger

FMID JMK8801 - Database Manager

FMID JMK8802 - Transaction Manager
APPC/LU Manager

FMID JMK8803 - Extended Terminal Option

FMID JMK8804 - Remote Site Recovery / Recovery-Level Tracking

FMID JMK8805 - Remote Site Recovery / Database Level Tracking

FMID JMK8806 - IMS Java Application Support

FMID HIR2101 - IRLM V2 R1 (product number 5695-164)

Orderable Optional Source
Database
System Services

The IMS logo is located in the bottom right corner of the page, consisting of the letters 'IMS' in a stylized, bold font with a blue and red color scheme.

The IMS V8 product number and FMIDs are listed.

Summary

IMS V8 packaging, installation, and IVP changes

▶ **Packaging**

- Installation and IVP are separate processes

▶ **Installation**

- ADFSBASE | SDFSBASE contain sample jobs to install IMS
 - DFSALA and DFSALB sample jobs provided to install IMS in its own SMP/E environment
- Non SYSGEN elements built during SMP/E APPLY processing
- SMP/E processing done using RECEIVE, APPLY, and ACCEPT

▶ **Samples and some user exits**

- Are located in new IMS V8 libraries - ADFSSMPL | SDFSSMPL
- Line update maintenance provided for user exits

▶ **Installation Verification Program (IVP)**

- New name, install jobs removed, panels updated, variables removed
- Includes IMS V8 samples
 - OM, RM, SCI, SPOC sample, Syntax Checker sample
- Provides option to include/exclude Fast Path samples



Attachment A - 'B' Series Jobs

JOB	DESCRIPTION
IV_B001T	NOTE - STEP INTRODUCTION - DLIB BUILD - IMS
IV_B003T	NOTE - STEP INTRODUCTION - DLIB BUILD - RSR/RLT
IV_B004T	NOTE - STEP INTRODUCTION - DLIB BUILD - RSR/DLT
IV_B005T	NOTE - STEP INTRODUCTION - DLIB BUILD - SURVEYOR
IV_B006T	NOTE - STEP INTRODUCTION - DLIB BUILD - IRLM S
IV_B007T	NOTE - STEP INTRODUCTION - DLIB BUILD - PRE-GEN
IV_B008T	NOTE - STEP INTRODUCTION - DLIB BUILD - FUNCTION DELETE
IV_B009T	NOTE - STEP INTRODUCTION - DLIB BUILD - ETO
IV_B010T	NOTE - STEP INTRODUCTION - DLIB BUILD - ORS
IV_B101J	JOB - ALLOCATE SMP/E DATA SETS
IV_B102J	JOB - ALLOCATE IMS DLIB DATA SETS
IV_B103J	JOB -ALLOCATE IMS SYSLIB DATA SETS
IV_B202J	JOB - INITIALIZE SMP/E ZONES >>> SEE DESC.
IV_B203T	XMPL - DELETE AND RE-DEFINE TZONE, MTS, STS, SCDS
IV_B204J	JOB - ZONEMERGE PRIOR DLIBZONE INTO CURRENT
IV_B205J	JOB - DELETE PRIOR RELEASE/FUNCTION
IV_B207J	JOB - PGEN SERVICE - RECEIVE >>> SEE DESC.
IV_B208J	JOB - CBPDO - RECEIVE
IV_B209T	TASK - CBPDO - PRINT PDIRS
IV_B210J	JOB - PRINT SMP/E HOLDDATA
IV_B211T	TASK - RESEARCH EXCEPTION SYSMODS



This is a list of the IVP 'B' series jobs that have been removed from the IVP. These jobs are referenced on page 6. The 'B' Series jobs were run as part of the installation process for IMS V7 and prior versions.

These jobs have been eliminated from the IMS V8 IVP dialog process as sample jobs are provided and pointed to by the Program Directory.

Attachment A - 'B' Series Jobs ...

JOB	DESCRIPTION
IV_B303J	JOB - SMP/E PROCESSING - SYSTEM SERVICES
IV_B305J	JOB - SMP/E PROCESSING - DATA BASE MANAGEMENT
IV_B307J	JOB - SMP/E PROCESSING - TRANSACTION MANAGEMENT
IV_B310J	JOB - SMP/E PROCESSING - ETO FEATURE
IV_B330J	JOB - PGEN SERVICE - ACCEPT GROUPEXTEND
IV_B331J	JOB - ZONEMERGE DLIB TO TARGET
IV_B332J	JOB - SMP/E PROCESSING - IRLM INSTALL AND SERVICES
IV_B333J	JOB - SMP/E PROCESSING - RSR/RLT FEATURE
IV_B334J	JOB - SMP/E PROCESSING - RSR/DLT FEATURE
IV_B335J	JOB - SMP/E PROCESSING - ONLINE RECOVERY SERVICE
IV_B337J	JOB - SMP/E PROCESSING - NON SYSGEN SERVICE - APP/ACC GROUPEXTEND
IV_B340J	JOB - JCLIN FOR IMS NON-SYSGEN FUNCTIONS
IV_B350J	JOB - FINISH INSTALL OF IMS NON-SYSDEF FUNCTION
IV_B360T	TASK - JCLIN/UCLIN/LKED/ETC. FOR OTHER PRODUCTS
IV_B401J	JOB - SMP/E PROCESSING - IRLM
IV_B501J	JOB - COPY OPTIONAL SOURCE TAPES
IV_B503T	TASK - INSTALL/IVP SERVICE >>> SEE DESC.

IMS

Attachment B - Installation Jobs

JOB	FUNCTION
DFSALA	OPTIONAL, SAMPLE JOB TO ALLOCATE/INITIALIZE A NEW SMP/E CSI DATA SET
DFSALB	OPTIONAL, SAMPLE JOB TO ALLOCATE SMP/E DATA SETS
DFSRECV1	SAMPLE JOB TO RECEIVE IMS SYSTEM SERVICES
DFSRECV2	SAMPLE JOB TO RECEIVE IRLM
DFSRECV3	SAMPLE JOB TO RECEIVE IMS DB
DFSRECV4	SAMPLE JOB TO RECEIVE IMS TM
DFSRECV5	SAMPLE JOB TO RECEIVE IMS ETO FEATURE
DFSRECV6	SAMPLE JOB TO RECEIVE RECOVERY LEVEL TRACKING FEATURE
DFSRECV7	SAMPLE JOB TO RECEIVE DATABASE LEVEL TRACKING FEATURE
DFSRECV8	SAMPLE JOB TO RECEIVE JAVA
DFSALLOC	SAMPLE JOB TO ALLOCATE TARGET AND DISTRIBUTION LIBRARIES
DFSJMKD	SAMPLE JOB TO INVOKE SUPPLIED DFSJMKDR EXEC TO ALLOCATE HFS PATHS
DFSDDEF1	SAMPLE JOB TO DEFINE SMP/E DDDEFs FOR IMS
DFSDDEF2	SAMPLE JOB TO DEFINE SMP/E DDDEFs FOR IMSJAVA
DFSAPPLY	SAMPLE APPLY JOB
DFSACCEP	SAMPLE ACCEPT JOB



A new IMS library (ADFSBASE distribution library and SDFSBASE target library) contains sample jobs to perform an IMS V8 installation. The sample jobs are replacements for the INSTALL/IVP 'B' series jobs and are customized by the installation to install all desired IMS FMIDs using SMP/E. The table provides a list of the jobs that are run in the IMS V8 installation process.

ADFSSMPL/SDFSSMPL

MEMBER	DESCRIPTION
DBFMLBX0	FAST PATH MADS I/O TIMING USER HASH ROUTINE
DFSADSCT	IMS CONTROL BLOCK DSECTS
DFSAOE00	TYPE 2 AUTOMATED OPERATOR EXIT ROUTINE
DFSAOPGM	AUTOMATED OPERATOR SAMPLE APPLICATION PROGRAM
DFSAOUE0	TYPE 1 AUTOMATED OPERATOR EXIT ROUTINE
DFSBXITA	CEEBXITA ASSEMBLER USER EXIT FOR IMS
DFSCCMD0	COMMAND AUTHORIZATION EXIT ROUTINE
DFSCMLR0	MSC LINK RECEIVE ROUTING EXIT ROUTINE
DFSCMPR0	MSC PROGRAM ROUTING EXIT ROUTINE
DFSCMPX0	SEGMENT EDIT/COMPRESSION EXIT ROUTINE
DFSCMTR0	TERMINAL ROUTING EXIT ROUTINE
DFSCNTE0	MESSAGE SWITCHING (INPUT) EDIT ROUTINE
DFSCSGN0	SIGN ON/OFF SECURITY EXIT ROUTINE
DFSCSMB0	TRANSACTION CODE (INPUT) EDIT ROUTINE
DFSCTRN0	TRANSACTION AUTHORIZATION EXIT ROUTINE
DFSCCTO0	PHYSICAL TERMINAL (OUTPUT) EDIT ROUTINE
DFSFDOT0	DUMP OVERRIDE TABLE
DFSFEBJ0	FRONT-END SWITCHCH EXIT ROUTINE
DFSGMSG0	GREETING MESSAGES EXIT ROUTINE
DFSINSX0	OUTPUT CREATION EXIT ROUTINE
DFSINTX0	INITIALIZATION EXIT ROUTINE
DFSISC00	IMS-CICS ISC SAMPLE PROGRAM
...	

