CICS Transaction Server for z/OS



What's New

Version 5 Release 4

CICS Transaction Server for z/OS



What's New

Version 5 Release 4

Note
Before using this information and the product it supports, read the information in "Notices" on page 31.

This edition applies to the IBM CICS Transaction Server for z/OS Version 5 Release 4 (product number 5655-Y04) and to all subsequent releases and modifications until otherwise indicated in new editions.

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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.

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Chapter 1. What's new?

CICS® Transaction Server for z/OS®, Version 5 Release 4 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 V5.4 announcement letter.

Table 1. Features of CICS TS for z/OS 5.4. The features in this table are not exclusive to each of the job roles shown; several are of interest across roles. The features that are shown with an asterisk (*) are also available with APARs on previous releases. Details are in the description of each feature.

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Table 1. Features of CICS TS for z/OS 5.4 (continued). The features in this table are not exclusive to each of the job roles shown; several are of interest across roles. The features that are shown with an asterisk (*) are also available with APARs on previous releases. Details are in the description of each feature.

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CICS asynchronous API

This release introduces four EXEC CICS API commands: **RUN TRANSID**, **FETCH CHILD**, **FETCH ANY**, and **FREE CHILD**. Using these commands, an application developer can run asynchronous transactions in CICS, pass and consume data, and reduce the challenges that are involved in the management and execution of programs.

The CICS asynchronous API uses a parent-child model, enabling application developers to use an asynchronous programming model that can improve the responsiveness of applications, especially those applications that make multiple calls to external services, or which spend a lot of time waiting for the responses of other transactions.

As part of the parent-child model, the asynchronous API flows the security context of the parent task to the child task, ensuring that the children of any given parent task have the correct security authorization to run. New statistics are also provided to monitor the activity of the asynchronous services domain.

Learn more...

Support for Java EE 7 Full Platform

Java developers require access to the latest Java Standard Edition (Java SE) and Enterprise Edition (Java EE) APIs. In addition to the existing support for Java SE applications, CICS TS now supports Java applications that are written to the Java EE 7 Full Platform specification using the embedded version of WebSphere Application Server Liberty (Liberty).

Java EE 7 provides a wealth of features that allow Java developers to quickly and easily write web applications, web service applications, enterprise applications, and Java batch applications. It also provides a number of standard connectors such as JDBC, JCA, and JMS that allow Java applications to operate with applications and data outside a Java runtime environment.

Java applications that are hosted in CICS TS are integrated with CICS tasks by default. This allows applications that are written in different programming languages to share core characteristics such as CICS security, transactionality, management, and monitoring. Using Java capabilities directly in CICS can provide a simple and powerful way to modernize CICS applications, without the requirement to unnecessarily distribute application components across multiple runtimes.

Additionally, a new standard-mode option is added to the Liberty JVM server. This mode is designed for applications that do not require tight integration with CICS by default, but benefit from the performance of Java on z/OS and proximity to data provided by IBM DB2 for z/OS and IBM MQ for z/OS.

Support for Java EE 7 Web Profile, a subset of Java EE 7 Full Platform, is also available on CICS TS 5.3 with APAR PI63877. Support for standard-mode Liberty is also available on CICS TS 5.3 with APAR PI58375.

Learn more...

Enable CICS programs to invoke a Java™ EE application

A CICS program is now able to invoke a Java EE application that is running in a Liberty JVM server. You can invoke a Java EE application as the initial program of a CICS transaction, or by using the **EXEC CICS LINK** command or **EXEC CICS START** command from any CICS program.

This can be used if you want to write new function in Java as part of your CICS application, invoke Java code from part of an existing web application, or if you want to re-implement existing COBOL applications in Java.

This capability is also available on CICS TS 5.3 with APAR P167640 and APAR PI58375.

Learn more...

New web services commands

The **EXEC CICS TRANSFORM** command converts JSON data and a language structure. The following commands are now available:

- **TRANSFORM DATATOJSON** to convert application data to JSON.
- **TRANSFORM JSONTODATA** to convert JSON to application data.

This capability is also available on CICS TS 5.3 with APAR PI54841.

Learn more about TRANSFORM DATATOJSON...

Learn more about TRANSFORMJSONTODATA ...

New parameters for DFHLS2WS

New optional parameters, **PORT-NAME**, **BINDING-NAME**, and **SERVICE-NAME**, are added to the high-level language to WSDL conversion (DFHLS2WS) procedure to prevent your program name from being shown in the port and portType name, the binding name, and the service name in the generated WSDL document.

If you specify the following optional parameters, the PGMNAME name is not included in the generated WSDL 1.1 document:

- BINDING-NAME
- OPERATION-NAME
- PORT-NAME
- REQUEST-NAMESPACE
- RESPONSE-NAMESPACE
- SERVICE-NAME
- WSDL-NAMESPACE

Learn more ...

New MAPPING-OVERRIDES option for schema-to-PL/I conversion

A new MAPPING-OVERRIDES option, `HYPHENS-AS-UNDERSCORES`, is available in the DFHWS2LS, DFHJS2LS, and DFHSC2LS assistants. You can use this option to convert any hyphens in the schema to underscores, rather than the character X. Using this option can improve the readability of the generated PL/I language structures.

This capability is also available on CICS TS 5.3 with APAR PI57467.

Learn more ...

New WIDE-COMP3 option for schema-to-COBOL or schema-to-PL/I conversion

A new WIDE-COMP3 option, `FULL`, is available in the DFHWS2LS, DFHJS2LS, and DFHSC2LS assistants. You can use this option to generate packed decimal fields that are large enough to hold all valid values. The maximum size is 31 digits.

This capability is also available on CICS TS 5.3 with APAR PI47466.

Learn more ...

Support for mapping level 4.1 in the CICS assistants

Mapping level 4.1 is added to the web services assistants, XML assistants, and JSON assistants. This mapping level implements improved mappings for simple arrays generated bottom-up from existing copybooks. It also adds the ability for CICS to auto-detect uninitialized trailing storage in arrays, and to omit those records from the generated XML/JSON form.

This capability is also available on CICS TS 5.3 with APAR PI67641.

Learn more ...

Enhancement of sockets domain (SO)

The sockets domain allows data that is received or sent over a TCP/IP socket to reside in any valid data location, which is normally either 31-bit (above-the-line) storage or 64-bit (above-the-bar) storage. This change relieves 31-bit storage, depending on the size of the HTTP body that is sent or received.

As a result, the following EXEC CICS WEB commands are changed:

For the WEB RECEIVE (Server) command, CICS receives the body of the server HTTP request into above-the-bar storage if the HTTP request contains a Content-Length header or is sent as a chunked request. The body is copied into below-the-bar storage only when CICS needs to provide a below-the-bar version for the server application.

