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Upgrading to CICS Transaction Server for z/OS V4.1

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Notes

- IBM CICS Transaction Server for z/OS (CICS TS) is a modern, dependable, cost-effective application platform. It is designed to execute mixed language application workloads, supporting both modern and traditional programming languages and models. Its extensive data communication services, and its foundations in service oriented architecture (SOA), provide unparalleled connectivity and scalability. As a result, CICS TS fits naturally into a "smart" infrastructure of the kind needed for a flexible, global enterprise.

- CICS TS V4.1 addresses the needs of a rapidly changing business environment. Its features include the emission of business events, Web 2.0 programming support, and new operational tooling. These and other enhancements bring a new agility to CICS, complementing established qualities of security, reliability, availability, scalability, data integrity and application responsiveness.

- CICS TS V4.1 brings new levels of ease-of-use and flexibility to meet the needs of the next generation of business users, and is aimed at helping users in:

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- **Competing** for new opportunities by gaining insight into business processes and responding by modifying key business applications quickly and with confidence.

- **Complying** with corporate, industry and government policies to manage business risk of critical business applications.

- **Controlling** costs by simplifying IT infrastructure and improving development and operations productivity through easier-to-use interfaces and functions.

- CICS TS V4.1 is suitable for all CICS customers.

Acknowledgements

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Session Agenda

- **Software prerequisites**

- **General external changes**
  - Resource definition
  - Application and systems programming interfaces
  - Global user exits
  - Monitoring and statistics

- **Functional changes**
  - Obsolete function removal

- **Documentation**

- **Summary**

CICS Transaction Server V4.1 Elements

- **CICS Transaction Server V4.1**
  - CICS 0660
  - Service Flow Runtime now shipped with CICS TS V4.1

- **CICSPlex SM V4.1**

- **CICS Explorer**
  - Available via download site
- **REXX**
  - Development System
  - Runtime Facility
  - REXX Common for z/OS

- **CICS Information Center V4.1**

- **Rational Developer for System z promotion**
  - 1 unrestricted entitlement, no service entitlement
  - Integrated development environment for CICS and WebSphere
    - COBOL, PL/I, Java for CICS and J2EE applications

- *CICS Application Migration Aid V1.1 is no longer provided as an element in CICS TS V4.1*

Notes

- **ELEMENTS INCLUDED IN CICS TS V4.1:**
- The base CICS element of CICS Transaction Server for z/OS V4.1 is CICS V6.6.
- CICS TS V4.1 is shipped with CICS Service Flow Runtime, previously only available as a separately orderable feature, which allows the deployment of CICS business services (or service flows) created by the Service Flow Modeler component of IBM Rational Developer for System z. The service flow runtime capability of CICS TS V4.1 is fully compatible with IBM CICS Service Flow Feature V3.2.

  The CICSPlex System Manager element is CICSPlex SM V4.1.

  After general availability of CICS TS V4.1, customers can download and use a fully featured version of the CICS Explorer for CICS TS V4.1. A version of the CICS Explorer for CICS TS V3 customers is also to be made available as a no-charge optional feature. Further information about the CICS Explorer and how to download it can be found at: http://www.ibm.com/cics/explorer/

- Other elements of CICS TS V4.1, that were previously available as separate IBM products, are:
  - CICS REXX Runtime Facility
  - CICS REXX Development System
  - CICS REXX Common for z/OS
- Shipped with this product as a marketing promotion is a media pack with a trial license for IBM Rational Developer for System z. Rational Developer for System z is not part of CICS TS and 5 is not required to use CICS TS, but does provide several productivity enhancing tools for developers and system programmers, including complete integration with the CICS Explorer. Rational Developer for System z is a workstation based integrated development environment (IDE) that helps developers create dynamic Web, Web 2.0, and traditional CICS applications all from the same desktop tool. It includes support for Java Enterprise Edition (JEE), XML, and Web services technologies that can integrate Rational and WebSphere software, and traditional transactional environments, including CICS, IMS, and Batch systems.

- *CICS Application Migration Aid V1.1 is no longer provided as a separate element of CICS TS V4.1.*

Software Prerequisites

- **CICS TS V4.1 requires z/OS V1.9, or later**
  - The product will not initialize with a lower level of operating system installed

- **The IBM XML Toolkit V1.10 for z/OS is not required for installation**
  - Required at runtime if WS-Security is used
  - If not present at runtime DFHPI0119 will be issued

- **IBM SDK for z/OS, Java Technology Edition, V6, Service Refresh 4**
  - 64-bit SDK is not supported
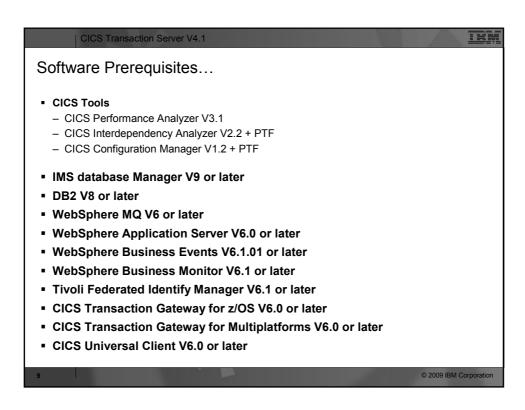
- **IBM XML Toolkit and SDK <u>NOT</u> shipped with CICS**

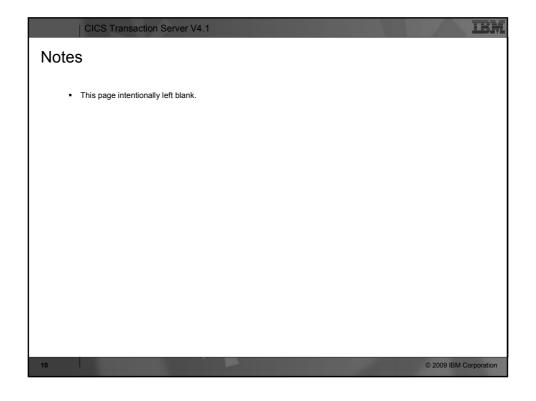
Notes

- IBM z/OS (5994-A01) V1.9, or later is required. CICS TS V4.1 will not initialize in an environment with a lower level of operating system installed.
- If used with IBM z/OS V1.9, PTF for APAR OA19565 is required.
- Ensure that the following APARs are applied: OA20352, PK45354, OA20343, OA19958.
- If used with WebSphere MQ for z/OS V6.0, then the following APARs are required: PK38772, PK42616.