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The following is a list of the members contained in the IMS.ADFSSMPL distribution library and the IMS.SDFSSMPL target library. Some sample user exit routines and other samples have been moved to these new IMS V8 libraries. (The samples were moved from the ADFSSRC distribution library.)

Attachment C - Elements/Parts ...

ELEMENT/PART	DESCRIPTION
DFSJVMAP	MAPPING EXAMPLE FOR AN IMS JAVA PSB
DFSJVMEV	SAMPLE JAVA ENVIRON= MEMBER
DFSJVMMS	SAMPLE JAVA JVMOPMAS= MEMBER
DFSJVMWK	SAMPLE JAVA JVMOPWKR= MEMBER
DFSKMPX0	SEGMENT EDIT/COMPRESSION EXIT ROUTINE
DFSLGFX0	LOGOFF EXIT ROUTINE
DFSLGNX0	LOGON EXIT ROUTINE
DFSMSCE0	TM and MSC MESSAGE ROUTINE and CONTROL USER EXIT ROUTINE
DFSNDMX0	NON-DISCARDABLE MESSAGES EXIT ROUTINE
DFSNPRT0	INPUT MESSAGE ROUTING EXIT ROUTINE
DFSPIXT0	PHYSICAL TERMINAL (INPUT) EDIT ROUTINE
DFSPRE60	SYSTEM DEFINITION PREPROCESSOR EXIT ROUTINE (INPUT PHASE)
DFSPRE70	SYSTEM DEFINITION PREPROCESSOR EXIT ROUTINE (NAME CHECK COMPLETE)
DFSPSE00	HALDB Partition Selection Exit Routine
DFSREXXU	IMS ADAPTER FOR REXX EXIT ROUTINE
DFSSGFX0	SIGNOFF EXIT ROUTINE
DFSSGNX0	SIGN-ON EXIT ROUTINE
DFSSIML0	SHARED PRINTER EXIT ROUTINE
DFSUTL	SAMPLE MVS IEFUTL TIMEOUT EXIT
DFSYCCMP	JOB TO COMPILE and LINK C PROGRAM DFSYCSMP
DFSYCRUN	JOB TO INVOKE THE C SAMPLE PROGRAM DFSYCSMP
DFSYCSMP	EXAMPLE FOR USING THE OTMA CLIENT API FOR THE C LANGUAGE
DFSYCWAT	PROCEDURE USED TO SUSPEND THE CURRENTLY EXECUTING TASK
...	

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Attachment C - Elements/Parts ...

ELEMENT/PART	DESCRIPTION
DFSYDRU0	OTMA DESTINATION RESOLUTION EXIT ROUTINE
DFSYINIT	JOB TO EXECUTE PROGRAM DFSYSV10
DFSYIOE0	OTMA INPUT/OUTPUT EDIT EXIT ROUTINE
DFSYPRX0	OTMA PREROUTING EXIT ROUTINE
DFSZLDSF	PL/I SOURCE PROGRAM THAT GETS VARIABLE LENGTH FAST PATH SEGMENTS and PUTS THEM INTO A QSAM DATA SET
DFSZLDSG	PL/I SOURCE PROGRAM THAT GETS ALL FAST PATH SEGMENTS & PUTS THEM INTO A QSAM DATA SET
DFSZLDSP	PL/I SOURCE PROGRAM THAT GETS FIXED LENGTH SEGMENTS OF 1 SEGMENT TYPE and PUTS THEM TO A QSAM DATA SET
DFSZLDSQ	PL/I SOURCE PROGRAM THAT GETS ALL FIXED LENGTH SEGMENTS FROM A DATABASE and PUTS THEM IN QSAM DATA SET
DFSZLDSV	PL/I SOURCE PROGRAM THAT GETS VARIABLE LENGTH SEGMENTS OF 1 SEGMENT TYPE and PUTS THEM INTO A QSAM DATA SET
DFSZLDSW	PL/I SOURCE PROGRAM THAT GETS ALL VARIABLE LENGTH SEGMENTS FROM A DATABASE and PUTS THEM INTO A QSAM DATA SET
DFS36010	4701 TRANSACTION INPUT EDIT ROUTINE
DSPCEXT1	RECON I/O EXIT ROUTINE
DSPDCAX0	DBRC COMMAND AUTHORIZATION EXIT ROUTINE
DSPSCIX0	DBRC SCI REGISTRATION EXIT ROUTINE
UETRANS	SAMPLE AUTOMATED OPERATOR (AO) APPLICATION PROGRAM

IMS

Migration

Software requirements

Supported connections

Coexistence

Requirements

Migration

IMS Tools support



IMS

Software Requirements

IMS Base Product

- ▶ OS/390 V2 R10 or later
- ▶ IBM High Level Assembler Release 2 (5696-234)
 - High Level Assembler Toolkit feature

Transaction Trace

- ▶ OS/390 V2 R10 with APAR OW50696

MSC FICON CTC support

- ▶ z/OS V1 R2

Synchronous APPC/OTMA SMQ Enablement

- ▶ z/OS V1 R2 with Resource Recovery Services (RRS) enabled
 - On all systems where members of the shared queues group execute



IMS V8 requires a minimum of OS/390 V2 R10. As we will see, some functions require a higher level of the operating system.

IMS V8 also requires the High Level Assembler Release 2 with the High Level Assembler Toolkit feature. This feature is also required for IMS V7, but not for IMS V6. Those migrating directly from IMS V6 should ensure that they have this feature.

The new transaction trace is implemented in OS/390 V2 R10 via APAR OW50696.

MSC FICON CTC support requires z/OS V1 R2. It also has hardware requirements. At least one side of the MSC link must be an IBM G6 processor or IBM zSeries with the FICON channel and FICON CTC microcode. The other side can be any processor with a FICON channel.

Synchronous APPC/OTMA shared message queue enablement uses the multi-system cascaded transaction support of RRS in z/OS V1R2. This is expected to be delivered via an APAR.

Software Requirements ...

IMS Java Applications require

- ▶ The IBM Developer Kit for OS/390, Java 2 Technology Edition (5655-D35), with the Persistent Reusable Java Virtual Machine (JVM)
 - This is required for the new IMS V8 Java Dependent Region support

Java Application Program access to IMS DB

- ▶ From DB2 Stored Procedures
 - Requires DB2 V7 with APAR PQ46673
- ▶ From CICS applications
 - Requires CICS TS V2
- ▶ From WebSphere applications
 - Requires WebSphere Application Server z/OS V4.0.1
 - and -
 - WebSphere Application Server z/OS Connection Management support



The requirement for the Persistent Reusable JVM is new in IMS V8. IMS V7 used the High Performance Java Compiler for IMS Java application support. This is not supported in IMS V8.

Software Requirements ...

All IMS V8 CF Structures require a minimum of

- ▶ CF Level 9

System-Managed Duplexing of VSO, CQS, and IRLM structures require

- ▶ z/OS V1 R2
- ▶ CF level 11
- ▶ Bidirectional CF to CF links

Sysplex Terminal Management session-level affinity support requires

- ▶ z/OS 1.2



System-managed rebuild for VSO, shared queues, and the IRLM lock structure is available with IMS V7. This requires OS/390 V2 R8 or higher.

Auto-Alter for OSAM, VSAM, CQS, and IRLM structures is available with IMS V7. This requires OS/390 V2 R10 or higher.

System-Managed Duplexing of VSO, CQS, and IRLM structures is available with IMS V7. Both IMS V7 and IMS V8 require z/OS V1 R2 and CF Level 10 for this support.

The new Sysplex Terminal Management support in IMS V8 includes the capability to support session-level affinities for VTAM. This requires z/OS 1.2.

Software Requirements ...

IMS/DB2 Coordinated Disaster Recovery Support requires

- ▶ XRC (Extended Remote Copy) for DB2
- ▶ Remote Site Recovery
 - Recovery Level (or Database Level) Tracking for IMS



IMS/DB2 Coordinated Disaster Recovery Support is based on IMS using Remote Site Recovery and DB2 using XRC. IMS RSR requires the Recovery Level Tracking feature. DB2 logs and BSDSs must be propagated to the disaster recovery site by XRC.

Supported Connections

ISC is supported with

- ▶ All supported IMS releases: IMS V8, V7, and V6
- ▶ All supported CICS releases: CICS TS V1 and V2, CICS/ESA V4
- ▶ User written software

DB2 connections are supported to

- ▶ All supported DB2 releases: DB2 V6 and V7

DBCTL connections are supported with

- ▶ All supported CICS releases: CICS TS V1 and V2, CICS/ESA V4

MSC is supported with

- ▶ All supported IMS releases: IMS V8, V7, and V6 with PQ27555



Coexistence Requirements

IMS V8 has some requirements to coexist with prior IMS versions in the areas of

- ▶ Database Recovery Control (DBRC)
- ▶ Data Sharing
 - Common Queue Server (CQS)
 - Fast Path Data Sharing Restrictions
 - VSO structure allocation on systems with system-managed duplexing
 - Different sizes for primary and secondary NON-PRELOADED VSO structures
 - Non-recoverable DEDBs
 - DEDBs with more than 240 areas
 - APPC/OTMA synchronous shared queues support
- ▶ Utility Inputs



IMS V8 has some requirements to coexist with prior IMS versions in the areas listed.

