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Session 4100

CICS TS Version 3 migration planning (Migrating to CICS TS 3.2)

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Notes

CICS TS V3 delivers:

- Facilities to re-use CICS applications within broader SOA scenarios, via standard APIs and protocols
- Enhancements that aid extension of existing applications, and construction of new applications, using contemporary programming languages, constructs and tools
- An execution environment for complex and demanding mixed-language application workload while efficiently integrating with SOA enterprise solutions
- Effective management of large run-time configurations via modern user interfaces, so that demanding service level objectives can be met

This new release of CICS TS provides a platform from which an enterprise can evolve toward the adoption of flexible business processes, exploiting all the advantages of the approach described above while capturing new opportunities derived from the latest technologies. As such, it represents the next logical step on the CICS road map.

CICS TS V3.2 is applicable to all CICS customers, and becomes the level of CICS to which all customers are recommended to migrate. As such, it replaces CICS TS V3.1 and all releases of CICS TS V2, and also all earlier levels of CICS.

Acknowledgements

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
- Future planning
- Documentation
- Summary

CICS Transaction Server V3.2 Elements

- CICS 0650
- CICSPlex SM 320
- CICS Information Center
- REXX Development System and Runtime Facility for CICS/ESA
- CICS Application Migration Aid
- WebSphere Developer for System z V7 promotion
  - 1 unrestricted entitlement, no service entitlement
  - Integrated development environment for CICS and WebSphere
    - COBOL, PL/I, Java for CICS and J2EE applications

Notes

In the shipment when you order CICS TS 3.2 is:

CICS at functional level CICS TS V3 R2 (Internal level CICS 0650)

CICSPlex SM at functional level CICS TS V3 R2

Application Migration Aid at functional level CICS TS V1 R1.

REXX for CICS at functional level CICS TS V1 R2 (REXX for CICS/ESA V1R1)

One unrestricted, promotional copy of Websphere Developer for System z V7

CICS Transaction Server V3.2 Elements…

- Service Flow Feature
  - Separately orderable, no charge feature of CICS TS 32
    - New function
      - Exploitation of channels and containers
      - Support for Link3270 non-mapped conversations
      - Improved installation and management capabilities
    - WebSphere Developer for System z V7
      - Service Flow Modeler
      - XML Services for the Enterprise (XSE)
      - Entitlement to 10 product licences (with service on those functions relating to SFF)
  - Will be delivered during the second half of 2007
    - The SFF of CICS 31 will NOT run with CICS TS 32
  - After general availability of CICS TS 32 it will NOT be possible to order the CICS TS 31 Service Flow Feature

Notes

The CICS Service Flow Feature of CICS TS V3.2 is an optional, no-charge feature. In a single offering, the CICS Service Flow Feature provides the tooling and run-time capabilities to enable the creation of CICS business services by composing existing CICS applications and resources into service flows that implement the required business service behavior. CICS business services can be published as Web services, or integrated with enterprise solutions such as business processes hosted on WebSphere Process Server or WebSphere MQ-based Enterprise Application Integration (EAI) solutions. The CICS Service Flow Feature of CICS TS V3.2 will deliver enhanced tooling and run-time capabilities that extend the existing function of the CICS Service Flow Feature of CICS TS V3.1 with:

- Exploitation of CICS channels and containers by Service Flow DPL nodes
- Support for Link3270 non-mapped conversations
- Improved installation, management, and error handling capabilities

The CICS Service Flow Feature of CICS TS V3.2 will be orderable with CICS TS V3.2, and will be delivered during the second half of 2007. This edition of the CICS Service Flow Feature is the successor to the CICS Service Flow Feature of CICS TS V3.1. It will **not** be possible to order the CICS Service Flow Feature of CICS TS V3.1 after the general availability of CICS TS V3.2.

Software Prerequisites

- CICS TS 3.2 requires z/OS V1.7, or later
  - The product will not initialize with a lower level of operating system installed
  - For EWLM support
    - The EWLM Managed Server must be active in the MVS image where CICS is running
      - With z/OS V1.7, z/OS APAR OA12935 is required
  - 64-bit support requires z/OS APAR OA19565
- The IBM XML Toolkit for z/OS V1.9 is required
  - No-charge product
  - Used by WS-Security
    - CICS TS 3.2 will not install if it is not present
- IBM SDK for Java 1.4.2 is required
  - 64-bit SDK is not supported
  - Will continue to be supported as long as CICS 31 is in service
- IBM XML Toolkit and SDK NOT shipped with CICS

Notes

CICS TS V3.2 requires z/OS (5694-A01) V1.7, or later. The product will not initialize in an environment with a lower level of operating system installed.

If used with z/OS V1.7, PTF UA24585 for APAR OA14340 is required.

For EWLM support

- The EWLM Managed Server must be active in the MVS image where CICS is running.
- With z/OS V1.7, z/OS PTF for APAR OA12935 is required. This is UA29986 (Release 720), UA29987 (Release 72J), or UA29988 (Release 72S).

64-bit support requires z/OS PTF(s) for APAR OA19565.

For TCP/IP support, Communications Server PTFs are needed. For z/OS V1.7, this is PTFs UK19627 and UK19628, both for APAR PK32534. For z/OS V1.8, this is PTF(s) for APAR PK40411.

The IBM XML Toolkit for z/OS (5655-J51) V1.9 is required. This is a no-charge product. It is used by WS-Security, but note that CICS TS V3.2 will not install if it is not present.

