



CICS Transaction Server V4.2

CICS Transaction Server V4.2: *Everything You Need to Know about Upgrading*

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Notes

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 that is needed for a flexible, global enterprise.

CICS TS V4.2 builds upon the new and enhanced capabilities developed and delivered in Version 4.1, to enable customers to compete in the marketplace, comply with standards and regulations, and control their IT processes. CICS TS V4.2 delivers technical innovation and significant business value in five main focus areas, satisfying in excess of fifty customer and user group enhancement requests. The result is a powerful new release with a huge amount of value for all stakeholders - delivering a smarter transaction processing experience for CICS users and their customers in turn.

This presentation will outline the changes that you will encounter when upgrading your CICS release level to CICS TS V4.2.

Planned availability date: June 24, 2011

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Session Agenda

- **Software prerequisites**
- **General external changes**
 - Resource definition
 - Application and systems programming interfaces
 - Global user exits
 - Monitoring and statistics
- **Statement of directions**
 - Planned enhancements
 - Planned function removal
- **Documentation**
- **Summary**

Notes

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Statements of direction

- **IBM intends in the future for IBM WebSphere MQ for z/OS to provide Group Units of Recovery (Group UR) support for IBM CICS Transaction Server for z/OS (CICS TS)**

- **IBM intends in the future to deliver a Dynamic Scripting Feature Pack for use with CICS TS V4.2**

- **IBM intends a future release of CICS TS to discontinue support for both:**
 - Session beans using Enterprise Java Beans (EJB)
 - The Java pool infrastructure

Notes

IBM declares the following statements of general direction:

IBM intends in the future for IBM WebSphere MQ for z/OS to provide Group Units of Recovery (Group UR) support for IBM CICS Transaction Server for z/OS (CICS TS).

IBM intends in the future to deliver a Dynamic Scripting Feature Pack for use with CICS TS V4.2.

IBM intends a future release of CICS TS to discontinue support for both: (i) session beans using Enterprise Java Beans (EJB); and (ii) the Java pool infrastructure. Customers are encouraged to migrate Java applications to the new JVM server infrastructure, and to migrate EJB applications to Java SE components and make them available through web services or the JEE Connector architecture (JCA). CICS will continue to support Java as a first class application programming language for CICS applications, including enhancements to the CICS interfaces, the deployment infrastructure, and Java runtime environment.

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CICS Transaction Server V4.2 Elements

- **CICS Transaction Server V4.2**
 - CICS 0670
 - Service Flow Runtime now shipped with CICS TS V4.2

- **CICSplex SM V4.2**

- **REXX**
 - Development System
 - Runtime Facility
 - REXX Common for z/OS

- **Available via download**
 - CICS Explorer V1.1
 - CICS Information Center V4.2

CICS Application Migration Aid V1.1 is no longer provided as an element in CICS TS V4.2

Notes

The base CICS element of CICS TS V4.2 is CICS V6.7. The CICSplex SM element is CICSplex SM V4.2.

Other elements of CICS TS V4.2, that were previously available as separate IBM products, are:

- CICS REXX Runtime Facility
- CICS REXX Development System
- CICS REXX Common for z/OS

CICS TS V4.2 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, V7.5 or later. The service flow runtime capability of CICS TS V4.2 is fully compatible with IBM CICS Service Flow Feature V3.2. Customers upgrading to CICS TS V4.2 might use the integrated support for business services in this release as a direct replacement for IBM CICS Service Flow Feature V3.2.

CICS Application Migration Aid V1.1 is no longer provided as a separate element of CICS TS V4.2.

Software prerequisites

- **CICS TS V4.2 requires z/OS V1.11, or later**
 - The product will not initialize with a lower level of operating system installed
 - z/OS V1.12 with OA34311 required for 64-bit subspace support
 - IBM 64-bit SDK for z/OS, Java Technology Edition V6.0.1
 - Required if using Java application programs, enterprise beans, or the CICS Web Services Assistant

- **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 XML Toolkit and Java SDK NOT shipped with CICS

Notes

z/OS V1.11 or later is required. CICS TS V4.2 will not initialize in an environment with a lower level of operating system installed. If z/OS V1.12 is used, to enable 64-bit subspace support APAR OA34311 is also required.

The IBM 64-bit SDK for z/OS, Java Technology Edition V6.0.1, or later, is required if using 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/>

Software prerequisites...

■ CICS Tools

- Performance Analyzer V3.2 with PM30692
- Interdependency Analyzer V3.1 with PM34054
- Configuration Manager V2.1 with PM32874
- Deployment Assistant V1.1 with PM34068
- CICS VSAM Recovery V4.2 or V4.3 with PM34799

■ CICS Transaction Gateway V8.0 or later

■ IMS

- 10 with PM31730
- 11 with PM31729
- 12 with PM31420 for threadsafe support
- At GA of CICS TS V4.2, IMS 12 is available through a Quality Partnership Program

■ DB2 V8.1 or later

■ WebSphere MQ V6.0 or later

■ WebSphere Application Server for z/OS V6.1 or later

■ Current pre-requisite levels will be maintained at:

<http://www.ibm.com/support/docview.wss?uid=swg27020857>

Notes

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External Changes

- **Conditions for CICS facilities to use 64-bit storage**

z/OS Level	TRANISO setting	Storage utilized
V1R11 V1R12	YES	31-bit
V1R11 V1R12	NO	64-bit
V1R12 (with OA34311 applied) or later	YES or NO	64-bit

Notes

CICS operates without transaction isolation when the TRANISO system initialization parameter is set to NO.