Coexistence Requirements ...

- ▶ Exit Routines
 - RECON I/O Exit Routine
 - Multiple Systems Coupling (MSC) Exit Routines

- ▶ IMS Commands
 - Not Supported
 - Not Recoverable
 - Issued by Automated Operator (AO) programs

- ▶ Remote Site Recovery (RSR) Coordinated Disaster Recovery for IMS and DB2

- ▶ High Performance Java (HPJ) compiler

- ▶ Sysplex Terminal Management

- ▶ Message Requeuer and Queue Control Facility (QCF)

The IMS logo consists of the letters 'IMS' in a bold, blue, sans-serif font. The letters are slightly shadowed, giving them a three-dimensional appearance as if they are floating above a surface.

Coexistence Requirements ...

- ▶ Extended Checkpoint
- ▶ Coordinated Online Change
- ▶ Installation Verification Program (IVP)
- ▶ Automated Operator (AO) programs

Coexistence requirements are covered in the
'Migration' section

IMS

Migration

Initial Migration Assumption

- ▶ This section assumes you will initially migrate to IMS V8 without implementing optional new functions
 - Implementation of new functions was covered in previous class materials

Migration Overview:

- ▶ Similar tasks as previous IMS release-to-release migrations
- ▶ Application programs continue to work without any change or recompile
- ▶ Databases do not have to be changed, upgraded, reorged, image copied, etc.



Migration ...

Migration tasks

- ▶ Apply coexistence maintenance to other IMS systems
 - DBRC, MSC, RSR

- ▶ Install IMS V8
 - See IVP Enhancements section of this class

- ▶ Upgrade RECONs

- ▶ System definition

- ▶ ACBGEN

- ▶ Possible upgrade to IMS tools and related products

- ▶ Possible modifications to procedures or jobs

IMS

PSP Buckets

See IMS PSP buckets

- ▶ Upgrade name: IMS810

- ▶ Subset entries:
 - CHG/INDEX
 - Used to reference changes in entire upgrade
 - HMK8800 - System Services
 - JMK8801 - Database Manager
 - JMK8802 - Transaction Manager
 - JMK8803 - ETO
 - JMK8804 - Recovery Level Tracking
 - JMK8805 - DB Level Tracking
 - JMK8806 - IMS Java Application Support
 - HIR2101/0036 - IRLM V2.1



Before installing IMS V8 you should check the Preventive Service Planning (PSP) bucket for IMS V8. It is found by using Upgrade Name IMS 810. The subset entries are listed here.

Release Coexistence and Fallback

Coexistence with previous releases

- ▶ Data Sharing
 - IMS databases may be shared between IMS V8, V7, and V6
- ▶ IMS V8 database recovery utilities accept inputs generated by previous releases
 - Image Copies
 - Change Accumulations
 - Logs
- ▶ IMS V8 RECONs may be used by IMS V7 and V6

Fallback support

- ▶ A system may fallback to a previous release after upgrade to IMS V8
 - IMS V8 RECONs are used
 - Database recoveries use IMS V8 utilities



IMS V8 may coexist with other supported IMS releases. These are IMS V7 and IMS V6.

Databases may be shared between IMS V8, V7, and V6. The IMS V8 database recovery utilities accept inputs which were produced by multiple IMS releases. These inputs include Image Copies, Change Accumulations, and logs. The image copies include all types, such as IC2, CIC, and OLIC. When using data sharing, all sharing IMS subsystems must use the same set of RECONs. If IMS V8 is one of these subsystems, the RECONs must be at the IMS V8 level.

Fallback from IMS V8 to a previous release is supported. That is, you may process using IMS V8 and later use IMS V7 or V6. If a fallback is done, the RECONs must remain at IMS V8. That is, there is no way to "downgrade" a set of RECONs from IMS V8 to a previous release level. If any of the inputs to a recovery were produced by IMS V8, the IMS V8 utilities must be used to process the input.

Utilities Coexistence

Utility inputs

- ▶ Batch Backout, Log Archive, and Log Recovery
 - Use utility from IMS release which produced the log

- ▶ IMS V8 Database Recovery utility and Online Recovery Service (ORS)
 - Accept Image Copies from IMS V8, V7, and V6
 - Accept HISAM Unloads from IMS V8, V7, and V6
 - Accept logs from IMS V8, V7, and V6
 - Accept Change Accumals from IMS V8, V7, and V6*
 - *ORS will not accept a CA from IMS V6

- ▶ IMS V8 Change Accumulation utility
 - Accepts logs from IMS V8, V7, and V6
 - Accepts Change Accumals from IMS V8, V7, and V6



The Batch Backout, Log Archive, and Log Recovery utilities read only logs from one IMS system. The utility which reads these logs must be at the same release as the system which created the logs.

On the other hand, some utilities may read logs created by multiple IMS systems. Since these systems might be at different release levels, these utilities may need to read logs from multiple releases. There is one minor exception. ORS will not accept Change Accumulation data sets created by IMS V6. This is true for ORS executions running under both IMS V7 and IMS V8.

Migration - Logs

Log records have been modified and added

- ▶ Products which read logs may need to be updated
- ▶ User written programs may need to be modified

- ILOGREC macro may be assembled for guidance

```
ILOGREC RECID=ALL
```

- For guidance on macros for Fast Path log records see Log Records section of SYS-System Service Aids chapter in IMS V8 Diagnosis Guide and Ref.

IMS

RECON Migration

RECONs must be upgraded to V8

- ▶ RECON compatibility SPE should be applied to IMS V6 and/or V7
 - Required if IMS V6 or V7 will access RECONs after upgrade
- ▶ RECONs are upgraded with DBRC Utility (DSPURX00)
 - May upgrade from IMS V6 or V7
 - RECON Upgrade utility (DFSURU00) is not available

Coexistence

- ▶ V8 RECONs may be used by IMS V7 or V6
 - V7 compatibility SPE: PQ54585 (UQ99327)
 - V6 compatibility SPE: PQ54584 (UQ99326)

IMS V6 DBRC systems can not access or display some information in an IMS V8 RECON.



You should apply the RECON compatibility SPE to your existing IMS system before upgrading your RECONs. You must do this to allow your existing IMS system to access the RECONs after the upgrade.

The upgrade process is the same as it was when going from IMS V6 to V7. That is, the upgrade is done by using the DBRC CHANGE.RECON UPGRADE command. This command may be used to upgrade IMS V6 RECONs to IMS V8 and to upgrade IMS V7 RECONs to IMS V8. The DBRC Upgrade utility which was used to upgrade RECONs from IMS V5 and prior releases is not available with IMS V8

IMS V6 systems can not access/display: the partition (PART record, DBDSGRP records defined in IMS V8/V7 as Recover groups, and fields added to RECON records for IMS V8 (e.g. non-recoverable DEDBs and DEDBs with more than 240 areas)

RECON Migration ...

Sharing RECONS with previous releases

- ▶ IMS V7 and V6 can read and write segmented records
 - Requires compatibility SPE
 - Maximum record size still limited by RECORDSIZE for IMS V7 and V6
- ▶ Previous releases required the same record and CI sizes in all RECONS
 - Equal sizes recommended, but not required, in IMS V8



RECON Migration ...

Large RECON Record Warning Messages

- ▶ Adjust LOGALERT and SIZALERT specifications
 - Based on space left in 16MB record
 - Do not do this while still using the RECONs with IMS V7
 - IMS V7 limits record to the VSAM maximum record size specification



LOGALERT and SIZALERT parameters control the issuing of warning messages. They are based on the amount of space available to expand the record. For IMS V8 a record is limited to 16MB. For IMS V7 a record is limited to the VSAM maximum record size specification. If IMS V8 and V7 both use the RECONs, you must be careful about the LOGALERT and SIZALERT settings. Values based on a limit of 16MB would probably cause IMS V7 to issue the warning messages much before you want them.

Migration - Exit Routines

RECON I/O Exit routine (DSPCEXT0)

- ▶ Receives V8 format records after upgrade
 - IMS V7 or V6 exit routine receives V8 format
 - During concurrent upgrade, exit routine receives old format before upgrade and V8 format after upgrade
- ▶ Receives unsegmented records
 - Up to 16 megabytes
- ▶ Exit [interface](#) has not changed
 - If exit routine sensitive to RECON [record formats](#)
 - Exit will have to be modified



MSC Exit Routines Removed

IMS V8 removes support for DFSCMPRO, DFSCMTR0, DFSCMLR0, DFSCMLR1, and DFSNPRT0

- ▶ TM and MSC Message Routing and Control User exit routine (DFSMSCE0) replaces them
 - Introduced in IMS V7
 - Consolidates functions of other message exit routines
 - New routing capabilities
- ▶ IMS V7 users should migrate to new exit routine while on IMS V7
- ▶ IMS V6 users must migrate to new routine when migrating to IMS V8



IMS V8 removes support for the following exit routines:

- DFSCMPRO - MSC Program Routing exit routine
- DFSCMTR0 - Terminal Routing exit routine
- DFSCMLR0/DFSCMLR1 - MSC Link Receive Routing exit routines
- DFSNPRT0 - Input Message Routing exit routine

Their functions have been moved to the TM and MSC Message Routing and Control User exit routine, DFSMSCE0. IMS V7 introduced this exit routine. If you are using IMS V7, you should migrate the earlier exit routines to DFSMSCE0 before migrating to IMS V8. If you are using IMS V6, you must migrate to DFSMSCE0 when you migrate to IMS V8.

