

CICS Transaction Server for z/OS
Version 5 Release 5

What's New



Note

Before using this information and the product it supports, read the information in [“Notices” on page 45.](#)

This edition applies to the IBM® CICS® Transaction Server for z/OS® Version 5 Release 5 (product number 5655-Y04) and to all subsequent releases and modifications until otherwise indicated in new editions.

© **Copyright International Business Machines Corporation 1974, 2020.**

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

About this PDF.....V

Chapter 1. What's new?..... 1

Chapter 2. Changes to externals in this release..... 25

Notices.....45

About this PDF

"What's New" is a summary of the new features and capabilities of the latest version of CICS Transaction Server for z/OS. Details of how to use these features is provided in the rest of the product documentation. It also summarizes any changes to CICS externals, such as the application programming interface, for this version of CICS TS. "What's New" is primarily aimed at application programmers and system programmers who need to understand the scope of the new release.

For details of the terms and notation used in this book, see [Conventions and terminology used in the CICS documentation](#) in IBM Knowledge Center.

Date of this PDF

This PDF was created on January 20th 2020.

Chapter 1. What's new?

CICS Transaction Server for z/OS, Version 5 Release 5 enables development teams to create powerful, mixed-language applications while allowing the operational teams to manage these applications from a single point of control.

You might also like to refer to the [CICS Transaction Server for z/OS V5.5 announcement letter](#). New features in CICS Explorer® are described in [CICS Explorer product documentation](#).

The following features and enhancements are delivered as part of CICS Transaction Server for z/OS, Version 5 Release 5, and cover the following areas:

- [Language Support](#)
- [System management](#)
- [Security](#)
- [Performance](#)
- [Continuous delivery APARs](#)

The features in the following tables are not exclusive to each of the job roles shown; several are of interest across roles.

Language support features:





Table 1. Language support features provided with CICS TS for z/OS, Version 5.5	
For application developers	For system programmers
“Liberty enhancements” on page 20	“CMCI GraphQL API supports queries about CICS resources and inter-resource relationships” on page 10
“Node.js application support” on page 6	“Controlling the use of CICS API and SPI commands” on page 10
“Enhancements to environment variables” on page 20	“External CICS interface (EXCI) clients can query and browse containers on a channel” on page 7
“FREEMAIN and FREEMAIN64 enhanced to reject an attempt to release CICS-maintained storage” on page 9	“Inquiring enablement and configuration settings of toggle-enabled features through SPI, XPI, and CICSplex SM” on page 5
“Changes to the translation of Cobol programs by CICS translator” on page 9	
“New parameter LOCALCCSID on ASSIGN” on page 5	
 “REXX for CICS internal tracing, online help, and product documentation improvements” on page 21	
 Build support for other toolchains	
 “Support for Java EE 8 Full Platform” on page 23	

Table 1. Language support features provided with CICS TS for z/OS, Version 5.5 (continued)

For application developers	For system programmers
 “Support for EXEC CICS LINK to a Spring Boot application running in a Liberty JVM server” on page 23	

System management features:

Table 2. System management features provided with CICS TS for z/OS, Version 5.5




For system programmers
“Enhancements in CICS Explorer” on page 11
“Ability to specify HPO in PARM parameter on EXEC PGM=DFHSIP statement and in SYSIN data set” on page 19
“Changes to support for PLTs (Program List Tables)” on page 18
“Changes to EXEC CICS START” on page 18
“New parameters TNADDR, TNIPFAMILY, and TNPORT in CICS SPI and API commands for inquiry on IP addresses of TN3270 clients” on page 13
“Enhanced data management from pseudo conversations” on page 7
“Enhanced management of requests that are canceled by another task” on page 8
“New count of DFHEP.DATA and DFHEP.CHAR containers for CFE and CCE format CICS events” on page 8
“Statistics for CICS policy rules” on page 9
 “New Policy system rule types” on page 22
“Restriction on the use of CICS-supplied MQ trigger monitor program DFHMOTSK” on page 10
“Distributed routing program no longer invoked for BTS transactions defined as DYNAMIC(NO)” on page 18
“New options and fields show the date and time of the last CICS system startup” on page 15
“Monitoring outbound web requests” on page 5
“Enhanced management of automatic initiator descriptors in the AID chain for the local system” on page 16
“Enhancement to the local system entry in the terminal control table of the region” on page 17
“Extended support for PATH aliases for VSAM data sets” on page 17
“Ability to control the levels of CICS Explorer that may connect to CICS” on page 11
“JVM server logging enhancements” on page 20
“JVM profile enhancements” on page 19
“Changes in CICS handling of USS processes associated with X8, X9, L8, and L9 TCBs” on page 6
 “New replication log record” on page 22
 “New feature toggle to help you with RLS migration” on page 23

Table 2. System management features provided with CICS TS for z/OS, Version 5.5 (continued)

For system programmers



[“Improvement to CICS exception handling when a JVM server encounters a TCB failure” on page 24](#)

Security features:

Table 3. Security features provided with CICS TS for z/OS, Version 5.5

For application developers	For system programmers
“New parameter GROUPID in VERIFY PASSWORD and VERIFY PHRASE to support password or passphrase verification against supplied group ID” on page 4	“Improved security for JCL job submissions to the JES internal reader” on page 16
“QUERY SECURITY extended to support an application to query the security authorization of a different user ID” on page 4	“Default minimum TLS level changed to 1.2” on page 8
	“Changes to the CMCI to support security enhancements” on page 11
	“Check on the region user ID's authority to access all category 1 transactions at startup” on page 6
	“New options on GMTRAN for terminal sign-on security control” on page 7

Performance features:

Table 4. Performance features provided with CICS TS for z/OS, Version 5.5

For application developers	For system programmers
“Performance improvement for channels and containers” on page 19	“Access to coupling facility data tables is now threadsafe” on page 15
“Performance improvement to QUERY SECURITY” on page 18	“CICS-MQ alert monitor CKAM enhanced to react to MXT conditions” on page 5
“Web client use of 64-bit (above-the-bar) buffers” on page 8	

Continuous delivery APAR updates:

Table 5. Features that are available as continuous delivery updates to other releases through APARs, and also provided with CICS TS for z/OS, Version 5.5

For application developers	For system programmers
“Link to Liberty DPL subset relaxation” on page 21	“Management of Db2 threads used by CICS tasks subject to purge or forcepurge requests” on page 13
“JWT and OpenID Connect (OIDC) support in Liberty JVM server” on page 21	“Multiple Liberty JVM servers can run in one region without using JVM server option WLP_ZOS_PLATFORM” on page 14
“CICS assistants support mapping levels 4.2 and 4.3” on page 12	“New system rule types in CICS policies” on page 14

Table 5. Features that are available as continuous delivery updates to other releases through APARs, and also provided with CICS TS for z/OS, Version 5.5 (continued)

For application developers	For system programmers
	“New system initialization parameter KERBEROSUSER specifies a user ID to be associated with the Kerberos service principal” on page 12
	“Support for static data capture items and event names for policy events” on page 12
	“VSAM dynamic buffer addition disabled for CICS LSR pools” on page 13
	“Enhanced use of the regions z/OS WLM health value in CICSplex SM workload routing decisions” on page 14
	“Enhanced replication logging for VSAM files” on page 7



New parameter **GROUPID** in **VERIFY PASSWORD** and **VERIFY PHRASE** to support password or passphrase verification against supplied group ID

With the new parameter **GROUPID** in **VERIFY PASSWORD** and **VERIFY PHRASE**, CICS can perform password or password phrase verification against the group ID in addition to a user ID and password, or password phrase that are recorded in the external security manager.



[Learn more about **VERIFY PASSWORD**...](#)



[Learn more about **VERIFY PHRASE**...](#)

[Back to table](#)



QUERY SECURITY extended to support an application to query the security authorization of a different user ID

The **QUERY SECURITY** command has a new option **USERID** in which an application that is running under one user ID can specify another user ID to query whether the supplied user ID has access to specified resources.

CICS runs a surrogate user check with an external security manager such as RACF® to verify whether a query on a different user ID is authorized.



[Learn more...](#)

[Back to table](#)



New parameter **LOCALCCSID** on **ASSIGN**

New parameter **LOCALCCSID** is added to the **ASSIGN** command to support inquiry on the code page that is being used by the CICS region.



[Learn more about **ASSIGN**...](#)

[Back to table](#)



CICS-MQ alert monitor CKAM enhanced to react to MXT conditions

If CICS encounters an MXT condition, CKAM calculates the maximum number of MQGET calls that an MQMONITOR can issue per second when this condition exists; effectively imposing a restriction on the number of tasks being started by MQMONITOR resources while CICS is at MXT.



[Learn more...](#)

[Back to table](#)



Inquiring enablement and configuration settings of toggle-enabled features through SPI, XPI, and CICSplex SM

Following the introduction of feature toggles in CICS TS V5.4, CICS now provides several methods that you can use to obtain the value of feature toggles:

- A new SPI command **INQUIRE FEATUREKEY**

INQUIRE FEATUREKEY also supports browsing through the feature toggles.

- A new XPI function, called DFHPAIQX INQUIRE_FEATUREKEY
- CICSplex® SM queries on feature toggles, supported by the new FEATURE resource table

Feature toggles are used to enable and set configuration options for toggle-enabled features. The new SPI command and XPI function and the enhancement to CICSplex SM make it easier for you to inquire enablement and configuration settings for toggle-enabled features for your CICS region.



- [Learn more about **INQUIRE FEATUREKEY**...](#)



- [Learn more about DFHPAIQX INQUIRE_FEATUREKEY...](#)

[Back to table](#)



Monitoring outbound web requests

You can now monitor in real time the URIMAPs and WEBSERVICES that are opened or invoked by CICS as a web client. CICS monitoring is enhanced with new monitoring records URIMAP and WEBSERVICE in the resource monitoring class. Multiple URIMAP or WEBSERVICE records can be monitored for one task.

A URIMAP record monitors the completion of **WEB OPEN URIMAP**, **WEB RECEIVE**, **WEB SEND**, and **WEB CONVERSE** requests that are issued by the user task for a URIMAP.

A WEBSERVICE record monitors the completion of **INVOKE SERVICE** requests that are issued by the user task for a WEBSERVICE, and tracks the name of the PIPELINE resource definition that was used.

This enhancement makes it easier to identify the URIMAPs or WEBSERVICES associated with prolonged socket wait time and diagnose troublesome destinations.



[Learn more...](#)

[Back to table](#)



Check on the region user ID's authority to access all category 1 transactions at startup

At startup, CICS now checks whether the region user ID is authorized to access all category 1 transactions. If any unauthorized category 1 transactions are found, CICS issues message DFHXS1113 for each unauthorized transaction and fails to initialize.



[Learn more...](#)

[Back to table](#)



Node.js application support

Node.js is a server-side runtime for applications that are written in JavaScript. It is lightweight, efficient, and best suited for I/O-intensive applications. It can use the underlying asynchronous I/O support in z/OS and provides a module-driven, highly scalable approach to application design and development that encourages agile practices.