- The IBM SDK for z/OS, Java Technology Edition, V6, Service Refresh 4 (SR4) is required for use of Java application programs, enterprise beans, or the CICS Web services assistant.The IBM SDK for z/OS is available, without charge, on tape or by download from
-         http://www.ibm.com/servers/eserver/zseries/software/java/
- The IBM 64-bit SDK for z/OS, Java 2 Technology Edition, Version 1.4 (5655-M30), is not supported. Also, IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V5 (5655-N98), is not supported.

Software Prerequisites…

- **CICS Tools**
  - CICS Performance Analyzer V3.1
  - CICS Interdependency Analyzer V2.2 + PTF
  - CICS Configuration Manager V1.2 + PTF

- **IMS database Manager V9 or later**
- **DB2 V8 or later**
- **WebSphere MQ V6 or later**
- **WebSphere Application Server V6.0 or later**
- **WebSphere Business Events V6.1.01 or later**
- **WebSphere Business Monitor V6.1 or later**
- **Tivoli Federated Identify Manager V6.1 or later**
- **CICS Transaction Gateway for z/OS V6.0 or later**
- **CICS Transaction Gateway for Multiplatforms V6.0 or later**
- **CICS Universal Client V6.0 or later**

Notes

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Operating System Setup

- **CICS uses z/OS conversion services**
  - Conversion facility must be enabled
    - Documented in "z/OS Support for Unicode Using Conversion Services"

- **SDFHLINK modules are downward compatible**
  - e.g. SVC, DFHIRP

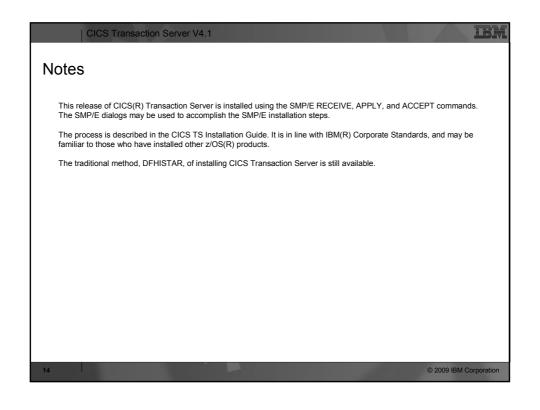- **For 64 bit exploitation MEMLIMIT needs to be set equal to or greater than 2GB**

Notes

- For Unicode conversion support, you must enable the z/OS conversion services and install a conversion image which specifies the conversions that you want CICS to perform. Refer to the instructions in the z/OS Support for Unicode: Using Conversion Services manual SA22-7649 to find out the steps needed to set up and configure conversions supported though the operating system services.

- To use storage above the 2GB boundary (above the bar) when upgrading to CICS® TS for z/OS®, Version 4.1, you need to set your MEMLIMIT value equal to or greater than 2GB.

- The MEMLIMIT value can be set using any of these methods:
  1. JCL. MEMLIMIT can either be set to a specific value in JCL or as NOLIMIT, if REGION=0M is specified.
  2. SMFPRM PARMLIB member. A MEMLIMIT value can be set in SYS1.PARMLIB(SMFPRMxx).
  3. IEFUSI z/OS global user exit.

- System usage and workload remain the same as before you altered the MEMLIMIT value. The MEMLIMIT value cannot be altered on a running system. If MEMLIMIT is set lower than 2GB, but higher than EDSALIM, a warning message is displayed. If MEMLIMIT is set lower than the EDSALIM value, an error message is displayed and CICS does not start up.

Installation Process

- **Default installation process**
  - Common IBM install procedures
    - SMP/E RECEIVE, APPLY, ACCEPT commands
  - Described in the CICS Installation Guide
- **DFHISTAR process**
  - CICS generated installation job stream
  - Described in the CICS Installation Guide

Notes

This release of CICS(R) Transaction Server is installed using the SMP/E RECEIVE, APPLY, and ACCEPT commands. The SMP/E dialogs may be used to accomplish the SMP/E installation steps.

The process is described in the CICS TS Installation Guide. It is in line with IBM(R) Corporate Standards, and may be familiar to those who have installed other z/OS(R) products.

The traditional method, DFHISTAR, of installing CICS Transaction Server is still available.

Installation Process…

- **CICSPlex SM integrated into the standard install process**
  - No separate installation job stream
    - SEYUINST integrated with SDFHINST
      - SEYUJCL starter set library removed

    - EYUINST integrated with DFHINST

    - EYUISTAR integrated with DFHISTAR

  - EYUCMSDS & EYU9XDUT
    - Enhanced CICSPlex SM Data repository setup

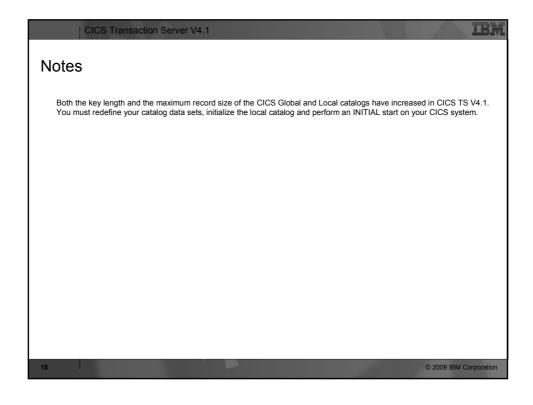 - New CPSM Installation Verification Programs

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Notes

The installation of CICSPlex SM is integrated with the installation of CICS.