For the WEB SEND (Server) command:

- If the HTTP server body is held in a container before it is sent to the server, CICS keeps the body in and sends it from above-the-bar storage.
- If the HTTP server body is held in an application buffer and needs to be copied or converted before it is sent, CICS keeps the body in and sends it from above-the-bar storage.

Learn more about EXEC CICS WEB RECEIVE...

Learn more about EXEC CICS WEB SEND...

EXCI support for channels and containers

The external CICS interface (EXCI) can pass more than 32 K of data. EXCI now supports passing a CHANNEL with its set of containers, instead of passing a COMMAREA, when linking to a CICS program from a non-CICS address space.

EXCI supports issuing **EXEC CICS PUT CONTAINER**, **GET CONTAINER**, **MOVE CONTAINER**, **DELETE CONTAINER**, and **DELETE CHANNEL** commands in batch.

EXCI also provides the ability to do code page conversion in and out of containers.

A channel can be specified on both the EXEC API (**EXEC CICS LINK**) and the call level API (**DPL_REQUEST**).

Any CICS applications that are coded to the channels and containers API and invoked by CICS Distributed Program Link (DPL) can now also be invoked unchanged from an EXCI client, including CICS applications that run on previous releases of CICS TS that support channels and containers.

Learn more ...

New execution diagnostic facility transactions

New transactions CEDG and CEDY, read-only forms of CEDF and CEDX, are now available. You can examine application programs by using CEDG and CEDY, but you cannot modify resources or alter the execution of commands.

Learn more ...

Decision Server Insights Event format

The Decision Server Insights Event format is an XML representation of a CICS event that is recognized by the Decision Server Insights component of IBM® Operational Decision Manager. This format can also be used by any consumer that can recognize the Decision Server Insights Event format.

This capability is also available on CICS TS V5.1 and CICS TS V5.2 with APAR PI55133, and on CICS TS V5.3 with APAR PI55134.

Learn more ....

Additional Event Processing (EP) enhancements

The following enhancements are made to CICS Event Processing support:

- Addition of new transient data queue (TDQ) EP adapter to emit events to any consumer that can read events from a TD queue.
- Custom EP adapters are passed capture data in a printable (character) form. A new set of containers (DFHEP.CHAR.nnnnn) is passed to custom EP adapters, which contain a printable version of the raw capture data that is passed in the DFHEP.DATA.nnnnn containers.
- Addition of the MESSAGE_TEXT capture item on a MESSAGE system event to allow the complete message text to be captured.

Learn more about TDQ adapter ...

Learn more about DFHEP.CHAR.nnnnn containers ...

Learn more about MESSAGE_TEXT capture item ...

Support for Kerberos mutual authentication through the EXEC CICS VERIFY TOKEN command

New options `OUTTOKEN` and `OUTTOKENLEN` are added to **`VERIFY TOKEN`** to support Kerberos mutual authentication.

This capability is also available on CICS TS V5.3 with APAR PI56774.

Learn more ...

NOSUSPEND option on EXEC CICS named counter server commands

A new option, `NOSUSPEND`, is added to the following EXEC CICS named counter server commands to allow an immediate return to the application program during a coupling facility structure rebuild:

- **`DEFINE COUNTER`** and **`DEFINE DCOUNTER`**
- **`DELETECOUNTER`** and **`DELETE DCOUNTER`**
- **`GET COUNTER`** and **`GET DCOUNTER`**
- **`QUERY COUNTER`** and **`QUERY DCOUNTER`**
- **`REWIND COUNTER`** and **`REWIND DCOUNTER`**
- **`UPDATE COUNTER`** and **`UPDATE DCOUNTER`**

Learn more ...

New resource, MQMONITOR, provides a better mechanism for controlling MQ trigger and bridge monitors

A new RDO-defined resource, MQMONITOR, is provided to complement the existing MQCONN resource. You can use this new resource to configure an MQMONITOR, which can be a trigger monitor, an MQ bridge monitor, or a user-written monitor.

Configuration options include the ability to specify a transaction ID to be used by the monitor, the user ID under which a monitor task runs, and the user ID to be used by the monitor to start the application tasks if an alternative user ID is not provided by the application. The **AUTOSTART** option automatically starts monitors when the CICS-MQ connection is started. Monitors are automatically stopped when the CICS-MQ connection is stopped. Any number of MQMONITOR resources can be defined and installed. Using the MQMONITOR resource removes the need to use the CKQC transaction to start and stop monitors manually.

With the introduction of the MQMONITOR resource, CICS now differentiates between the userID under which the transaction that is monitoring the MQ queue runs (the MONUSERID) and the userID under which the initiated transactions run. This userID (the USERID) is used by default, unless it is otherwise provided. This has implications for any MQMONITOR resources that are dynamically created when an MQCONN is installed. See Review the use of MQCONN for details.

Learn more ...

Removal of TCB switch for Java applications that access MQ

CICS Java applications that run in an OSGi JVM can now use the MQ Classes for Java and the MQ Classes for JMS to access IBM MQ for z/OS from a T8 TCB instead of forcing a move to an L8 TCB.

The CICS-MQ task-related user exit changed to take advantage of an enhancement to the RMI that allows TRUEs to run on any key 8 TCB, not just an L8 TCB. The `REQUIRED` option on the ENABLE PROGRAM command is used to specify that a task-related user exit must run on an open TCB. If `OPENAPI` is specified with `REQUIRED`, an L8 TCB is used. If `OPENAPI` is not specified, any key 8 open TCB is used. Hence the CICS-MQ TRUE is enabled with the `REQUIRED` option but not the `OPENAPI` option.

The change in TCB switch behavior affects the results that you see in CICS monitoring and statistics. TCB usage for Java MQ applications is changed in that MQ CPU time is now accumulated against a T8 TCB. End of task syncpoint processing is still accumulated on an L8 TCB.

Learn more ...

Improved management of JVM servers and associated CICS tasks

The ability to robustly manage workloads is critical to an application server. CICS can now remove disruptive tasks from the JVM server by using the `PURGE` option on the SET TASK command. (This command should be used with caution and with the understanding that objects that are modified by that application might be left in an inconsistent state.) In addition, when disabling the JVM server by using

the SET JVMSERVER command, CICS can now remove associated threads and tasks in an orderly sequence in most situations.

Learn more about SET TASK...

Learn more about SET JVMSERVER...

Non-Java support for JSON web services

JSON messages can now be processed in CICS regions with no Java configuration. You don't have to configure and install a JVM server. Performance and throughput for many workloads will be better than when using a JVM server to process JSON messages.

To set up CICS as a non-Java JSON service provider, you must configure a provider pipeline that uses the CICS-supplied program DFHPIJT as the terminal handler. For detailed instructions, see Creating the CICS infrastructure for a non-Java JSON service provider.

Learn more ...