Commands Not Supported

IMS commands not supported in IMS V8:

- ▶ /TEST LINE
 - ▶ /TEST NODE
 - ▶ /TEST USER
- These commands put the line, node, or user in test (echo) mode
 - Test mode caused input to be sent back to the terminal



Three rarely used commands are no longer supported in IMS V8. These are the /TEST LINE, /TEST NODE, and /TEST USER commands. These commands caused input to be sent back or "echoed" to the terminal.

The /TEST MFS command is still supported in IMS V8.

The commands which are not supported do not apply to DBCTL systems.

Commands Not Recoverable

IMS commands not recoverable in IMS V8:

- ▶ /LOCK LTERM, /LOCK NODE, /LOCK PTERM
- ▶ /PSTOP LTERM
- ▶ /PURGE LTERM
- ▶ /SET LTERM, /SET TRAN
- ▶ /RESET
- ▶ /UNLOCK LTERM, /UNLOCK NODE, /UNLOCK PTERM
 - The effects of these commands will not be recovered when IMS is terminated and restarted



These commands are supported in IMS V8, but they are not recoverable. If IMS is restarted the effects of these commands are not reinstated. For example, a node which is locked by a /LOCK NODE command will not be locked if IMS is restarted.

The /RESET and /UNLOCK commands undo the effects of the /SET and /LOCK commands. Since the /SET and /LOCK commands which are listed here are not recoverable, a restart of IMS undoes their effects. This means that the /RESET and /UNLOCK commands do not need to be recoverable. The undoing of the settings done by /SET and /UNLOCK is not required.

The commands listed here do not apply to DBCTL systems.

Automated Operator (AO) Applications

User-written AO programs on pre-IMS V8 systems may coexist with an IMS V8 IMSplex Single Point of Control (SPOC) application

- ▶ But the behavior of some IMS commands may be different when the commands are issued by an IMS V8 SPOC application
 - For example, to stop a node on 15 IMSs in an IMSplex using the
 - **OS/390 ROUTE *ALL** command would result in **15** updates to the Resource Structure in the CF
 - **SPOC application** to access the Operation Manager (OM) API would result in only **1** update to the Resource Structure in the CF



If you have user-written automated operator applications on pre-IMS Version 8 systems and you want those systems to coexist with an IMS Version 8 IMSplex, consider carefully the ramifications of intermixing these applications with the actions of a IMS Version 8 SPOC application, such as the TSO SPOC application.

For example, if you want to stop a node on all the IMSs in an IMSplex (and you used the OS/390 ROUTE *ALL command), each IMS in the IMSplex would stop the node and initiate an update to the Resource Manager for that node. If there were 15 IMSs in the IMSplex, the Resource Manager would access a CQS 15 times and the CQS would perform 15 updates to the resource structure in the coupling facility. The same action (stop the node) performed from a SPOC application accessing the OM API would result in only one update to the resource structure.

Recommendation: For those who are using complex, user-written schemes for managing multiple IMSs in a Sysplex environment, IBM recommends evaluating the new system management functions delivered in IMS Version 8 as a replacement.

IC2 Automation Migration

IMS V8 changes the logical copy complete message

▶ IMS V7:

DFS3121A LOGICAL COPY SUCCESSFUL FOR DB/AREA
dbname DDN ddname DSN dsname

▶ IMS V8:

DFS3121A LOGICAL COPY COMPLETE FOR DB/AREA
dbname; n OF m DATA SETS FAILED

followed by:

DFS3121I COPIED DB/AREA dbname DDN ddname DSN
dsname

Automation based on this message may require
~~modification~~

IMS

When a logical copy completes, the database may be restarted. It may be read and updated while the physical copy completes. Installations may have used automation to respond to the logical copy by issuing a /START DB command.

The message has changed in IMS V8. Since IMS V8 IC2 may copy multiple data sets in one execution, the logical copy complete message has changed. There are two messages. The DFS3121A message indicates that the data sets in the database or area have been logically copied. The DFS3121I message lists the copied data sets. Even if you continue to copy only one data set per IC2 execution, you will receive both messages. This change may require modifications to automation that reacts to the DFS3121A message.

Similar changes are NOT required for physical copy complete. Previous releases of IMS did not have a physical copy complete message. Since the job step ended with the completion of the physical copy, the job step completion message could be used as a sign that the copy was complete. This remains true when only one data set is copied per execution. Alternatively, an installation may choose to react to the new DFS3141A and DFS3141I messages for physical copy complete.

DB Authorization and Open During Restart

Database authorization and open changes for IMS restart

- ▶ Previous releases only authorized and opened databases requiring backout
 - Authorizations were released and data sets closed at the end of restart

- ▶ IMS V8 authorizes and opens all databases which were open at termination
 - Could eliminate the need to run jobs which open and authorize databases
 - Some installations use such jobs to eliminate overhead from first transactions to access databases
 - Could affect batch and utility jobs started after online restart
 - Batch or utility job could fail authorization



When IMS V8 online systems are restarted, they authorize and open all full function databases which were open when the system previously terminated. This can have two effects on installations migrating to IMS V8.

First, it may eliminate the need to run some jobs. Some installations run special jobs after restarting an IMS system. These jobs access many databases. This is done to authorize and open them before they are needed by online transactions. These jobs will probably not be required with IMS V8. The restart will already have opened and authorized the databases if they were open when the system terminated.

Second, IMS V8 could create a potential problem for some batch or utility jobs. Some batch or utility jobs could fail authorization for a database due the change in IMS V8. This will occur if the online system has a database authorized, but would not have had it authorized in previous releases. This should be very unusual, but installations should determine if they have this situation. An example of the affect on a batch or utility job is the following:

An IMS online system comes up at 5 a.m., but no transactions for the database are submitted before 8 a.m. In this case, an IMS V7 system would not authorize the database.

A batch job accesses the IMS database between 5 a.m. - 8:00 a.m. For IMS V7 this was not a problem. The batch job would get authorization for the database. It would release this authorization when it terminated. With IMS V8 this is a problem. The batch job will not get authorization for the IMS database. There are two potential solutions. The database could be /DBRed from the online system after the restart or data sharing could be used.

Database Allocation Message

DFS2500I message is not issued:

- ▶ During restart processing
- ▶ In response to /START DB ALL or /DBR DB ALL command
- ▶ In response to /START DATAGROUP datagroupname or /DBR DATAGROUP datagroupname command

```
DFS2500I DATABASE|DATASET xxxxxxxxx SUCCESSFULLY  
ALLOCATED|UNALLOCATED
```

Automation based on this message may require
modification



In conjunction with the changes in database authorizations and data set opens during restart processing, IMS V8 suppresses the DFS2500I message at certain times. It is not issued during restart or in response to the commands shown here. These are the /START DB and /DBR DB commands with the ALL keyword and the /START and /DBR commands with the DATAGROUP keyword. Installations which have based automation on these messages may need to modify their automation.

Shared Queues Migration

CQS V8 supports only IMS V8

- ▶ A CQS and its IMS clients must be migrated to V8 together

Queues may be shared between V8, V7, and V6

- ▶ Different CQS/IMS pairs may be migrated at different times
 - IMS V6 requires PQ27555
 - IMS V6 as back-end with asynchronous APPC/OTMA support requires PQ29879



When using shared queues, an IMS V8 control region must use an IMS V8 CQS. Similarly, an IMS V7 control region must use an IMS V7 CQS. This means that the IMS control region and its CQS must be migrated to IMS V8 together.

On the other hand, the pairs of IMS control regions and CQSs may be migrated at different times. That is, the queues may be shared between different IMSs at different version levels.

APPC/OTMA Sync. Shared Queues

In order to exploit the APPC/OTMA synchronous shared queues support, all IMS systems in the SQ group

- ▶ Must be **IMS V8** and the DBRC RECON must specify **MINVERS(81)**
- ▶ Run on an operating system of at least z/OS V1R2 with Resource Recovery Services (RRS) enabled
 - APAR OW50627 must be applied to RRS
- ▶ NOTE: The following are not supported
 - Synchronous input for a **remote** transaction
 - Program-to-program message switches for conversational transactions

IMS

Prior to IMS Version 8, implicit APPC/OTMA messages could only use shared queues for synchronous messages if the transaction was processed by the front-end IMS. For IMS Version 8, this restriction has been eliminated.

Following are the requirements for this enhancement:

- All of the IMS systems in the shared queue group must be on IMS Version 8 with z/OS V1R2 or above to use the synchronous APPC/OTMA shared queue support. All systems involved in using APPC/OTMA Synchronous Shared Queues support for the multi-system Cascaded Transactions support.
- Resource Recovery Services must also be active on all of these systems.
- The RECON data set must have MINVERS81 set.

If any member of the IMSplex within the shared queue group cannot support the synchronous APPC/OTMA enablement, the function will not be activated and all synchronous APPC/OTMA transactions will run on the front-end IMS. Synchronous transactions created by a program-to-program switch will always run on the same IMS system as the transaction that initiates the program-to-program switch.