- If the WS-Security function is used, XML Toolkit PTF UA32191 for APAR OA19511 is recommended.

The IBM SDK for z/OS, Java 2 Technology Edition V1.4.2 (5655-I56) is required for use of Java application programs, enterprise beans, or the Web Services Assistant.

Note: The IBM 64-bit SDK for z/OS, Java 2 Technology Edition, Version 1.4 (5655-M30), is not supported.

Software Prerequisites…

- IMS Database Manager V8 or later
- DB2 V7 or later
- WebSphere MQ V5.3.1 or later
- CICS Universal Clients V5.1 or later
- CICS Transaction Gateway V5.1 or later

Notes

The following levels of other products are supported for use with CICS TS V3.2:

IMS Database Manager V8 (5655-C56)
IMS Database Manager V9 (5655-J38)
IMS Database Manager V10 (5635-A01)
DB2 Universal Database Server for OS/390 V7.1 (5675-DB2), or later.
WebSphere MQ for z/OS V5.3.1 (5655-F10)
WebSphere MQ for z/OS V6.0 (5655-L82)
Tivoli Decision Support for z/OS (5698-A27) V1.7, with PTF for APAR PK39321
Tivoli Business Systems Manager V3.3 (toleration support only)
Tivoli Federated Identity Manager V6.1.1
Tivoli Composite Application Manager for SOA V6.1
Tivoli Composite Application Manager for WebSphere V6.1
CICS Universal Client V5.1, or later
CICS TG V5.1, or later From V6.0 onwards, this is two products:
CICS TG for Multiplatforms and CICS TG for z/OS.

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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
- zFS is used as default instead of HFS
  - HFS steps commented out in installation jobs
- For 64 bit exploitation MEMLIMIT needs to be set equal or greater than 2GB

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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.

CICS installation jobs that require Unix System Services will now by default install in to a ZFS rather than an HFS. Job names are the same as they have always been except that a zfs gets created and customized rather than an HFS.

To use storage above the 2GB boundary (above the bar) when migrating to CICS® TS for z/OS®, Version 3.2, 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

- New default installation process
  - Common IBM install procedures
    - SMP/E RECEIVE, APPLY, ACCEPT commands
  - Described in the CICS Program Directory
- DFHISTAR process still available
  - 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 3.2 Program Directory. 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 Systems Manager is 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

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.

CICSPlex SM Resource Definitions

- Default resource definitions created at startup for
  - CMAS
  - WUI
  - MAS
- Removed requirement to customize DFHCNV
- Enhanced EYUSAMP set
  - EYU$CDEF (CMAS)
  - EYU$WDEF (WUI)
  - EYU$MDEF (MAS)

Notes

CICSPlex® SM creates default CICS® resource definitions for a CMAS, MAS and WUI server during an INITIAL start of these systems when the CPSMCONN system initialization parameter is selected. These default definitions are also created for a MAS started with the COLM transaction, and for a WUI server started with COVC transaction.

The default resource definitions are supplied in the following members of the SEYUSAMP sample library:

EYU$CDEF contains the default resource definitions for a CMAS.

EYU$MDEF contains the default resource definitions for a MAS.

EYU$WDEF contains the default resource definitions for a WUI server.

Systems Initialization Table: New parameters

- FCQRONLY={NO | YES}
  - Specifies whether you want CICS to force all CICSAPI user application programs that are specified as threadsafe to run file control requests under the CICS QR TCB, as if they were specified as quasi-reentrant programs.
    - FCQRONLY=YES can improve the performance of file-owning regions.
- XCFGROUP={DFHIR000 | name}
  - Name of the cross-system coupling facility (XCF) group to be joined by this CICS region.
- XHFS={YES | name | NO}
  - Specifies whether CICS is to check the transaction user's ability to access files in the z/OS UNIX System Services file system
- XRES={YES | name | NO}
  - Specifies whether you want CICS to perform resource security checking for DOCTEMPLATE resources

Notes

FCQRONLY={NO|YES}

Specifies whether you want CICS to force all CICSAPI user application programs that are specified as threadsafe to run file control requests under the CICS QR TCB, as if they were specified as quasi-reentrant programs.

NO

CICS honors the CONCURRENCY(THREADSAFE) attribute on program resource definitions, and allows user application programs to run applicable file control request on an open TCB to avoid unnecessary TCB switching.

YES

CICS forces all file control requests to run under the CICS QR TCB, as if they were specified as CONCURRENCY(QUASIRENT) programs. With all file requests on the QR TCB, CICS is able to minimise the amount of locking required at the expense of additional TCB switches if requests are run on open TCBs.

The FCQRONLY=YES can improve the performance of file-owning regions.

XCFGROUP={DFHIR000|name}

specifies the name of the cross-system coupling facility (XCF) group to be joined by this CICS region. Th same parm can be specified in the EXCI options table DFHXCOPT for EXCI clients.

XHFS={YES|name|NO}

specifies whether CICS is to check the transaction user's ability to access files in the z/OS® UNIX® System Services file system. At present, this checking applies only to the user ID of the Web client when CICS Web support is returning z/OS UNIX file data as the static content identified by a URIMAP definition.