CICS now supports running Node.js applications inside the CICS address space. You can write Node.js applications as you would for any other platform. You can run them in CICS to take advantage of proximity to CICS data and operational integration with existing tools and procedures. CICS provides a locally optimized API for Node.js applications to call CICS services, taking advantage of CICS JSON web services support to handle transformation between application data and JSON.

With APAR PH18618, CICS supports running Node.js applications using IBM SDK for Node.js - z/OS Version 12. IBM SDK for Node.js - z/OS Version 8 is still supported.



[Learn more...](#)

[Back to table](#)



Changes in CICS handling of USS processes associated with X8, X9, L8, and L9 TCBs

CICS now manages the release of USS processes from X8, X9, L8, and L9 TCBs when the TCB is released from the CICS task and returned to the relevant CICS dispatcher pool of open TCBs.



[Learn more...](#)

[Back to table](#)



Enhanced replication logging for VSAM files

A new system transaction, called CFCT, and its associated program, DFHFCLJ1, are supplied to provide tie-up records for VSAM files (including non-recoverable VSAM files) to a replication log at specified intervals. You enable this capability by setting the **INITPARM** system initialization parameter.

This capability is also available on CICS TS 5.3 and 5.4 with APAR PI97207.



[Learn more...](#)

[Back to table](#)



External CICS interface (EXCI) clients can query and browse containers on a channel

The external CICS interface (EXCI) provides four new commands: **QUERY CHANNEL**, **STARTBROWSE CONTAINER**, **GETNEXT CONTAINER**, and **ENDBROWSE CONTAINER**. EXCI clients can use these commands to query the number of containers on a channel and to browse containers on a channel.



[Learn more...](#)

[Back to table](#)



New options on GMTRAN for terminal sign-on security control

If you use the CICS-supplied sign-on transaction CESL or CESN to log on, new options, EXIT or DISCONNECT, on the **GMTRAN** system initialization parameter allow you to control what happens if the user fails to complete the sign-on.

If the DISCONNECT option is in effect, when PF3 or PF15 is used, the sign-on transaction terminates and the terminal session is disconnected. EXIT is the default. If the EXIT option is in effect, when PF3 or PF15 is used, the sign-on transaction terminates but the terminal session remains connected, and all subsequent transactions use the CICS default user ID.

Specifying CESN or CESL with the DISCONNECT option on the **GMTRAN** system initialization parameter allows terminal users either to enter with a valid sign-on credential or disconnect the terminal session. This increases your control over terminal session security.

The new option takes effect only on CESL or CESN.



[Learn more...](#)

[Back to table](#)



Enhanced data management from pseudo conversations

A new system initialization parameter, **GNTRAN** allows you to specify the transaction that CICS invokes when a user's terminal-timeout period expires. This parameter instructs CICS whether to keep a pseudo-conversation in use at a terminal that is the subject of a timeout sign-off.



[Learn more...](#)

[Back to table](#)



Default minimum TLS level changed to 1.2

CICS TS uses the **MINTLSLEVEL** system initialization parameter to specify the minimum TLS protocol for secure TCP/IP connections. The default value for **MINTLSLEVEL** is changed to TLS1.2.



[Learn more...](#)

[Back to table](#)



Enhanced management of requests that are canceled by another task

The CICS command **DELAY** is enhanced so that you can distinguish between a delay that completes successfully and a delay that completes as a consequence of a cancel request. If a **DELAY** command is canceled by command **CANCEL REQID** from another task, the **DELAY** command completes with RESP(NORMAL) and a RESP2 value of 23.



[Learn more...](#)

[Back to table](#)



New count of DFHEP.DATA and DFHEP.CHAR containers for CFE and CCE format CICS events

A new count of the number of capture data items, **EPFE - ITEMCOUNT**, is added to the CICS event processing contextual header (EPFE). This header is included in both CICS Flattened Events (CFE) and CICS Container-based Events (CCE). CCE events include this new count in a context container, called **DFHEP.CCECONTEXT**, and the count equals the number of DFHEP.DATA and DFHEP.CHAR containers that are passed to tasks started by the transaction start EP adapter.



[Learn more...](#)

[Back to table](#)



Web client use of 64-bit (above-the-bar) buffers

The Web domain (WB) now uses internal 64-bit (above the bar) buffer storage when it sends and receives HTTP outbound messages. This change relieves constraint on 31-bit virtual storage and enables more 31-bit application use in a CICS region.



[Learn more about WEB SEND \(Client\)...](#)



[Learn more about WEB RECEIVE \(Client\)...](#)



[Learn more about WEB CONVERSE...](#)

[Back to table](#)



Statistics for CICS policy rules

Statistics are now available for CICS policy rules. CICS collects resource statistics for each rule that is defined in a policy, and supplies a summary report.

You can retrieve policy rule statistics by using the **EXEC CICS PERFORM STATISTICS RECORD POLICY** system command.



[Learn more...](#)

[Back to table](#)



Changes to the translation of Cobol programs by CICS translator

The CICS translator no longer inserts the COBOL LIB parameter into the CBL card when it compiles COBOL programs. This change does not affect the integrated translator.

The CICS translator has been changed to match the behaviour of the integrated translator by generating fields defined as PIC S9(4) COMP-5 rather than PIC S9(4) COMP to avoid truncation problems when using TRUNC(OPT). This allows exploitation of COBOL 5 and COBOL 6 performance improvements when using TRUNC(OPT).



[Learn more...](#)

[Back to table](#)



FREEMAIN and FREEMAIN64 enhanced to reject an attempt to release CICS-maintained storage

The CICS commands **FREEMAIN** and **FREEMAIN64** are enhanced to reject an attempt to release CICS-maintained storage (for example, storage returned by a **GET CONTAINER SET** command) with RESP(INVREQ) and a RESP2 value of 3.



[Learn more about FREEMAIN...](#)



[Learn more about FREEMAIN64...](#)

[Back to table](#)



Restriction on the use of CICS-supplied MQ trigger monitor program DFHMQTSK

The CICS-supplied MQ trigger monitor program DFHMQTSK is reserved for use with the CICS-MQ trigger monitor and task initiator transaction CKTI. Any attempt to invoke DFHMQTSK as a user transaction will cause the user transaction to abend with abend code AMQO.

If you want to use a user transaction as your MQ queue monitor, the user transaction should invoke a user-written MQ monitor or MQ message consumer program.



[Learn more...](#)

[Back to table](#)



Controlling the use of CICS API and SPI commands

You can now define a restricted commands parmlib member DFHAPIR, to impose rules on the use of specific CICS API and SPI commands.

The CICS translator has been enhanced to process the restricted commands parmlib member. During translation, the CICS translator checks a source file against the specified restricted commands or keywords, and will generate warning or error messages in the case of violation.

The check is performed only when a program is being translated, and does not affect translated programs.

You can use this capability to prevent the use of specific commands and keywords in application programs.

This capability applies only to CICS API and SPI commands. It does not apply to **EXEC CICS GDS**, **EXEC DLI**, **EXEC CICS FEPI**, and **EXEC CPSM** commands. It does not apply to programs that are interpreted, such as REXX execs.



[Learn more...](#)

[Back to table](#)



CMCI GraphQL API supports queries about CICS resources and inter-resource relationships

The CMCI GraphQL API is an HTTP based API for system management clients. With this API, it is easier to query multiple types of CICS resources across CICSplexes in a single request, with relationship between them explicitly shown.

The API supports queries about all the CICS resources, as well as the relationships between:

- BAS resources and resource groups
- BAS resource descriptions
- System definitions and system group definitions
- Workload definitions and groups
- Workload specifications

The CMCI GraphQL API also provides support for the [Map view and aggregation functions in CICS Explorer](#).



[Learn more...](#)

[Back to table](#)



Enhancements in CICS Explorer

Exploiting the CMCI GraphQL API, CICS Explorer now provides enhanced ability to handle relationships between CICS resources. The following functions are introduced:

Map view

Shows related resources in a CICSplex, making it easier to understand the relationships between such resources. The view supports BAS resources and definitional workload management (WLM) resources and can be opened from many views or editors that are related to those resources.

Aggregation in resource views

Merges resource records together to display a summarized view for one or more attributes, making it easier to identify similarities and differences in a set of CICS resources.



[Learn more...](#)

[Back to table](#)



Changes to the CMCI to support security enhancements

Security and data protection regulations, for example Payment Card Industry (PCI) Data Security Standard (DSS) 3.2 and the European Union's General Data Protection Regulation (GDPR), require higher levels of user authentication for some or all users. To enhance security capabilities of the CICS management client interface (CMCI), the CMCI JVM server, a Liberty server, is introduced to handle client authentication when CICS Explorer and other HTTP clients attempt to log in. The user credentials can be a user ID and password, a PassTicket, an MFA token or a certificate.

In addition, the CMCI JVM server also provides support for GraphQL API for system management, which allows execution of expressive queries with inherent relationships and reduced latency.

The CMCI JVM server is an optional but highly recommended component of the CMCI.



[Learn more...](#)

[Back to table](#)



Ability to control the levels of CICS Explorer that may connect to CICS

If you opt to use the [CMCI JVM server](#) in your CMCI configuration, you can control what levels of CICS Explorer may connect to CICS by defining a client whitelist file to the CMCI JVM server.



[Learn more...](#)

[Back to table](#)



New system initialization parameter `KERBEROSUSER` specifies a user ID to be associated with the Kerberos service principal

You can use the new **`KERBEROSUSER`** system initialization parameter to specify a user ID other than the CICS region user ID, to be associated with the Kerberos service principal for the CICS region. This user ID must not be a protected user ID because protected user IDs should not be used for Kerberos authentication and Kerberos authentication failures can result in user revocation.

Typically, the CICS region user ID is a protected user ID, so it is recommended to specify a non-protected user ID on **`KERBEROSUSER`** for the Kerberos service principal.

`KERBEROSUSER` is an optional system initialization parameter in CICS TS 5.5. Specify this parameter if you want the region to support the Kerberos service. If it is not specified, the Kerberos service is disabled.

This capability is also available on CICS TS 5.2, 5.3, and 5.4 by service. Note that in 5.2 through 5.4, the default is the region user ID.



[Learn more...](#)

[Back to table](#)



Support for static data capture items and event names for policy events

If you use CICS Explorer Version 5.4.0.6 or later and you use the policy definition editor to work with policy rules, you can now define items of static data to be emitted with policy events and specify a user-defined name for the event.

This capability is also available on CICS TS 5.1, 5.2, 5.3, and 5.4 with APAR PI88500.



[Learn more...](#)

[Back to table](#)



CICS assistants support mapping levels 4.2 and 4.3

The CICS web services assistants, XML assistants, and JSON assistants now support mapping levels 4.2 and 4.3.