The installation and configuration of CICSPlex SM are made easier by the introduction of a more integrated installation process. The following improvements reduce the complexity of installing and configuring CICSPlex SM:

You can now edit the DFHISTAR job to modify the CICS and CICSPlex SM installation parameters for your environment. You no longer need to edit, separately, a EYUISTAR job. There is one set of input parameters that you can modify and submit in the DFHISTAR job. DFHISTAR produces customized JCL for CICS and CICSPlex SM.

CICS Local and Global Catalog Changes

- **Key length increased to 52 bytes**
  - Local and Global catalog
- **Maximum record size increased**
  - Local and Global catalog

- **Define new datasets for CICS TS V4.1**
  - Initialize the Local catalog
  - Perform an INITIAL start

Notes

Both the key length and the maximum record size of the CICS Global and Local catalogs have increased in CICS TS V4.1. You must redefine your catalog data sets, initialize the local catalog and perform an INITIAL start on your CICS system.

Systems Initialization Table: New Parameters

- **USSHOME={/usr/lpp/cicsts/cicsts41/|directory}**
  - Name/Path of the root directory for CICS files on z/OS UNIX
- **MNIDN={OFF|ON}**
  - Monitoring identity class recording

Notes

USSHOME={/usr/lpp/cicsts/cicsts41/|directory}
The value for the USSHOME system initialization parameter must match the directory that you specified for CICS TS 4.1 files on z/OS UNIX when you installed CICS using the DFHISTAR installation job. The default value for the USSHOME system initialization parameter is /usr/lpp/cicsts/cicsts41, which matches the default values for the DFHISTAR installation job. If you changed any of the parameters TINDEX, PATHPREFIX, or USSDIR in the DFHISTAR installation job, you must specify a value for the USSHOME system initialization parameter to match the name and path that you specified for the root directory using those DFHISTAR parameters.

MNIDN={OFF|ON}
The monitoring identity class status is recorded in the CICS global catalog for use during warm and emergency restarts. The MNIDN system initialization parameter specifies whether the monitoring identity class is to be made active during CICS initialization.

A new monitoring Identity Class data record is written by CICS as an SMF 110 subtype 1 record. The new record is created during transaction detach processing for each transaction that has identity context propagation data (a distinguished name and realm). The Performance Class record field now includes an indicator in the current Transaction Flags field that indicates that there is an identity record available for this task.

Systems Initialization Table: Changed Parameters

- **INITPARM=(DFHMQPRM=….)**
  - Specify the MQ connection parameters
  - *Replaced* by the MQCONN resource definition
- **MQCONN={NO|YES}**
  - Connect to MQ during initialization
  - Use the attributes in the MQCONN resource definition
- **JVMPROFILEDIR={ /usr/lpp/cicsts/cicsts41/JVMProfiles | directory }**
  - Location of the JVM profile directory
  - USSHOME SIT parameter + JVMPROFILEDIR
- **PSTYPE={SNPS|MNPS|NOPS}**
  - Specifies persistent session support required

Notes

You can no longer use the INITPARM system initialization parameter with a DFHMQPRM operand to specify a default WebSphere MQ queue manager name and initiation queue name for the CICS-MQ connection. Instead, set up an MQCONN resource definition for the CICS region to provide these defaults. CICS issues a warning message if the DFHMQPRM operand is present on INITPARM when you start the CICS-MQ connection, and the settings are ignored. The INITPARM system initialization parameter itself is still valid with other operands.

When you specify MQCONN=YES, the information that CICS needs to start the connection to WebSphere MQ, such as the name of a WebSphere MQ queue manager or queue-sharing group, is taken from the MQCONN resource definition for the CICS region.

An MQCONN resource definition must be installed before CICS can start the connection to WebSphere MQ. When you start the connection automatically at CICS initialization, for an initial or cold start, the MQCONN resource definition must be present in one of the groups named in the list or lists named by the GRPLIST system initialization parameter. For a warm or emergency start of CICS, the MQCONN resource definition must have been installed by the end of the previous CICS run.

The default value for the JVMPROFILEDIR system initialization parameter now consists of the value of the new USSHOME system initialization parameter, followed by the subdirectory JVMProfiles. The default value for the USSHOME system initialization parameter is /usr/lpp/cicsts/cicsts41, so if that default value is used, the default value of JVMPROFILEDIR is /usr/lpp/cicsts/cicsts41/JVMProfiles.

NOPS is a new option for the PSTYPE system initialization parameter. If you do not require persistent sessions support, specify NOPS.

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CICS Supplied Transactions

- **CEMN**
  - New options for:
    - Identity class monitoring
    - DPL, FILE and TSQ Limits
- **CKQC**
  - MQCONN resource definitions supplies default settings
- **CRTE**
  - Supports transaction routing over IPIC
- **CWWU**
  - Alias transaction for the system management client API
- **CW2A**
  - Alias transaction for Atom service requests

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Notes

The **CEMN** transaction now includes the new distributed program link resource limit and a new identity class field. The CEMN transaction has been split into a primary panel and a second options panel. Also, you can change the DPLLIMIT, FILELIMIT, and TSQUEUELIMIT values using the CEMN transaction.

When you use the **CKQC** transaction from the CICS-MQ adapter control panels or call it from the CICS command line or a CICS application, the default settings in the transaction are now taken from the MQCONN resource definition for the CICS region, rather than from an INITPARM system initialization parameter.

The routing transaction, **CRTE**, now supports transaction routing over an IPIC connection

The Client API uses **CWWU** instead of CWBA to run the CICS alias program DFHWBA, to distinguish Client API requests from other types of Web requests.

CW2A, the default alias transaction for Atom feeds, is used for processing with ATOMSERVICE resource definitions.