System autoinstall of program definitions for Language Environment®

CICS now uses system autoinstall to install program definitions for Language Environment as required, removing the need to maintain definitions in the CEE CSD group. Only those programs that are used have their definitions installed.

This capability is also available on CICS TS V5.1 and CICS TS V5.2 with APAR PI60388 and APAR PI73184, and on CICS TS V5.3 with APAR PI60389.

Learn more ....

Changes to the CICS IPIC heartbeat function

The CICS IPIC heartbeat function is changed. IPIC heartbeat messages are sent out only if the connected CICS region is running in a different sysplex.

Learn more ...

XPTKT now defaults to making a RACF® check before generating a PassTicket

The CICS system initialization parameter, **XPTKT**, now defaults to YES. This means that CICS makes a RACF check before generating a PassTicket. If you have applications that generate PassTickets by using the **EXEC FEPI REQUEST PASSTICKET**, **EXEC CICS REQUEST PASSTICKET**, or **EXEC CICS REQUEST ENCRYPTPTKT** commands, you must create RACF definitions to allow regions (and, optionally, user IDs or groups) to generate PassTickets.

Learn more ...

3270 Intrusion Detection Service (IDS)

This service allows CICS to detect if 3270 emulators invalidly modify protected fields, potentially compromising the security of an application. You can opt into

this capability with a feature toggle, as described in Specifying feature toggles. You configure this service by using feature toggle `com.ibm.cics.bms.ids`.

CICS BMS 3270 IDS works with the z/OS Communications Server 3270 Intrusion Detection Service to provide an IDS that handles all 3270 or BMS applications. The BMS only service was previously called BMS 3270 data stream validation and was configured using a user replaceable module (URM).

Learn more ...

Support for ABSTIME format in EXTRACT STATISTICS command

The **EXTRACT STATISTICS** SPI command now can return the time at which the counters for the requested statistics were last reset in ABSTIME format, through the new **LASTRESETABS** option. ABSTIME specifies the absolute time, which can be transformed into any familiar format by using the **FORMATTIME** command. You can now handle time periods that cross a day boundary more easily.

Learn more ...

New fields added to TCP/IP statistics

New fields are added to TCP/IP global statistics and TCP/IP services resource statistics to provide more information about TCP/IP performance.

New fields in TCP/IP: Global statistics
: The new fields better illustrate how well connections are reused to give a view of connection persistence for a CICS region.

New fields in TCP/IP services: Resource statistics
: Some new fields illustrate how well connections are reused to give a view of connection persistence for connections into a specific TCPIPSERVICE.

  Some new fields show the effects of performance tuning for HTTP connections on a TCPIPSERVICE.

  Some new fields show the socket backlog and details on connections that are dropped to help diagnostics when CICS is under stress.

Learn more ...

New options to dump non-CICS address and data spaces

New options, `JOBLIST` and `DSPLIST`, are added to the INQUIRE SYSDUMPCODE and SET SYSDUMPCODE commands to dump additional non-CICS address spaces and data spaces when a CICS dump is triggered.

You can set JOBLIST and DSPLIST only through the **SET SYSDUMPCODE** SPI command or the **CEMT SET SYDUMPCODE** command. `JOBLIST` and `DSPLIST` are inquire-only for CPSM SYSDUMP.

Learn more ...

New system initialization parameter allows preset userid terminals to share a single ACEE

A new system initialization parameter, **SNPRESET**, allows userid terminals that are associated with the same user ID to share a single ACEE. You can save storage by specifying SNPRESET=SHARED.

Learn more ...

New option to restart a CICS region after a normal shutdown

A new option, RESTART, is added to the **PERFORM SHUTDOWN** command to support the automatic restart of CICS regions even if they shut down normally.

If you specify the RESTART option on the **PERFORM SHUTDOWN** command for a CICS region, when the region shuts down normally, it is restarted by MVS™ Automatic Restart Manager (ARM) after the shutdown.

Learn more ...

VSAM data set access control is extended for GDPS®/Active-Active availability solutions

To enhance the IBM GDPS/Active-Active (GDPS/AA) availability solution to support replication of VSAM data for active-standby and active-query configurations, you can now set VSAM data sets to allow only replication programs to have full access, and other programs to have read access only.

The **AVAILABILITY** option of the **SET DSNAME** and **INQUIRE DSNAME** commands has a new CVDA value, RREPL. If you specify **AVAILABILITY(RREPL)** for a VSAM data set, full access to the data set is restricted to REPLICATOR programs. Other programs only have read access. The new **AVAILABILITY(RREPL)** option allows you to set up a fence that is specific to a VSAM data set, rendering the data set accessible only for read and replication. To remove the fence, issue a **SET DSNAME AVAILABILITY(AVAILABLE)** command.

The **SET PROGRAM** and **INQUIRE PROGRAM** SPI commands have a new option, **REPLICATION**, which allows you to specify REPLICATOR programs. For a REPLICATOR program to update a VSAM data set in the AVAILABILITY state of RREPL, the program must be executed in the region that owns the data set.

Learn more ...

New previous transaction association data

To enable more efficient use of the new “CICS asynchronous API” on page 2, association data identifies the local or parent task of a request to attach a task by an **EXEC CICS RUN TRANSID** command to allow the transaction tracking and monitoring of parent and child tasks. The new association data also works for **EXEC CICS START** commands that are not a new point of origin.

Learn more ...

Support for the z/OS Workload Manager Health API

CICS now uses the z/OS Workload Manager Health (IWM4HLTH) API as a means of controlling the flow of work into a CICS region. This service is used to inform z/OS WLM of the health state of a server (in this context, a CICS region). This can allow a CICS region to have a warm-up process after the end of system initialization until the region is fully ready to receive work.

The WLMHEALTH system initialization parameter specifies the parameters to be used by CICS on z/OS WLM Health API (IWM4HLTH) calls, which CICS makes to inform WLM about the health state of a CICS address space. You can view the z/OS WLM health service settings for CICS regions through the INQUIRE WLMHEALTH SPI command or the CEMT INQUIRE WLMHEALTH command. You can also change the health service settings by using the SET WLMHEALTH SPI command or CEMT SET WLMHEALTH.

The primary user of CICS regions' health indicator values is TCP/IP, but the values are also used by CICS and CPSM components. When TCP/IP is configured, the health indicator feeds into the WLM server recommendations to sysplex distributor, affecting when connections are established with a CICS region. In CICS, the health indicator affects when MQ trigger monitors, the MQ Bridge, and user-written MQ consumers that are using the MQMONITOR resource are started and stopped. In addition, CPSM workload management takes into account the health state of target AORs when deciding where to route work.

Learn more ...