Program-to-program switches are not allowed for protected conversations.

If the APPC/OTMA synchronous input is a remote transaction, it will not participate in the APPC/OTMA shared queue enablement.

Fast Path Data Sharing Restrictions

VSO Structures

- ▶ May be allocated by an IMS system that
 - Supports system-managed duplexing (e.g. IMS V8 and IMS V7 with APAR PQ50661)
 - IMS V7 without the APAR and IMS V6 systems do **not** supported system-managed duplexing
 - Does **not** support system-managed duplexing
 - In this case IMS V8, V7, and V6 systems can connect to the VSO structure but the system-managed duplexing function is **not** available
- ▶ When different primary and secondary VSO structures sizes are used for **NON-PRELOADED** VSO structures
 - Only IMS V8 and IMS V7 with APAR PQ50661 can access a NON-PRELOADED VSO structure



Fast Path has been enhanced for IMS Version 8 as follows:

- Shared VSO has been enhanced to provide:
 - ▶ System-managed rebuild of a VSO structure.
 - ▶ Automatic altering of a VSO structure size.
 - ▶ System-managed duplexing of VSO structures.
- DEDBs can now have up to 2048 areas.
- DEDBs can now be defined as “non-recoverable” in DBRC.

When VSO structures are allocated by an IMS system that can exploit System-Managed Duplexing, IMS Version 8 and IMS Version 7 (with APAR PQ50661) can connect to these structures. IMS Version 6 and IMS Version 7 (without PQ50661) systems cannot connect to these structures.

IMS systems that do not support System-Managed Duplexing cannot participate in data sharing with systems that do after System-Managed Duplexing is enabled. That is, if the first IMS that connects to a VSO structure starts System-Managed Duplexing, IMS systems that do not support System-Managed Duplexing data sharers are not allowed to connect to the VSO structure because they do not support System-Managed Duplexing.

When VSO structures are allocated by an IMS system that is not capable of using System-Managed Duplexing (such as IMS Version 6 or IMS Version 7 without PQ50661), all supported versions of IMS can connect to the VSO structures, but the System-Managed Duplexing function is not available.

For a NON-PRELOAD VSO structure, a smaller structure size might cause data on the new VSO structure instance to be invalidated more frequently. Therefore, data would be read in from DASD more often when there is not enough space to accommodate the data. If the primary and the secondary structure sizes are different, IMS Version 8 systems can successfully connect to the structures whereas IMS Versions 6 and 7 systems are prevented from connecting. Message DFS2829I AREA areaname CONNECT CF FAILED;INCONSISTENT STRUCTURE SIZES is issued for data sharing IMS systems that do not support the auto rebuild, auto alter, and auto duplexing functions. IMS Version 7 with PQ50661 applied supports these OS/390

FP Data Sharing Restrictions ...

Non-recoverable DEDB

- ▶ Can only be accessed by IMS V8 systems
- ▶ In ***mixed-version data sharing environments***, DEDBs must be defined to DBRC as **recoverable**

DEDB with more than 240 areas

- ▶ Can only be shared if all the sharing IMSs are at IMS V8
 - DEDBs with ***less than 240 areas*** may be shared by IMS V8, IMS V7, and/or IMS V6 systems



Fast Path has been enhanced for IMS Version 8 to allow DEDBs to be defined as “non-recoverable” in DBRC. The non-recoverable DEDBs support provides a non-recoverable option for both VSO and non-VSO DEDBs: Only IMS Version 8 can access non-recoverable DEDBs. If you want to access DEDBs in a mixed-version data sharing environment, the DEDBs must be declared to DBRC as recoverable.

DEDBs with more than 240 areas can only be shared if all the sharing IMSs are at the Version 8 level. DEDBs with less than 240 areas can be shared by all supported versions of IMS as long as the IMS Version 8 rules for sharing are followed.

RSR Migration

RSR Migration:

- ▶ Upgrade the remote site RECON data set to IMS V8
 - Use standard RECON upgrade facility

- ▶ Migrate the tracking IMS to IMS V8
 - Migrate the tracking site Transport Manager Subsystem (TMS) to IMS V8 at the same time

- ▶ Upgrade the active site RECON data set to IMS V8

- ▶ Migrate the active site Transport Manager Subsystem running the Isolated Log Transport facility to IMS V8
 - This step must be done before migrating any active site IMS participating in RSR to IMS V8

- ▶ Migrate the active site IMS subsystems to IMS V8



An IMS V8 RSR tracking system will support IMS RSR active site subsystems running prior releases of IMS.

IMS V8 RSR support allows IMS V8 RSR tracking systems to process log records created by IMS subsystems at previous IMS release levels. It allows the IMS V8 Isolated Log Sender (ILS) to send log records created by IMS subsystems at previous IMS release levels. Log records created by an active IMS V8 system are rejected by an ILS or tracking IMS running at a previous IMS release level.

Java Application Migration

IMS V8 does not support Java applications in MPPs and BMPs

- ▶ High Performance Java compiler cannot be used

IMS V8 Java Applications must run in JMP and JBP regions

- ▶ Requires use of Persistent Reusable Java Virtual Machine (JVM)
- ▶ Migration to JVM and new Java regions may be done under IMS V7



IMS Java was introduced in IMS V7. It originally used the High Performance Java compiler instead of a JVM. The Persistent Reusable JVM capability with JMP and BMP regions has been added to IMS V7 as mentioned earlier in this course. The High Performance Java compiler implementation is not supported with IMS V8. This means that users of IMS Java under IMS V7 should migrate to the use of the region types while under IMS V7. Alternatively, the migration would have to be done concurrently with the migration to IMS V8.

Sysplex Terminal Mgmt Migration

Different versions of IMS can coexist in an IMSplex and use VTAM Generic Resources (VGR)

- ▶ The recoverable status of resources may be kept locally, in the CF, or both - depending on the version of IMS
 - IMS V8 provides the options of keeping the status
 - In the **Resource Structure** in the CF
 - **Locally** and in the **Resource Structure** in the CF
 - Non-IMS V8 systems keep the status locally
- ▶ Recommendation
 - Do not mix versions of IMS in VGR groups



Different versions of IMS can coexist in an IMSplex and can use VTAM Generic Resources. While message integrity is maintained in this scenario, the operating characteristics of the IMS components at the Version 8 level are different from the other IMSs, especially with respect to recoverable status of resources. The status is kept locally for the non-Version 8 IMSs. For the Version 8 IMSs, the resource status could be kept both locally and in a resource structure managed by the RM.

Recommendation: IBM recommends that you do not mix versions of IMS in VTAM Generic Resource groups.

MRQ and QCF Migration

Queue Control Facility (QCF) is the replacement product for the Message Requeuer (MRQ)

- ▶ MRQ is supported in IMS V7 and IMS V6 environments only
- ▶ QCF support is provided for IMS V8, IMS V7, and IMS V6

In environments where both MRQ and QCF are used

- ▶ ***Do not intermix messages***
 - Messages processed by MRQ may not be used as input to QCF and vice versa



If both MRQ and QCF are used (for example, if concurrent IMS systems are running, one IMS Version 8 and one IMS Version 6), do not intermix messages. Messages processed by MRQ should not be used as input to QCF and messages processed by QCF should not be used as input to MRQ. As QCF is a complete replacement for MRQ, intermixing messages should not be necessary.

Other Coexistence Considerations

Extended Checkpoints

- ▶ Can ***not*** be used to restart applications across different versions of IMS

IVP for IMS V8 has different requirements than prior IMS versions

- ▶ Different data set names must be used so that IVP components of different versions are not intermixed
- ▶ IMS V8 IVP can coexist with IVPs of other versions of IMS

Coordinated online change

- ▶ An IMS V8 system must specify CSLG= in startup parms to participate in coordinated online change
- ▶ The OLCSTAT data set used for coordinated online change is not compatible with IMS V7 and IMS V6 systems



You cannot use extended checkpoint to restart applications across different releases of IMS. If extended checkpointing is used in data sharing environments, all IMS systems in a data sharing group must be on the same version of IMS.

The IMS Version 8 Installation Verification Program (IVP) has different requirements than previous releases of IMS. The IVP programs will not be able to run correctly on systems that do not meet the new requirements. The IVP for IMS Version 8 can coexist with IVPs of other releases of IMS. Different data set names must be used so that the IVP components of different IMS versions are not intermixed.

To support IMSplexes, a number of IMS functions have been enhanced and a number of new functions have been added. A new coordinated online change function (of the Resource Manager) has been added to coordinate global online change activities of all the IMSs in the IMSplex. To migrate IMSs to an IMS Version 8 IMSplex, including a Common Service Layer (CSL), an SCI must be available on each OS/390 image and one OM and one RM must be available in the IMSplex where an IMS Version 8 release control region specifies the CSLG= parameter. An IMS Version 8 release control region that does not specify CSLG= will not be able to receive commands routed to it from OM and it can not participate in coordinated online exchange. The OLCSTAT data set (used for Coordinated Online Change) is not compatible with pre-Version 8 IMSs.