In CICS TS V4.2, some CICS facilities use 64-bit storage rather than 31-bit storage, depending on the version of the z/OS operating system and whether the CICS region operates with transaction isolation.

External Changes...

■ **MEMLIMIT**

- CICS TS V4.2 requires a minimum of **4GB**
- DFHSM0602 message is issued and CICS terminates
 - if MEMLIMIT is less than 4GB

- Possible above bar storage usage
 - Main Temporary storage
 - Minimum 1MB
 - Limited to 25% of MEMLIMIT
 - Channels and containers
 - Limited to 5% of MEMLIMIT
 - Internal Trace Table
 - Minimum 16KB
 - Maximum 1GB
 - Transaction Dump Table (TRTRANSZ SIT parameter)
 - Minimum 16KB
 - Maximum 1GB

Notes

To provide sufficient 64-bit (above-the-bar) storage for a CICS® TS V4.2 region, set the value for the z/OS MEMLIMIT parameter equal to or greater than 4 GB. The default value in z/OS for MEMLIMIT is 2 GB.

A CICS region requires at least 4 GB of 64-bit storage. You cannot start a CICS region with a MEMLIMIT value that is lower than 4 GB. If you attempt to do so, message DFHSM0602 is issued, a system dump with the dump code KERNDUMP is produced, and CICS terminates.

You cannot alter the MEMLIMIT value for the CICS region while CICS is running. You can specify a new MEMLIMIT value on the next start of the CICS region.

External Changes...

■ MEMLIMIT...

– Possible above bar storage usage

- Association Data control blocks (1KB per active task)
- Message Tables (3MB for English + 3MB for each additional language)
- Event Processing capture queues
- I/O buffers for z/OS system services parser
- CPSM API results sets
- CMCI retained results
- Pooled JVMs
 - $-Xmx + \text{HEAP64} + \text{LIBHEAP64} + (\text{STACK64} * 5)$
 - + JVMCCSIZE if using shared class cache
 - DFHJVMRO contains HEAP64, LIBHEAP64 and STACK64
- JVMServers
 - $Xmx + \text{HEAP64} + \text{LIBHEAP64} + (\text{STACK64} * (\text{THREADLIMIT} + Xgctthreads))$

Notes

Refer to the CICS TS V4.2 Performance Guide, *Estimating, checking, and setting MEMLIMIT* for the detailed subpool usage.

External Changes...

- **JAVADIR parameter**

- Default value has changed in the installation procedures
- java/J6.0.1_64

- **Release levels**

- INQUIRE SYSTEM RELEASE returns 0670
- Utility programs suffixed with 670
 - e.g. DFHPD670

Notes

The default location for Java has changed to support the 64-bit JVM.

The default value for the JAVADIR parameter in the installation procedures has changed to java/J6.0.1_64. You must download the IBM® 64-bit SDK for z/OS®, Java Technology Edition and configure CICS® to point to the correct location in z/OS UNIX.

You use the EXEC CICS INQUIRE SYSTEM CICSTSLEVEL command to determine the version and release number of CICS. Use the EXEC CICS INQUIRE SYSTEM OSLEVEL command to determine the level of z/OS.

To ensure compatibility with previous releases, the CICS base element maintains its own level (identification) number. Each time new function is added to CICS and shipped with the CICS Transaction Server product, the CICS level number is incremented.

The CICS level number in CICS TS V4.2 is 0670. This number is returned in the RELEASE parameter of the INQUIRE SYSTEM command.

The level number also appears in the alternative decimal form 6.7 in output from offline utilities such as statistics and dump formatters to identify the level of utility being used, and as the suffix in module names such as DFHPD670.

External Changes...

■ **New System Initialization parameters**

- TSMMAINLIMIT={64M|nnnnnnM|nnG}
 - Limit for main temporary storage
 - Cannot be greater than 25% of MEMLIMIT

■ **Changed System Initialization parameters**

- CSDLSRNO={1|number|NONE|NO}
 - The LSR pool number can now be from 1-255
- EDSALIM={48M|number}
 - The default and minimum value changed from 10M to 48M
- FCQRONLY={YES|NO}
 - Specify FCQRONLY=YES for MRO and ISC connections
 - Specify FCQRONLY=NO for IPIC connections
- TRTABSZ={4096|number-of-kilobytes}
 - 64-bit storage may be acquired
- TRTRANSZ={16 |number-of-kilobytes}
 - 64 bit storage will be acquired

Notes

The TSMAINLIMIT system initialization parameter specifies a limit for the storage that is available for main temporary storage queues to use. You can specify an amount of storage in the range 1 - 32768 MB (32 GB), but this amount must not be greater than 25% of the value of the z/OS parameter MEMLIMIT. The default is 64 MB.