Support for mapping level 4.2

Mapping level 4.2 is primarily for use with DFHJS2LS. This mapping level implements support for Additional Properties in JSON, and introduces the following three parameters to DFHJS2LS: `ADDITIONAL - PROPERTIES - DEFAULT`, `ADDITIONAL - PROPERTIES - MAX`, and `ADDITIONAL - PROPERTIES - SIZE`.

This capability is also available on CICS TS 5.4 with APAR PI86039.



[Learn more...](#)

Support for mapping level 4.3

Mapping level 4.3 implements support for multidimensional arrays in JSON.

This capability is also available on CICS TS 5.4 with APAR PI88519.



[Learn more...](#)

[Back to table](#)



New parameters **TNADDR**, **TNIPFAMILY**, and **TNPORT** in CICS SPI and API commands for inquiry on IP addresses of TN3270 clients

New parameters **TNADDR**, **TNIPFAMILY**, and **TNPORT** are added to SPI commands **INQUIRE TERMINAL** and **INQUIRE NETNAME** and to API command **ASSIGN** to support inquiry on IP addresses of TN3270 clients.

This enhancement makes it easier to retrieve the IP address of the TN3270 client that initiated a task.



[Learn more about **INQUIRE TERMINAL** and **INQUIRE NETNAME**...](#)



[Learn more about **ASSIGN**...](#)

[Back to table](#)



VSAM dynamic buffer addition disabled for CICS LSR pools

From z/OS V2.2, VSAM provides a dynamic buffer addition capability that allows for the addition of extra buffers for an LSR pool if no buffer is available for a given VSAM request. For CICS, it is preferable to retry the request rather than allow uncontrolled expansion of an LSR pool, so dynamic buffer addition is not enabled for CICS LSR pools.

This change also applies to CICS TS 5.1 through 5.4 with APAR PI92486.



[Learn more...](#)

[Back to table](#)



Management of Db2 threads used by CICS tasks subject to purge or forcepurge requests

The **SET TASK** command has been enhanced such that CICS processing of task purge or forcepurge requests will attempt to cancel active Db2® threads used by CICS tasks that are being purged or forcepurged.

If CICS detects that the task being purged or forcepurged has a thread active in Db2, it will issue a Db2 cancel thread command to cancel the request in Db2 before initiating the purging of the CICS task. This enhancement ensures that the purge does not cause problems for Db2 and that the Db2 updates are safely backed out.

To cancel the Db2 thread in Db2 used by the task being purged or forcepurged, CICS uses a Db2 IFI command to issue the cancel thread command. This IFI request uses a command thread defined as part of the DB2CONN. The ID passed to Db2 needs to have the relevant authority to issue cancel thread requests; therefore, you should review the COMAUTHTYPE or COMAUTHID settings of the DB2CONN. Processing of the purge or forcepurge request continues, even if the cancel thread request is unsuccessful.

Note: This capability requires APAR PI92893 on DB2® Version 11 or higher.

This change also applies to CICS TS 5.1 through 5.4 with APAR PI98569.



[Learn more...](#)

[Back to table](#)



Multiple Liberty JVM servers can run in one region without using JVM server option WLP_ZOS_PLATFORM

The JVM server option `WLP_ZOS_PLATFORM={TRUE | FALSE}` is no longer needed to allow more than one Liberty JVM server to be started in the same region. Multiple Liberty JVM servers can connect to a single angel process within individual regions.

This change also applies to CICS TS 5.4 with APAR PI98174.



[Learn more...](#)

[Back to table](#)



Enhanced use of the regions z/OS WLM health value in CICSplex SM workload routing decisions

The z/OS WLM health value of a region is now a more effective factor in CICSplex SM workload routing decisions. When determining the target region to route workload to, CICSplex SM workload management assigns additional weights in the routing algorithm based on the actual health value of each region. The higher the health value, the lower the weight assigned, which makes a region with a greater health value more favorable as a target. In addition, a region with a health value of zero is now deemed as ineligible to receive work.

With this enhancement to CICSplex SM workload routing, you can have better control of flow of work into regions that are in warm-up or cool-down.

This capability is also available on CICS TS 5.4 with APAR PI90147.



[Learn more...](#)

[Back to table](#)



New system rule types in CICS policies

CICS policies now support several new system rule types:

AID threshold

Use this rule to monitor the number of Automatic initiate descriptors (AIDs) in a CICS system and define the action to be taken when the current number exceeds a threshold.

Bundle available status

Use this rule to monitor the change in available status of bundles that declare application entry points and define the action to be taken when the status changes from or to a specific state.

This rule is not applicable to any bundles that do not declare application entry points.

This capability is also available on CICS TS 5.4 with APAR PI92806.

Bundle enable status

Use this rule to monitor the change in enable status of bundles and define the action to be taken when the status changes from or to a specific state, or when the status changes from a specific state to another specific state.

This capability is also available on CICS TS 5.4 with APAR PI92806.

IPIC connection status

Use this rule to monitor the change in status of IPIC connections and define the action to be taken when the status changes from or to a specific state.

This capability is also available on CICS TS 5.4 with APAR PI92806.

MRO connection status

Use this rule to monitor the change in status of MRO connections and define the action to be taken when the status changes from or to a specific state.

This capability is also available on CICS TS 5.4 with APAR PI92806.

Program enable status

Use this rule to monitor the change in enable status of CICS programs and define the action to be taken when the status changes from or to a specific state.

This capability is also available on CICS TS 5.4 with APAR PI92806.



[Learn more...](#)

[Back to table](#)



New options and fields show the date and time of the last CICS system startup

You can now find out the date and time when a CICS region last undertook a cold, emergency, initial, or warm startup by using the **INQUIRE SYSTEM** SPI command, the **CEMT INQUIRE SYSTEM** command, or the Regions view in CICS Explorer. The **INQUIRE SYSTEM** and **CEMT INQUIRE SYSTEM** commands provide four new options to inquire on the system startup date and time: LASTCOLDTIME, LASTEMERTIME, LASTINITTIME, and LASTWARMTIME. Corresponding new fields are available in the CICSplex SM CICSRRN resource table and the Regions view in CICS Explorer. This enhancement removes the need to search through the job logs to obtain this information.

For **CEMT INQUIRE SYSTEM**, the display now shows status fields in a single column split across multiple screens.



[Learn more about **INQUIRE SYSTEM**...](#)



[Learn more about **CEMT INQUIRE SYSTEM**...](#)

[Back to table](#)



Access to coupling facility data tables is now threadsafe

Access to coupling facility data tables (CFDTs) is now threadsafe, so CFDTs can be accessed by applications that are running on open TCBs without incurring a TCB switch. Syncpoint processing of CFDTs can also run on an open TCB. However, note that the open and loading of a CFDT still occurs on a QR TCB.



[Learn more...](#)

[Back to table](#)



Improved security for JCL job submissions to the JES internal reader

For JCL jobs that are submitted to the JES internal reader by using a **SPOOLWRITE** or a **WRITEQ TD** command, CICS now performs surrogate user checking to verify if the user is authorized to submit a job with the user ID specified on the job card.

To support this verification, a new toggle-enabled feature is introduced:

Surrogate user checking for spool commands

`com.ibm.cics.spool.surrogate.check`

When the JOB card written to the JES internal reader by using a **SPOOLWRITE** command doesn't contain a **USER** parameter, by default the job user ID will be the CICS region user ID. The default can be changed to the user ID under which the task is running by setting the feature toggle value `com.ibm.cics.spool.defaultjobuser=task`.

When the JOB card written to the JES internal reader by using a **WRITEQ TD** command doesn't contain a **USER** parameter, the job user ID is taken from the `JOBUSERID` option on the TDQ definition. If this option is not defined, the job user ID will be the CICS region user ID. Because security is provided by TDQ resource security and by the install surrogate check, no surrogate user checking will be performed against the job user ID in this case.

If you want specific applications to always submit JCL under the CICS region user ID, you should code either `USER=region_userid` or `USER=&SYSUID` on the JOB card written to the JES internal reader.

These enhancements make job submissions from CICS to the JES internal reader more secure.



[Learn more...](#)

[Back to table](#)



Enhanced management of automatic initiator descriptors in the AID chain for the local system

CICS TS provides enhanced management capabilities for monitoring and controlling automatic initiator descriptors (AIDs) in the AID chain for the local system. You can now use these capabilities to prevent the occurrence of inordinately high number of AIDs chained from the local system's TCSE, and minimize chances of high CPU usage that might arise under such circumstances and subsequent degradation in task response times.

Monitoring AIDs

Inquiring the current number of AIDs

You have two options to find out the current number of AIDs that are in the AID chain for the local system:

- Option 1: Use SPI command [INQUIRE CONNECTION](#) or [INQUIRE SYSTEM](#).

For both commands, a new option, `AIDCOUNT`, is introduced, which returns the current number of AIDs chained from the local system. In addition, for [INQUIRE CONNECTION](#), `CONNECTION(data-value)` now accepts the name of the local system.

- Option 2: Use the [ISC/IRC system entry statistics](#).

The ISC/IRC system entry statistics have been enhanced such that automatic initiate descriptors statistics now report on the local system. You can view the local system entry through CEMT, the SPI, CICSplex SM, and CICS Explorer.

Inquiring the peak number of AIDs

New field Peak aids in chain (A14EAHWM) is introduced in the ISC/IRC system entry statistics to report on the peak number of automatic initiate descriptors that were present in the AID chain at any one time.

Controlling and limiting AIDs

Purging AIDs

You can now issue SET CONNECTION to purge all AIDs for the local system. SET CONNECTION has been enhanced such that CONNECTION(data-value) now accepts the name of the local system.

Defining an AID threshold

You can now define an AID threshold system rule to monitor the number of AIDs in a CICS system and specify the action to be taken when the current number exceeds a threshold. For example, you can define a system rule to reject EXEC CICS START requests that would cause the number of AIDs to exceed the specified threshold, effectively putting a cap on the number of AIDs that can exist in the system.



[Learn more...](#)

[Back to table](#)



Enhancement to the local system entry in the terminal control table of the region

The connection for the local system entry in the terminal control table of the region is now visible through the CEMT transaction, the CICS SPI, CICS Explorer, and the CICSplex SM Web User Interface. This enhancement is introduced in support for CANCEL or FORCECANCEL operations of AIDs that are associated with the local system entry and are waiting to be shipped to a terminal owning region.



[Learn more...](#)

[Back to table](#)



Extended support for PATH aliases for VSAM data sets

For the CICS VSAM data sets, a VSAM path can be used as a means of providing an alias dsname for the base dsname. This support is now extended for ESDS data sets DFHINTRA and DFHTEMP, in addition to KSDS data sets DFHCSD, DFHGCD, and DFHLCD.