Other IMS V6 Considerations

IMS V7 changed many system data set names:

- ▶ Adherence of IMS data sets to the z/OS and OS/390 naming standards
 - Distribution Libraries: ADFS prefix
 - Target Libraries: SDFS prefix

- ▶ Single set of MACRO libraries
 - Macros from all features moved into System Services base feature
 - Distribution library: ADFSMAC
 - Target library: SDFSMAC

- ▶ Migration
 - Impact lessened through the use of Install/IVP
 - User jobs may need to be updated with new data set names



The names of most IMS system data sets were changed in IMS V7. As of IMS V7, IMS adheres to the z/OS and OS/390 naming standards. For example, RESLIB is SDFSRESL.

All of the macros were placed in one distribution library and one target library.

Users could be affected by these changes. If you use the Install/IVP, the implications are minimized. In any case, you may need to change some jobs which refer to IMS system data set names.

Other IMS V6 Considerations ...

IMS V7 changed PSBGEN output

- ▶ IMS V6 ACBGEN requires PQ37363 to read PSB generated by IMS V7 or V8 PSBGEN

IMS V7 and V8 set I C Needed when a database is initially loaded

- ▶ May require changes to jobs which update DB before IC done

IMS V7 increased I/O area size for INQY ENVIRON call

- ▶ May require application program changes

IMS V7 and V8 Batch Backout honor CHECK17 in RECON

- ▶ IMS V6 verified the entire data set name



This is a list of the changes implemented in IMS V7 which are most likely to affect migrations from IMS V6.

If you create a PSB using IMS V8 PSBGEN and try to use it as input to an IMS V6 ACBGEN, you must have PQ37363 on your IMS V6 system to be successful. This is most likely to affect you if you have multiple systems at different release levels or if you fallback from IMS V8 to IMS V6.

IMS V7 added DBRC support for initial loads of databases. This support sets the Image Copy Needed flag on for a database when it is loaded by a job invoking DBRC. This is intended to prevent users from updating a database without being able to recover it subsequently. Some installations have jobs which are affected by this change. The most common type of job is one which initially loads a database by inserting a dummy record. A following step deletes this record. The following step will fail if an intervening step does not turn off the Image Copy Needed flag. This may be done with a DBRC CHANGE.DBDS ICOFF command or by taking an Image Copy.

IMS V7 added information returned by the INQY ENVIRON call. This increased the data from 140 to 152 bytes. If an application's I/O area is not large enough to hold the additional information and it does not accept the 'AG' status code with return code x'100' and reason code x'C' in the AIB, the application program will have to be changed when migrating to IMS V8.

The IMS V7 and V8 Batch Backout utilities honor CHECK17 in the RECONS. This indicates that only the last 17 bytes of the data set name for a log should be verified. IMS V6 always verified the entire data set name. That is, it ignored the CHECK17 setting in the RECONS. This change could create an integrity exposure when migrating to IMS V8. IMS V6 BBO checked the entire name even when CHECK17 was specified. IMS V8 checks only the last 17 characters. The simplest and most desirable way to address this is to specify CHECK44. This causes the entire data set name to be verified.

IMS V8 Functions for IMS V7

Some IMS V8 functions will be made available for IMS V7

- ▶ Batch Remote Recovery Service support
- ▶ System-managed duplexing of VSO structures
- ▶ MSC FICON CTC support
 - APAR PQ51769 is required
- ▶ XML enhancements
 - IMS COBOL and PL/I programs can receive/send XML directly
 - Metadata and XML support
- ▶ JDBC Access to IMS DB Data
- ▶ SLDS read support
 - APAR PQ50657 is required



Some of the enhancements offered in IMS V8 will be made available in IMS V7 via the service process. Shown are a list of the IMS V8 functions that will also be available in IMS V7.

Batch programs can now use the operating system's Resource Recovery Services (RRS) to manage 2-phase commit processing. This support is extended to both IMS DB and DB2® batch programs. This enhancement is being provided in IMS Version 7 via the service process.

When VSO structures are allocated by an IMS system that can exploit System-Managed Duplexing, IMS Version 8 and IMS Version 7 (with APAR PQ50661) can connect to these structures.

Multiple Systems Coupling (MSC) Facility Fiber Connection (FICON) Channel-to-Channel (CTC) support increases the volume of IMS messages that can go between IMS systems when using the IMS Multiple Systems Coupling Facility. IMS customers require reliable, high bandwidth, host-to-host communications support between IMS systems. This is the role of the IMS Multiple Systems Coupling Facility.

IMS V8 provides enhanced application development, execution and connectivity with Java and XML enhancements.

For IMS Version 8, there are three Java enhancements. They provide:

- Support for new Java standards as they evolve
- JDBC access to IMS DB data
- New Java Virtual Machine (JVM) dependent regions in IMS TM

JDBC access to IMS DB data is provided for Java applications running in CICS Transaction Server/390, and DB2 for OS/390 Java stored procedures applications. This access is in addition to the access available from IMS TM Java applications that run in the new JMP or JBP regions. A new IMS utility is provided that automatically generates the required IMS Java metadata class from IMS PSB and DBD source, eliminating the previously existing manual task of preparing these classes. High Performance Java (HPJ) is no longer supported when running in these environments (CICS, DB2, JMP, JBP), as applications in these environments use a Persistent Reusable Java Virtual Machine.

IMS needs to retrieve its own log records for several reasons, restart and dynamic backout among them. Before this APAR, IMS could retrieve log records from SLDS only during restart. If dynamic backout needed a record that was only available on a SLDS, the backout failed and the user was required to run the batch backout utility. This APAR allows IMS to read log data from SLDS after restart completes.

Compatibility SPEs

IMS V7

- ▶ DBRC - PQ54585

IMS V6

- ▶ DBRC - PQ54584
- ▶ MSC - PQ27555
- ▶ Shared Queues - PQ27555
- ▶ Shared Queues Asynch.
APPC/OTMA - PQ29879
- ▶ PSBs - PQ37363



This is a list of the compatibility SPEs that were mentioned in this section,

Installation and Migration Summary

Similar tasks as previous IMS release-to-release migrations

- ▶ Preparation
 - Prerequisite software and maintenance
 - Coexistence and compatibility maintenance
 - New releases or maintenance for related products

- ▶ Installation
 - Upgrade of RECONs
 - System definition
 - ACBGEN

- ▶ Migration
 - Possible modifications to procedures, automation, etc.
 - Implementation

IMS

Migration

IMS Tools support



IMS

Tools Agenda

Tools/products support

- ▶ Supported
- ▶ To be determined
- ▶ Replacement products required

Table summarizing tools/products table



A variety of IBM and vendor tools may be used in environments running IMS. The tables in this section provide the:

- Version and release levels of IBM tools supported with IMS V8.
- IBM tools that IBM needs to test to determine the version/release level and support requirements
- IBM tools that are not supported and, where appropriate, the replacement tools that is supported with IMS V8.

If you have IBM tools used in an IMS environment that are not listed in this section, please notify IBM for version/release level and support information.

Tools/Products Supported with IMS V8

Product Name	Number	Comments
IMS Advanced ACB Generator V1	5655-E05	Support available 2/28/2002 via APAR/PTF
IMS Application Development Facility V2.1.1	5665-348	No change needed Available now
IMS Batch Terminal Simulator V2.1	5655-A14	Requires APAR PQ57111 PTF UQ62630 APAR/PTF available
IMS Command Control Facility V1.1	5655-F40	Support date to be determined
IMS Connect V1.1 and V1.2	5655-E51	No change needed Available now
IMS Database Control Suite V2.1	5655-F76	Support available on 3/4/2002 APAR PQ57072
IMS Database Repair Facility V1	5655-E03	Support available on 3/4/2002
IMS DataPropagator V3	5655-E52	Required for IMS V8 Support available on 3/4/2002
IMS DEDB Fast Recover V2.2	5655-E32	V2.2 needed for IMS V8 V2.2 also supports IMS versions 6 and 7 QPP support provided via load library without SMP Support available on 9/27/2002
IMS Extended Terminal Option Support V2.2	5655-E12	Support date to be determined
IMS Fast Path Basic Tools V1.2	5655-E30	Support available on 3/15/2002
IMS Fast Path Online Tools V2.1	5655-F78	Support available on 2/15/2002 Requires APAR PQ53579
IMS Hardware Data Compression Extended V2.2	5655-E02	Requires APAR PQ53759 PTF UQ59607
IMS High Performance Change Accumulation V1.1	5655-F59	Support available on 3/29/2002 APAR PQ57540
IMS High Performance Load V1.1	5655-E07	Support available on 2/28/2002
IMS High Performance Pointer Checker V1.1	5655-E09	Support available on 2/28/2002



The following IBM tools are supported with IMS V8. The 'Product Name' column shows the product with minimum version and release levels required to operate with IMS V8. The 'Number' column provided the product number. The last column, the 'Comments' column, provides additional information on the following:

- Whether the product is supported now and, if not, an approximate date when the support may be available.
- APAR and/or PTF required to enable the support
- Whether or not the product supports more than one version of IMS
- Indicates that the product is currently supported, but has been withdrawn from marketing.

Tools/Products Supported with IMS V8 ...