FCQRONLY={YES|NO}

Before CICS TS V4.2, you specified FCQRONLY=YES to improve the performance of all file-owning regions. However, for file-owning regions in CICS TS for z/OS, Version 4.2, choose an appropriate setting for FCQRONLY:

- For FORs where the connections to that region are primarily MRO or ISC connections, these requests run on the QR TCB, and CICS runs the mirror program primarily on the QR TCB. Specify FCQRONLY=YES so that all file control requests are processed on the QR TCB. This setting improves performance by avoiding locking, which is unnecessary when all file control requests run on the same TCB.
- For FORs where the connections to that region are primarily IPIC connections, these requests run on open TCBs, and CICS runs the mirror program on an L8 open TCB whenever possible. Specify FCQRONLY=NO so that file control requests do not switch to the QR TCB to be processed. This setting improves performance by multi-threading file control requests.

External Changes...

■ **Obsolete Resource Definitions**

- LSRPOOLID in LSRPOOL resource definitions
 - Replaced by LSRPOOLNUM

■ **New Resource Definitions or Attributes**

- FILE resource definition: new LSRPOOLNUM attribute
 - Replaces LSRPOOLID
- LSRPOOL resource definition: new LSRPOOLNUM attribute
 - Replaces LSRPOOLID
- PROGRAM resource definition: new JVMSERVER attribute
 - Specifies the JVMSERVER to use to run this Java program
- TCPIP SERVICE resource definition: new MAXPERSIST attribute
 - Specifies the maximum number of persistent connections from Web clients
- TSMODEL resource definition: new EXPIRYINT attribute
 - Specifies the expiration time for an unreferenced TSQUEUE (Main or Aux)
- URIMAP resource definition: new SOCKETCLOSE attribute
 - Specifies for how long, CICS keeps a client HTTP connection open for reuse
- WEBSERVICE resource definition: new ARCHIVEFILE attribute
 - Specifies the archive file that contains the WSDL

Notes

LSRPOOLID in LSRPOOL resource definitions

The LSRPOOLID attribute in LSRPOOL resource definitions is obsolete, but is supported to provide compatibility with earlier releases of CICS®. The value specified for LSRPOOLID in existing definitions is transferred to the new option LSRPOOLNUM, which has values in the range 1 - 255, compared to the range 1 - 8 for LSRPOOLID.

FILE resource definition: new LSRPOOLNUM attribute

A new attribute, LSRPOOLNUM, specifies the identifier of the local shared resource pool. The value must be in the range 1 - 255.

LSRPOOL resource definition: new LSRPOOLNUM attribute

A new attribute, LSRPOOLNUM, specifies the identifier of the local shared resource pool. The value must be in the range 1 - 255.

PROGRAM resource definition: new JVMSERVER attribute

A new attribute, JVMSERVER, specifies the name of the JVMSERVER resource that you want to use to run a Java program. A JVMSERVER resource represents the JVM server runtime environment in CICS.

TCPIPSERVICE resource definition: new MAXPERSIST attribute

A new attribute, MAXPERSIST, specifies the maximum number of persistent connections from Web clients that the CICS region allows for this port at any one time. For more information, see TCPIPSERVICE resources.

TSMODEL resource definition: new EXPIRYINT attribute

A new attribute, EXPIRYINT, specifies the expiry interval, in hours, for a local temporary storage queue that matches the temporary storage model.

URIMAP resource definition: new SOCKETCLOSE attribute

A new attribute, SOCKETCLOSE, specifies if, and for how long, CICS keeps a client HTTP connection open for reuse after the CICS application has finished using it.

WEBSERVICE resource definition: new ARCHIVEFILE attribute

A new attribute, ARCHIVEFILE, specifies the 1- to 255-character fully-qualified file name of an archive that contains one or more WSDL files. The supported format for the archive is .zip.

External Changes...

- **Changed Resource Definitions**
 - PROGRAM resource definition: changed CONCURRENCY attribute
 - New option of REQUIRED

- **Macro Control Tables**
 - Reassemble all tables against the CICS TS V4.2 libraries

 - CICS initialization will fail if you try and load an old version of DFHCNV (data conversion tables)

Notes

PROGRAM resource definition: changed CONCURRENCY attribute

The CONCURRENCY option of the PROGRAM resource now allows you to specify the new option REQUIRED.

Macro Tables

When upgrading to CICSTS V4.2 reassemble all CICS control tables using the CICS TS V4.2 macro libraries, even if the macro externals have no changes. You must also reassemble any DFHCNV data conversion tables that you use, because CICS initialization fails if you try to load DFHCNV tables assembled using macros from an earlier release.

External Changes...

▪ **Obsolete SPI options**

- LSRPOOLID is replaced by LSRPOOLNUM on:
 - CREATE LSRPOOL
 - CREATE FILE
 - INQUIRE FILE
 - SET FILE
- For compatibility
 - The LSRPOOLID value will be transferred to LSRPOOLNUM

Notes

The LSRPOOLID option is obsolete, but is supported to provide compatibility with earlier releases of CICS. Use the new option LSRPOOLNUM instead, which has values in the range 1 - 255, compared to the range 1 - 8 for LSRPOOLID. If you do use LSRPOOLID in any CICS SPI command, CICS transfers the value that you specify to LSRPOOLNUM.

External Changes...