New CMCI URI parameter `OVERRIDEWARNINGCOUNT`

The new CICS management client interface (CMCI) URI parameter, **`OVERRIDEWARNINGCOUNT`**, provides the option to bypass the warning count limit mechanism and allow the request to execute as if default warning count limits were not specified. The **`OVERRIDEWARNINGCOUNT`** parameter is effective only when the following CPSM WUI server initialization parameters are in effect:

- **`RESOURCELIMIT`** is set to WARNING.
- **`DEFAULTWARNCNT`** is non-zero (which means a non-zero default warning count limit).

`OVERRIDEWARNINGCOUNT` is applicable to DELETE, GET, and PUT requests, but accepted by POST with no effect.

Learn more ...

Changes to defaults of resource definition attributes

Defaults of several resource definition attributes are changed for better system performance:

- To avoid the inadvertent use of 24-bit storage, defaults of the following attributes are changed:

  DATALOCATION on program definitions

  TASKDATALOC on transaction definitions
- To allow better recovery from failure and stall scenarios, defaults of attributes that affect transaction purgeability are changed:

  SPURGE and TPURGE on transaction definitions

Learn more about PROGRAM attributes ...

Learn more about TRANSACTION attributes ...

Changes to the way that CICS handles unused HTTP persistent connections

If you are using a TCPIPSERVICE resource for CICS web support with the HTTP protocol, when a command is issued to close the TCPIPSERVICE and there are unused HTTP persistent connections, CICS now ensures that the TCPIPSERVICE closes within 30 seconds or within the time as specified in the TCPIPSERVICE **SOCKETCLOSE** attribute if this value is less than 30 seconds.

Learn more ...

Support for IBM Health Checker for z/OS

IBM Health Checker for z/OS provides a foundation to help simplify and automate the identification of potential configuration problems. CICS TS now supports three health checker rules that define best practice for CICS TS security. If a CICS region becomes non-compliant with these security best practices, a warning message is issued so that you can take corrective actions.

Learn more ...

Support for system rules in CICS policies

If you want to monitor the state of system resources or the overall health of a CICS system, you can define system rules in CICS policies. System rules define an automated action to be performed (issue a message or emit a CICS event) when something of interest happens in a CICS system, such as a resource state change, a threshold that is crossed, or an unusual system state or action.

System rules provide equivalent function to system events, which are now deprecated. You should use system rules instead.

Following the introduction of system rules, policy threshold rules are renamed to policy task rules.

Learn more ...

CICSPlex® SM tasks in a MAS changed to be system tasks

Tasks that are internally initiated by CICSPlex SM in a MAS and that have transaction IDs beginning with the characters CO are changed to run as CICS system tasks. As a result, these tasks are no longer displayed among active tasks in a MAS that is at CICS TS Version 5.4 or later. Web User Interface (WUI) tasks and CPSM utility transactions (for example COLM for starting the MAS agent initialization) continue to run as user tasks.

As a result of this change:

- A MAS can now have an initial user task count of zero tasks, even when the MAS agent is active.
- In a CICSPlex, where workload target regions are a mix of both CICS TS V5.4 and lower releases, the workload distribution favors target regions that run CICS

TS V5.4 because those regions have a lower initial user task count. CICSPlex SM WLM continues as normal to select the target region with the lowest routing weight and the bias disappears as the CICS TS V5.4 target regions calculated routing weight starts to equal or exceed that of the lower CICS TS releases.

- It is no longer possible to purge CPSM internal system tasks, protecting the system from accidental damage.

New STALLASYCNT and STALLASYTSK system parameters for CICSPlex SM

Two new system parameters, **STALLASYCNT** and **STALLASYTSK**, are introduced to CICSPlex SM to enable the tracking and STALL detection of asynchronous tasks.

Learn more ...

Change in TCB allocation for Liberty threads

To alleviate the potential impact of Liberty thread pooling on zIIP-eligibility of workloads, tasks that run as Liberty threads now invoke a TRUE on the T8 TCB that CICS provided to the Liberty ThreadPool. All other tasks continue to invoke it on the QR TCB.

This capability is also available on CICS TS V5.3 with APAR PI54263.

Learn more ....

Support for new deployment tasks in DFHDPLOY

DFHDPLOY is enhanced to perform PIPELINE SCAN, PROGRAM NEWCOPY, and PROGRAM PHASEIN. This enables automation to be written to update these resources without requiring the direct use of the CICSPlex SM API.

This capability is also available on CICS TS V5.1, CICS TS V5.2, and CICS TS V5.3 with APAR PI72104.

Learn more ....

Feature toggles to enable new features that are available to in-service or open beta CICS releases

CICS delivers features on a continual basis to enhance its capabilities. You can now enable new features that are made available to in-service or open beta CICS releases by configuring feature toggles. This mechanism gives you more control over the enablement of such features.

Learn more ...

z/OS Provisioning Toolkit, a command-line utility to rapidly provision and deprovision CICS and other z/OS environments

IBM z/OS Provisioning Toolkit (z/OS PT) is a simple command-line utility that uses the IBM z/OS Management Facility (z/OSMF) REST API to rapidly provision and deprovision CICS and other z/OS development environments. System programmers can set up the environments, authorize access to individuals or teams, and set provisioning controls and limits. Then, using a command-line

interface, application developers can quickly provision and deprovision environments, without needing mainframe administration skills or authority.

Learn more ...

Changes to documentation

This release has some changes to the structure and availability of the product documentation:

- Documentation for CICS Explorer® in IBM Knowledge Center is published independently from the documentation for CICS Transaction Server. The CICS Explorer documentation is in CICS Explorer User Guide.
- The table of contents in IBM Knowledge Center is streamlined into fewer sections.
- There are a number of changes to the way that the PDF manuals are structured and delivered.
- IBM Knowledge Center V2.0 withdrew support for creating bespoke PDFs. As a consequence, the collections that were provided to support this facility are also withdrawn from the CICS documentation.

Learn more ...

Chapter 2. Changes to externals in this release

CICS Transaction Server for z/OS, Version 5 Release 4 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 2. 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 16	"Changes to installing"
"Changes to resource definitions" on page 17	"Changes to resource definitions" on page 17
"Changes to the CICS utilities" on page 17	"Changes to the CICS utilities" on page 17
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	Changes to CICSPlex SM

Changes to installing

- All source changes are now made by source replacement. Source updates are no longer made.
- New optional job, DFHIFTGS, tags the text files in the CICS USSHOME directory with the correct coded character set. The highest expected return code is 0.
- The DFHALLOC and DFHINST3 jobs have been changed to create the ADFHMOD, SDFHAUTH, and SDFHLOAD data sets as PDSEs. CICS now requires these data sets to be PDSEs.