Product Name	Number	Comments
IMS High Performance Prefix Resolution V1.1	5655-E08	Support available on 3/8/2002
IMS High Performance Sysgen Tools for z/OS	5655-F43	Support date to be determined
IMS High Performance Unload V2.1	5655-E06	Support available on 2/28/2002
IMS Image Copy Extensions V1.1	5655-E10	Support available on 5/31/2002
IMS Index Builder V2.1	5655-E24	Support available on 3/29/2002 APAR PQ57541
IMS Library Management Utilities V1.1	5655-E04	Requires APAR PQ55864 PTF UQ61449
IMS MFS Reversal Utilities	5655-F45	No change needed Available now
IMS Network Compression Facility V1.1	5697-E41	Support date to be determined
IMS Online Recovery Service V1.1	5655-E50	Requires APAR PQ55888 APAR availability approximately 2/15/2002
IMS Parallel Reorganization V2.1	5655-F74	IMS V8 requires V2.1. Support available 9/30/2002.
IMS Performance Analyzer V3.1	5655-E15	Requires APAR PQ55317 PTF UQ62098 APAR/PTF available now
IMS Program Restart Facility V2.1	5655-E14	Support date to be determined
IMS Queue Control Facility	5697-E99	Requires APAR PQ54538 PTF UQ60536 APAR/PTF available now
IMS Recovery Saver V1.1	5655-A68	Withdrawn from marketing. Supported with IMS V8. Requires APAR PQ56549. Service discontinued 3/31/2002.
IMS Sequential Randomizer Generator V1	5655-E11	Support available on 5/31/2002.
OS/VS DB/DC Data Dictionary V1R6	5740-XXF	Requires APAR PQ56902 APAR availability approximately 3/4/2002
System Automation for OS/390 IMS Automation Feature	5645-005	Requires APAR OW53189 APAR availability approximately 3/4/2002



Tools/Products - Support To Be Determined

Product Name	Number	Comments
IMS Workload Router V2.2	5697-B87	Support to be determined
Data Refresher V1	5696-703	Withdrawn from marketing
Tivoli Decision Support for OS/390	5698-TD9	Support to be determined



The status of the tools listed here is not known at this time. In other words, IBM must perform testing to determine if the product is supported in the IMS V8 environment.

Replacement Products Required For IMS V8

Product Name	Number	Comments
IMS ADF Tool Pak	5655-A21	Withdrawn from marketing Support discontinued 9/30/2002 (AL 901-202)
IMS Database Control Suite V1	5697-D15	Service to be withdrawn 9/30/2002 IMS DB Control Suite V2.1 is replacement
IMS Database Integrity Control Facility V7	5697-F61	Withdrawn from marketing IMS DB Control Suite V2.1 is replacement
IMS DataPropagator V2R2	5696-705	Withdrawn from marketing IMS DPROP V3 is replacement
IMS Dynamic Resource Control Facility V1	5697-D14	To be withdrawn from marketing 3/ 4/2002
IMS Extended Terminal Option Support V1	5697-D68	Service discontinued 12/31/2001 IMS ETO Support V2.2 is replacement
IMS Hardware Data Compression Extended V2.1	5655-085	Service withdrawn 12/31/2001 IMS HDCE V2.2 is replacement
IMS Index Builder V1	5697-C33	Withdrawn from marketing Support discontinued 3/31/2002 Index Builder V2.1 is replacement
IMS Partition DB V2.1 and V2.2	5697-D85	V2.1 withdrawn from marketing Marketing discontinued on 3/4/2002 for V2.2 HALDB is the replacement
IMS Performance Analyzer V2	5697-F02	Service discontinued 3/31/2002 IMS Performance Analyzer V3.1 is replacement
IMS Program Restart Facility V1	5697-F18	Withdrawn from marketing Service discontinued on 3/31/2002 IMS Program Restart Facility V2.1 is replacement
IMS Recovery Saver V2.1	5655-E16	ORS (5655-E50) <i>may</i> be used instead
IMS Workload Router V1	5697-074	Service discontinued 1/31/2001 IMS Workload Router V2.2 is replacement



The products listed here are not supported in an IMS V8 environment. Where applicable, the comments indicate whether the product:

- Has been withdrawn from marketing
- Is no longer supported
- Has a replacement version and release that will work in an IMS V8 environment.

Migration Planning

CSL Migration Planning

- ★ Decisions
- ★ Tasks



IMS

This last section addresses some of the issues associated with implementing a CSL environment in IMS V8.

Decisions

What is target environment?

▶ **No CSL**

- Still have some changes to IMS command processing
 - Some no longer supported
 - Some no longer recoverable

Review Command
Reference manual

▶ **SCI only**

- Automatic RECON Loss Notification

▶ **SCI + OM + RM without RM Structure**

- Coordinated global online change
- OM API
 - SPOC
 - User/vendor written AOPs

▶ **SCI + OM + RM + RM Structure + Shared Queues**

- Sysplex terminal management

IMS

The first decision is, of course, what is your target environment? Even without CSL, there have been some changes in IMS classic commands. It is important that you carefully review the Command Reference manual to see what these changes are.

If all you want is Automatic RECON Loss Notification, than all that is required is a SCI address space everywhere there is a DBRC.

If you do not want (or need) sysplex terminal management (e.g., CICS DBCTL), you do not need a resource structure. If you do want STM, then you need both a resource structure and shared queues.

Tasks

Setting up the environment

- ▶ Hardware/Software currency
 - OS/390 V2 R10 (base IMS V8 requirement)
 - z/OS 1.2 (SM duplexing and VGR session level affinity)
 - CF Level 9 (SM rebuild)
 - CF Level 11 or 12 (SM duplexing)
 - CF-to-CF links (SM duplexing)
- ▶ Program properties table
 - Add BPEINI00
- ▶ SCI, OM, and RM address spaces
 - PROCedure JCL
 - Proclib members (BPECFG, CSLSIxxx, CSLOIxxx, CSLRIxxx)
- ▶ CQS address space
 - Single or dual function (SQ and/or RM)
 - RM CQS
 - Proclib members (CQSIPxxx, CQSSGxxx) have CSL parameters



Note here that if the CF itself is a zSeries machine (for example, it is an LPAR on a zSeries CPC), then CF Level 12 is required. Otherwise, CF Level 11 is required. z/OS 1.2 or later is required on the CPC regardless of the CF Level.

The CQS address space can support both the Shared Queues structures as well as the Resource Structure. To support the Resource Structure, new parameters have been added to CQSIPxxx (initialization proclib member) and CQSSGxxx (global proclib member). There are no changes to CQSSLxxx (local proclib member).

Tasks ...

Setting up the environment ...

- ▶ IMS control region
 - Add CSLG= to procedure, or include in DFSPBxxx
 - Update proclib members (DFSPBxxx, DFSDCxxx, DFSVSMxx)
 - SGN= should be consistent across all IMSs
 - Create new proclib member (DFSCGxxx)
 - If OLC=GLOBAL in DFSCGxxx
 - Add and initialize OLCSTAT dataset
 - All control regions must use same OLC data sets
 - Update ETO descriptors
 - Add SRM and RCVYxxxx overrides -or- use system defaults
 - Verify APPC descriptors do not conflict with trancodes, lterm names, or msnames



Adding the CSLG parameter to DFSPBxxx instructs IMS to initialize itself for the CSL environment. In addition to DFSPBxxx, DFSDCxxx and DFSVSMxx also have CSL-related parameters. Be sure that the SGN= parameter is consistent across all IMSs. If they are different, the first IMS to join the IMSplex sets the value and all others are stuck with it. There is also a new proclib member (DFSCGxxx) which is pointed to by CSLG in DFSPBxxx.

To enable online change, a new data set pointed to by the OLCSTAT DDname must be created and initialized. It only needs to be initialized once. As each IMS joins the IMSplex, it will update OLCSTAT. Although all IMSs must use the same OLCSTAT, they do not have to use the same OLC data sets (ACBLIB, CTLBLKS, FORMAT, MATRIX). You may decide that you want (for example) each IMS to have its own copy of ACBLIB. In this case, it is a user responsibility to make sure the copies are in sync (they all use the same A or B suffix). And DFSCGxxx should specify NORSCCC for whatever libraries are not the same data set.

ETO descriptors can be updated for SRM and RCVY values, but it is not necessary. APPC descriptors should be examined to make sure they do not conflict with LTERM names defined on other IMS systems.

Tasks ...

Setting up the environment ...

▶ DBRC address spaces

- To use ARLN, address spaces using DBRC must have IMSPLEX= parameter coded in executed PROCedure, or can set IMSPLEX name with DSPSCIX0 exit
 - Online DBRC
 - FDBR
 - DBRC batch utility (DSPURX00)
 - Batch job with DBRC=Y
 - Database utility with DBRC=Y
- IMSPLEX name must match IMSPLEX name in RECONS



All of the address spaces which invoke DBRC are eligible to participate in ALRN. To do this, they must join the IMSplex either by coding IMSPLEX=plexname in their execution JCL, or by using exit DSPSCIX0. The exit is easier because you don't have to change every job or procedure.

The RECON header record includes an IMSPLEX name, so if a DBRC job tries to join the plex using a set of RECONS for another IMSplex, it will not be able to access the RECONS.

Tasks ...

Setting up the environment ...