CICS Supplied Transactions…

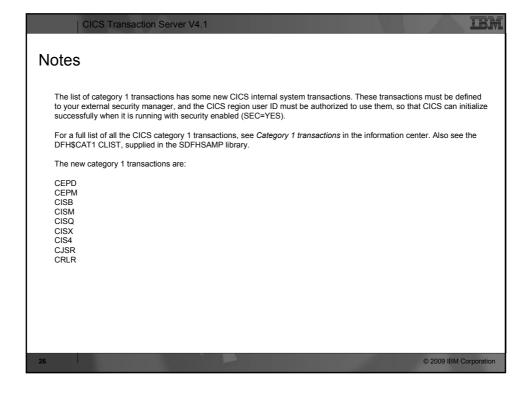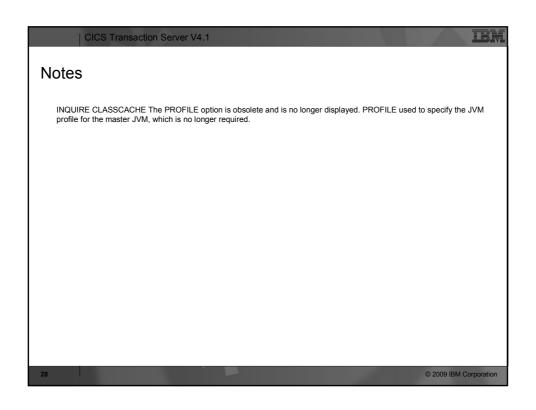- **New CICS RACF category 1 transactions**
  - CEPD
    - Event Processing Dispatcher
  - CEPM
    - Event Processing Queue Manager
  - CISB
    - IPCONN release processing
  - CISM
    - IS remote scheduler
  - CISQ
    - IS local queue processor
  - CISX
    - IPCONN recovery processing
  - CIS4
    - IS external security interface
  - CJSR
    - JVM server resolution
  - CRLR
    - Bundle resource resolution

Notes

The list of category 1 transactions has some new CICS internal system transactions. These transactions must be defined to your external security manager, and the CICS region user ID must be authorized to use them, so that CICS can initialize successfully when it is running with security enabled (SEC=YES).

For a full list of all the CICS category 1 transactions, see *Category 1 transactions* in the information center. Also see the DFH$CAT1 CLIST, supplied in the SDFHSAMP library.

The new category 1 transactions are:

CEPD
CEPM
CISB
CISM
CISQ
CISX
CIS4
CJSR
CRLR

CICS Supplied Transactions: CEMT

- **Obsolete options**
  - INQ CLASSCACHE (PROFILE option)
- **New options**
  - DISCARD
    - ATOMSERVICE, BUNDLE, EVENTBINDING, JVMSERVER, MQCONN
  - INQ & SET
    - ATOMSERVICE, BUNDLE, EVENTBINDING, EVENTPROCESS, JVMSERVER, MQCONN, MQINI (INQ only), XMLTRANSFORM
  - INQUIRE SYSTEM
    - CICSTSLEVEL returns 040100
    - RELEASE returns 0660

Notes

INQUIRE CLASSCACHE The PROFILE option is obsolete and is no longer displayed. PROFILE used to specify the JVM profile for the master JVM, which is no longer required.

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CICS Supplied Transactions: CEMT…

- **Changed options**
  - Changes to support IPv6
    - CORBASERVER, IPCONN, TCPIPSERVICE, WORKREQUEST
  - INQ DISPATCHER
    - ACTTHRDTCBS, MAXTHRDTCBS
  - INQ Monitor
    - Identity class
    - DPL limit
  - INQ TERMINAL and TRANSACTION
    - REMOTESYSTEM shows IP information
  - INQ URIMAP
    - New option AUTHENTICATE indicates whether specified host requires authentication
  - INQ VTAM
    - Persistent sessions specification
  - Resource signature data options added

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Notes

The HOST option has been extended to display IPv6 addresses. The values HOSTNAME, IPV4HOST, IPV6HOST, and NOTAPPLIC filter the contents of the new HOST option. A new option, IPRESOLVED, displays the IPv4 or IPv6 address of the host. The values IPV4FAMILY, IPV6FAMILY, and UNKNOWN filter the contents of the new IPRESOLVED option.

Two new options are added to the INQUIRE DISPATCHER:
ACTTHRDTCBS(value) Displays the number of T8 mode open TCBs that are currently active; that is, allocated to a user task.
MAXTHRDTCBS(value) Displays the maximum number of T8 mode open TCBs that can exist concurrently in the CICS region for all enabled JVMSERVER resources

A new option, DPLLIMIT, is added and the default for data compression is changed. A new option, IDNTYCLASS, specifies whether identity class monitoring is enabled.

INQUIRE TERMINAL and TRANSACTION: The REMOTESYSTEM option now provides information about IP connections.

INQUIRE URIMAP: A new option, AUTHENTICATE, displays information about whether the host specified in the USAGE(CLIENT) URIMAP resource requires authentication.

INQUIRE VTAM: A new option PSTYPE is added that displays the type of VTAM persistent sessions support for the CICS region. The values are as follows:
SNPS Single-node persistent sessions. VTAM sessions can be recovered after a CICS failure and restart.
MNPS Multinode persistent sessions.
NOPS VTAM persistent sessions support is not used for this CICS region.

The definition and installation signature options are added to the INQUIRE command for most CICS resources.

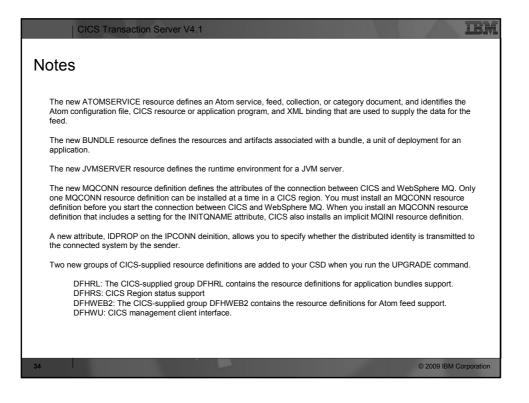30 © 2009 IBM Corporation

Resource Definition

- **CICS System Definition (CSD)**
  - Define New CSD

  - REPRO existing CSD to new dataset

  - Run DFHCSDUP UPGRADE
    - Use DFHCSDUP SCAN command to check for user changes
    - Review CEE group
    - MIGRATE command has been removed

  - Sharing the CSD
    - CICS TS V4.1 CSD can be shared with prior releases
    - Check for the appropriate compatibility groups

Notes

Run the DFHCSDUP utility program, specifying the UPGRADE command, to upgrade the CICS-supplied definitions in your CSD to the latest CICS TS level. You can create a new CSD using the DFHCSDUP INITIALIZE command.