[Learn more...](#)

[Back to table](#)



Changes to support for PLTs (Program List Tables)

As in previous releases of CICS, PLTs should be coded using DFHPLT macro calls. However, with CICS TS 5.5, after PLTs are coded, it is not required to assemble the tables before use. CICS is no longer able to process assembled PLTs. Attempts to assemble a PLT will cause the DFHPLT macro to issue return code 8 with a message stating that the assembly is not required, and the assembly will not be performed.

As a result of this change, you must ensure that the source code of any required PLTs are available to CICS at run time, and this includes any copy members referenced by the source. To achieve this, you can either place the source in a parmlib member that is part of the IPL parmlib concatenation, or add a DD card that specifies the PLT source location into the CICS JCL. The DD statement should be of the form: `// DFHTABLE DD DSN=pds name, DISP=SHR`

Ensure CICS has READ access to data sets in PARMLIB or DFHTABLE concatenations.

The **PLTPI** and **PLTSD** system initialization parameters have been enhanced to allow specification of the full name of the PLT held in the IPL parmlib or DFHTABLE concatenation. Likewise, the CEMT and SPI **PERFORM SHUTDOWN** commands have been enhanced to allow specification of the full name of the PLT in the new PLTNAME option.



[Learn more...](#)

[Back to table](#)



Performance improvement to QUERY SECURITY

The **QUERY SECURITY** command has been enhanced such that the number of TCB switches has been reduced if more than one access level is specified on the command. This enhancement improves the performance of the API command.



[Learn more...](#)

[Back to table](#)



Changes to EXEC CICS START

If the transaction to be started is defined as dynamic, the distributed router will be invoked only if a valid distributed routing program name is specified. If omitted, the **DSRTPGM** system initialization parameter assumes a value of NONE by default, and the distributed router is not invoked; while in previous releases the **START** command invoked the IBM-supplied routing program DFHDSRP.



[Learn more...](#)

[Back to table](#)



Distributed routing program no longer invoked for BTS transactions defined as DYNAMIC(NO)

For BTS transactions, if the transaction to be invoked is defined as DYNAMIC(NO), the distributed routing program is no longer invoked.



[Learn more...](#)

[Back to table](#)



Ability to specify HPO in PARM parameter on EXEC PGM=DFHSIP statement and in SYSIN data set

You can now specify the **HPO** system initialization parameter in the **PARM** parameter on an EXEC PGM=DFHSIP statement or in the SYSIN data set. This enhancement makes **HPO** overrides possible, giving you more flexibility in setting **HPO**.

In support for this enhancement, a new security profile DFHSIT.HPO is introduced to allow **HPO** overrides. The CICS region user ID that is associated with the **HPO** override must be defined to an external security manager such as RACF to authorize the use of the HPO facility.



[Learn more...](#)

[Back to table](#)



Performance improvement for channels and containers

As a result of a performance improvement for channels and containers in this release, the order in which containers are returned when browsing a channel might change. As in previous releases, the order in which containers are returned is undefined. Therefore, it is important that applications should not rely on the order of returned containers.

If you have existing applications that are written to rely on the order of returned containers, see [Upgrading applications](#) for advice.



[Learn more...](#)

[Back to table](#)



JVM profile enhancements

A new JVM profile directive INCLUDE is provided to enable additional configuration to be loaded from another file. The file can contain configuration information that is common to several JVM profiles, for example security, logging, timeout settings, or database driver configuration and shared debug controls. Unique configuration is held in the JVM profile, and all common configuration is held in an INCLUDE file.

Use %INCLUDE=<file_path> to include a file in your profile. The file can contain common system-wide configuration that can be maintained separate to the profile. This enables configuration that is common to several profiles to be shared, giving more control and providing easier maintenance for profiles.

A new append syntax uses a + character at the start of a variable to append the value that is specified to the existing value of that variable by using a comma separator.



[Learn more...](#)

[Back to table](#)



Enhancements to environment variables

A set of CICS provided environment variables are now available for Node.js application developers to optionally reference in application code. A Node.js application can find out information about the CICS bundle and environment by using these environment variables.

Environment variables are accessed in the Node.js application by using the `process.env` global variable, for example:

```
console.log("Node.js application " + process.env.CICS_NODEJSAPP +  
  " is running in CICS region " + process.env.CICS_APPLID);
```



[Learn more...](#)

[Back to table](#)



JVM server logging enhancements

Information messages are now reported in the `dfhjvmlog` file to make it easier to diagnose errors. The type of messages that are held in the log file can be configured by using the **LOG_LEVEL** parameter in the JVM profile. Valid values are INFO, WARNING, ERROR, or NONE. For example, a value of NONE suppresses all output and the file is empty and a value of WARNING gives log entries of warning level and above. The default value is INFO.

A **PRINT_PROFILE** option is introduced and can be set to TRUE or FALSE. If the value is set to TRUE, or if SJ level 3 trace or higher is switched on, then the canonicalised profile is written to `SYSPRINT`.



[Learn more...](#)

[Back to table](#)



Liberty enhancements

Support for multiple Liberty servers

Multiple CICS Liberty JVM servers can run in the same CICS region and connect to a Liberty angel process, for security and other services. Applications can be isolated from each other, as each Liberty process has its own configuration and lifecycle. Applications can be hosted in more than one Liberty server in the same CICS region, for improved redundancy and development scenarios.

CICS bundle status reflects Liberty application status

Java™ EE applications that are installed by using CICS bundle parts, remain in the ENABLING state until they are successfully installed in Liberty, or the application fails to install, or the application install is timed-out. In the failure and time-out situations the CICS bundle is placed in the DISABLED state, making it easier to diagnose application configuration issues.

Option to wait for Liberty angel process to be ready

A JVM server option is provided to ensure that a Liberty JVM server does connect to a Liberty angel process before reaching the ENABLED state.

LIBERTY_INCLUDE_XML option

A new JVM profile option LIBERTY_INCLUDE_XML is provided to enable Liberty to load shared configuration, making it easier to administer, clone, and control OSGi and Liberty JVM servers. Use the + character before a variable to append the value specified to the existing value of that variable using a comma separator. For example, if

LIBERTY_INCLUDE_XML=path/file1

exists, then using a JVM profile option of

+LIBERTY_INCLUDE_XML=path/file2

is equivalent to

LIBERTY_INCLUDE_XML=/path/file1,/path/file2

LIBERTY_PRODUCT_EXTENSIONS option

A new JVM profile option LIBERTY_PRODUCT_EXTENSIONS is provided to allow installation of a users own product extension into a Liberty server.



Support for administering Liberty using Admin Center

Available with APAR PH08321. The adminCenter-1.0 feature enables the Liberty Administrative Center, a web-based graphical interface for deploying, monitoring, and managing Liberty servers.



[Learn more...](#)

[Back to table](#)



JWT and OpenID Connect (OIDC) support in Liberty JVM server

JSON Web Token (JWT) support and OpenID Connect scenarios are now fully supported in CICS Liberty. You can generate and consume JWT by using all of the built-in Liberty capabilities, as well as using JWT as part of a larger enterprise authorisation mechanism, for example, OpenID Connect.



[Learn more...](#)

[Back to table](#)



Link to Liberty DPL subset relaxation

The DPL subset and SyncOnReturn restriction for Link To Liberty applications is removed. FULLAPI capabilities are available when linking to Liberty applications.



[Learn more...](#)

[Back to table](#)



REXX for CICS internal tracing, online help, and product documentation improvements

Available with APARS OA56111, OA56806 and OA56807. Support for REXX for CICS internal tracing and a new online help utility are now provided. To use the help utility, you must load the relevant data sets, as

described in [Create the help files](#). The REXX for CICS Transaction Server product documentation is provided in this Knowledge Centre, and in the online help.



[Learn more about Developing REXX applications...](#) [Learn more about REXX/CICS Reference ...](#)

[Back to table](#)



New replication log record



Available with APAR PH09381. Replication logging in support of GDPS® Continuous Availability is enhanced to log a REDO record when an application issues an UNLOCK command following a read-update command, or a series of write-massinsert commands. It allows replication products to cater more efficiently for non-RLS applications, which, in the absence of browse for update support, issue read-update requests against all records in a file, but update very few and unlock most records.



[Learn more ...](#)

[Back to table](#)



New Policy system rule types



Available with APAR PH07632, the following Policy system rule types are introduced:

DBCTL connection status

Use this rule to monitor and react to the change in status of a connection between CICS and DBCTL.

IBM MQ connection status

Use this rule to monitor and react to the change in status of a connection between CICS and IBM MQ.

Pipeline enable status

Use this rule to monitor and react to the change in the enable status of a CICS PIPELINE resource.



[Learn more ...](#)



Build support for other toolchains



Available through continuous delivery. Build toolchains such as Maven and Gradle are extremely popular for developing, building, and testing applications. To provide an enhanced experience for Java developers who are using such tools, CICS now offers JCICS and related artifacts through Maven Central.

With this enhancement, you can manage Java dependencies more easily, develop the applications in an integrated development environment (IDE) of your choice, and integrate the application build smoothly with popular automation tools such as Jenkins and Travis CI during development.



[Learn more ...](#)

[Back to top](#)



New feature toggle to help you with RLS migration



Available with APAR PH07596. A new feature toggle `com.ibm.cics.rls.delete.ridfld` has been introduced to help you with RLS migration. When this feature is enabled, you can issue a **DELETE** command with the RIDFLD option for a single record without causing AFCG abends.



[Learn more ...](#)

[Back to top](#)



Support for Java EE 8 Full Platform



Available with APAR PH15017. By using the embedded version of IBM WebSphere® Liberty (Liberty), CICS TS V5.5 supports applications that are written to the Java Enterprise Edition (EE) 8 Full Platform specification in integrated mode. Java EE 8 includes many new and enhanced APIs, such as JSON processing, RESTful web services, authentication by using custom identity stores, and JavaMail™.

Java EE 8 also provides new versions of features for JavaBean validation, servlet, JavaServer Faces and Contexts and Dependency Injection (CDI).

Java applications that are hosted in CICS TS are integrated with a CICS task by default and can use the JCICS API to call other CICS programs and services. This provides a powerful mechanism to modernize CICS applications by using the latest Java EE 8 features and capabilities.



[Learn more ...](#)

[Back to top](#)



Support for EXEC CICS LINK to a Spring Boot application running in a Liberty JVM server



Available with APAR PH14856. You can add the `@CICSProgram` annotation to a method on a Spring bean. When the application is started in Liberty, a CICS program definition is dynamically created. Then, the Spring Boot application can be invoked by any CICS program through an **EXEC CICS LINK** call.



[Learn more ...](#)



Improvement to CICS exception handling when a JVM server encounters a TCB failure



Available with APAR PH12280. CICS exception handling when a JVM server encounters a TCB failure has been changed to the following process to ensure that the JVM server is recycled.

