CICS Transaction Server for z/OS 5.4

What's New

Note

Before using this information and the product it supports, read the information in "Notices" on page 57.

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.

While IBM values the use of inclusive language, terms that are outside of IBM's direct influence are sometimes required for the sake of maintaining user understanding. As other industry leaders join IBM in embracing the use of inclusive language, IBM will continue to update the documentation to reflect those changes.

You might also like to refer to the CICS Transaction Server for z/OS V5.4 announcement letter (continuous delivery release) and the CICS TS for z/OS V5 Performance Report.

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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For application developers	For system programmers
	Service New system initialization parameter, **KERBEROSUSER**, specifies a user ID to be associated with the Kerberos service principal
	Service VSAM dynamic buffer addition disabled for CICS LSR pools
	Service Management of Db2 threads used by CICS tasks subject to purge or forcepurge requests
	Service Enhanced replication logging for VSAM files
	Service Multiple Liberty JVM servers can run in one region without using JVM server option `WLP_ZOS_PLATFORM`
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	Service Enabling multiple client URIMAPs that point to the same endpoint
	Service Prepare for a future release of CICS TS
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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.

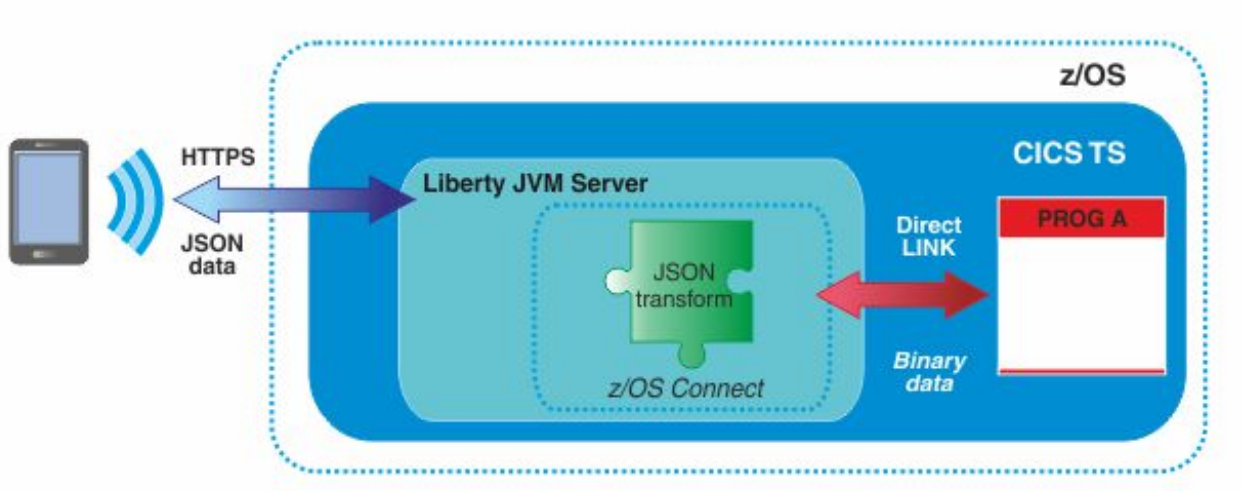
The CICS asynchronous API uses a parent-child model, enabling application developers to use an asynchronous programming model that can improve the responsiveness of applications, especially those applications that make multiple calls to external services, or which spend a lot of time waiting for the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

z/OS Connect

IBM z/OS Connect enables better and more manageable connectivity between mobile systems and back-end z/OS systems and applications. You can now use z/OS Connect in a CICS region. It provides a consistent interface for mobile systems using REST and JSON, shields back-end systems from having to understand those protocols and formats, and shields mobile application developers from having to understand CICS.



Learn more...

Service z/OS Connect Enterprise Edition

CICS TS 5.4 supports z/OS Connect Enterprise Edition, a separately orderable IBM product that builds on the capabilities of z/OS Connect for CICS 1.0. z/OS Connect Enterprise Edition enables API developers to construct JSON APIs from JSON services. The APIs are constructed and packaged with the Eclipse-based API Editor that is provided with z/OS Connect Enterprise Edition, then deployed to the z/OS Connect runtime. The API package includes Swagger 2.0 definitions to make it easier for developers to incorporate the APIs into their applications. Key z/OS Connect capabilities, such as authorization security checking for service invocation, creation of System Management Facility (SMF) records, and logging of RESTful service requests also apply to the APIs.