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Changes to the CICS API

Table 3. Changes to **EXEC CICS** *commands in this release*

API	This release
• DEFINE COUNTER and DEFINE DCOUNTER • DELETE COUNTER and DELETE DCOUNTER • GET COUNTER and GET DCOUNTER • QUERY COUNTER and QUERY DCOUNTER • REWIND COUNTER and REWIND DCOUNTER • UPDATE COUNTER and UPDATE DCOUNTER	**CHANGED:** New option: NOSUSPEND
FETCH ANY	**NEW:** Used by a parent task to inquire on the status of any completed child task.
FETCH CHILD	**NEW:** Used by a parent task to inquire on the status a specific child task.
FREE CHILD	**NEW:** Used by a parent task to free a specified child token.
RUN TRANSID	**NEW:** To initiate a local child transaction that runs asynchronously with the parent transaction.
TRANSFORM DATATOJSON	**NEW:** To convert application data to JSON.
TRANSFORM JSONTODATA	**NEW:** To convert JSON to application data.
VERIFY TOKEN	**CHANGED:** New options OUTTOKEN and OUTTOKENLEN
XCTL	**CHANGED:** New INVREQ with RESP2 value 33 when a public program issues XCTL to another program that is an application entry point. New INVREQ with RESP2 value 34 when a program with an application context issues XCTL to a public program.
• DELETE • READ • READNEXT • READPREV • REWRITE • WRITE	**CHANGED:** New INVREQ with RESP2 value 57, issued when a non-REPLICATOR program attempted to update a VSAM data set that has an AVAILABILITY state of RREPL
LINK (EXCI)	**CHANGED:** New option CHANNEL to support passing a CHANNEL with its set of containers
• DELETE CHANNEL (EXCI) • DELETE CONTAINER (EXCI) • GET CONTAINER (EXCI) • MOVE CONTAINER (EXCI) • PUT CONTAINER (EXCI)	**NEW:** EXCI can issue these commands in batch.
• WEB RECEIVE (Server) • WEB SEND (Server)	**CHANGED:** The WEB RECEIVE command is enhanced to allow the body of an HTTP server request to be received into 64-bit (above-the-bar) storage. The WEB SEND command is enhanced to allow the body of an HTTP server response to be sent from above-the-bar storage.

Table 4. Changes to JCICS API in this release

Class	Method	This release
AsyncService (interface)	runTransactionId()	**NEW:** to start an asynchronous child task.
AsyncServiceImpl	getAny()	**NEW:** to fetch the results of any completed child task.
	freeChild()	**NEW:** to free a specified child task.
ChildResponse (interface)	getCompletionStatus()	**NEW:** returns the completion status of a child task.
	getAbendCode()	**NEW:** returns the abend code of a child task.
	getChannel()	**NEW:** returns the channel from a child task.
Future<ChildResponse>	get()	**NEW:** to fetch the results of a completed child task.
	isDone()	**NEW:** checks if a child task has finished.
Container	getDatatype()	**NEW:** to return the data type of a container.

Changes to resource definitions

Table 5. Changes to resource definitions in this release

Resource	This release
MQCONN	**CHANGED:** **INITQNAME** attribute allows use of a symbolic parameter, *&APPLID.*, to identify the APPLID of a CICS region
MQMONITOR	**NEW:** to define MQ monitors such as trigger monitors, MQ bridge monitors, and user-written monitors
PROGRAM	**CHANGED:** • The default value of the **DATALOCATION** attribute is now ANY to reduce the 24-bit storage usage for better CICS system resilience • Attribute JVMCLASS changed to support invoking a calling applications in a Liberty JVM server
TRANSACTION	**CHANGED:** • **RUNAWAY** attribute accepts a new, lower limit of 250. • The default value of **SPURGE** and **TPURGE** is changed to YES. • The default value of **TASKDATALOC** is changed to ANY.

Changes to the CICS utilities

Table 6. Changes to CICS-supplied utilities in this release

Utility	This release
DFHMNDUP	**CHANGED:** Specifying a 2 digit year on the DATE and JOBDATE control parameters now defines a date in the twenty-first century.

Table 6. Changes to CICS-supplied utilities in this release (continued)

Utility	This release
DFHPDxxx	**CHANGED:** • Renamed with new release identifier. • Formatting of the DFHMQINI CICS MQINI control block has been replaced by formatting the DFHMQMNT CICS MQMONITOR control block. • Formatting of an EXCI dump has been enhanced as follows: – A PG section is added to format channels and containers control blocks. – The KE section is enhanced to format a 64 bit PSW and registers. – The LD section lists the new modules added for EXCI channels and containers support.
DFH$MOLS	**CHANGED:** Specifying a 2 digit year on the DATE control parameter now defines a date in the twenty-first century.
DFHSTUP	**CHANGED:** Specifying a 2 digit year on the DATE control parameter now defines a date in the twenty-first century. **NEW:** option MQMONITOR on **SELECT TYPE** and **IGNORE TYPE** control parameters

Changes to the CICS assistants

Table 7. Changes to the CICS web services assistants, XML assistants, and JSON assistants in this release

Assistant	This release
DFHJS2LS	**CHANGED:** • New option, HYPHENS-AS-UNDERSCORES, on MAPPING-OVERRIDES • New option, FULL, on WIDE-COMP3 • Support for mapping level 4.1
DFHLS2JS	**CHANGED:** Support for mapping level 4.1
DFHLS2SC	**CHANGED:** Support for mapping level 4.1
DFHLS2WS	**CHANGED:** • New parameters, PORT-NAME, BINDING-NAME, and SERVICE-NAME • Support for mapping level 4.1
DFHSC2LS	**CHANGED:** • New option, HYPHENS-AS-UNDERSCORES, on MAPPING-OVERRIDES • New option, FULL, on WIDE-COMP3 • Support for mapping level 4.1
DFHWS2LS	**CHANGED:** • New parameters, PORT-NAME, BINDING-NAME, and SERVICE-NAME • New option, FULL, on WIDE-COMP3 • Support for mapping level 4.1

Changes to messages and codes

Table 8. Changes to messages and codes in this release

New messages	Changed messages	Removed messages
• **DFHAM4900** indicates an attempt to install an obsolete group. • **DFHAM4962** indicates that an attempt to install an MQ monitor has failed because an MQ monitor with the same name is already installed and is in use. • **DFHAM4963** indicates that an attempt to install an MQ monitor has failed because no MQCONN is installed in the CICS system. • **DFHAM4964** indicates an attempt to install an obsolete group as part of a list. • **DFHAM4965** indicates that an attempt to install the MQMONITOR resource has failed because a value for MONUSERID has not been specified. • **DFHAM4966** indicates that an attempt to install the MQMONITOR resource has failed because the current user is not a surrogate of MONUSERID. • **DFHAM4967** indicates that obsolete group CEE group has been installed and CICS will terminate. • **DFHAS0001** indicates that an abend has occurred. • **DFHAS0002** indicates that a severe error has occurred. • **DFHAS0004** indicates that a possible loop has been detected. • **DFHAS0100** indicates that the asynchronous services domain initialization has started. • **DFHAS0101** indicates that the asynchronous services domain initialization has ended.	• **DFHMP2004** no longer used to report BASESCOPE errors. • **DFHSO1001** includes new error codes to identify NMI errors when CICS attempts to obtain TCPIPSERVICE resource statistics. • **DFHWU4302** includes new information about using the OVERRIDEWARNINGCOUNT URI parameter to bypass the warning count limit. • **EYUNX0157** is renamed to **EYUXL0157** • **EYUNX0158** is renamed to **EYUXL0158** • **EYUNX0159** is renamed to **EYUXL0159**	• **EYUVC1003** is superseded by new message EYUVC1031I. • **EYUVC1004** is superseded by new message EYUVC1030E. • **EYUVC1005** is superseded by new message EYUVC1030E. • **EYUVC1006** is superseded by new message EYUVC1030E.