1. CICS disables the JVMSERVER resource with the PHASEOUT option to allow existing work in the JVM to complete where possible and prevent new work from using the JVM.
2. If the PHASEOUT operation fails to disable the JVMSERVER within the interval specified by the PURGE_ESCALATION_TIMEOUT JVM server option, CICS escalates to the next disable action PURGE until the JVMSERVER is disabled.
3. If the PURGE operation fails to disable the JVMSERVER within the interval, CICS escalates to the next disable action FORCEPURGE.
4. If the FORCEPURGE operation fails to disable the JVMSERVER within the interval, CICS escalates to KILL.
5. After the JVMSERVER is successfully disabled, message DFHSJ1008 is issued.
6. CICS attempts to re-enable the resource to create a new JVM.

You can control the interval between the disable actions that CICS performs by setting the PURGE_ESCALATION_TIMEOUT JVM server option.



[Learn more about JVM server option PURGE_ESCALATION_TIMEOUT](#)

Chapter 2. Changes to externals in this release

CICS Transaction Server for z/OS, Version 5 Release 5 changes a number of externals, including commands, transactions, resources, system initialization parameters, messages, trace and user exits.

For a summary of changes across all supported releases, see [Changes between releases](#) in the Upgrading information.

Table 6. Changes between releases. . These changes are not exclusive to each of the roles shown; some will be of interest across roles

For application programmers	For system programmers
“Changes to the CICS API” on page 26	“Changes to installing” on page 25
“Changes to resource definitions” on page 27	“Changes to resource definitions” on page 27
“Changes to the CICS utilities” on page 28	“Changes to the CICS utilities” on page 28
“Changes to the CICS assistants” on page 28	“Changes to messages and codes” on page 30
“Changes to messages and codes” on page 30	“Changes to compiler and translator support” on page 36
“Changes to event processing adapters and formats” on page 36	“Changes to SIT parameters” on page 37
“Changes to compiler and translator support” on page 36	“Changes to JVM profiles” on page 37
	“Changes to control tables” on page 38
	“Changes to CICS SPI” on page 38
	“Changes to CICS EXCI” on page 40
	“Changes to XPI functions” on page 40
	“Changes to CICS-supplied transactions” on page 40
	“Changes to CICS monitoring” on page 42
	“Changes to statistics” on page 42
	“Changes to GLUEs and TRUEs” on page 43
	“Changes to user-replaceable programs” on page 43
	“Changes to CICSplex SM resource tables” on page 43
	“Changes to CICSplex SM WUI server initialization parameters” on page 44
	Changes to CICSplex SM

Changes to installing

- The Java components that were included within FMID JCI710D at CICS TS V5.4 are moved into the base FMID HCI7200.
- DFHALLOC, DFHINST1 and DFHINSTA jobs have been changed to allocate the following PDSs with BLKSIZE=0 rather than the previous BLKSIZE=400:

ADFHCOB

ADFC370
ADFHPL1
SDFHCOB
SDFHC370
SDFHPL1

Changes to the CICS API

Table 7. Changes to EXEC CICS commands in this release	
API	This release
ASSIGN	CHANGED: New parameter LOCALCCSID returning the fullword binary Coded Character Set Identifier (CCSID) used for the CICS region. New parameters TNADDR , TNIPFAMILY , and TNPORT , returning the IPv4 or IPv6 address and port of the TN3270 client.
DELAY	CHANGED: New condition NORMAL with RESP2 value 23 to indicate that the DELAY request was canceled by another task that issued a CANCEL REQID command specifying the unique identifier used by the issuing task.
DELETE	THREADSAFE: The command is threadsafe if it refers to a coupling facility data table.
ENDBR	THREADSAFE: The command is threadsafe if it refers to a coupling facility data table.
FREEMAIN	CHANGED: New INVREQ with RESP2 value 3 to indicate that an attempt to release CICS-maintained storage has been rejected.
FREEMAIN64	CHANGED: New INVREQ with RESP2 value 3 to indicate that an attempt to release CICS-maintained storage has been rejected.
GETNEXT CONTAINER (CHANNEL)	CHANGED: A container performance improvement introduced in this release changes the order in which containers are returned. You should modify existing applications that rely on the order in which containers are returned, as instructed in Upgrading applications .
QUERY SECURITY	CHANGED: <ul style="list-style-type: none"> Performance improvement. The number of TCB switches has been reduced if more than one access level is specified on the command. Extended with new option USERID to support querying whether a user ID other than the terminal user has access to specified resources.
READ	THREADSAFE: The command is threadsafe if it refers to a coupling facility data table.
READNEXT	THREADSAFE: The command is threadsafe if it refers to a coupling facility data table.
READPREV	THREADSAFE: The command is threadsafe if it refers to a coupling facility data table.
RESETBR	THREADSAFE: The command is threadsafe if it refers to a coupling facility data table.
REWRITE	THREADSAFE: The command is threadsafe if it refers to a coupling facility data table.
SPOOLWRITE	CHANGED: New NOTAUTH with RESP2 value 1, issued when a surrogate security check failed on the user ID specified on the job card.

Table 7. Changes to EXEC CICS commands in this release (continued)	
API	This release
START	CHANGED: <ul style="list-style-type: none"> • New condition INVREQ with RESP2 value 400 to indicate that the a START request has been rejected because the threshold for an AID system rule has been exceeded. • If the transaction to be started is defined as dynamic, the distributed router will be invoked only if a valid distributed routing program name is specified. If omitted, the DSRTPGM system initialization parameter assumes a value of NONE by default, and the distributed router is not invoked; while in previous releases the START command invoked the IBM-supplied routing program DFHDSRP.
STARTBR	THREADSAFE: The command is threadsafe if it refers to a coupling facility data table.
STARTBROWSE CONTAINER (CHANNEL)	CHANGED: A container performance improvement introduced in this release changes the order in which containers are returned. You should modify existing applications that reply on the order in which containers are returned, as instructed in Upgrading applications .
VERIFY PASSWORD	CHANGED: New parameter GROUPID to support password verification against the group ID in addition to the user ID and password that are recorded by the external security manager.
VERIFY PHRASE	CHANGED: New parameter GROUPID to support password phrase verification against the group ID in addition to the user ID and password phrase that are recorded by the external security manager.
WRITE	THREADSAFE: The command is threadsafe if it refers to a coupling facility data table.
WRITEQ TD	CHANGED: New NOTAUTH with RESP2 value of 102, indicating a surrogate security check failure.

Table 8. Changes to JCICS API in this release		
Class	Method	This release
		NEW:

Changes to resource definitions

Table 9. Changes to resource definitions in this release	
Resource	This release
DB2CONN	CHANGED: A command thread is now used by CICS when CICS attempts to cancel a Db2 thread as part of purge or forcepurge processing of a CICS task.
TDQUEUE	CHANGED: New attribute JOBUSERID specifies a user ID under which the JCL job submitted to the internal reader runs if the JCL includes a JOB card without specifying a USER parameter.
TRANCLASS	CHANGED: The allowable characters for the name of a transaction class is expanded to be the same as that supported for the name of a transaction.

Table 9. Changes to resource definitions in this release (continued)	
Resource	This release
TRANSACTION	CHANGED: The allowable characters for the transaction class attribute is expanded to be the same as that supported for the name of a transaction.

Changes to the CICS utilities

Table 10. Changes to CICS-supplied utilities in this release	
Utility	This release
DFH\$MOLS	CHANGED: New options URIMAP and WEBSERVIC added to control statement RESOURCE.
DFHSTUP	CHANGED: <ul style="list-style-type: none"> New fields Urimap Resource Limit (MNGURIRL) and Webservice Resource Limit (MNGWEBRL) added to the Monitoring domain statistics. DFHSTUP reports on the local system entry. New field Peak aids in chain (A14EAHWM) added to the ISC/IRC system entry resource statistics. New field Current number of connections with pthreads (D2G_TCB_PROTECTED_CURRENT) added to the CICS Db2 global statistics. New option POLICY, NODEJSAPP on SELECT TYPE and IGNORE TYPE control parameters.
DFHOSTAT	CHANGED: <ul style="list-style-type: none"> DFHOSTAT reports on the local system entry. New field Peak aids in chain (A14EAHWM) added to the Connections and Modenames report. New field Current number of connections with pthreads (D2G_TCB_PROTECTED_CURRENT) added to the Db2 Connection report. DFHOSTAT reports on NODEJSAPP resources.

Changes to the CICS assistants

Table 11. Changes to the CICS web services assistants, XML assistants, and JSON assistants in this release	
Assistant	This release
DFHJS2LS	CHANGED: <ul style="list-style-type: none"> MAPPING-LEVEL and MINIMUM-RUNTIME-LEVEL now accept 4.2 and 4.3. New parameters: ADDITIONAL-PROPERTIES-DEFAULT, ADDITIONAL-PROPERTIES-MAX, and ADDITIONAL-PROPERTIES-SIZE. JSON schema to high-level language mapping now supports oneOf, anyOf, allOf and not keywords.

Table 11. Changes to the CICS web services assistants, XML assistants, and JSON assistants in this release (continued)

Assistant	This release
DFHLS2JS	CHANGED: <ul style="list-style-type: none"> MAPPING-LEVEL and MINIMUM-RUNTIME-LEVEL now accept 4.2 and 4.3. The TRUNCATE-NULL-ARRAY-VALUES parameter has a new option PACKEDZERO, which instructs the assistant to treat a positive signed packed decimal zero (0x0C), a negative signed packed decimal zero (0x0D), or an unsigned packed decimal zero (0x0F) as empty.
DFHLS2SC	CHANGED: <ul style="list-style-type: none"> MAPPING-LEVEL and MINIMUM-RUNTIME-LEVEL now accept 4.2 and 4.3. The TRUNCATE-NULL-ARRAY-VALUES parameter has a new option PACKEDZERO, which instructs the assistant to treat a positive signed packed decimal zero (0x0C), a negative signed packed decimal zero (0x0D), or an unsigned packed decimal zero (0x0F) as empty.
DFHLS2WS	CHANGED: <ul style="list-style-type: none"> MAPPING-LEVEL and MINIMUM-RUNTIME-LEVEL now accept 4.2 and 4.3. The TRUNCATE-NULL-ARRAY-VALUES parameter has a new option PACKEDZERO, which instructs the assistant to treat a positive signed packed decimal zero (0x0C), a negative signed packed decimal zero (0x0D), or an unsigned packed decimal zero (0x0F) as empty.
DFHSC2LS	CHANGED: <ul style="list-style-type: none"> MAPPING-LEVEL and MINIMUM-RUNTIME-LEVEL now accept 4.2 and 4.3. New parameters: ADDITIONAL-PROPERTIES-DEFAULT, ADDITIONAL-PROPERTIES-MAX, and ADDITIONAL-PROPERTIES-SIZE.
DFHWS2LS	CHANGED: <ul style="list-style-type: none"> MAPPING-LEVEL and MINIMUM-RUNTIME-LEVEL now accept 4.2 and 4.3. New parameters: ADDITIONAL-PROPERTIES-DEFAULT, ADDITIONAL-PROPERTIES-MAX, and ADDITIONAL-PROPERTIES-SIZE.