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 PI63005.

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 5.2 and 5.3 with APAR PI67641.

Learn more ...

Enhancement of sockets domain (SO)

The sockets domain is enhanced to allow 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 constraint on 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 64-bit storage if the HTTP request contains a Content-Length header or is sent as a chunked request. The body is copied into 31-bit storage only when CICS needs to provide a 31-bit version for the server application.

For the WEB SEND (Server) command:

- If the body of the server HTTP request is held in a container before it is sent to the server, CICS keeps the body in, and sends it from, 64-bit storage.
- If the body of the server HTTP request 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, 64-bit storage.

Learn more about WEB RECEIVE (Server)...

Learn more about WEB SEND (Server)...

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 5.1 and 5.2 with APAR PI55133, and on CICS TS 5.3 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 5.3 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 MQ monitor, the user ID under which an MQ monitor task runs, and the user ID to be used by the MQ monitor to start the application tasks if an alternative user ID is not provided by the application. The **AUTOSTART** option automatically starts MQ monitors when the CICS-MQ connection is started. MQ 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 user ID under which the transaction that is monitoring the MQ queue runs (the **MONUSERID**) and the user ID under which the initiated transactions run (for which, the **USERID** is used by default unless it is otherwise provided).

CHANGE OF IMPACT:

With the introduction of the MQMONITOR resource, you must be aware of the following changes to MQ resources:

- The MQINI(DFHMQINI) resource dynamically created by CICS when an MQCONN resource definition with the **INITQNAME** parameter set to the name of an MQ queue is installed has been replaced with a dynamically created MQMONITOR resource DFHQMINI.
- As is mentioned earlier, CICS now differentiates between the user ID under which the transaction monitoring the MQ queue runs and the user ID under which the initiated transactions run. This has implications for any dynamically created resources.

CICS TS V5.3 or earlier	**CICS TS V5.4 or later**
Resource name: MQINI(DFHMQINI)	**Resource name:** MQMONITOR(DFHQMINI)
Transaction: CKTI	**Transaction:** CKTI
Default user ID for CKTI: Either of – CICS region user ID – **PLTPIUSR**	**Default user ID for CKTI:** Either of – **DFLTUSER** – **PLTPIUSR**

CICS TS V5.3 or earlier	CICS TS V5.4 or later
The CKTI transaction runs under the authority of the transaction that initiated the CKTI instance. The CKTI transaction uses the authority of the transaction that initiated the CKTI instance also for starting the transaction associated with the IBM MQ application queue (IBM MQ Process name).	The CKTI transaction runs under the authority of the DFHQMINI **MONUSERID**, which is either the CICS region user ID, or the PLTPI user ID if specified. CKTI uses the DFHQMINI **USERID**, which is set to the CICS default user ID, for starting the required application transaction.

The user ID changes are required to remove a security exposure where potentially unauthorized user IDs could be used.

As you start using CICS TS 5.4 or later, you must review the use of MQCONN. Follow the advice in Review the use of MQCONN.

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 5.1 and 5.2 with APAR PI60388 and APAR PI73184, and on CICS TS 5.3 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 ...

New system initialization parameter XPTKT to control whether CICS performs a RACF check before generating a PassTicket

You can use the **XPTKT** system initialization parameter to instruct CICS to perform a RACF® check before it generates 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 userIDs or groups) to generate PassTickets.

Note that for CICS TS 4.2 through 5.3, the default is NO; for CICS TS 5.4, the default is changed to YES, which means that CICS performs a RACF check by default before generating a PassTicket.

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 3270 Intrusion Detection Service in z/OS Communications Server: SNA Network Implementation Guide 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 CICSPlex SM 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 access control environment element (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 Continuous Availability

To enhance the IBM GDPS® Continuous Availability (GDPS AA) 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 3, 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 values is TCP/IP, but the values are also used by CICS and CICSPlex SM components. When TCP/IP is configured, the health value feeds into the WLM server recommendations to sysplex distributor, affecting when connections are established with a CICS region. In CICS, the health value 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, CICSPlex SM workload management takes into account the health state of target AORs when deciding where to route work.