XRES={YES|name|NO}

specifies whether you want CICS to perform resource security checking for DOCTEMPLATE (CICS document template) resources, and optionally specifies the general resource class name in which you have defined the resource security profiles. If you specify YES, or a general resource class name, CICS calls the external security manager to verify that the userid associated with a transaction is authorized to use the resource. This checking is performed every time a transaction tries to access a CICS document template.

Systems Initialization Table: Changed parameters

- APPLID={DBDCCICS | applid}
  - Now required to be unique within the local sysplex
- CONFDATA={SHOW | HIDETC}
  - Now applies to initial input data received on IPIC connections
- ICVTSD={500 | number}
  - Now applies also to IP interconnectivity input
- MSGCASE={MIXED | UPPER}
  - Now also applies to messages displayed by CPSM message domain
  - Also governs if mixed or upper case English CICS-MQ mapsets are to be used
- UOWNETQL=user_defined_value
  - Now used as the default NETWORKID of this CICS region on the IPCONN definitions that define IPIC connections

Notes

APPLID={DBDCCICS|applid} CICS application identifiers (APPLIDs) are now required to be unique within the local sysplex. Also, APPLID can now be used as the application identifier of this CICS region on IPIC connections.

CONFDATA={SHOW|HIDETC} CONFDATA now applies to initial input data received on IPIC connections (IS data), as well as to initial input data received on VTAM RECEIVE ANY operations, MRO connections, and FEPI screens and RPLAREAs.

ICVTSD={500|number} ICVTSD, the terminal scan delay value that determines how quickly CICS deals with some terminal I/O requests made by applications, now applies also to IP interconnectivity input.

MSGCASE={MIXED|UPPER} In previous releases, this parameter applied only to messages displayed by the CICS message domain. It now also applies to messages displayed by the CPSM message domain.

For CICS-MQ mapsets used by the CKQC transaction, when the language in use is English, it governs whether mixed or upper case English mapsets are to be used.

UOWNETQL=user_defined_value

On VTAM=NO regions, UOWNETQL, or its default value, is now used as the default NETWORKID of this CICS region on the IPCONN definitions that define IPIC connections.

Systems Initialization Table: Obsolete Parameters

- MNSUBSYS
  - Used in earlier releases to specify the subsystem identification in monitoring SYSEVENT class records

Notes

MNSUBSYS

This parameter, used in earlier releases to specify the subsystem identification in monitoring SYSEVENT class records, is obsolete. If it is specified, it is rejected with a message.

New CICS Supplied Transactions

- CEMN
  - CICS Monitoring Facility transaction
- CJGC
  - internally attached Java garbage collection transaction
- CJPI
  - Internally attached Java JVMPOOL management transaction
- CISC, CISD, CISE, CISR, CISS, CIST, CISX
  - Internally attached transactions for IPIC support
- CKQC
  - CICS-MQ Connection/disconnection and display transaction
- CKAM, CKBM, CKBP, CKBR, CKCN, CKDP, CKDL, CKRS, CKRT, CKSD, CKSQ, CKTI
  - Internally attached transactions for CICS-MQ support

Notes

CEMN gives you an alternative to the INQUIRE MONITOR and SET MONITOR system programming commands and the equivalent CEMT commands. You can use the transaction to inquire on the settings for the CICS monitoring facility, and to change some of the settings without needing to restart CICS.

When CICS initiates garbage collection in a JVM, this transaction is used for the process, so that the time spent in garbage collection is assigned to **CJGC** rather than to one of the user transactions that used the JVM.

If garbage collection is caused by an allocation failure in the JVM, rather than being scheduled by CICS, this takes place while the user application is running, and the CJGC transaction is not used.

CJPI starts up new JVMs as a result of a PERFORM JVMPOOL command.

There are a set of transactions **CIS*** that are part of the IPIC support

There are a set of **CK**** transactions for CICS-MQ support, including **CKQC** which is the operator interface to start/stop/display the CICS-MQ connection.

CICS Supplied Transactions…

- New CEMT command options
  - INQUIRE
    - IPCONN
    - LIBRARY
  - SET
    - IPCONN
    - LIBRARY
    - DOCTEMPLATE
  - DISCARD
    - IPCONN
    - LIBRARY
  - PERFORM
    - JVMPOOL

Notes

CEMT supports the standard inquire, set and discard commands for the new IPCONN, LIBRARY and DOCTEMPLATE.

CICS Supplied Transactions…

- Changed CEMT command options for
  - INQUIRE
    - Doctemplate, DSAS, FILE, IRC, MONITOR, PROGRAM, PIPELINE, SYSTEM, TCPIPSERVICE, WEBSERVICE
  - SET
    - Doctemplate, Monitor, Pipeline
  - PERFORM
    - Statistics
- INQUIRE SYSTEM
  - CICSTSLEVEL returns 030200
  - RELEASE returns 0650

Notes

There are a number of changed options on the CEMT INQUIRE, PERFORM and SET commands.

CICS Supplied Transactions…

- New CICS RACF category 1 transactions
  - CICS region user ID must be authorized to these transactions
    - CJGC Java Garbage Collection
    - CJPI JVMPOOL management
    - CKAM CICS-MQ Alert monitor
    - CKTI CICS-MQ Trigger monitor
    - CISC IPIC Acquire IPCONN (client side)
    - CISD IPIC Release IPCONN (client side)
    - CISE IPIC error
    - CISR IPIC request/response receiver
    - CISS IPIC Acquire IPCONN (server side)
    - CIST IPIC Terminate IPCONN

Notes

There are some new CICS(R) internal system transactions added to the list of category one transactions. These are the transactions that need to be defined to RACF(R), and to which the CICS region user ID must be authorized, to enable CICS to initialize successfully when you are running CICS with security enabled (SEC=YES).