Changes to messages and codes

Table 12. Changes to messages and codes in this release		
New messages	Changed messages	Removed messages
<ul style="list-style-type: none"> DFH7281 indicates that a command has been found which has been disallowed by translator rule. DFH7282 indicates that a command has been found which has been flagged as requiring a warning by a translator. DFH7283 indicates that a command has been found which contains a keyword which has been disallowed by a translator rule. DFH7284 indicates that a command has been found which contains a keyword which has been flagged as requiring a warning by a translator rule. DFH7286 indicates that a command has been found which contains a keyword which has been disallowed by translator rule. DFH7287 indicates that a command has been found which contains a keyword which has been flagged as requiring a warning by a translator rule. DFH7289 indicates that a command has been found which contains a keyword which has been disallowed by IBM. DFH7290 indicates that the translator has issued a message because a command was flagged for warning by a translator rule. 	<ul style="list-style-type: none"> DFHAM4852 now also warns against defining a resource with a name that starts EYU. DFHCA4852 now also warns against defining a resource with a name that starts EYU. 	

Table 12. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
<ul style="list-style-type: none"> DFHFC6045 indicates that an invalid interval value was specified for transaction CFCT. DFHFC6046 indicates that CICS has detected that a VSAM file that is defined with the LOGREPLICATE attribute was opened. DFHMP2018 indicates that an invalid name or value was specified for a static data item in a policy rule. DFHMP3013 indicates that a threshold specified in a system rule has been exceeded. DFHMP3014 indicates that a threshold specified in a system rule deployed with a CICS platform has been exceeded. DFHRL2105 indicates that the deployment of a bundle cannot continue because an existing installed bundle has the same ID in the specified scope. 	<ul style="list-style-type: none"> DFHH0002 includes new response code 0809, which indicates that surrogate user checking for spool jobs is disabled. DFHIS1002 provides error code <i>X'errorcode</i>, indicating the exception trace point ID that uniquely identifies what the error is and where the error was detected. DFHMP0002 is issued for errors that occurred in DFHMPST. DFHMP2006 is issued also if an event name contains invalid characters. DFHMP3009 emits application context information for programs or bundles when a program enable status rule, bundle available status rule, or bundle enable status rule is triggered for a program or bundle deployed with a CICS application. DFHMP3010 emits application context information for programs or bundles when a program enable status rule, bundle available status rule, or bundle enable status rule is triggered for a program or bundle deployed with a CICS application. 	

Table 12. Changes to messages and codes in this release (continued)


New messages	Changed messages	Removed messages
<ul style="list-style-type: none"> DFHRM0316 is issued by DFHRMUTL if it detects it is running on an unsupported operating system level for this release of CICS. DFHRM0317 is issued by DFHRMUTL if it detects it is running on an unsupported hardware level for this release of CICS. DFHSI1591 indicates that an attempt to attach transaction CFCT failed and that CICS is terminated with a dump. DFHSJ0006 indicates that the initial pthread TCB for NODEJSAPP resource <i>nodejsapp</i> has abended unexpectedly. DFHSJ1300 indicates that a NODEJSAPP has been created and is now in the ENABLING state. DFHSJ1301 NODEJSAPP <i>nodejsapp</i> was not created. DFHSJ1302 indicates that NODEJSAPP <i>nodejsapp</i> was not discarded. DFHSJ1303 indicates that the state of a NODEJSAPP resource has been changed. DFHSJ1304 E indicates that the processing for a NODEJSAPP resource has ended abnormally. DFHSJ1305 E indicates that CICS has attempted to send a USS signal to a process, and has received an error response. DFHSJ1306 E indicates that CICS cannot load or process the requested LE RUNOPTS module. DFHSJ1307 I indicates that CICS has attempted to stop a NODEJSAPP process by sending it a SIGTERM signal and then waiting for it to end. DFHSJ1308 I indicates that the processing for a NODEJSAPP resource has ended abnormally. 	<ul style="list-style-type: none">  DFHSJ1007 (with APAR PH12280) is updated to reflect changed system action when CICS detects that an abend has left a JVM in an inconsistent state. DFHSJ1201 now also applicable to NODEJSAPP resources. DFHSJ1202 now also applicable to NODEJSAPP resources. 	

Table 12. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
<ul style="list-style-type: none"> • DFHSJ1400 indicates that the Liberty JVM server failed to start because no default Liberty angel process is available. • DFHSJ1401 indicates that the Liberty JVM server failed to start because the named Liberty angel process is unavailable. • DFHSJ1402 indicates that no default Liberty angel process is available, and CICS will verify the availability of the Liberty angel process again in 30 seconds. After five retries, the operator is given the option to continue trying or to disable the JVMSERVER resource. • DFHSJ1403 indicates that the named Liberty angel process is unavailable, and CICS will verify the availability of the Liberty angel process again in 30 seconds. After five retries, the operator is given the option to continue trying or to disable the JVMSERVER resource. • DFHSJ1404 is issued after five unsuccessful attempts by CICS to verify that a running Liberty angel process is available for Liberty JVM server startup. It prompts the operator to decide whether to continue waiting for the Liberty angel process to be available or to disable the JVMSERVER resource. • DFHSJ1407 indicates that more than one user-agent whitelist file has been defined to the CMCI JVM server and the first file will be used. • DFHSJ1408 indicates that there is an issue with the user-agent whitelist file defined to the CMCI JVM server and no access to the CMCI is allowed. • DFHSJ1409 indicates that the current cache of whitelisted user-agent values will be deleted and the user-agent whitelist file will be reparsed following a create, modify, or delete operation to the file. 		

Table 12. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
<ul style="list-style-type: none"> DFHSJ1410 indicates that a user-agent has been added to the whitelist cache. DFHSJ1411 indicates that processing of the user-agent whitelist file has completed successfully, and whitelisted user-agents are allowed to access the CMCI. DFHSJ1412 indicates that a user-agent has been denied access to the CMCI because it is not listed in the user-agent whitelist file. DFHSJ1413 indicates that user-agent whitelist processing has been disabled, and no access to the CMCI JVM server is allowed. DFHSJ1414 indicates that the CMCI JVM server is available to process HTTP connections. DFHTD0387 is issued after DFHTD0386 and asks for a GO or CANCEL response to continue or terminate CICS initialization. DFHWU4303 indicates that the level of CICS Explorer is not allowed to be connected to the CMCI. DFHXM0612 indicates that an application entry point is unavailable because the specified transaction was deleted or replaced. DFHXS1404 indicates that system initialization failed because the region user ID did not have authority to access one or more category 1 transactions at startup. 	<ul style="list-style-type: none"> DFHSM0102 now indicates the <i>tranid</i> and <i>trannum</i> of the transaction whose storage has been violated. DFHXS1113 also indicates category 1 transactions that the region user ID does not have authority to access at startup. DFHXS1402 also indicates CICS regions that are not configured to support the Kerberos service. 	

Table 12. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
<ul style="list-style-type: none"> • EYUBM0349W indicates that the specified resource definition for the named CICSplex cannot be found in the data repository. • EYUCS0109I indicates that the connection to the specified CMAS could not be completed. • EYUVS0215E indicates that an attempt to create the named JVM server failed. • EYUVS0216I indicates that the CMCI JVM server has been successfully installed. • EYUVS0218E indicates that the named CMCI JVM server has been installed but could not be enabled. • EYUVS0219I indicates that the named CMCI JVM server has been installed and enabled successfully for the CMCI. • EYUVS0220E indicates that an attempt to disable and discard an existing CMCI JVM server failed. • EYUVS0221E indicates that the resources required to run the GraphQL interface could not be installed. • EYUVS0222I indicates that the CICS GraphQL Interface has been successfully enabled. • EYUVS0223I indicates that the CICSplex SM WUI region is waiting for an installed CMCI JVM server to become enabled. • EYUXE0048E indicates that CMAS initialization is not supported on this operating system level. • EYUXE0049E indicates that CMAS initialization is not supported on this hardware level. 	<ul style="list-style-type: none"> • EYUPN0005W text insert is now spelled DBCTL rather than DBCTRL when IMS DBCTL stall occurs. 	

Table 13. Changes to abend codes in this release

New abend codes	Changed abend codes	Removed abend codes
<ul style="list-style-type: none"> AMQO occurs when a user transaction attempts to invoke program DFHMQTSK. 		
<ul style="list-style-type: none"> ANJ1 occurs when an attempt is made to run the CICS internal task CNJL as a user transaction. 		
<ul style="list-style-type: none"> ANJ2 occurs when an unexpected error is encountered in the CNJL transaction. 		
<ul style="list-style-type: none"> ANJ3 occurs when an attempt is made to run the Node.js worker task CNJW as a user transaction. 		
<ul style="list-style-type: none"> ANJ4 occurs when an unexpected error is encountered processing a local Node.js call to CICS. 		

Changes to compiler and translator support

Table 14. Changes to compiler and translator support in this release

Compiler	This release
CICS translator	<p>WITHDRAWN: The CICS translator no longer inserts the COBOL LIB parameter into the CBL card when compiling COBOL programs.</p> <p>CHANGED: The CICS translator can now process the restricted commands parmlib member DFHAPIR, which contains rules that identify restricted CICS API and SPI commands. During translation, the CICS translator detects whether source programs are using any of the restricted commands and keywords, and will generate warning or error messages in case of violation.</p>

Changes to event processing adapters and formats

Table 15. Changes to event processing adapters and formats in this release

EP adapter or format	This release
CICS flattened event (CFE) format	NEW: count of the number of capture data items, EPFE-ITEMCOUNT , added to EPFE header.
CICS container-based event (CCE) format	NEW: count of the number of capture data items, EPFE-ITEMCOUNT , added to EPFE header.

Changes to SIT parameters

Table 16. Changes to system initialization parameters in this release	
SIT	This release
GMTRAN	CHANGED: New options, EXIT or DISCONNECT, control whether to disconnect a terminal session when PF3 or PF15 is used. These options affect only the CICS-supplied sign-on transactions CESN or CESL.
GNTRAN	NEW: Specifies the transaction that CICS invokes when a user's terminal-timeout period expires.
HPO	CHANGED: This parameter can now be specified in the PARM parameter on an EXEC PGM=DFHSIP statement or in the SYSIN data set.
KERBEROSUSER	NEW: Specifies the user ID associated with the Kerberos service principal for the CICS region.
MINTLSLEVEL	CHANGED: The default is changed to TLS12.
PLTPI	CHANGED: Allows specification of the full name of a program list table as an alternative to a suffix.
PLTSD	CHANGED: Allows specification of the full name of a program list table as an alternative to a suffix.
USSHOME	CHANGED: The NONE option is removed.