Service With APAR PI90147, the z/OS WLM health value of a region becomes 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 penalizing 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 deemed as ineligible to receive 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 CICSPlex SM 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.

This capability is also available on CICS TS 5.3, 5.2, and 5.1 with APAR PI76965, and on CICS TS 4.2 with APAR PI76963.

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

This capability is also available on CICS TS 5.1, 5.2, and 5.3 with APAR PI83667, and is further enhanced in CICS TS 5.4 by APAR PI92806, which adds support for the following new system rules:

Bundle available status
Use this rule to monitor and react to the change in available status of bundles that declare application entry points.

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

Bundle enable status
Use this rule to monitor and react to the change in enable status of bundles.

IPIC connection status
Use this rule to monitor and react to the change in status of IPIC connections.

MRO connection status
Use this rule to monitor and react to the change in status of MRO connections.

Program enable status
Use this rule to monitor and react to the change in enable status of CICS programs.

Learn more ...

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

Available with APAR PI88500. 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.

Learn more...

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

Ability to specify Transaction ID and User ID conditions for policy task rules

Available with APAR PH26145. When defining a policy task rule, you can now limit this rule to be triggered when status changes are made in relation to a specific transaction or a range of transactions, in relation to a specific user ID or a range of user IDs, or in relation to a combination of both, by setting **Transaction ID** and **User ID** filters in the Condition section in the Rules tab of the Policy definition editor.

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 CICSPlex SM 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 CICSPlex SM 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 5.3 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 5.1, 5.2, and 5.3 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.

z/OS PT is also available for use with CICS TS 5.1, 5.2, and 5.3.

Learn more ...

Changes to documentation

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

- CICS online documentation and IBM Documentation Offline are now automatically translated in various languages other than English: Brazilian Portuguese, French, German, Italian, Japanese, Korean, Simplified Chinese, and Spanish. PDF documentation is not currently translated.
- 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 ...

Service Secure CICS Explorer sign-in with Multi-Factor Authentication

Available with APAR PI87691. CICS TS now supports CICS Explorer sign-in with Multi-Factor Authentication for enhanced CICS Explorer sign-on security.

To implement this security capability in your CICS environment, you must configure the WUI region to use the CMCI JVM server. The CMCI JVM server runs in the WUI region and handles CMCI requests.

Learn more...

Service 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.

Learn more...

Service Support for mapping level 4.2 in the CICS assistants

Available with APAR PI86039. Mapping level 4.2 is added to the web services assistants, XML assistants, and JSON assistants. This mapping level is primarily for use with DFHJS2LS. It 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**.

Learn more...

Service Support for mapping level 4.3 in the CICS assistants

Available with APAR PI88519. Mapping level 4.3 is added to the web services assistants, XML assistants, and JSON assistants. This mapping level implements support for multidimensional arrays in JSON.

Learn more ...

Service VSAM dynamic buffer addition disabled for CICS LSR pools

Available with APAR PI92486. 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.

Service Enhanced support for IBM SDK, Java Technology Edition Version 8

Available with APAR PI87181, CICS is changed to report the full heap and garbage collection statistics for IBM SDK, Java Technology Edition Version 8 Service Refresh 5 and above. CICS has also been changed to disable the new heap structure by specifying `-XX:+HeapManagementMXBeanCompatibility`. You can override this setting by using `-XX:-HeapManagementMXBeanCompatibility` in the JVM profile.

APAR PI87695 is required by the Liberty JVM server to support IBM SDK, Java Technology Edition Version 8.

Learn more...

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

Available with APAR PI98569. 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 will continue even if the cancel thread request is unsuccessful.

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

Learn more...

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Service Enhanced replication logging for VSAM files

Available with APAR PI97207. 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.

Learn more...

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

Available with APAR PI98174. 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.

Learn more...

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Service Enhancement to JTA support of Db2 Type 2 Connectivity

Available with APAR PH07233, Db2 JDBC type 2 connectivity is supported for batch persistence.