A CICS TS V4.1 CSD can be shared with lower level CICS TS releases

Support for the DFHCSDUP MIGRATE command is withdrawn in CICS TS V4.1.

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Resource Definition…

- **New resource definitions**
  - ATOMSERVICE
  - BUNDLE
  - JVMSERVER
  - MQCONN
- **Changed resource definitions**
  - Changes to support IPv6
    - CORBASERVER, IPCONN, TCPIPSERVICE
  - IPCONN
    - IDPROP option added
  - URIMAP
    - ATOMSERVICE and AUTHENTICATE option added
- **New resource groups**
  - DFHRL
  - DFHRS
  - DFHWEB2
  - DFHWU

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Notes

The new ATOMSERVICE resource defines an Atom service, feed, collection, or category document, and identifies the Atom configuration file, CICS resource or application program, and XML binding that are used to supply the data for the feed.

The new BUNDLE resource defines the resources and artifacts associated with a bundle, a unit of deployment for an application.

The new JVMSERVER resource defines the runtime environment for a JVM server.

The new MQCONN resource definition defines the attributes of the connection between CICS and WebSphere MQ. Only one MQCONN resource definition can be installed at a time in a CICS region. You must install an MQCONN resource definition before you start the connection between CICS and WebSphere MQ. When you install an MQCONN resource definition that includes a setting for the INITQNAME attribute, CICS also installs an implicit MQINI resource definition.

A new attribute, IDPROP on the IPCONN deinition, allows you to specify whether the distributed identity is transmitted to the connected system by the sender.

Two new groups of CICS-supplied resource definitions are added to your CSD when you run the UPGRADE command.

DFHRL: The CICS-supplied group DFHRL contains the resource definitions for application bundles support.
DFHRS: CICS Region status support
DFHWEB2: The CICS-supplied group DFHWEB2 contains the resource definitions for Atom feed support.
DFHWU: CICS management client interface.

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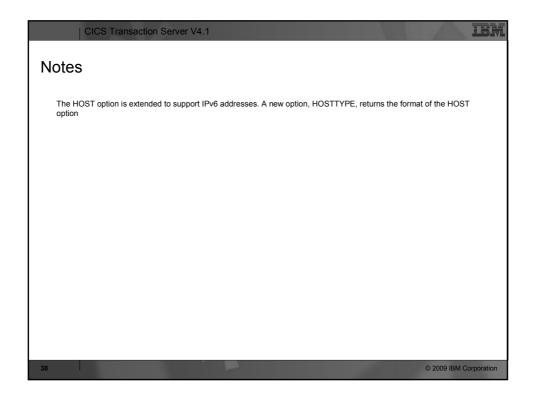# EXEC CICS Application Programming Interface

- **New commands**
  - BIF DIGEST
  - SIGNAL EVENT
  - TRANSFORM DATATOXML and TRANSFORM XMLTODATA
  - WEB READ QUERYPARM and browse QUERYPARM
  - WSACONTEXT
  - WSAEPR CREATE
  - INVOKE SERVICE command
    - Replaces INVOKE WEBSERVICE command
    - INVOKE WEBSERVICE available for compatibility

Notes

CICS Transaction Server for z/OS, Version 4 Release 1 includes some new API commands that you can use to create application programs that use new CICS functions.

EXEC CICS BIF DIGEST
  Calculate the SHA-1 digest of a string of data.
EXEC CICS INVOKE SERVICE
  This command calls a service from a CICS application. The command specifies the name of a service or the CICS resource, such as a WEBSERVICE resource, that contains information about the service to be called.
EXEC CICS SIGNAL EVENT
  Identify a place in an application program where one or more events could be emitted.
EXEC CICS TRANSFORM DATATOXML
  Use the TRANSFORM DATATOXML command to convert application data to XML.
EXEC CICS TRANSFORM XMLTODATA
  Use the TRANSFORM XMLTODATA command to convert XML to application data.
EXEC CICS WEB READ QUERYPARM
  Read name and value pairs from a query string in a URL.
EXEC CICS WEB STARTBROWSE QUERYPARM
  Start browsing query string data in a URL.
EXEC CICS WEB READNEXT QUERYPARM
  Get next item in query string.
EXEC CICS WEB ENDBROWSE QUERYPARM
  Finish browsing query string data in a URL.
EXEC CICS WSACONTEXT BUILD
  Use the WSACONTEXT BUILD command to insert or replace WS-Addressing message addressing properties (MAPs) in the addressing context.
EXEC CICS WSACONTEXT DELETE
  Use the WSACONTEXT DELETE command to delete the addressing context.
EXEC CICS WSACONTEXT GET
  Use the WSACONTEXT GET command in a service provider to get the message addressing properties (MAPs) sent by he service requester. Use the WSACONTEXT GET command in a service requester to get the MAPs of the reply message.
EXEC CICS WSAEPR CREATE
  Use the WSAEPR CREATE command to create an endpoint reference (EPR) to represent a Web service or Web service resource

EXEC CICS Application Programming Interface…

- **Changed commands**
  - Options added to support IPv6
    - EXTRACT TCPIP
    - EXTRACT WEB
    - WEB OPEN
    - WEB PARSE URL

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CICS Transaction Server V4.1

Notes

The HOST option is extended to support IPv6 addresses. A new option, HOSTTYPE, returns the format of the HOST option

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Application Programming Interface…

- **Changed commands…**
  - EXEC CICS ASKTIME
    - ABSTIME value returned is:
      - The system time-of-day clock
      - Adjusted for leap seconds and the local time zone offset
      - Truncated to the millisecond
        - > No longer rounded to 1/100 of a second
  - EXEC CICS CONVERTTIME
    - Recognizes date and time stamp strings in the RFC 3339 format
      - e.g. 2003-04-01T10:01:02.498Z
  - EXEC CICS FORMATTIME
    - STRINGFORMAT option now allows 'RFC3339'
    - New MILLISECONDS option