Table 8. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
• **DFHCA4900** indicates an attempt to install an obsolete group. • **DFHCA4962** indicates that an attempt to install the MQMONITOR resource has failed because an MQMONITOR resource with the same name is already installed and is in use. • **DFHCA4963** indicates that an attempt to install the MQMONITOR resource has failed because no MQCONN is installed in the CICS system. • **DFHCA4964** indicates an attempt to install an obsolete group as part of a list. • **DFHCA4965** indicates that an attempt to install the MQMONITOR resource has failed because a value for MONUSERID has not been specified. • **DFHCA4966** indicates that an attempt to install the MQMONITOR resource has failed because the current user is not a surrogate of MONUSERID. • **DFHCA4967** indicates that obsolete group CEE group has been installed and CICS will terminate. • **DFHEX0400** indicates that a PUT container request from an EXCI job has been rejected because total storage allocated for the channel will exceed 5% of the **MEMLIMIT** value for the EXCI job.		

Table 8. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
• **DFHMP2014** indicates an attempt to install a policy scope in a stand-alone bundle that duplicates an existing policy scope for the same operation. • **DFHMP2015** indicates that an attempt to install a policy scope in a stand-alone bundle failed because the referenced policy is undefined. • **DFHMP2016** indicates that an attempt to install a policy scope in a stand-alone bundle failed because the policy name that was specified has an invalid length. • **DFHMP2017** indicates that an attempt to install a policy in a stand-alone bundle failed because it duplicates an existing policy with region scope. • **DFHMP2020** and **DFHMP2021** indicate that an attempt to create a system policy in the BUNDLE resource failed as a result of an invalid predicate. • **DFHMP2022** indicates that an attempt to create a system policy in the BUNDLE resource failed because the policy was not installed into only a stand-alone CICS region or a CICS platform. • **DFHMP2023** indicates that an attempt to restrict the scope of a policy that defines system rules by using a policy scope failed. • **DFHMP3009** indicates a system rule defined in a policy that is installed in a stand-alone region is triggered. • **DFHMP3010** indicates a system rule defined in a policy that is installed on a platform is triggered. • **DFHMP3011** indicates emission of policy events has been suspended because event processing status is STOPPED. • **DFHMP3012** indicates emission of policy events has been resumed after event processing is re-started.		

Table 8. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
• **DFHMQ0370** indicates the maximum number of MQGET calls that an MQMONITOR can issue per second because the region's z/OS WLM health indicator is less than 100. • **DFHMQ0371** indicates that there is no longer a restriction on the number of MQGET calls that MQMONITORs can issue per second. • **DFHMQ0390** indicates that a request to start an MQMONITOR has failed. • **DFHMQ0391** indicates that a request to start the specified MQMONITOR has been processed. • **DFHMQ0392** indicates that a request to stop the specified MQMONITOR has been processed. • **DFHPA1950** indicates an attempt to read a feature toggle file. • **DFHPA1951** indicates that a feature toggle file was not found during CICS system initialization. • **DFHPA1952** indicates that a feature toggle file was found but could not be opened during CICS system initialization. • **DFHPA1953** indicates that a feature toggle file was opened but could not be read during CICS system initialization. • **DFHPA1954** indicates formatting errors in a feature toggle file. • **DFHPA1955** indicates that processing of a feature toggle file failed because of insufficient storage. • **DFHPA1956** indicates that a feature toggle file was not applied during CICS system initialization. • **DFHPA1957** indicates the feature toggles that will be used in a CICS region. • **DFHPA1958** indicates that the feature toggle file does not contain any feature toggles.		

Table 8. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
• **DFHSJ1204** indicates that while installing an application in a Liberty JVM server, CICS found a method annotated with @CICSProgram. A linkable service was registered and this method can now be invoked using **EXEC CICS LINK PROGRAM**(program). • **DFHSJ1205** indicates that while installing an application in a Liberty JVM server, CICS found a method annotated with @CICSProgram. However, it specified the same program name as another linkable service that was previously found. • **DFHSJ1206** indicates an attempt to invoke a method in an user application in a Liberty JVM server failed. The reason code provides further information about why the method could not be invoked. • **DFHSJ1207** indicates an attempt was made to EXEC CICS LINK to a program in a Liberty JVM server. However, no linkable service was defined for this program name. • **DFHSJ1208** indicates that while installing an application in a Liberty JVM server, CICS found an existing PROGRAM definition installed for program. This existing definition was found to be incompatible with the linkable service, either because it isn't defined for Java, for the correct JVMSERVER, or for the correct JVMCLASS. • **DFHTF0200** indicates that the 3270 datastream received from a terminal emulator client attempted to override a protected field. • **DFHWU4033** indicates that multiple OVERRIDEWARNINGCOUNT expressions were found in the URI. • **EYUVC1031I** indicates that you must enter a user name and password. This replaces message EYUVC1003 and partially replaces message EYUVC1002, both issued when the user ID or password were left blank. Message EYUVC1002 is still issued on WUIs where CPSM Simulated Security is switched off. • **EYUVC1030E** indicates that an invalid user name or password was used.		

Table 9. Changes to abend codes in this release

New abend codes	Changed abend codes	Removed abend codes
• **AASA** occurs when CICS detects an unexpected response from a call to the user domain during initialization of a child task. • **ABSX** occurs when CICS detects that a BMS protected field has been updated by the client. • **AEZ2** occurs when the BUSY condition is not handled. • **AMPC** occurs when CICS detects an unexpected error in the deferred rule evaluation task CMPE. • **AMPD** occurs when an attempt is made to attach a CICS deferred rule evaluation task CMPE, but the transaction is not attached internally by CICS. • **AXSB** occurs when CICS detects that a system transaction has been started from a terminal. • **0416** occurs when DFHXCEIP receives an unexpected return code from DFHXCBAM when processing a channels and containers command. • **0417** occurs when a PUT container request from an EXCI job has been rejected because total storage allocated for the channel will exceed 5% of the **MEMLIMIT** value. • **0418** occurs when DFHXCBAM receives a purged response when processing a channels and containers command. • **0419** occurs when DFHXCBAM receives an unexpected response when processing a channels and containers command.		