▶ CF structures

- Update CFRM CDS
 - Allow system managed rebuild and duplexing
- Define RM structure in CFRM policy
 - DUPLEX(ENABLED) or DUPLEX(ALLOWED)
 - ALLOWAUTOALT(YES)
 - FULLTHRESHOLD(value) - defaults to 80%
 - MINSIZE(size) - defaults to 75% of INITSIZE
- Update CFRM policy for other structures as desired
 - Shared Queues, Shared VSO, IRLM, OSAM/VSAM



As always, structures must be defined in the CFRM policy and the policy must be activated. New enhancements in this area (also available to IMS V7) are autoalter support, system-managed rebuild support, and system-managed duplexing support. For rebuild and duplexing, the CDS itself has to be reformatted. For duplexing, the CFRM policy needs to be updated.

Tasks ...

IMS exits

- ▶ Review and modify IMS exits as required
 - Logon exit (DFSLGNX0)
 - Override system defaults for SRM, RCVYxxxx
 - Allow stealing of SRM=LOCAL node
 - Signon exit (DFSSGNX0)
 - Override system defaults for SRM, RCVYxxxx
 - Allow stealing of SRM=LOCAL ETO user
 - Output creation exit (DFSINSX0)
 - Dynamic transactions and Iterms
 - Command security exit (DFSCCMD0)
 - Some classic commands may come from OM
 - Any other exits that use "callable services"
 - Default is GLOBAL

- ▶ DBRC SCI exit (DSPSCIX0)
 - Can set/modify/reject IMSPLEX name for DBRC registration to SCI



The Logon Exit and Signon Exit can override the SRM and RCVY values for each logon (or signon for non-STSN ETO terminals). They can also decide to "steal" a node when it is owned by an inactive IMS. These exits will need to be updated to use either of these features.

An Output Creation Exit should be written to handle the situation where IMS receives a message with unknown destination, but finds that destination in the Resource Structure. The exit should (probably) tell IMS to reject the message - not create a dynamic one - because IMS will assume default attributes, which may very well be incorrect. For example, IMS2 might have a transaction defined as conversational. It might not be defined to IMS1. If one of those transactions arrives in IMS1, without the exit, IMS1 would queue it as a non-conversational transaction (no SPA).

And then, of course, there is the SCI Reistration Exit for DBRC.

Tasks ...

Security environment

- ▶ **SCI security**
 - Authorize (RACF) connection to IMSplex for all SCI connectors
 - IMS, DBRC, CSL, DBRC utility, batch and utilities w/DBRC, AOPs
- ▶ **RM Structure security**
 - Authorize (RACF) RMs to access RM structure
- ▶ **OM command security**
 - If CMDSEC=A|E in CSLOlxxx
 - Define and create security exit (BPE User Exit)
 - If CMDSEC=A|R in CSLOlxxx
 - Update RACF for IMSplex and Classic command security for commands entered through OM
- ▶ **IMS command security**
 - If CMDSEC=A|E in DFSCGxxx
 - Update DFSCCMD0 to recognize OM-entered command
 - If CMDSEC=A|R
 - Update RACF for classic commands



Security issues include

- Authorization to join the IMSplex. Don't forget the DBRC and batch address spaces.
- Resource Structure access for the Resource Manager. Note that authorization is for RM, not for CQS.
- Command security for commands entered through the OM interface. This can be RACF or an Exit or both (or neither). If OM is doing the security, then you (probably) don't need IMS to do it also. If an exit is used, it must be coded and then identified in BPE.

Tasks ...

Operations

- ▶ Is SPOC or other AOP going to be used?
 - Define SPOC to TSO
 - Establish preferences and operating procedures
 - Write AOP using OM API
- ▶ Operations Manager
 - How many? User exits?
- ▶ Review all IMS commands
 - Some are no longer supported
 - Some are no longer recoverable
 - Some have global scope if using RM structure
 - Some depend on being "command master" or "owner"
 - Some cannot be submitted through OM API
 - Some have new parameters
- ▶ Automated operations
 - Exits cannot invoke OM API
 - NetView (etc) execs can



For operations, if a SPOC is going to be used, then procedures need to be created for the operator. If you are using automation, then consideration must be given to creating an interface with OM and then routing commands through OM.

There are several changes to the IMS commands. More than in most IMS releases. They are well documented in the Command Reference manual. It would be wise to review these carefully before implementing IMS V8. Not all changes are for CSL only.

Tasks ...

Resource management

- ▶ If not using RM structure, benefits are limited to
 - Global online change
 - ARLN
 - Dynamic LE runtime options

- ▶ Determine system defaults for SRM and RCVYxxx
 - May update Logon and Signon exits to override system defaults

- ▶ Need an Output Creation Exit (DFSINSX0)?
 - If resource exists in RM but not locally defined, IMS assigns default attributes unless overridden by DFSINSX0

- ▶ Resource Manager
 - How many? User exits?



You don't need a resource structure, but if you don't have one, you are limited in what features are available. Basically, without a resource structure, you don't get Sysplex Terminal Management.

It is not necessary to make any changes to the system defaults by including SRM and RCVY parameters in DFSDCxxx, but you may want to consider it. Even without STM, there is a new option of SRM=NONE and RCVYxxx=N which you should consider.

We've already talked about the Output Creation Exit. If you are using STM, you should probably have one to prevent IMS from creating destinations that have the wrong attributes.

You probably want at least two RMs - probably one on each MVS where there is an IMS for availability and performance. There are no "obvious" user exits that are needed.

Tasks ...

End-users

- ▶ Affected mostly by Sysplex Terminal Management
 - Procedures following session or IMS failure
 - Procedure for logging back on after a session failure
 - Procedure for logging back on after an IMS failure
 - Procedure for recovering end-user significant status
 - Logons may be rejected if RM affinity (ownership) exists
 - May want to implement logon userdata to tell Logon Exit to "steal"
- ▶ May be affected by command changes
 - Local vs global scope
 - Owned vs not owned resource



End-users are affected mostly by STM. The affect should be good - better availability. They can now continue a conversation (for example) on another IMS, or retrieve a fast path response, or have their STSN sequence numbers restored. Command status will also be restored on another IMS. Because RM affinity (ownership) may prevent a user from bypassing VGR and logging on to another system, the user should know how to tell the Logon Exit or Signon Exit to "steal" a node (of course, the exit must recognize this).

End-users may also be affected by command changes.

Mixed Environments

May have mixed environment sharing data and queues

- ▶ RECONs can be shared
 - V6 and V7 do not participate in ARLN
- ▶ Shared Queues
 - Can share message queues, but ...
 - V6 & V7 do not participate in STM
 - V6 & V7 cannot process synchronous APPC/OTMA messages
- ▶ Shared VSO
 - V6 does not support any of the SM functions
 - SM-rebuild, SM-duplexing, Autoalter
 - First connector decides if feature active
- ▶ Network
 - If sharing queues between V8 and previous IMS
 - Try to have all network resources connected to V8 system
 - Could be confusing to end-users switching from V8 to V6/V7
 - Or, do not use SRM=GLOBAL when users may switch between V8 and V6/V7



This just shows how V6, V7, and V8 can share resources in the same IMSplex. There are, of course, some restrictions on IMS V6 and V7, for example, they will not support shared queues for synchronous APPC or OTMA transactions.

Shared VSO is supported, but if duplexing is active, then IMS V6 will not be able to open the area. Don't duplex until all IMSs are V8.

If STM is enabled, users could get confused when switching from V6 or V7 to V8 since only V8 supports STM.

Other

XRF

- ▶ Requires SCI address space
- ▶ Class 1 terminals always use local status
- ▶ Class 2 and 3 terminals status depends on SRM

RSR

- ▶ Does not require CSL while tracking
 - May take advantage of OM and ARLN if available
- ▶ If using shared queues, takeover site must cold start
 - No message or status recovery

ARM

- ▶ Supported for all IMS V8 address spaces (default=yes)



If using XRF, class 1 terminals always use the local status when the session is switched to the new active. Class 2 and 3 status depends on the SRM.

If using RSR, the tracking site does not have to have CSL, however, if it is active, then the tracking site can take advantage of OM for command entry and SCI for ARLN.

All new address spaces default to ARM=Y. This is usually good.

Other ...

RNR

- ▶ Shouldn't use ARNR or NRNR with STM
 - Prevents logging on to surviving IMS until failing IMS restarts

Lots of new and changed messages and abends (and some deleted ones too)

- ▶ See Release Planning Guide, Chapter 6

Log record format changes

- ▶ See Release Planning Guide, Chapter 29



If you are using STM, then you probably don't want RNR. RNR keeps the session alive for the surviving IMS to be restarted then reestablishes the session. This would prevent the user from logging on to another IMS.

Look at the manuals to see what all the changed messages, abends, and log record formats are.

Other ...

Many features not affected by CSL or STM

- ▶ Application programs
 - Except CMD and ICMD entered commands may have local or global scope (same as terminal entered commands)

 - ▶ Databases

 - ▶ MSC, SPOOL API, FES, Associated Printers, TCO

 - ▶ APPC (except for APPC descriptor name consistency)

 - ▶ OTMA, BTAM

 - ▶ Definitional consistency of attributes across IMSs in IMSplex not verified for ...
 - IMS system defined resources
 - APPC descriptors, ETO descriptors
-

IMS

Many features are not affected by the implementation of CSL and STM. Some are listed here (with exceptions, if any).