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
  - Sharing the CSD
    - CICS TS 3.2 CSD can be shared with prior releases

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 3.2 CSD can be shared with lower level CICS TS releases

Changes to Resource Definition

- PIPELINE
  - RESPWAIT
- TCPIPSERVICE
  - REALM
  - ATTACHSEC(IDENTIFY)
  - PROTOCOL(IPIC)
  - URM(NO, DFHISAIP)
- MCT
  - TYPE=INITIAL
    - COMPRESS=YES|NO

Notes

PIPELINE resource definition: RESPWAIT(number)
Specifies the number of seconds that an application program should wait for a response message from a remote Web service. The value can range from 0 to 9999 seconds.

TCPIPSERVICE resource definition:

REALM(string) Specifies the realm that is used for HTTP basic authentication.
On the ATTACHSEC option, a new value of IDENTIFY is added:
On the PROTOCOL option, a new value of IPIC is added:
On the URM option, a new value of NO is added, and a new user-replaceable program can be specified:
This is only applicable for PROTOCOL(IPIC).
For the IPIC protocol, specify the name of the autoinstall user program for IP connections, if required. For PROTOCOL(IPIC), if you do not specify this attribute CICS uses the CICS-supplied, default, IP connections autoinstall user program, DFHISAIP.

MCT
COMPRESS={NO|YES} This option specifies whether or not you want data compression to be performed for the CICS SMF 110 monitoring records output by the CICS monitoring facility. NO This is the default, and specifies that you do not want monitoring record data compression to be performed for the CICS SMF 110 monitoring records output by the CICS monitoring facility. YES Specifies that you do want monitoring record data compression to be performed for the CICS SMF 110 monitoring records output by the CICS monitoring facility.

Resource Definition…

- New definitions
  - IPCONN
  - LIBRARY

Notes

New IPCONN resource definition type

Support for IPIC introduces a new CICS resource, the IP connection (IPCONN). An IP connection is a Transport Control Protocol/Internet Protocol (TCP/IP) communication link to a remote system. An IPCONN definition specifies the outbound attributes of the TCP/IP connection. The inbound attributes of the connection are specified by the TCPIPSERVICE definition named on the TCPIPSERVICE option of the IPCONN definition.

New LIBRARY resource definition type

Support for dynamic program library management introduces a new CICS resource, the LIBRARY. A LIBRARY represents a partitioned data set or sequence of concatenated partitioned data sets containing program entities that make up an application or group of applications (defined by the System Programmer). A LIBRARY definition specifies the name of the LIBRARY, the datasets belonging to that LIBRARY, its CRITICALity, and its RANKING in the overall LIBRARY search order.

CICS Java Enhancements

- Resettable JVM removed
  - Many removed, renamed and replaced options
    - Migration toward “Standard” JVMs
      - Most old options are ignored or tolerated
    - Improved error messages
- JVM Profile and Properties changes
  - Any JVM option or system property may now be specified
  - “X” options now use standard Java format
  - System Properties may be specified in JVM properties or profile
- JVM Application Isolation Utility
  - Standalone Utility
    - Code Analyzer tool
      - Support Pac CH1B available now
    - Useful for migrating to Continuous Mode JVMs
    - Reports Modifications to static Objects
- Improved Trace – CICS formats JVM trace output

Notes

Resettable JVMs are no longer supported in CICS® Transaction Server for z/OS®, Version 3 Release 2. Any Java programs that ran in resettable JVMs must be migrated to run in continuous JVMs. The migration process involves checking for certain actions in the program code, and then changing some options in your JVM profiles.

To migrate Java programs that ran in resettable JVMs, to run in continuous JVMs, follow these steps:

1. Check that your Java programs do not contain any code which might have an unwanted effect on serial isolation when the continuous JVM is reused by a subsequent program. The checks you should carry out are as follows:
   a. Check for any code that changes the state of the JVM (for example, changing the default time zone). Ensure that the program resets the JVM to the original state. If you need to police any application actions in the continuous JVM, the Java security manager can be used to do this.
   b. Check that any DB2® connections, or other task lifetime system resources, opened by the application are closed or released.
   c. Use the CICS JVM Application Isolation Utility to check for the use of any static variables in your Java programs. The use of static variables might cause Java programs that were designed to execute in a resettable JVM, to exhibit changed behavior when they execute in a continuous JVM. Possible Java application behavior changes in continuous JVMs explains potential issues. Review the findings of the utility and make any code changes that are necessary to preserve the original behavior. Auditing Java™ applications for the use of static variables tells you how to use the utility.
2. Examine the existing JVM profiles and JVM properties files for your applications. You can either make a new copy of your existing files and make changes to the options specified in them, or transfer the relevant settings from your existing files to new files based on the samples provided with CICS Transaction Server for z/OS, Version 3 Release 2. There are a number of changes to the options that you can specify in JVM profiles and JVM properties files, so you are recommended to use the new samples to help you create new files, rather than migrating your existing files.
3. Compare your existing JVM profiles and JVM properties files with the new CICS-supplied samples, and with the table of changed options shown in Changes to options in JVM profiles and JVM properties files. Identify the options and system properties which you customized in your existing files, and note any which are now obsolete or need to be specified differently.
4. Either transfer relevant settings from your existing files to new files based on the new CICS-supplied samples, or make appropriate changes to a new copy of your existing files. The most important changes to make are:
   a. Set the correct CICS and Java home directories to match your CICS Transaction Server for z/OS, Version 3 Release 2 installation. The correct directories are already specified in the CICS-supplied samples.
   b. Change REUSE=RESET to REUSE=YES, or replace Xresettable with REUSE=YES.
   c. Add the paths to classes that were specified on class paths in your existing files, to the appropriate class path in the new files. There are a number of changes to the way class paths are specified in CICS Transaction Server for z/OS, Version 3 Release 2. Migrating class paths in JVM profiles explains how to handle each of the changed class paths.
   d. Migrate your storage settings from the existing files to the new files. The way in which storage is used in a continuous JVM differs in some respects from the way it is used in a resettable JVM. Migrating storage settings in JVM profiles from resettable JVMs explains how to specify suitable storage settings as a starting point for your continuous JVMs.