Changes to compiler support

Table 10. Changes to compiler support in this release

Compiler	This release
Enterprise COBOL for z/OS	Support added for V6.1
Enterprise PL/I for z/OS	Support added for V5.1. V4.2 is withdrawn from service.
z/OS V2.1 XL C/C++	V1.13 is withdrawn from service.

Changes to SIT parameters

Table 11. Changes to system initialization parameters in this release

API	This release
EDSALIM	**CHANGED:** The minimum value is changed to 64 MB.
ICVR	**CHANGED:** The minimum value is changed from 500 to 250. The default value is changed from 5000 to 2000.
MAXOPENTCBS	**CHANGED:** The minimum value is changed from 1 to 32.
MAXSSLTCBS	**CHANGED:** The default value is changed from 8 to 32.
RACFSYNC	**CHANGED:** The RACFDB2SYNC option is removed and its functionality is included when RACFSYNC =YES is specified.
SNPRESET	**NEW:** Allows present userid terminals to have a single ACEE.
TCPIP	**CHANGED:** The default value is changed from NO to YES.
WLMHEALTH	**NEW:** Specifies the parameters to be used by CICS on z/OS WLM Health API calls
XPTKT	**CHANGED:** The default value is changed from NO to YES.

Changes to JVM profiles

Table 12. Changes to JVM profiles in this release

Option	This release
CICS_WLP_MODE	**NEW:** Choose the level of integration between CICS and Liberty.

Changes to control tables

Table 13. Changes to resource definitions in this release

Resource	This release
DFHXCOPT	**CHANGED:** • The default for the **CICSSVC** parameter has changed from 0 to 216. • New parameter **LOCALCCSID**, which specifies the default CCSID for the EXCI job. • The **TRACE** parameter has a new value of 3 to allow for level 3 tracing.

Changes to CICS SPI

Table 14. Changes to the system programming interface commands in this release

Command	This release
CREATE MQMONITOR	**NEW:** To create an MQMONITOR resource in the CICS region
DISCARD MQMONITOR	**NEW:** To remove an installed MQMONITOR resource
EXTRACT STATISTICS	**CHANGED:** New options: ASYNCSERVICE, LASTRESETABS, and MQMONITOR
INQUIRE ASSOCIATION	**CHANGED:** New options for previous transaction data: PTCOUNT, PTSTARTTIME, PTTASKID, PTTRANSID
INQUIRE DSNAME	**CHANGED:** New CVDA value RREPL on the AVAILABILITY option, which indicates that full access to the data set is restricted to replication programs; other programs have only read access

Table 14. Changes to the system programming interface commands in this release (continued)

Command	This release
INQUIRE EPADAPTER	**CHANGED:** New CVDA's: DSIE on DATAFORMAT option and TDQUEUE on ADAPTERTYPE option
INQUIRE MQMONITOR	**NEW:** To inquire on the information about an MQMONITOR resource
INQUIRE PROGRAM	**CHANGED:** • New option REPLICATION, which indicates a replication program with full access to VSAM data sets in RREPL state • New CVDA value DYNAMIC on the CHANGEAGENT and INSTALLAGENT options, which indicates that the program was changed or installed due to an @CICSProgram annotation in a Liberty application
INQUIRE SYSDUMPCODE	**CHANGED:** New options: DSPLIST and JOBLIST
INQUIRE SYSTEM	**CHANGED:** New option REGIONUSERID to return the CICS region user ID
INQUIRE WEBSERVICE	**CHANGED:** Options MAPPINGLEVEL and MINRUNLEVEL now accept the value `4.1`
INQUIRE WLMHEALTH	**NEW:** To retrieve information about the z/OS WLM health indicators set for a CICS address space.
INQUIRE XMLTRANSFORM	**CHANGED:** Options MAPPINGLEVEL and MINRUNLEVEL now accept the value `4.1`.
PERFORM SHUTDOWN	**CHANGED:** New option: RESTART
PERFORM STATISTICS RECORD	**CHANGED:** New options: ASYNCSERVICE and MQMONITOR
SET DISPATCHER	**CHANGED:** RUNAWAY option accepts a new, lower limit of 250
SET DSNAME	**CHANGED:** New CVDA value RREPL on the AVAILABILITY option, to allow only replication programs to have full access to a data set and other programs to have only read access
SET MQMONITOR	**NEW:** To enable or disable an MQMONITOR resource, and to start or stop and set automatic restart of the MQ monitor
SET PROGRAM	**CHANGED:** New option REPLICATION to specify a replication program and allow the program full access to VSAM data sets in RREPL state
SET SYSDUMPCODE	**CHANGED:** New options: DSPLIST and JOBLIST
SET SYSTEM	**CHANGED:** RUNAWAY option accepts a new, lower limit of 250
SET TRANSACTION	**CHANGED:** RUNAWAY option accepts a new, lower limit of 250
SET WLMHEALTH	**NEW:** To change the z/OS WLM health indicator process settings of a CICS address space server.

Changes to CICS-supplied transactions

Table 15. Changes to CICS-supplied transactions in this release

Transaction	This release
CEDG and CEDY	**NEW:** Transactions CEDG and CEDY, read-only forms of CEDF and CEDX, are now available.

Table 15. Changes to CICS-supplied transactions in this release (continued)

Transaction	This release
CEMT - master terminal	**CHANGED:** • Support added for DSIE XML format to INQUIRE EPADAPTER command • New commands: CEMT DISCARD MQMONITOR, CEMT INQUIRE MQMONITOR, CEMT INQUIRE WLMHEALTH, CEMT SET MQMONITOR, CEMT SET WLMHEALTH • CEMT INQUIRE MQINI has been removed and replaced by CEMT INQUIRE MQMONITOR • New options DSPLIST and JOBLIST on CEMT INQUIRE SYDUMPCODE and CEMT SET SYDUMPCODE commands • New option RESTART on the CEMT PERFORM SHUTDOWN command • New option RREPL on the CEMT INQUIRE DSNAME and CEMT SET DSNAME commands • New options ASYNCSERVICE and MQMONITOR on the CEMT PERFORM STATISTICS command • RUNAWAY option on CEMT SET DISPTACHER and CEMT SET SYSTEM accepts a new lower, limit of 250