■ **New SPI options**

– CREATE FILE

- A new option LSRPOOLNUM is added

– CREATE LSRPOOL

- A new option LSRPOOLNUM is added

– CREATE MQCONN

- A new value GROUPRESYNC is added to the RESYNCMEMBER option (Statement of direction)

– CREATE PROGRAM

- A new option JVMSERVER is added
- A new value REQUIRED is added to the CONCURRENCY option

– CREATE TCPIP SERVICE

- A new option MAXPERSIST is added

– CREATE TSMODEL

- A new option EXPIRYINT is added

– CREATE URIMAP

- A new option SOCKETCLOSE is added

Notes

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External Changes...

■ **New SPI options...**

- INQUIRE ASSOCIATION
 - The following options have been added for transaction tracking support:
 - ODADPTRID, ODADPTRDATA1, ODADPTRDATA2, ODADPTRDATA3
 - PHAPPLID, PHCOUNT, PHNETWORKID
 - PHSTARTTIME, PHTASKID, PHTRANSID
- INQUIRE ATOMSERVICE
 - New options URIMAP and XMLTRANSFORM are added
- INQUIRE DB2CONN
 - A new option REUSELIMIT is added
- INQUIRE EVENTBINDING
 - A new option EPADAPTER is added:
- INQUIRE EVENTPROCESS
 - A new option SCHEMALEVEL is added
- INQUIRE FILE
 - A new option LSRPOOLNUM is added
- INQUIRE IPCONN
 - A new option MIRRORLIFE is added

Notes

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External Changes...

■ **New SPI options...**

- INQUIRE JVMPOOL
 - A new option PROFILEDIR is added
- INQUIRE JVMSERVER
 - CURRENTHEAP, GCMODEL, INITHEAP, MAXHEAP,
 - OCCUPANCY, PID
- INQUIRE MQCONN
 - A new value GROUPRESYNC is added to the RESYNCMEMBER
- INQUIRE PROGRAM
 - A new option JVMSERVER is added
 - A new value REQUIRED is added to the CONCURRENCY option
- INQUIRE TCPIP SERVICE
 - A new option MAXPERSIST is added
- INQUIRE TSMODEL
 - A new option EXPIRYINT is added
- INQUIRE TSQUEUE / TSQNAME
 - A new option EXPIRYINT is added

Notes

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External Changes...

■ **New SPI options...**

– INQUIRE URIMAP

- New options SOCKETCLOSE and SOCKPOOLSIZE are added

– INQUIRE WEBSERVICE

- A new option ARCHIVEFILE is added

– INQUIRE CAPTURESPEC

– CURRPGM ,CURRPGMOP, CURRTRANID CURRTRANIDOP CURRUSERID, CURRUSERIDOP NUMDATAPRED,NUMINFOSRCE NUMOPTPRED , PRIMPRED PRIMPREDOP

– SET FILE

- A new option LSRPOOLNUM is added

– SET MQCONN

- A new value GROUPRESYNC is added to the RESYNCMEMBER

Notes

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External Changes...

■ **New SPI Commands**

- INQUIRE CAPDATAPRED
 - Retrieve information about an application data predicate
- INQUIRE CAPINFOSRCE
 - Retrieve information about an information source
- INQUIRE CAPOPTPRED
 - Retrieve information about an application command option predicate
- INQUIRE EPADAPTER
 - Retrieve information about a specified event processing adapter
- INQUIRE OSGIBUNDLE
 - Retrieve information about an OSGi bundle installed in a JVM server
- INQUIRE OSGISERVICE
 - Retrieve information about OSGi services that are registered
- INQUIRE TEMPSTORAGE
 - Retrieve information about storage used by TS queues
- SET EPADAPTER
 - Set the status of an EP adapter to enabled or disabled.
- SET TEMPSTORAGE
 - Set the amount of storage that is available to TS queues

Notes

INQUIRE CAPDATAPRED

Retrieve information about an application data predicate that is defined for a capture specification.

INQUIRE CAPINFOSRCE

Retrieve information about an information source that is defined for a capture specification.

INQUIRE CAPOPTPRED

Retrieve information about an application command option predicate that is defined for a capture specification.

INQUIRE EPADAPTER

Retrieve information about a specified event processing adapter.

INQUIRE OSGIBUNDLE

Retrieve information about an OSGi bundle that is installed in a JVM server.

INQUIRE OSGISERVICE

Retrieve information about OSGi services that are registered in a CICS region.

INQUIRE TEMPSTORAGE

Retrieve information about storage used by temporary storage queues in the CICS region.

SET EPADAPTER

Set the status of a specified EP adapter to enabled or disabled.

SET TEMPSTORAGE

Set the amount of storage that is available to temporary storage queues in the CICS region.

External Changes...

- **New CEMT Commands**
 - INQUIRE EPADAPTER
 - Retrieve information about an EP adapter
 - INQUIRE TEMPSTORAGE
 - Retrieve information about storage used by TS queues
 - SET EPADAPTER
 - Enable or disable an EP adapter
 - SET TEMPSTORAGE
 - Set the amount of storage that is available to TS queues

Notes

INQUIRE EPADAPTER

Retrieve information about an EP adapter.

INQUIRE TEMPSTORAGE

Retrieve information about storage used by temporary storage queues in the CICS region.