Notes

- **ASKTIME**
- The ABSTIME value that is returned by the EXEC CICS ASKTIME command is no longer rounded to the nearest 1/100 second. The absolute time returned is the system time-of-day clock, adjusted for leap seconds and the local timezone offset, truncated to the millisecond, and returned as a packed decimal of length 8 bytes. It therefore represents the number of milliseconds since 00:00 on 1 January 1900 in the local timezone and adjusted for daylight saving time.
- **CONVERTTIME**
- The XML dateTime datatype, specified in RFC 3339, which is taken from the ISO 8601 standard. This format is required for Atom feeds. An example of a date and time stamp in this format is "2003-04-01T10:01:02.498Z". Date and time stamps in this format are in UTC (Coordinated Universal Time, which differs only slightly from GMT), with the time zone offset (-12:00 to +12:00) indicated at the end of the date and time stamp, or the letter Z for a zero offset (+00:00). The decimal fraction of a second that is shown in the example is optional.
- **FORMATTIME**
- There is a new CVDA value RFC3339 for the STRINGFORMAT option which specifies the RFC 3339 format for the architected date and time stamp string returned in DATESTRING.
- There is a new option MILLISECONDS(data-area) returns the number of milliseconds in the current second that is specified by ABSTIME, as a binary integer in the range 0 - 999.
- Before CICS TS V4.1, the EXEC CICS FORMATTIME command rounded up a returned time if the number of milliseconds was greater than 500, except in the case where the ABSTIME argument contained a value representing the half-second before midnight, when no rounding was performed, and the TIME option returned 23:59:59. This rounding is no longer carried out, and the returned time (for example, with the TIME option) is given with the number of completed seconds. You can use the new MILLISECONDS option to obtain the number of milliseconds, and you can perform your own rounding if you need to replicate the former behavior of the command.

Systems Programming Interface

- **New commands**
  - CREATE
    - ATOMSERVICE, BUNDLE, JVMSERVER, MQCONN
  - DISCARD
    - ATOMSERVICE, BUNDLE, EVENTBINDNG, JVMSERVER, MQCONN
  - INQ
    - ATOMSERVICE, BUNDLE, BUNDLEPART, CAPTURESPEC, EVENTBINDING, EVENTPROCESS, JVMSERVER, MQCONN, MQINI, XMLTRANSFORM
  - SET
    - ATOMSERVICE, BUNDLE, EVENTBINDING, EVENTPROCESS, JVMSERVER, MQCONN, XMLTRANSFORM
  - CSD
    - Allows manipulation of the CICS System Definition file
- **Changed commands**
  - Similar to CEMT changes

Notes

CICS Transaction Server for z/OS®, Version 4 Release 1 includes some new SPI commands that you can use to control new system resources or to work in new ways with existing resources

Global User Exits

- *It is __HIGHLY recommended__ that ALL global user exits be analyzed to ensure that they are THREADSAFE and that their PROGRAM definitions changed to specify CONCURRENCY(THREADSAFE)*

- **Changes to the standard parameter list (DFHUEPAR)**
  - UEPGIND, task indicator field
    - EP
      - Event processing TCB
    - TP
      - Owns the LE enclave and THRD TCB pool for a JVM server
    - T8
      - Used by a JVM server to attach pthreads for system processing
- **All exits using XPI calls __MUST be reassembled__ !!**

Notes

The DFHUEPAR standard parameter list of TCB two-character codes and symbolic values addressed by the global user exit task indicator field, UEPGIND, is extended.

UEPTEP – A EP Event processing TCB
UEPTTP - A TP open TCB, used to own the Language Environment enclave and THRD TCB pool for a JVM server.
UEPTT8 - A T8 open TCB, used by a JVM server to attach pthreads for system processing.

If a global user exit or task-related user exit is assembled using CICS libraries from a release earlier than CICS TS V4.1 and makes a XPI call on a CICS TS V4.1 system the exit will fail. An error message is issued and the transaction that called the exit might end. You must reassemble all global user exits and task-related user exits, against the CICS TS V4.1 libraries, if they contain any XPI calls.

Global User Exits…

- **New exits**
  - XISQLCL, XWSPRRWI, XWSPRROI, XWSPRROO, XWSPRRWO, XWSRQRWO, XWSRQROO, XWSRQROI, XWSRQRWI, XWSSRRWO, XWSSRROO, XWSSRROI, XWSSRRWI
- **Changed exits**
  - Changes to support IPv6
    - XWBAUTH, XWBOPEN, XWBSNDO
  - Changes to support Breaking Event Address Register
    - XPCTA, XPCABND, XPCHAIR
  - Changes to support extended z/Architecture
    - XSRAB
  - XRSINDI
    - Changes to support new resources
    - Changes to support resource signatures

Notes

You can use the XISQLCL exit for EXEC CICS START NOCHECK commands that are scheduled for an IPIC connection

Twelve (12) new global user exits are provided to provide for control, monitoring and customization of a web service requests. Four exits points are provided when CICS is the service provider. When CICS is the service requester there eight (8) possible exit points. Four exit points are used in the normal case and an additional 4 exit points are provided when there is a secure request (a security handler is present).

XWBAUTH, XWBOPEN and XWBSNDO now support IPv6 addressing. You must ensure that any programs that use these global user exits can process IPv6 addresses that are passed in the UEPHOST parameter.

The transaction abend control block, TACB, is extended with the breaking event address register information, BEAR. The XPCTA, XPCABND, and XPCHAIR global user exits are passed a pointer to the TACB parameter. These exits have to be reassembled only if the new information is to be processed by the exit or the ABNDMSGT is not referenced by its address in field ABNDAMSG.
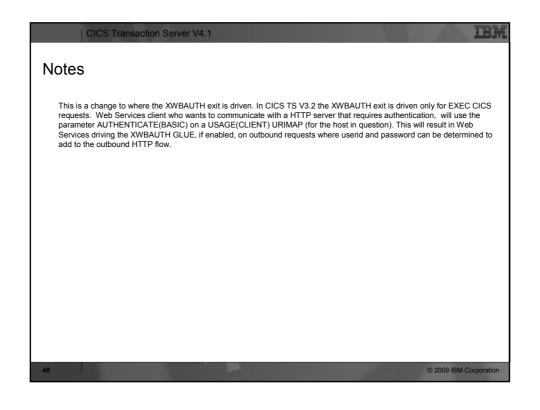
The TACB is also extended with additional GP and FP register information. Again, these exits have to be reassembled only if the new information is to be processed by the exit or the ABNDMSGT is not referenced by its address in field ABNDAMSG.