Changes to CICS monitoring

Table 16. Changes to monitoring data in this release

Data	This release
DFHPROG group	**CHANGED:** The following abend codes are now written to the ABCODEO and ABCODEC monitoring fields: ASPF ASPN ASPO ASPP ASPQ ASPR ASP1 ASP2 ASP3 ASP7 ASP8
DFHCICS group	**NEW:** New fields: MPSRACT, MPSRECT, PTSTART, PTTRANNO, PTTRAN, and PTCOUNT **CHANGED:** OTRANFLG field has new transaction origin type for asynchronous transactions: X'16' ASRUNTRAN
DFHTASK group	**NEW:** New fields: ASTOTCT, ASRUNCT, ASFTCHCT, ASFREECT, ASFTCHWT, ASRNATWT, and LPARNAME **CHANGED:** TRANFLAG field has new transaction origin type for asynchronous transactions: X'16' Asynchronous services domain (AS)-run transaction
Transaction resource class data	**NEW:** New header fields: MNR_PTD_ATTACH_TIME, MNR_PTD_TRANNUM, MNR_PTD_TRANID, and MNR_PTD_COUNT

Table 16. Changes to monitoring data in this release (continued)

Data	This release
Identity class data	**NEW:** New header fields: MNI_PTD_ATTACH_TIME, MNI_PTD_TRANNUM, MNI_PTD_TRANID, and MNI_PTD_COUNT

Changes to statistics

Table 17. Changes to statistics in this release

Statistics	This release
Asynchronous services statistics	**NEW**: Statistics are provided for asynchronous services.
TCP/IP global statistics	**CHANGED**: New fields added: Current® number of non-persistent inbound sockets (SOG_CURR_NPERS_INB_SOCKETS) Peak number of non-persistent inbound sockets (SOG_PEAK_NPERS_INB_SOCKETS) Peak number of persistent inbound sockets (SOG_PEAK_PERS_INB_SOCKETS) Total number of non-persistent inbound sockets created (SOG_NPERS_INB_SOCKETS_CREATED) Peak number of outbound sockets (SOG_PEAK_BOTH_OUTB_SOCKETS) Total number of times outbound sockets reused (SOG_TIMES_OUTB_REUSED) Total number of persistent outbound sockets created (SOG_PERS_OUTBOUND_CREATED)
TCP/IP services statistics	**CHANGED**: New fields added: Current Maximum Backlog (SOR_CURR_MAX_BACKLOG) Total Connections (SOR_TOTAL_CONNS) Requests processed (SOR_REQUESTS) Made non-persistent at MAXPERSIST (SOR_NONP_AT_MAXPERSIST) Disconnected after maximum uses (SOR_DISC_AT_MAX_USES) Made non-persistent at task limit (SOR_NONP_AT_TASK_LIMIT) Disconnected at task limit (SOR_DISC_AT_TASK_LIMIT) Current backlog (SOR_CURR_BACKLOG) Connections dropped (SOR_CONNS_DROPPED) Time connection last dropped (SOR_CONN_LAST_DROPPED)
WebSphere MQ monitor statistics	**NEW**: Statistics are provided for MQMONITOR resources.
z/OS Communications Server: Global statistics	**CHANGED**: New fields added: BMS 3270 Validation (A03BMVL) *Number of* BMS 3270 Validation Failures Abended (A03BMAB) *Number of* BMS 3270 Validation Failures Ignored (A03BMIG) *Number of* BMS 3270 Validation Failures Logged (A03BMLG)

Changes to user-replaceable programs

Table 18. Changes to the user-replaceable programs in this release

Program	This release
DFHBMSX	**NEW**: The DFHBMSX URM is called to enable 3270 data stream validation at CICS initialization. The URM is also called when a 3270 data stream validation error has been detected when issuing BMS RECEIVE MAP commands.

Changes to samples

Table 19. Changes to the samples provided with CICS in this release

Sample	This release
DFH$UMOD	**CHANGED:** CPSM module names updated in the sample.

Changes to CICSPlex SM resource tables

Table 20. Changes to the resource tables provided by CICSPlex SM in this release

Resource table	This release
CICSRGN	**CHANGED**: • new REGIONUSERID attribute • new RESTART parameter for the SHUTDOWN action
DB2CONN	**CHANGED**: New fields added: PPSIGNONS, PTCREATE
DB2ENTRY	**CHANGED**: New fields added: PSIGNONS, TCREATE
DSNAME	**CHANGED**: new value RREPL for AVAILABILITY
EPADAPT	**CHANGED**: new DSIE value for DATAFORMAT
HTASK	**CHANGED**: New fields added: ASTOTCT, ASRUNCT, ASFTCHCT, ASFREECT, ASFTCHWT, ASRNATWT, LPARNAME, MPSRECT, MPSRACT, PTCOUNT, PTTRAN, PTSTART, and PTTRANNO
MQMINGRP	**NEW**: resource table for MQMONITOR resource definitions in a resource group
MQMONDEF	**NEW**: resource table for MQMONITOR resource definitions
MVSWLM	**CHANGED**: New attributes added: MNGWLMAD, MNGWLMHL, MNGWLMHT, MNGWLMIN, and MNGWLMOS
TASK	**CHANGED**: New fields added: ASTOTCT, ASRUNCT, ASFTCHCT, ASFREECT, ASFTCHWT, ASRNATWT, LPARNAME, MPSRECT, and MPSRACT
TCPIPGBL	**CHANGED**: new fields added: CINSCKSNPERS, INSCKSNPERS, OUTSCKSREUSE, OUTSOCKSPERS, PINSCKSNPERS, PINSCKSPERS, and POUTSCKSBOTH
TCPIPS	**CHANGED**: new fields added: CMAXBACKLOG, CONNLASTDROP, CONNSDROPPED, CURRBACKLOG, DISCATTLIM, DISCATUSELIM, NPERSATMAXP, NPERSATTLIM, REQUESTS, and TOTALCONNS
WLMATARG	**CHANGED**: New WLMHLTH attribute
WLMAWAOR	**CHANGED**: New WLMHLTH attribute

Changes to CICSPlex SM system parameters

Table 21. Changes to the system parameters used by CICSPlex SM in this release

System parameter	This release
STALLASYCNT	**NEW:** to enable the tracking and STALL detection of asynchronous tasks.
STALLASYTSK	**NEW:** to enable the tracking and STALL detection of asynchronous tasks.

Change of behavior in reporting the routing load of empty target regions in CICSPlex SM

Before CICS TS 5.4, a target region always has a non-zero routing load value because of the standard CPSM long running tasks. In CICS TS 5.4, these tasks are invisible to routing load queries because they are converted into CICS system tasks. As a result, in a scope containing CICS regions of different releases, more transactions are routed to the apparently less loaded target regions of CICS TS 5.4. Regions of CICS TS 5.4 might appear to handle more dynamic traffic than regions in earlier releases, but the overall workload throughput is not affected.

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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 4 are included in the following sections of the online product documentation:

- Developing applications
- Developing system programs
- RACF security overview
- Developing for external interfaces
- Reference: application developmenth
- 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 4 , 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 4 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
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- IMS Database Control Guide
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- CICSPlex SM Problem Determination Guide

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