When you use the JVM profiles, if you have omitted any key changes, CICS issues warning messages to explain what changes are still required.

Systems Programming Interface

- New and changed commands
  - Changes similar to the CEMT changes
- EXEC CICS EXTRACT STATISTICS
  - DOCTEMPLATE
  - IPCONN
  - LIBRARY
  - MQCONN

Notes

Changes to the System Programming Interface SPI) are the same as those listed earlier for CEMT.

Global User Exits (GLUEs)

- *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)*
- *First Phase PLT programs can now enable GLUEs using a THREADSAFE keyword on the enable command*
  - *Ensures system auto-installed exits are defined as threadsafe*

Notes

All user programs defined by a program resource definition have a concurrency attribute, which can be either QUASIRENT or THREADSAFE. By default, global user programs are defined as quasi-reentrant, which means they are given control on the CICS QR TCB. If the task under which the global user exit is invoked is executing on an open TCB, and the exit program is defined as quasi-reentrant, CICS switches back to the QR TCB for the execution of the exit program.

To avoid unnecessary TCB switching, you are strongly recommended to make sure that your global user programs conform to threadsafe programming standards. When you are satisfied that your exit programs are threadsafe, ensure that they are defined as CONCURRENCY(THREADSAFE).

If GLUEs are enabled during first phase PLT, because this is very early in CICS initialization, there is no program definition capability nor program autoinstall active. CICS system auto installs the exit program definition and it always installs it as CONCURRENCY(QUAISRENT). In CICS TS 3.2 this can now be overcome by the PLT program specifying THREADSAFE on the enable command for the GLUE.

Global User Exits…

- New global user exits
  - XAPADMGR
    - Add user information to a task's Associated Data Origin Descriptor
  - XISQUE
    - Control the number of queued DPL requests for IPCONN sessions
  - XWBAUTH
    - Supply credentials for an out HTTP request

Notes

Application Associated Data exit **XAPADMGR.** The XAPADMGR exit is for use with distributed transactions. It allows you to add user information to a task's Associated Data Origin Descriptor, at the point of origin of the distributed transaction. This information could later be used as, for example, search keys for processing carried out through CICSPlex SM. CICS provides a sample global user exit program, DFH$APAD, for use at the XAPADMGR exit point. The exit program is invoked, if enabled, when non-system tasks for which no input Origin Descriptor Record is provided are attached.

HTTP client send exit **XWBAUTH.** This exit can be used to supply credentials for an outbound http request using basic authentication.

The **XISQUE** exit, for managing intersystem queues on IP connections. You can use the XISQUE exit to control the number of queued distributed program link (DPL) requests for sessions on IP interconnectivity (IPIC) connections. The XISQUE exit enables you to detect queuing problems (bottlenecks) early. It is invoked only for DPL requests across IPCONNs. XISQUE enables allocate requests to be queued or rejected, depending on the length of the queue. It also allows an IPCONN on which there is a bottleneck to be terminated and then re-established.

Global User Exits…

- Changed global user exits
  - Parameter changes due to XRBA processing
    - XFCFRIN, XFCFROUT
    - XFCREQ, XFCREQC
    - XFCDEL, XFCBFAIL, XFCBOVER, XFCBOUT
  - Parameter changes due to PB Token
    - XEIIN, XEIOUT
    - XEISPIN, XEISPOUT
    - XPCREQ, XPCREQC, XPCERES
    - XRMIIN, XRMIOUT
  - XRSINDI
    - New resources – IPCONN and LIBRARY
  - XMEOUT
    - New parameters for CPSM messages

Notes

UEP_EI_PBTOK
Address of a 4-byte field containing the z/OS Workload Manager (WLM) Performance Block Token. An exit program can use this token to access information (such as the service class token, SERVCLS, or the current EWLM correlator, EWLM_CHCORR) in the WLM Performance Block. To do so, it must use the WLM EXTRACT macro, IWMMEXTR, passing the Performance Block Token as the MONTKN input parameter.

XFCLDEL, XFCBFAIL, XFCBOVER, and XFCBOUT, file control exits

If you have exit programs that run at these exit points, you might need to recode them to cope with the format of the new log records that are issued for extended addressing ESDS data sets.

User Replaceable Modules

- New URM
  - DFHISAIP
    - IPCONN auto install program

Notes

The IPCONN autoinstall user program performs a similar role, to that performed for APPC connections by the APPC autoinstall user program. Like the APPC autoinstall user program, the IPIC autoinstall user program chooses an installed connection to use as a template for the new connection, the main difference being that the template is an IPCONN rather than a CONNECTION definition.