SET EPADAPTER

Enable or disable an EP adapter.

SET TEMPSTORAGE

Set the amount of storage that is available to temporary storage queues in the CICS region.

External Changes...

■ **Changed CEMT Commands**

- INQUIRE ATOMSERVICE
 - New options URIMAP and XMLTRANSFORM are added
- INQUIRE CLASSCACHE
 - A new option STARTTIME is added which replaces DATESTARTED and TIMESTARTED
- INQUIRE EVENTBINDING
 - A new option EPADAPTER is added
- INQUIRE EVENTPROCESS
 - A new option SCHEMALEVEL is added:
- INQUIRE IPCONN
 - A new option MIRRORLIFE is added
- INQUIRE MQCONN
 - A new value GROUPRESYNC is added to the RESYNCMEMBER
- INQUIRE PROGRAM
 - A new option JVMSERVER is added
 - The CONCURRENCY option has a new value of REQUIRED

Notes

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External Changes...

■ **Changed CEMT Commands...**

- INQUIRE TCPIP SERVICE
 - A new option MAXPERSIST is added
- INQUIRE TSMODEL
 - A new option EXPIRYINT is added
- INQUIRE TSQUEUE / TSQNAME
 - A new option EXPIRYINT is added
- INQUIRE URIMAP
 - New options SOCKETCLOSE and SOCKPOOLSIZE are added
- INQUIRE WEBSERVICE
 - A new option ARCHIVEFILE is added
- SET MQCONN
 - A new value GROUPRESYNC is added to the RESYNCMEMBER

Notes

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External Changes...

■ **New CICS Supplied Transactions**

– CESL transaction

- New transaction to sign on to CICS using a password or a password phrase
- Supports both 3270, Sequential and Console devices
- Does not support 40x12 size screens
- CESN will remain unchanged

■ **New CICS RACF category 1 transaction**

– CEPF

- Event processing deferred filtering task

Notes

CESL is a new supplied transaction you can use to sign on to CICS using a password or a password phrase as authorization. With CESL, you can sign on to CICS with a password phrase of 9- to 100-characters or a standard password of up to 8 characters. In other respects CESL operates in the same way as the CESN sign-on transaction. CESN does not support password phrases but you can specify CESL as an alias for CESN. If you enter a password that is 9- to 100-characters, CESL treats the password as a password phrase. CESL is a category 3 transaction.

External Changes...

- **Changed CICS supplied Transactions**
 - CEDF transaction
 - Changed to hide passwords or password phrases

- **DFHMIRS is now Threadsafe**
 - Supplied definition is CONCURRENCY(THREADSAFE)
 - Switch to L8 made before TS and FC requests
 - Only requests function shipped over IPIC will run on an Open TCB

 - Review your DFHSIT specification
 - FCQRONLY

Notes

The CEDF transaction is changed to prevent the viewing of password phrases as well as standard passwords when debugging an application. When one of the following EXEC CICS commands are issued by a transaction running under CEDF, the password or password phrase (and new password or password phrase, where applicable) is blanked out:

CHANGE PASSWORD

CHANGE PHRASE

SIGNON

VERIFY PASSWORD

VERIFY PHRASE

The CICS-supplied mirror program DFHMIRS, which is used by all mirror transactions, is now defined as threadsafe. For IPIC connections only, CICS runs the mirror program on an L8 open TCB whenever possible. For threadsafe applications that function ship commands to other CICS regions using IPIC, the resulting reduction in TCB switching improves the performance of the application compared to other intercommunication methods. To gain the performance improvement, you must specify the system initialization parameter FCQRONLY=NO in the file-owning region.

External Changes...

■ 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 CONCURRENTY(THREADSAFE)
- All exits that user XPI calls **MUST** be reassembled

Notes

The CICS global user exit programming interface is product-sensitive, and depends on the facilities that are set up in your CICS system. It is advisable to reassemble global user exit programs for each CICS release.

A global user exit or task-related user exit might be assembled using CICS libraries from one CICS release and make an XPI call on a system that runs a different CICS release. In this situation, it depends on the combination of CICS releases, and whether the XPI call is a release-sensitive call, whether control is successfully transferred from the exit to the correct CICS module to handle that XPI call. For the user exit to succeed, you must also check other factors, for example whether XPI parameters have changed between releases.

If a user exit fails, an error message is issued and the transaction that called the exit might abend.

External Changes...

■ Global User Exits

- Changed Global User Exits
 - UEPTERM (zero) affected by IPIC Function Shipping
 - XTSQRIN, XTSQROUT, XTSPTIN, and XTSPTOUT
 - XFCFRIN and XFCFROUT
 - Exits that must be threadsafe
 - XTSQRIN, XTSQROUT, XTSPTIN, and XTSPTOUT
 - XFCFRIN and XFCFROUT, XISQUE
 - XRSINDI installation and discard exit
 - UEPIDTYP parameter
 - > UEIDEPAD: An EPADAPTER resource
 - > UEIDOSGB: An OSGi bundle

Notes

Temporary storage exits domain exits: XTSQRIN, XTSQROUT, XTSPTIN, and XTSPTOUT

The UEPTERM parameter is a zero value for temporary storage requests that have been function shipped over an IPIC connection. To use IPIC connections for temporary storage requests, ensure that XTSQRIN, XTSQROUT, XTSPTIN, and XTSPTOUT check that the UEPTERM parameter is a non-zero value before trying to use it as an address.