Changes to JVM profiles

Table 17. Changes to JVM profiles in this release	
Option	This release
com.ibm.cics.jvmserver.cmci.user.agent.white.list	NEW: Only for the CMCI JVM server. Specify the location of the client whitelist file and enable whitelist processing in the CMCI JVM server.
com.ibm.cics.jvmserver.cmci.user.agent.white.list.monitor.interval	NEW: Only for the CMCI JVM server. Specify the interval of Liberty cache file monitoring checks performed by the CMCI JVM server.
com.ibm.cics.jvmserver.cmci.user.agent.white.list.reject.text	NEW: Only for the CMCI JVM server. Specify a custom response message to return to the user when a request to connect to the CMCI is rejected because the system management client being used is not in the client whitelist.
com.ibm.ws.zos.core.angelName	CHANGED: Specify a named angel process for the Liberty JVM server to connect to upon startup.
com.ibm.ws.zos.core.angelRequired	NEW: Enforce the requirement to connect to the Liberty angel process when the Liberty JVM server is being enabled.

Table 17. Changes to JVM profiles in this release (continued)	
Option	This release
<u>PURGE_ESCALATION_TIMEOUT</u>	NEW (APAR PH12280), compatible with: All JVM Environments New JVM server option to specify the interval between the disable actions that CICS performs when a JVM server encounters a TCB failure.

Changes to control tables

Table 18. Changes to resource definitions in this release	
Resource	This release
DFHMCT	CHANGED: <ul style="list-style-type: none"> New option URIMAP available on DFHMCT TYPE=INITIAL, to set a limit for URIMAP transaction resource monitoring New option WEBSERVIC available on DFHMCT TYPE=INITIAL, to set a limit for WEBSERVICE transaction resource monitoring
DFHPLT	CHANGED: Assembled PLTs are no longer processed by CICS. Instead CICS reads the source of the tables from PARMLIB or DFHTABLE and uses it to control PLT processing. Ensure CICS has READ access to data sets in PARMLIB or DFHTABLE concatenations.
DFHXCOPT	CHANGED with APAR: The SURROGCHK parameter has been removed. Surrogate checking is always done. If you want the option of SURROGCHK=NO , you need to request a usermod from IBM support.

Changes to CICS SPI

Table 19. Changes to the system programming interface commands in this release	
Command	This release
<u>EXTRACT STATISTICS</u>	CHANGED: new option NODEJSAPP
<u>INQUIRE CFDTPOOL</u>	THREADSAFE
<u>INQUIRE CONNECTION</u>	CHANGED: <ul style="list-style-type: none"> CONNECTION(<i>data-value</i>) now accepts the name of the local system. New option AIDCOUNT returns the current number of automatic initiator descriptors (AIDs) that are in the AID chain for the connection. New CVDA value DYNAMIC added to options CHANGEAGENT and INSTALLAGENT. New CVDA value NOTAPPLIC added to options ACCESSMETHOD, AUTOCONNECT and SERVSTATUS.
<u>INQUIRE FEATUREKEY</u>	NEW: Retrieves the value of a feature toggle.

Table 19. Changes to the system programming interface commands in this release (continued)	
Command	This release
INQUIRE MONITOR	CHANGED: <ul style="list-style-type: none"> New option URIMAPLIMIT returns the maximum number of URIMAPs that are specified on the WEB OPEN URIMAP command for which CICS is to perform transaction resource monitoring. New option WEBSERVLIMIT returns the maximum number of WEBSERVICES that are used for the INVOKE SERVICE command for which CICS is to perform transaction resource monitoring.
INQUIRE NETNAME	CHANGED: New parameters TNADDR , TNIPFAMILY , and TNPORT , returning the IPv4 or IPv6 address and port of the TN3270 client.
INQUIRE NODEJSAPP	NEW: Retrieves information about Node.js applications that are running in a CICS region.
INQUIRE SYSTEM	CHANGED: <ul style="list-style-type: none"> New option AIDCOUNT returns the current number of automatic initiator descriptors (AIDs) that are in the AID chain for the local system. New option LASTCOLDTIME, returning the date and time of the last cold start of the CICS system since the last initial start. New option LASTEMERTIME, returning the date and time of the last emergency start of the CICS system since the last initial start. New option LASTINITTIME, returning the date and time of the last initial start of the CICS system. New option LASTWARMTIME, returning the date and time of the last warm start of the CICS system since the last initial start. New option PLTPUIUSR, returning the user ID applicable to PLTPI processing.
INQUIRE TERMINAL	CHANGED: New parameters TNADDR , TNIPFAMILY , and TNPORT , returning the IPv4 or IPv6 address and port of the TN3270 client.
INQUIRE WEBSERVICE	CHANGED: MAPPINGLEVEL and MINRUNLEVEL now accept 4.2 and 4.3.
INQUIRE XMLTRANSFORM	CHANGED: MAPPINGLEVEL and MINRUNLEVEL now accept 4.2 and 4.3.
PERFORM SHUTDOWN	CHANGED: New PLTNAME option allows specification of a full PLT name.
PERFORM STATISTICS	CHANGED: New option POLICY generates CICS policy rule statistics. New option NODEJSAPP generates statistics for NODEJSAPP resources.
SET CONNECTION	CHANGED: CONNECTION(<i>data-value</i>) now accepts the name of the local system.

Table 19. Changes to the system programming interface commands in this release (continued)	
Command	This release
<u>SET MONITOR</u>	CHANGED: <ul style="list-style-type: none"> New option URIMAPLIMIT sets the maximum number of URIMAPs that are specified on the WEB OPEN URIMAP command for which CICS is to perform transaction resource monitoring. New option WEBSERVLIMIT sets the maximum number of WEBSERVICES that are used for the INVOKE SERVICE command for which CICS is to perform transaction resource monitoring.
<u>SET TASK</u>	CHANGED: CICS processing of a task purge is enhanced to ensure that a Db2 cancel thread command is issued to cancel a thread that is active in Db2 at the time the task that is using the thread is purged or forcepurged.

Changes to CICS EXCI

Table 20. Changes to the external CICS interface (EXCI) commands in this release	
Command	This release
<u>ENDBROWSE CONTAINER (EXCI)</u>	NEW: ends a browse of the containers that are associated with a channel.
<u>GETNEXT CONTAINER (EXCI)</u>	NEW: browses the containers that are associated with a channel.
<u>QUERY CHANNEL (EXCI)</u>	NEW: counts the number of containers that are in a channel.
<u>STARTBROWSE CONTAINER (EXCI)</u>	NEW: starts a browse of the containers that are associated with a channel.

Changes to XPI functions

Table 21. Changes to XPI functions in this release	
Command	This release
<u>Parameter domain XPI functions</u>	NEW: DFHPAIQX INQUIRE_FEATUREKEY inquires on the setting of a feature toggle.

Changes to CICS-supplied transactions

Table 22. Changes to CICS-supplied transactions in this release	
Transaction	This release
CDBE	NEW: CICS Db2 attachment facility shutdown force transaction (category 1)
CDBF	CHANGED: Now a Category 2 transaction.
CDBP	NEW: CICS Db2 attachment facility shutdown quiesce transaction (category 1)
CDBQ	CHANGED: Now a Category 2 transaction.
<u>CEMN - CICS monitoring facility transaction</u>	CHANGED: Added options to set URIMAP and WEBSERVICE resource limits.

Table 22. Changes to CICS-supplied transactions in this release (continued)

Transaction	This release
<u>CEMT - master terminal</u>	<p>CHANGED:</p> <ul style="list-style-type: none"> • <u>CEMT INQUIRE CONNECTION</u>: CONNECTION(<i>data-value</i>) now accepts the name of the local system. New option AIDCOUNT returns the current number of automatic initiator descriptors (AIDs) that are in the AID chain for the connection. • <u>CEMT INQUIRE MONITOR</u>: New option URIMAPLIMIT returns the maximum number of URIMAPs that are specified on the WEB OPEN URIMAP command for which CICS is to perform transaction resource monitoring. New option WEBSERVLIMIT returns the maximum number of WEBSERVICES that are used for the INVOKE SERVICE command for which CICS is to perform transaction resource monitoring. • <u>CEMT INQUIRE SYSTEM</u>: New option AIDCOUNT returns the current number of automatic initiator descriptors (AIDs) that are in the AID chain for the local system. New option PLTPUIUSR, returning the user ID applicable to PLTPI processing. New option LASTCOLDTIME, returning the date and time of the last cold start of the CICS system since the last initial start. New option LASTEMERTIME, returning the date and time of the last emergency start of the CICS system since the last initial start. New option LASTINITTIME, returning the date and time of the last initial start of the CICS system. New option LASTWARMTIME, returning the date and time of the last warm start of the CICS system since the last initial start. • <u>CEMT PERFORM SHUTDOWN</u>: New PLTNAME option allows specification of a full PLT name. • <u>CEMT PERFORM STATISTICS</u>: New option POLICY generates CICS policy rule statistics. • <u>CEMT SET CONNECTION</u>: CONNECTION(<i>data-value</i>) now accepts the name of the local system. • <u>CEMT SET MONITOR</u>: New option URIMAPLIMIT sets the maximum number of URIMAPs that are specified on the WEB OPEN URIMAP command for which CICS is to perform transaction resource monitoring. New option WEBSERVLIMIT sets the maximum number of WEBSERVICES that are used for the INVOKE SERVICE command for which CICS is to perform transaction resource monitoring. • <u>CEMT SET TASK</u>: CICS processing of a task purge is enhanced to ensure that a Db2 cancel thread command is issued to cancel a thread that is active in Db2 at the time the task that is using the thread is purged or forcepurged. <p>NEW:</p> <ul style="list-style-type: none"> • <u>CEMT INQUIRE NODEJSAPP</u>: retrieves information about the status of a Node.js application.
CFCT	NEW: Provides tie-up records for VSAM files to a replication log at specified intervals.
CKAM	CHANGED: Reacts to MXT conditions.
CNJL	NEW: Listens for Node.js related notifications.

Table 22. Changes to CICS-supplied transactions in this release (continued)	
Transaction	This release
CNJW	NEW: CICS pipeline Node.js inbound router.

Changes to CICS monitoring

Table 23. Changes to monitoring data in this release	
Data	This release
DFH SOCK group	NEW: New field SOCONMSG indicates whether the task processed the first message for establishing a new connection for a client. You can use SOCONMSG to measure how often a new socket connection is created.
DFH WEBB group	NEW: <ul style="list-style-type: none"> New field WBURIOPN indicates the total elapsed time that the user task was processing WEB OPEN URIMAP requests that are issued by the user task. New field WBURIRCV indicates the total elapsed time that the user task was processing WEB RECEIVE requests and the receiving side of WEB CONVERSE requests that are issued by the user task. New field WBURISND indicates the total elapsed time that the user task was processing WEB SEND requests and the sending side of WEB CONVERSE requests that are issued by the user task. New field NJSAPPNM.
DFH WEBC group	NEW GROUP: New field WBSVINVK indicates the total elapsed time that the user task was processing INVOKE SERVICE requests for WEBSERVICES.