If IPCONN autoinstall is active, CICS installs the new IPCONN connection using:

The information in the connect flow

The IPCONN template selected by the IPCONN autoinstall user program

Values returned by the user program in its communications area

DFHISAIP, the Assembler language version, is the default user program for autoinstall of IP connections. Sample COBOL, PL/I, and C versions are also supplied. The source for all the versions of the sample program is supplied in the CICSTS32.CICS.SDFHSAMP library.

Task Related User Exits

- New Workload Manager CICS TRUE Invocation …
  - Enables a CICS application to interact with a non-CICS ARM Enabled product in order to support EWLM
- Task Related User Exit program …
  - Sets a bit in the Scheduling flag word for the current transaction
  - CICS will then invoke the user exit program whenever the transaction issues a non-terminal-related EXEC CICS START command
    - Task related user exit program extracts the ARM correlator included in the work request and makes it available to CICS. How the correlator is passed in the work request and its location must be understood by the user exit program
- At transaction attach of the 'STARTed' transaction
  - Correlator is passed to z/OS WLM at Transaction Classification

Notes

A CICS application that interacts with another (non-CICS) product that supports the Application Response Measurement (ARM) workload balancing and reporting standard can use a task-related user exit program, invoked by CICS context management, to support cross-product workload monitoring. Sometimes, such a task-related user exit program is supplied by the non-CICS, ARM-enabled, product.

A task-related user exit program signals that it wants to be invoked by CICS context management by setting a bit in the schedule flag word. It can set this bit when it is invoked by an application program or by the CICS task manager at start-of-task.

Note that the only way to cause the exit program to be invoked by CICS context management is for the exit program itself, on a preliminary invocation, to set the bit in the schedule flag word. Calls by the CICS termination manger, for instance, can be scheduled by specifying the SHUTDOWN option on the EXEC CICS ENABLE command that enables the exit program. There is no equivalent option on the EXEC CICS ENABLE command to cause the exit program to be invoked by CICS context management.

If the context management bit in the schedule word is set for the current transaction, CICS context management invokes the exit program whenever the transaction issues a non-terminal-related EXEC CICS START command. (The exit program is not invoked for terminal-related EXEC CICS START commands.)

CICS-MQ adapter

- Components transferred from the WebSphere MQ product into CICS TS V3.2:
  - CICS-MQ Adapter. (CICS-MQ TRUE upgraded to use OTE. MQ API is now threadsafe.)
  - MQ trigger monitor for CICS
  - MQ bridge (includes the DPL bridge and link 3270 bridge)
    - Does not include the 3270 start bridge which is obsolete
- CICS shipped components
  - CICS-MQ Adapter and MQ trigger monitor for CICS - will work with all supported releases of Websphere MQ
  - MQ bridge - will work with MQ V6 and above, for MQ V5.3.1 control will be transferred to MQ shipped bridge
  - CICS Level 2 and Level 3 will service CICS shipped components
- Websphere MQ will continue to ship components for use with CICS TS V3.1 & below
  - Until such time that all releases of CICS TS prior to CICS TS V3.2 are out of service
  - Limited enhancements over time, will functionally stabilize
  - MQ Level 2 and Level3 will continue to service MQ shipped components

Notes

The CICS-MQ adapter, trigger monitor and MQ bridge have transferred from the WMQ product into CICS TS.

The CICS TS shipped components are for use with CICS TS 3.2. The adapter and trigger monitor work with all supported releases of WMQ. The CICS TS 3.2 shipped bridge works with WMQ V6 and above. When connected to WMQ V5.3.1, the CICS TS 3.2 shipped bridge will transfer control to the WMQ V5.3.1 shipped bridge.

The CICS TS 3.2 shipped MQ adapter has been enhanced to use OTE and as such the MQ API is now threadsafe, and will not cause TCB switching when an application is running on a CICS open TCB.

CICS-MQ Interfaces – name changes

- Most transferred modules have been renamed from CSQCxxxx to DFHMQxxx
  - CSQCxxxx aliases provided for compatibility where exposed on the API
- API crossing exit CSQCAPX.
  - Source supplied as CSQCAPX unchanged. Load module supplied as CSQCAPX
- API stub is DFHMQSTB but with alias CSQCSTUB and all other aliases currently supported
  - e.g. CSQCGET, CSQCPUT…..
  - Stub shipped in SDFHLOAD and SDFHAUTH
  - No recompile, no re-linkedit of applications required
- CICS-MQ TRUE renamed from CSQCTRUE to DFHMQTRU but with same entryname MQM
  - EXTRACT EXIT PROGRAM(CSQCTRUE) ENTRYNAME(MQM) commands will work
    - At runtime CICS will substitute DFHMQTRU as the program name
  - INQUIRE EXITPROGRAM(CSQCTRUE) ENTRYNAME(MQM) commands will work
    - At runtime CICS will substitute DFHMQTRU as the program name

Notes

The CICS-MQ adapter, trigger monitor modules have been renamed from CSQCxxxx to DFHMQxxx with aliases of CSQCxxxx provided when needed to provide compatibility, for example when an API is provided via link to a CSQCxxxx module.

No recompile or relinkedit is required for existing CICS-MQ applications.