XTSQRIN, XTSQROUT, XTSPTIN, and XTSPTOUT must be coded to threadsafe standards and declared threadsafe to get the benefits of threadsafe remote temporary storage queue support using an IPIC connection.

File control domain exits: XFCFRIN and XFCFROUT

The UEPTERM parameter is a zero value for file control requests that have been function shipped over an IPIC connection. To use IPIC connections for function shipping file control requests, ensure that XFCFRIN and XFCFROUT check that the UEPTERM parameter is a non-zero value before trying to use it as an address.

XFCFRIN and XFCFROUT must be coded to threadsafe standards and declared threadsafe to get the benefits of threadsafe remote file support using an IPIC connection.

Managing IPIC intersystem queues exit: XISQUE

XISQUE controls the requests and commands that are queued on an IPIC connection. XISQUE must be coded to threadsafe standards and declared threadsafe to get the benefits of threadsafe distributed program link (DPL) support, and threadsafe function shipping file control and temporary storage support, using an IPIC connection.

Changes to resource management installation and discard exit XRSINDI

The range of values in the 1-byte field addressed by the UEPIDTYP parameter now covers the installation and discarding of the following new resource types:

UEIDEPAD: An EPADAPTER resource

UEIDOSGB: An OSGi bundle

External Changes...

- **Global User Exits...**

- New Global User Exits

- XEPCAP Event capture exit

- Invoked just before an event is captured by CICS

Notes

Event capture exit XEPCAP

The XEPCAP exit is invoked just before an event is captured by CICS event processing. Use the XEPCAP exit to detect when events are captured.

External Changes...

■ **Task Related User Exits...**

- Changed Task Related User Exits
 - New Context management parameters
 - Exit invoked a non-terminal-related EXEC CICS START command
 - Not invoked for terminal-related EXEC CICS START commands
 - Allows origin data to be added to the task

Notes

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

When called, the exit program is passed a parameter list, which is mapped by the DFHUECON DSECT:

UECON_ADAPTER_ID_PTR

The address of a 64-character area in which the exit program can pass the data to be placed into the origin data adapter identifier field. Use the same value for all instances of the adapter; for example, the product identifier for the owner of the adapter. If an adapter does not specify an identifier in this area then none of the other adapter data is set.

UECON_ADAPTER_DATA1_PTR

The address of a 64-character area in which the exit program can pass the data to be placed into the origin data adapter data 1 field. This field can be used to identify the server to which the adapter instance (which might be one of many) is connected.

UECON_ADAPTER_DATA2_PTR

The address of a 64-character area in which the exit program can pass the data to be placed into the origin data adapter data 2 field. This field can be used to identify the instance of the adapter task that is starting the task with the START command.

UECON_ADAPTER_DATA3_PTR

The address of a 64-character area in which the exit program can pass the data to be placed into the origin data adapter data 3 field. This field can contain details to identify the reason that the adapter instance started this particular task with the START command.

UECON_FLAGS

The address of a single byte with bit definitions that indicate to the adapter whether any adapter data it sets is placed in the origin data of the task being started.

UECON_ADAPTER_DATA_ON

(X'80') indicates that the adapter is permitted to set origin data adapter data fields.

If the adapter returns values for the adapter data when this flag is not set, the values are ignored. Only the first (origin) adapter for a task, or a set of tasks, is permitted to set the origin data adapter fields.

External Changes...

■ User Replaceable Modules...

- Changed User Replaceable Modules
 - Custom EP Adaptors
 - DFHDSRP
 - New settings for UOW affinity
 - Must honor EPAP_RECOVER setting
 - DFHDYP
 - Should be coded to threadsafe standards
 - DFHJVMAT
 - Only for pooled JVMs
 - DFHJVMRO
 - New 64-bit parameters for pooled JVMs
 - DFHAXRO
 - Only for JVMServers
 - EYU9WRAM
 - New settings for UOW affinity
 - EYU9XLOP
 - New settings for UOW affinity

Notes

Custom EP adapters

Your custom adapter programs must now honor EPAP_RECOVER in the DFHEP.ADAPTPARM container to support synchronous event emission. You must review your custom EP adapter programs and update as necessary.

DFHDSRP, distributed routing program: DFHDYPDS copybook

There are changes to the copybook DFHDYPDS that defines the communication area for the CICS-supplied sample distributed routing program DFHDSRP.

If you use your own routing program, you might have to make adjustments for these changes. Because the length of DFHDYPDS has changed, you must recompile your user-written dynamic routing and distributed routing programs if they check the length of DFHDYPDS as the CICS-supplied samples do.

DFHDYP, dynamic routing program

A threadsafe program can function ship a DPL request using dynamic routing to ship the request to another region. If the dynamic routing program DFHDYP is coded to threadsafe standards and defined CONCURRENCY(REQUIRED) or CONCURRENCY(THREADSAFE) there should be no or minimal penalty in terms of undesirable TCB switches to invoke DFHDYP.