New fields have been added to the system recovery program exit, XSRAB, to support the extended z/Architecture MVS linkage support.

The range of values in the 1-byte field addressed by the UEPIDTYP parameter now covers the installation and discarding of the new resource types. New parameters are added to the install and discard global user exit XRSINDI to support the resource signatures.

Global User Exits…

- **Exit point moved to the Web Domain from the EXEC Layer**
  - XWBAUTH now may be driven for outbound Web Services requests
    - Exit driven for a Web Services Requester if:
      - A URIMAP with USAGE(CLIENT) is present
      - Basic authentication is requested
        - AUTHENTICATE(BASIC)
      - Exit XWBAUTH is enabled

    - EXEC CICS WEB SEND|CONVERSE requests will drive the exit

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Notes

This is a change to where the XWBAUTH exit is driven. In CICS TS V3.2 the XWBAUTH exit is driven only for EXEC CICS requests. Web Services client who wants to communicate with a HTTP server that requires authentication, will use the parameter AUTHENTICATE(BASIC) on a USAGE(CLIENT) URIMAP (for the host in question). This will result in Web Services driving the XWBAUTH GLUE, if enabled, on outbound requests where userid and password can be determined to add to the outbound HTTP flow.

User Replaceable Modules

- **Changes to support IPv6**
  - Analyzer program for web support
  - Converter program for web support
  - Web error program
- **DFHPEP**
  - Changes to support Breaking Event Address Register
  - Changes to support extended z/Architecture linkage conventions

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Notes

Analyzer program for CICS Web support
New fields, wbra_client_ipv6_address and wbra_server_ipv6_address, handle IPv6 addressing. User replaceable modules will behave as before with all IPv4 connections and you do not need to recompile existing modules unless they use the new parameters. If you introduce an IPv6 connection, the wbra_client_ip_address and wbra_server_ip_address fields are populated with zeros.

Converter program for CICS Web support
New fields, decode_client_ipv6_address and decode_client_ipv6_address_string, handle IPv6 addressing. User replaceable modules will behave as before with all IPv4 connections and you do not need to recompile existing modules unless they use the new parameters. If you introduce an IPv6 connection, the decode_client_address and decode_client_address_string fields are populated with zeros.

DFHWBEP, Web error program
New fields, wbep_client_ipv6_address_len, wbep_client_ipv6_address, wbep_server_ipv6_address_len, and wbep_server_ipv6_address handle IPv6 addressing. User replaceable modules will behave as before with all IPv4 connections and you do not need to recompile existing modules unless they use the new parameters. If you introduce an IPv6 connection, the wbep_client_address_len, wbep_client_address, wbep_server_address_len, and wbep_server_address fields are populated with zeros.

DFHPEP, Program error program
A new field has been added to the supplied program error program (DFHPEP) to support the improvements in wild branch diagnosis. New fields have been added to the supplied program error program to support the extended z/Architecture MVS linkage conventions.

Monitoring and Statistics

- **Monitoring**
  - Record size increases to 2672 bytes
  - **COMPRESS=YES** is now the default
  - New monitoring data
    - Event Processing
    - Web Services
    - Web 2.0
    - Identity class
  - DFH$MOLS
    - Support for DPL resource and identity class
- **Statistics**
  - DFHSTUP support for new resources
    - ATOMSERVICE, BUNDLE, CAPTURESPEC, EVENTBINDING, EVENTPROCESS, JVMSERVER, PROGRAMDEF, XMLTRANSFORM

Notes

Changes to CICS monitoring data might affect user-written and vendor-written utilities that analyze and print CICS SMF 110 monitoring records..

The length of a standard performance class monitoring record, as output to SMF, has increased to 2672 bytes. The length does not take into account any user data that you add or any system-defined data fields that you exclude by using a monitoring control table (MCT). The offsets have changed for a number of the default CICS dictionary entries in the dictionary data sections of CICS monitoring SMF 110 records.

CICS Transaction Server for z/OS, Version 3 Release 2 introduced a data compression facility for SMF 110 monitoring records, which can provide a significant reduction in the volume of data written to SMF. All monitoring records, except identity records, are compressed by default. If you do not want to compress monitoring records, you must change the compression option to COMPRESS=NO.

You can request a new type of monitoring data called identity data, which retrieves the distinguished name and realm for a transaction. This facility is dependent on the z/OS Identity Propagation function that is provided in z/OS, Version 1 Release 11 and post-GA code that will be delivered as a number of APARs

The statistics formatting utility program now formats additional statistics reports for the new statistics. You can code new resource types on the SELECT TYPE and IGNORE TYPE parameters using these keywords:
ATOMSERVICE , BUNDLE, CAPTURESPEC, EVENTBINDING, EVENTPROCESS, JVMSERVER, PROGRAMDEF, XMLTRANSFORM

You can retrieve all the new statistics using the EXEC CICS EXTRACT STATISTICS command, the EXEC CICS PERFORM STATISTICS RECORD command, and the CEMT PERFORM STATISTICS command.

CICSPlex Systems Manager

- **CICSPlex upgrade similar to previous releases**
  - –Maintenance point CMAS must be upgraded first

  - –CMAS and MAS agent code must all be at V4.1 level
    - CMAS CWA size now 2048

  - –WUI Server and its connected CMAS must be at V4.1 level
    - Migrate contents of WUI Server repository
    - Views and resource tables added to reflect the new resource types

Notes

You must migrate your CICSPlex SM CMAS to CICS TS Version V4.1 at the same time as you migrate the CICS system on which it runs. This is because since CICS Transaction Server for z/OS, Version 4 Release 1 a CICSPlex SM CMAS will run only in a CICS system at the same release level.