Changes to statistics

Table 24. Changes to statistics in this release	
Statistics	This release
CICS Db2 statistics in Reference	CHANGED: New field Current number of connections with pthreads (D2G_TCB_PROTECTED_CURRENT), indicating the current number of connections that have protected threads.
ISC/IRC system entry statistics	CHANGED: <ul style="list-style-type: none"> Automatic initiate descriptors statistics now report on the local system. Aids in chain (A14EALL) is changed from a half-word binary field to a full-word binary field. It is also moved and now follows field A14EMQPC in the statistics DSECT. New field Peak aids in chain (A14EAHWM), indicating the peak number of automatic initiate descriptors that were present in the AID chain at any one time.

<i>Table 24. Changes to statistics in this release (continued)</i>	
Statistics	This release
Monitoring domain statistics	CHANGED: New fields Urimap Resource Limit (MNGURIRL) and Webservice Resource Limit (MNGWEBRL), indicating the maximum limit for URIMAP and WEBSERVICE transaction resource monitoring.
NODEJSAPP Statistics	NEW: Statistics for Node.js applications.
Policy statistics	NEW: Statistics are provided for CICS policy rules.
Transaction resource statistics	CHANGED: New field: Abend Count (XMRAENDC).

Changes to GLUEs and TRUEs

<i>Table 25. Changes to global user exits and task-related user exits in this release</i>	
Exit	This release
XDTAD	CHANGED: Exit programs must be made threadsafe and enabled at the exit point as threadsafe; otherwise, excessive TCB switching will occur for CFDT requests running on open TCBs.
XPCFTCH	CHANGED: New field on UEPPCDS parameter, PCUE_INVOKING_PROGRAM_NAME

Changes to user-replaceable programs

<i>Table 26. Changes to the user-replaceable programs in this release</i>	
Program	This release
DFHWBOPT	NEW with APAR PH16992: Handler program that can be invoked to process HTTP OPTIONS requests.

Changes to CICSplex SM resource tables

<i>Table 27. Changes to the resource tables provided by CICSplex SM in this release</i>	
Resource table	This release
CICSRGN	CHANGED: New fields: AIDCOUNT, LASTCOLDTIME, LASTEMERTIME, LASTINITTIME, LASTWARMTIME, and PLTPUIUSR.
CONNECT	CHANGED: New fields: AIDHWM and AIDSF
DB2CONN	CHANGED: New field TCBPROTCUR, indicating the current number of connections that have protected threads.
FEATURE	NEW: Provides information about the feature toggles that are specified for the region.
HTASK	CHANGED: New field TMRNJAPN, indicating the Node.js application name from which the task was started.
MONITOR	CHANGED: New fields URIMAPLIMIT and WEBSERVLIMIT, indicating the maximum limit set for URIMAP and WEBSERVICE transaction resource monitoring
NODEJSAP	NEW: Provides information about Node.js applications.

Table 27. Changes to the resource tables provided by CICSplex SM in this release (continued)	
Resource table	This release
RULE	CHANGED with APAR: <ul style="list-style-type: none"> • PH07632: New values dbctlConnection, mqConnection and pipelineEnable added to RULETYPE field.
TASK	CHANGED: New field TMRNJAPN, indicating the Node.js application name from which the task was started.
TDQDEF	CHANGED: New field JOBUSEID, specifying a default job user ID for jobs to the JES internal reader.
TERMNL	CHANGED: New fields: TNADDR, TNIPFAMILY, and TNPORT.

Changes to CICSplex SM WUI server initialization parameters

Table 28. Changes to the WUI server initialization parameters used by CICSplex SM in this release	
System parameter	This release
TCPIPSSL	CHANGED: New value ATTLSEBASIC, to support Application Transparent Transport Layer Security (AT-TLS).

Changes to behavior of CICSplex SM

Enhanced use of the regions z/OS WLM health value in CICSplex SM workload routing decisions

The z/OS WLM health value of a region is now a more effective factor in CICSplex SM workload routing decisions. When determining the target region to route workload to, CICSplex SM workload management assigns penalizing weights in the routing algorithm based on the actual health value of each region. The higher the health value, the lower the penalizing weight assigned, so a region with a greater health value becomes more favorable as a target. In addition, a region with a health value of zero is now deemed as ineligible to receive work.

Record size increase of EYUHIST* data sets

The record size of EYUHIST* data sets has increased from RECORDSIZE(3536 3540) to RECORDSIZE(3620 3624). The EYUJHIST sample for creating and upgrading your CICSplex SM history data sets has been updated to reflect this change.

Notices

This information was developed for products and services offered in the U.S.A. This material might be available from IBM in other languages. However, you may be required to own a copy of the product or product version in that language in order to access it.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property rights may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

*IBM Director of Licensing
IBM Corporation
North Castle Drive, MD-NC119
Armonk, NY 10504-1785
United States of America*

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

*Intellectual Property Licensing
Legal and Intellectual Property Law
IBM Japan Ltd.
19-21, Nihonbashi-Hakozakicho, Chuo-ku
Tokyo 103-8510, Japan*

INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM websites are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this IBM product and use of those websites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who want to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact

*IBM Director of Licensing
IBM Corporation
North Castle Drive, MD-NC119 Armonk,
NY 10504-1785
United States of America*

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Programming License Agreement, or any equivalent agreement between us.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to actual people or business enterprises is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. The sample programs are provided "AS IS", without warranty of any kind. IBM shall not be liable for any damages arising out of your use of the sample programs.

Programming interface information

CICS supplies some documentation that can be considered to be Programming Interfaces, and some documentation that cannot be considered to be a Programming Interface.

Programming Interfaces that allow the customer to write programs to obtain the services of CICS Transaction Server for z/OS, Version 5 Release 5 are included in the following sections of the online product documentation:

- [Developing applications](#)
- [Developing system programs](#)
- [CICS security](#)
- [Developing for external interfaces](#)
- [Reference: application development](#)
- [Reference: system programming](#)
- [Reference: connectivity](#)

Information that is NOT intended to be used as a Programming Interface of CICS Transaction Server for z/OS, Version 5 Release 5, but that might be misconstrued as Programming Interfaces, is included in the following sections of the online product documentation:

- [Troubleshooting and support](#)
- [Reference: diagnostics](#)

If you access the CICS documentation in manuals in PDF format, Programming Interfaces that allow the customer to write programs to obtain the services of CICS Transaction Server for z/OS, Version 5 Release 5 are included in the following manuals:

- Application Programming Guide and Application Programming Reference
- Business Transaction Services
- Customization Guide

- C++ OO Class Libraries
- Debugging Tools Interfaces Reference
- Distributed Transaction Programming Guide
- External Interfaces Guide
- Front End Programming Interface Guide
- IMS Database Control Guide
- Installation Guide
- Security Guide
- Supplied Transactions
- CICSplex SM Managing Workloads
- CICSplex SM Managing Resource Usage
- CICSplex SM Application Programming Guide and Application Programming Reference
- Java Applications in CICS

If you access the CICS documentation in manuals in PDF format, information that is NOT intended to be used as a Programming Interface of CICS Transaction Server for z/OS, Version 5 Release 5 , but that might be misconstrued as Programming Interfaces, is included in the following manuals:

- Data Areas
- Diagnosis Reference
- Problem Determination Guide
- CICSplex SM Problem Determination Guide

Trademarks

IBM, the IBM logo, and ibm.com® are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at [Copyright and trademark information at www.ibm.com/legal/copytrade.shtml](http://www.ibm.com/legal/copytrade.shtml).

Adobe, the Adobe logo, PostScript, and the PostScript logo are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States, and/or other countries.

Intel, Intel logo, Intel Inside, Intel Inside logo, Intel Centrino, Intel Centrino logo, Celeron, Intel Xeon, Intel SpeedStep, Itanium, and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries.

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Spring Boot is a trademark of Pivotal Software, Inc. in the U.S. and other countries.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Terms and conditions for product documentation

Permissions for the use of these publications are granted subject to the following terms and conditions.

Applicability

These terms and conditions are in addition to any terms of use for the IBM website.

Personal use

You may reproduce these publications for your personal, noncommercial use provided that all proprietary notices are preserved. You may not distribute, display or make derivative work of these publications, or any portion thereof, without the express consent of IBM.

Commercial use

You may reproduce, distribute and display these publications solely within your enterprise provided that all proprietary notices are preserved. You may not make derivative works of these publications, or reproduce, distribute or display these publications or any portion thereof outside your enterprise, without the express consent of IBM.

Rights

Except as expressly granted in this permission, no other permissions, licenses or rights are granted, either express or implied, to the publications or any information, data, software or other intellectual property contained therein.

IBM reserves the right to withdraw the permissions granted herein whenever, in its discretion, the use of the publications is detrimental to its interest or, as determined by IBM, the above instructions are not being properly followed.

You may not download, export or re-export this information except in full compliance with all applicable laws and regulations, including all United States export laws and regulations.

IBM MAKES NO GUARANTEE ABOUT THE CONTENT OF THESE PUBLICATIONS. THE PUBLICATIONS ARE PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE.

IBM online privacy statement

IBM Software products, including software as a service solutions, ("Software Offerings") may use cookies or other technologies to collect product usage information, to help improve the end user experience, to tailor interactions with the end user or for other purposes. In many cases no personally identifiable information is collected by the Software Offerings. Some of our Software Offerings can help enable you to collect personally identifiable information. If this Software Offering uses cookies to collect personally identifiable information, specific information about this offering's use of cookies is set forth below:

For the CICSplex SM Web User Interface (main interface):

Depending upon the configurations deployed, this Software Offering may use session and persistent cookies that collect each user's user name and other personally identifiable information for purposes of session management, authentication, enhanced user usability, or other usage tracking or functional purposes. These cookies cannot be disabled.

For the CICSplex SM Web User Interface (data interface):

Depending upon the configurations deployed, this Software Offering may use session cookies that collect each user's user name and other personally identifiable information for purposes of session management, authentication, or other usage tracking or functional purposes. These cookies cannot be disabled.

For the CICSplex SM Web User Interface ("hello world" page):

Depending upon the configurations deployed, this Software Offering may use session cookies that collect no personally identifiable information. These cookies cannot be disabled.

For CICS Explorer:

Depending upon the configurations deployed, this Software Offering may use session and persistent preferences that collect each user's user name and password, for purposes of session management, authentication, and single sign-on configuration. These preferences cannot be disabled, although storing a user's password on disk in encrypted form can only be enabled by the user's explicit action to check a check box during sign-on.

If the configurations deployed for this Software Offering provide you, as customer, the ability to collect personally identifiable information from end users via cookies and other technologies, you should seek your own legal advice about any laws applicable to such data collection, including any requirements for notice and consent.

For more information about the use of various technologies, including cookies, for these purposes, see [IBM Privacy Policy](#) and [IBM Online Privacy Statement](#), the section entitled *Cookies, Web Beacons and Other Technologies* and the [IBM Software Products and Software-as-a-Service Privacy Statement](#).