CICS-MQ Migration…

- CICS supplies CSD definitions for adapter, trigger monitor and bridge in group DFHMQ
  - Group DFHMQ is part of list DFHLIST
- Users need to remove existing MQ groups CSQCAT1 and CSQCKB from the CSD unless sharing the CSD with lower releases
  - For CICS TS 3.2: install DFHMQ but do not install CSQCAT1 and CSQCKB
  - When sharing a 3.2 CSD & running on CICS TS 3.1 and below:
    - delete Tdqueue CKQQ from group CSQCAT1 (CKQQ is provided in group DFHDCTG)
    - Install groups CSQCAT1 and CSQCKB which will override group DFHMQ
- Change INITPARM SIT parameter for CICS-MQ:
  - Change program name from CSQCPARM to DFHMQPRM
  - Remove TN=xxx sub parameter as trace point is nolonger settable
- Ensure WMQ libraries are **AFTER** CICS libraries in STEPLIB and DFHRPL concatenations
- For WMQ V5.3.1 apply apar PK39200
  - Polices use of the correct adapter. Without this apar, the MQ bridge will not operate
- For WMQ V6 apply apar PK42616
  - Polices use of the correct adapter

Notes

CICS provides all required definitions in CSD group DFHMQ. For previous releases definitions were supplied by WMQ in groups CSQCAT1 and CSQCKB. These groups should not be installed on CICS TS 3.2

A CICS TS 3.2 CSD can be shared with lower level CICS TS releases. In this case the CSQCAT1 and CSQCKB groups should be installed to override DFHMQ. However tdqueue CKQQ should first be deleted from group CSQCAT1 on a 3.2 CSD as this definition is supplied in group DFHDCTG.

The INITPARM syntax has changed. The TN= parm is obsolete and the program name changes to DFHMQPRM. For example

INITPARM=(CSQCPARM='SN=CSQ1,TN=001,IQ=CICS01.INITQ')

changes to
INITPARM=(DFHMQPRM='SN=CSQ1,IQ=CICS01.INITQ')

The WMQ libraries must be placed after the CICS libraries in the STEPLIB and DFHRPL concatenations to ensure that the CICS shipped components are used. This is because there are modules with the same name in both product libraries.

Apar PK39200 is required on WMQ V5.3.1 and PK42616 on WMQ V6.

CICS-MQ Interfaces – Statistics and Monitoring

- MQCONN Global statistics supplied via DFH0STAT, DFHSTUP and CPSM WUI
  - DSECT name is DFHMQGDS
- CICS Monitoring - Performance Class Data
  - Two new fields in DFHDATA group
    - WMQREQCT (count) – Total number of MQ requests
    - WMQGETWT (clock and count) MQ GETWAIT wait time
      - Records CICS dispatcher wait identified as MQSeries GETWAIT
    - MQSeries TASKSWCH wait will no longer occur as TRUE will use L8 open TCB
  - Existing group DFHRMI (activated via RMI=YES in MCT) is unaffected
    - Already contains RMIMQM
      - The total elapsed time spent in the CICS RMI for WebSphere MQ requests
      - RMIMQM is a subset of total elapsed time spent in the RMI for all TRUEs

Notes

New CICS-MQ connection statistics are are provided via the standard CICS statistics mechanisms EXEC CICS PERFORM STATISTICS MQCONN and EXEC CICS EXTRACT STATISTICS MQCONN.

Statistics can be viewed via DFHSTUP and DFH0STAT and via CPSM Web User Interface.

CICS-MQ statistics can be reset via the CKQC transaction, and are also subject to reset via the normal CICS mechanisms, eg when an interval expires or via an API command.

New monitoring fields records the number of MQ requests, the number of getwaits and how long they waited.

CSAQRTCA (formerly CSACDTA)

- Support for direct access to CICS's CSA and TCAs was removed in CICS/ESA 4.1 However people still have their fingers in the code!!
- CSACDTA was a field in the CSA (offset +4C) that pointed to the TCA of the currently dispatched task.
- This worked when all user tasks ran on QR TCB
- With the introduction of OTE in CICS TS 13:
  - It is invalid for any code not running on the QR TCB
    - It gives the address of someone else's TCA
      - ie the task running on QR
  - In CICS TS 1.3 a new macro was introduced
    - DFHKERN INQUIRE_TASK, TCAADDRESS=Rx,STACK_AVAIL=YES¦NO
    - Gets TCA address of task via stack, or via TCB then stack
    - Use STACK_AVAIL(YES) if R13 points at kernel stack else use NO

Notes

CSAQRTCA (formerly CSACDTA) was a field in the CSA giving access to the TCA of the currently active task. Since the introduction of OTE use of this field has been heavily discouraged as it can not be relied upon.

CSAQRTCA (formerly CSACDTA) …

- Since CICS TS 1.3 users have been urged to use the SPI where possible else use the DFHKERN macro
- In CICS TS 3.1 all remaining use of CSACDTA was removed from CICS & CPSM
  - Even from code that always runs on QR
  - The field was still set, but never used
  - To further discourage use the field was renamed CSAQRTCA
- In CICS TS 3.2 CSAQRTCA is loaded with a fetch protected address
  - If used, abend ASRD with console message DFHSR0618 will result.

Notes

In CICS TS 3.1 all use of CSAQRTCA (formerly CSACDTA) by CICS and CPSM was removed.