Both the Web User Interface server and the CMAS that it connects to must be at the highest level of CICSPlex SM within the CICSplex. This means that both must be at the same level as the maintenance point CMAS.
Before you migrate a Web User Interface server, you must migrate the CMAS that it connects to. You must migrate the Web User Interface server before you migrate any other MASs. If the CMAS that the Web User Interface server connects to is not the maintenance point CMAS, you must migrate the maintenance point CMAS at the same time.

As the CICS system that acts as your Web User Interface server is a local MAS, all the considerations that apply to a local MAS also apply to a Web User Interface server.

Discontinued Function

- **Support for the SOAP for CICS feature**

- **CICS documentation in Book Manager format**

- **Support for Java 1.4.2 and Java 5**

- **Support for the DFHCSDUP MIGRATE command**

- **Support for CPSM's WLMLOADCOUNT & WLMLOADTHRSH values**

- **Removal of EWLM support**

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Notes

In CICS TS V4.1, support for the SOAP for CICS feature is withdrawn. Customers should upgrade to the web services capabilities provided as part of CICS TS V3, or later.

CICS documentation is no longer published in BookManager Book format. Customers are recommended to use the Information Center. For previous levels of CICS TS that are still in service, the documentation that has previously been licensed will be included in an unlicensed Information Center at the next refresh cycle.

CICS TS for z/OS, Version 4.1, support for Version 1.4.2 and Version 1.5.0 is withdrawn, and you must upgrade to Version 6 of the SDK. When you upgrade to Java 6 from Java 1.4.2 you can benefit from the new Java language features, and also from the improvements to runtime technology in the IBM SDK for z/OS, V6. These improvements include better garbage collection and simpler class sharing. CICS TS for z/OS, Version 4.1 only supports the 31-bit version of the IBM SDK for z/OS, Version 6, not the 64-bit version.

Support for the DFHCSDUP MIGRATE command is withdrawn in CICS TS for z/OS®, Version 4.1. In previous versions of CICS, the DFHCSDUP MIGRATE command migrated the eligible DFHDCT, DFHRCT, DFHTCT, and DFHTST macro resource definitions to the CICS system definition data set (CSD). If you use any of these tables, you must migrate them to the CSD before you upgrade to CICS TS for z/OS, Version 4.1. To do so, you can use the DFHCSDUP MIGRATE command on any supported release up to CICS TS for z/OS, Version 3.2.

Support for the WLMLOADCOUNT and WLMLOADTHRSH EYUPARM values is discontinued in CICS TS for z/OS, Version 4.1. If you use the WLMLOADCOUNT or WLMLOADTHRSH EYUPARM values, you must now specify them using the Task load health threshold and Task load queue mode attributes in the CSYSDEF resource table. If you are using WLMLOADTHRSH EYUPARM, you must now specify the WLMLOADTHRSH EYUPARM as a Task load health threshold attribute in your target regions. This specification is a change from the discontinued EYUPARM which you previously specified in the routing regions.

In September 2008, IBM TechNote 1305697 announced the end of support for the Enterprise Work Load Manager (EWLM) in CICS TS V3.2 and CICS TG for z/OS V7.1. Similarly, CICS TS V4.1 does not support EWLM.

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Planning Information

- **Enterprise Java Bean support**
  - Will be removed in a future release of CICS TS for z/OS

- **ONC RPC feature**
  - Will be removed in a future release of CICS TS for z/OS

- **CICS Web Interface COMMAREA interfaces**
  - Will be removed in a future release of CICS TS for z/OS

- **CICS Web Server plug-in**
  - Will be removed in a future release of CICS TS for z/OS

Notes

Enterprise Java Beans: CICS TS V4.1 support for session beans using the Enterprise Java Bean (EJB) 1.1 specification and the associated CICS EJB Server components are stabilized. It is IBM's intention to discontinue support for session beans in a future release of CICS TS. Customers are encouraged to migrate these applications to be Java SE components and make them available through Web services or the JEE Connector Architecture (JCA). CICS continues to support Java as a first class application programming language for CICS applications, including enhancements to the CICS Java class library JCICS and support for Java 6.

Removal of ONC RPC in a future release: CICS support for Open Network Computing Remote Procedure Call (ONC RPC) clients will be removed in a future release of CICS TS. The recommended migration path is to access CICS using the new support for Web services.

CWI commarea interface removal: Notice is given that the support for passing HTTP requests and responses via commareas between applications and CICS will be removed in a future release of CICS TS. This mechanism, which was part of the initial CICS Web Interface, was superseded by the CICS Web Support APIs in CICS TS V1.3. Web-aware programs and converters using this interface should be migrated to use the EXEC CICS WEB commands designed for HTTP server applications.

DFHWBCLI commarea interface removal: As previously indicated in the announcement of the SOAP for CICS feature, the DFHWBCLI function introduced to provide outbound HTTP support will be withdrawn in a future release of CICS TS. Consideration should be given to migrating applications that link to DFHWBCLI, to use the new CICS Web Support EXEC CICS WEB SESSTOKEN() commands for HTTP client applications, made available in this release.

Web server plug-in removal: The CICS WebServer plug-in, DFHWBAPI, will be removed in a future release of CICS TS. This is the CICS supplied plug-in program that enables a pass-through mechanism from the IBM HTTP Server, via the EXCI, into CICS Web support using the CICS business logic interface. Users are recommended to migrate to use the CICS Transaction Gateway.

Summary

- **Installation**
  - Similar to previous releases
    - Standard installation procedure or DFHISTAR
  - Additional Unix System Services and zFS components

- **Upgrading**
  - Application Programmers
    - Review use of time functions
  - Systems Programmers
    - Review ALL GLUEs, TRUEs and URMs

Notes

The installation of CICS TS V4.1 is similar to previous releases of the product.

For systems programmers, the upgrade to CICS TS V4.1 is business as usual. All exits need to be reviewed for parameter list changes and thread safe applicability. Regions must be analyzed to determine if function removed in CICS TS V4.1 is being utilized and Independent Software Vendor (ISV) products must be review to determine the correct release levels required to support CICS TS V4.1

Good luck in your efforts.