DFHJVMAT, JVM options

DFHJVMAT is a user-replaceable program that you can use to override the options specified in a JVM profile. It can only be used for a single-use pooled JVM, and not for a continuous pooled JVM. The use of DFHJVMAT is not recommended for new development.

The DFHJVMRO program contains changed options to support the 64-bit Language Environment runtime options. Update your programs to use the following 64-bit options:

EYU9WRAM, dynamic routing program: EYURWCOM communication area

EYURWCOM is the communication area used by the dynamic routing user-replaceable module EYU9WRAM. There are changes to support UOW affinities.

EYU9XLOP, dynamic routing program: EYURWTRA communication area

There are changes to support UOW affinities.

External Changes...

■ **Monitoring and Statistics**

- Monitoring
 - Record size increases to 2960 bytes
- New monitoring data
 - Origin data
 - Previous hop data
 - Event data
- DFH\$MOLS
- Support for new monitoring data fields
 - UNLOAD function only supported for CICS V3 .2 and V4
- Statistics
 - Support for new EP adapter statistics
 - New Storage Manager reports for 64-bit

Notes

The length of a standard performance class monitoring record, as output to SMF, has increased to 2960 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.

The CICS Transaction Server for z/OS V4.2 release of DFH\$MOLS processes monitoring data for earlier supported CICS releases, but the UNLOAD control statement has additional restrictions.

In CICS Transaction Server for z/OS, Version 4 Release 2, DFH\$MOLS can process SMF 110 monitoring data records for the following supported releases:

- CICS Transaction Server for z/OS, Version 4 Release 2
- CICS Transaction Server for z/OS, Version 4 Release 1
- CICS Transaction Server for z/OS, Version 3 Release 2
- CICS Transaction Server for z/OS, Version 3 Release 1

However, the UNLOAD control statement (which unloads performance class monitoring data into a fixed length record format) can be used only with monitoring data for CICS Transaction Server for z/OS V3.2. Any version or release of DFH\$MOLS cannot process monitoring data for a version or release later than itself, so you must always use the DFH\$MOLS from the highest version or release available to you.

External Changes...

■ **Sample Programs**

- DFH0EPAC
 - Sample to show handling of EPAP-RECOVER fields
- DFH0STEP
 - Changed to support the new INQ CAPTURESPEC options
- DFHJVMAX
 - Shows how to specify JVM initialization options
- DFHAXR0
 - Shows how to set 64-bit JVM LE values
- DFH\$APDT
 - Sample TRUE to show how to add origin data

Notes

The DFH0EPAC program now honors the EPAP_RECOVER flag. Your custom EP adapter programs must now honor the EPAP_RECOVER flag in the DFHEP.ADAPTPARM container to support synchronous event emission.

DFH0STEP is changed to collect and print EPADAPTER statistics and to support the new command options for the INQUIRE CAPTURESPEC command.

DFHJVMAX is a JVM profile file that specifies the options for initializing the JVM server, including the 64-bit options. The JVMSERVER resource defines the name of the JVM profile. Its location is determined by the JVMPROFILEDIR system initialization parameter.

DFHAXRO is a sample program that provides default values for configuring the 64-bit Language Environment enclave of a JVM server. Modify and recompile this program to change the Language Environment enclave for a JVM server. The JVMSERVER resource defines the name of the program that controls the options for the Language Environment enclave. Each JVM server can use a different version of the runtime options if required. The program must be in the hlq.SDFHLOAD library.

A new sample task-related user exit (TRUE) program, DFH\$APDT, has been added. You can use the DFH\$APDT sample TRUE to learn how to use adapter data fields for transaction tracking.

External Changes...

- **Application Programming Interface changes**
 - QUERY SECURITY
 - New EPADAPTER resource type
 - SIGNON
 - Added options for password phrases
 - WRITEQ TS
 - MAIN and AUX setting honored for IPIC function shipping
 - CHANGE PHRASE
 - Change the password phrase
 - VERIFY PHRASE
 - Verify the password phrase is valid

Notes

The QUERY SECURITY command is changed to include a new resource type of EPADAPTER.

The SIGNON command is changed to support password phrases as well as standard passwords.

The MAIN and AUXILIARY options on the WRITEQ TS command have been enhanced with IPIC support for function-shipped requests between CICS TS V4.2 regions or later. Previously, the MAIN and AUXILIARY options were supported only by using the multiregion operation (MRO) facility. APPC does not support the MAIN and AUXILIARY options. Temporary storage queues (TSQs) created as a result of function shipping WRITEQ TS using APPC are stored in auxiliary storage.

CICS Transaction Server for z/OS V4.2 includes some new API commands that you can use to create application programs that use new CICS functions.

EXEC CICS CHANGE PHRASE

Change the password or password phrase recorded by an external security manager (ESM) for a specified user ID.

EXEC CICS VERIFY PHRASE

Verify that a password or password phrase matches the password or password phrase recorded by an external security manager.

Upgrade Process

■ 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

- MEMLIMIT needs to be set equal to or greater than 4GB

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 through the operating system services.

Upgrade Process...

■ Installation Process

- Default installation process
 - Common IBM install procedures
 - SMP/E RECEIVE, APPLY, ACCEPT commands
 - Described in the CICS Program Directory

- DFHISTAR process
 - CICS generated installation job stream
 - Described in the CICS Installation Guide

Notes

This release of CICS 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 Program Directory. It is in line with IBM 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 described in the CICS Installation Guide

Upgrade Process...