In CICS TS 3.2 CSAQRTCA (formerly CSACDTA) is loaded with a fetch protected address. Referencing the address held in CSAQRTCA will produce as ASRD abend. The explanation of the he ASRD abend has been updated.

Monitoring and Statistics

- Performance class data
  - Record size increases to 2352 bytes
    - Consider compression
    - Reduce using INCLUDE and EXCLUDE option on the MCT
  - Clock size precision changes
- Changes to statistics record
  - New DSECTs
    - DFHDHDDS Document template statistics
    - DFHISRDS IP connections resource statistics
    - DFHLDBDS Library resource statistics
    - DFHMQGDS WebSphere MQ Connection statistics

Notes

There are changes to CICS® monitoring data that could 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 2352 bytes. This 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). CICS Transaction Server for z/OS®, Version 3 Release 2 introduces a data compression facility for SMF 110 monitoring records, which can provide a significant reduction in the volume of data written to SMF.

The offsets have changed for a number of the default CICS dictionary entries in the dictionary data sections of CICS monitoring SMF 110 records.

The length of a monitoring clock for performance class data has increased from 8 bytes to 12 bytes. This affects all performance class data fields defined as "TYPE-S", and also affects any user-defined event-monitoring points (EMPs) which involve clocks. User clocks are defined in the monitoring control table (MCT) using DFHMCT TYPE=EMP macros. Note that the monitoring clocks for transaction resource class data are not changed, and they remain at 8 bytes.

Check your utility programs that process CICS SMF records to ensure that they can still process SMF 110 records correctly. If you have utility programs provided by independent software vendors, you should ensure that these also are able to handle the SMF 110 records correctly. This is particularly important if you want to activate data compression for monitoring records. You need to make sure that the product is able to identify compressed CICS SMF 110 monitoring records, and expand the data section using the z/OS Data Compression and Expansion Services, so that the monitoring records can be processed correctly. If the reporting tool is not able to do this, you could use the CICS-supplied monitoring sample program DFH$MOLS with the EXPAND control statement to produce an output data set containing the SMF 110 monitoring records in their expanded format, for the tool to work with.

CICS SOAP Feature

- Not orderable with CICS TS V3.2
  - Existing Version 2 feature may be used with 3.2
    - Intent is to aid migration
    - Not intended as a substitute for Web Services

Notes

If you use the SOAP for CICS feature, you can continue to do so; the feature continues to be fully supported in CICS TS 3.2 independently of Web services in CICS.

The SOAP for CICS feature can interoperate with the support for Web services in CICS TS for z/OS, Version 3.2: the feature can be the service requester or the service provider.

CICSPlex Systems Manager

- CICSPlex migrations similar to previous releases
  - –CMAS and MAS agent code must all be at 3.2 level
    - –No CAS to migrate
  - –WUI Server and its connected CMAS must be at 3.2 level
    - –Migrate contents of WUI Server repository
  - –Maintenance point CMAS must be upgraded first

Notes

You must migrate your CICSPlex SM CMAS to CICS TS Version 3.2 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 2 Release 3 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.

Planning Information

- 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

From the CICS TS 3.2 announcement letter:

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.

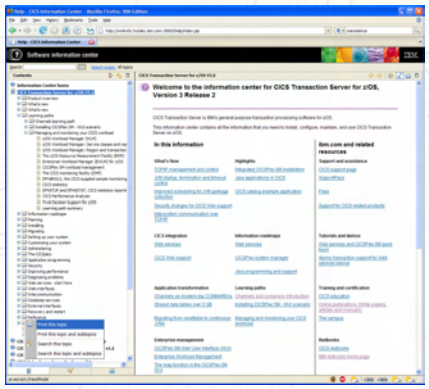
CWI commarea interface removal: Notice is given that the support for passing HTTP requests and responses via commareas between applications and CICS will be removed in a future release of CICS TS. This mechanism, which was part of the initial CICS Web Interface, was superseded by the CICS Web Support 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.

CICS Information Center

- Content
  - Builds upon navigational improvements introduced in V3.1
  - New and updated learning paths and product overview Incl. Managing, measuring, and analyzing your CICS workload
  - New headers and footers on every page
    - feedback link
    - timestamp of last update
    - a link to the PDF
    - URL for the displayed topic
  - Anchors enable the Info Center to be extended with your own documentation
- Upgraded to IBM Eclipse Help System V3.1
  - Update Manager – install or update documentation from an IBM server via FTP or HTTP
  - An enhanced search and results
  - "Quick menu" to search or print a topic or section of the navigation
  - Icon to turn search highlighting on and off
- Use via IBM Web site, workstation, or server



Notes

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Summary

- Installation
  - Similar to previous releases
    - Standard installation procedure or DFHISTAR
  - Additional Unix System Services and zFS components
- Migration
  - Application Programmers
    - Java: review any dependency on a resettable JVM
  - Systems Programmers
    - Review ALL GLUEs, TRUEs and URMs

Notes

The installation of CICS TS 3.2 is similar to previous releases of the product. New in CICS TS 3.2 is the use of the standard IBM installation procedure using an SMP/E RECEIVE, APPLY and ACCEPT process. To accommodate users familiar with the CICS based installation process DFHISTAR is still available.

For systems programmers, the migration to CICS TS 3.2 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 3.2 is being utilized and Independent Software Vendor (ISV) products must be review to determine the correct release levels required to support CICS ST 3.2.

Good luck in your migration efforts.