- **CICS Local and Global Catalog**
 - Define new Local and Global catalogs
 - Initialize the catalogs
 - Perform a START=INITIAL

Notes

Define and initialize new local and global catalogs, following the instructions in Setting up the catalog data sets . When you initialize the catalogs, make sure that you use the CICS TS V4.2 versions of the DFHRMUTL and DFHCCUTL utility programs and the sample jobs.

When you start the CICS region for the first time after upgrading, make sure that it is an initial start with the START=INITIAL parameter.

Upgrade Process...

■ 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
 - MIGRATE command has been removed
- Sharing the CSD
 - CICS TS V4.2 CSD can be shared with prior releases
 - DFHCOMPE (41)
 - DFHCOMPDP (32)
 - DFHCOMPC (31)

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 V4.2 CSD can be shared with lower level CICS TS releases

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

Upgrade Process...

■ Java

- All JVMs run in 64-bit
 - Review your MEMLIMIT specification
- JCICS packaging has changed
 - Now will use OSGI bundles for JVMSERVER
- New JVM profile options
 - JAVA_PIPELINE
 - OSGI_BUNDLES
 - OSGI_STARTUP_TIMEOUT
 - &JVMSERVER
 - Name of the JVMSERVER is substituted at run time
- Obsolete JVM profile options
 - CICS_HOME used if USSHOME=NONE

Notes

All JVMs run in a 64-bit environment. Although you can continue to use a supported SDK to build your Java applications, you must use the IBM 64-bit SDK for z/OS, Java Technology Edition, Version 6.0.1, to run your Java workloads. When you are upgrading CICS, you must perform the following steps to make sure your Java applications work in a 64-bit environment:

Ensure that CICS has enough memory available to run 64-bit JVMs. To do this, set a suitable value for the z/OS MEMLIMIT parameter before you start your CICS regions. You must allow for other CICS facilities that use 64-bit storage. For more information, see Estimating, checking, and setting MEMLIMIT.

Ensure that any Java Native Interface (JNI) code can run in a 64-bit environment. You might have to recompile or rewrite application code if it uses JNI. You must also check that any third-party products that have JNI can run in a 64-bit environment.

CICS provides two runtime environments for Java applications. The pool of JVMs still provides support for Java applications. These JVMs are called pooled JVMs. However, you can move your applications to run in a JVM server if they are threadsafe. The JVM server can handle multiple requests for Java applications concurrently in a single JVM, saving on the number of JVMs that are required in the CICS region. JVM servers can use class caches, but these class caches are not managed by CICS interfaces, such as the SPI and CEMT.

The JCICS API packaging has changed. The dfjcics.jar and dfjoutput.jar files have been replaced by a set of OSGi bundles that can run in both a JVM server and pooled JVMs. Any existing Java applications that use JCICS can run without requiring recompiling. However, if you want to change your Java applications, you must import the OSGi bundles for the JCICS API.

Upgrade Process...

- **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 V4.2 level
 - WUI Server and its connected CMAS must be at V4.2 level

Notes

You must migrate your CICSplex SM CMAS to CICS TS V4.2 at the same time as you migrate the CICS system on which it runs. This is because 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.

Upgrade Process...

■ **Miscellaneous Items**

- New DSAs
 - GCDSA: above bar CICS dynamic storage
 - ETDSA: extended trusted dynamic storage

- Release Sensitive XPI call RELENSCALL
 - Support is stabilized in CICS TS V4.2

- CICS Messages and Codes file (CMAC)
 - IBM will no longer provide updates via PTFs

Notes

Support for the release sensitive XPI call RELENSCALL is stabilized in CICS TS V4.2. A future release of CICS TS intends to discontinue support for RELENSCALL.

For CICS TS V4.2 and later, IBM will no longer provide updates to CICS Messages And Codes (CMAC) files via PTF. Changes to message definitions that arise either from APARs which add or amend a message, or from Readers Comment Forms, will be made available via the CICS Information Center only. A refreshed CMAC file incorporating all Information Center updates made during the service of CICS TS V4.2 will be shipped in a future release of CICS TS.

Documentation

- **CICS Information Center**

The CICS Transaction Server library: HTML

The books in the CICS® Transaction Server library are viewable in HTML format in the CICS Information Center.

General

[What's new?](#)

[Upgrading from CICS TS Version 3.1](#)

[Upgrading from CICS TS Version 3.2](#)

[Upgrading from CICS TS Version 4.1](#)

[Installation Guide](#)

Notes

Upgrading information from the various release can be found in the CICS Information Center.

Summary

■ Installation

- Similar to previous releases
- Standard IBM procedure or DFHISTAR

■ Upgrading

- Application Programmers
 - Review Java programs and procedures
- Systems Programmers
 - “Normal” release process
 - Review all GLUES, TRUES, URM's and Resource definitions

Notes

The installation of CICS TS V4.2 is similar to previous releases of the product.

For systems programmers, the upgrade to CICS TS V4.2 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 V4.2 is being utilized and Independent Software Vendor (ISV) products must be review to determine the correct release levels required to support CICS TS V4.2

Good luck in your efforts.