Back to top

Service 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 ...

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Service 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 ...

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Service 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 ...

Service 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 ...

Service 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

Service SNI now supported in CICS TS communications with an HTTP server over TLS connections

Available with APAR PH20063. CICS TS now supports the use of the Server Name Indication (SNI) extension as defined in Internet Engineering Task Force RFC 6066. With this enhancement, CICS TS, when acting as an HTTP client, can use a TLS connection to a virtual host where the server supports multiple virtual hosts using a single IP address.

No configuration change is required in CICS TS. CICS TS supports SNI if it is supported by the HTTP server.

Service CICS capability of exploiting IBM z/OS Workload Interaction Correlator

Available with APAR PH16392.

IBM z/OS Workload Interaction Correlator (Correlator) is a priced feature that provides infrastructure for z/OS software to generate synchronized, standardized, concise, content-rich data with common context

for automated analysis by an analytics engine such as the IBM z/OS Workload Interaction Navigator. You can use Correlator to generate standardized SMF records for CICS, making it easier to identify and correlate workload across your mainframe environment.

CICS uses the WIC IFAWIC service to register CICS regions for collecting data about transaction activities, and provides a WIC exit routine that SMF calls for WIC processing. The WIC exit routine aggregates and summarizes transaction activities from all registered CICS regions and records exceptional CICS regions into SMF type 98 subtype 1024 records.

Available with APAR PH30291, CICS-supplied Assembler copybook DFHWICCD is updated to enable IBM z/OS Workload Interaction Navigator with PTF UJ04388 to analyze multiple SMF files collected from multiple systems respectively and display the correlated anomalies across multiple systems for a single interval in one screen.

Hardware and system requirements: IBM z/OS Workload Interaction Correlator requires IBM z14 or z15 hardware and is provided in PTFs for APAR OA57165 for z/OS in V2R3 and V2R4.

Learn more ...

Service Support for Spring Boot applications packaged as WAR files

The CICS Liberty JVM server supports Spring Boot applications using the Spring application programming model. Spring was originally designed to simplify Java Enterprise Edition (EE), using plain old Java objects (POJOs) and dependency injection. It has since grown to extend and encompass many aspects of Java EE development.

Spring Boot builds on Spring by adding components to avoid complex configuration, reduce development time, and offer a simpler startup experience. Spring Boot applications can run on CICS without modification. It also is possible to configure Spring Boot applications for integration with CICS transactions and security, and to call the CICS API using JCICS when built as a web application archive (WAR). A Spring Boot application can be deployed and managed using CICS bundles in the same way as can other CICS Liberty applications.

The LINK capability is available in CICS TS V5.5 for Spring Boot applications packaged as WAR or JAR files. It is not available in CICS TS v5.4 or v5.3

Learn more ...

CICS-MQ trigger monitor and CICS-MQ bridge improvements

The CICS-MQ trigger monitor transaction CKTI now handles abends produced when starting user transactions. If an abend occurs when the CKTI transaction attempts to start the user transaction, rather than terminating, CKTI will now send the trigger message to the dead-letter queue, and trigger monitor processing continues.

Service Additionally with APAR PH22136, both the CICS-MQ trigger monitor transaction CKTI and the CICS-MQ bridge monitor transaction CKBR now handle temporary errors that occur when issuing MQOPEN and MQGET requests. Rather than terminating, CKTI and CKBR will retry every minute for up to an hour. If the error is not resolved after an hour, the monitor transactions will then terminate. This caters for errors caused by the loss of a coupling facility when the monitor transactions are processing shared queues. The IBM MQ queue manager can recover from a coupling facility failure, and when the connection is restored, bridge and trigger monitor processing will resume.

Service Improved usage of BAS data space storage for large CICSplex environments

Available with APAR PH19761. The CICSPlex SM BAS component is now able to use all available BAS data space storage by spreading large resource deployment lists for BAS across multiple data spaces instead of being constrained to a single data space. This feature is controlled by the feature toggle `com.ibm.cics.cpsm.bas.largecicsplex`.

This feature is disabled by default, but you can opt into this feature by setting the feature toggle `com.ibm.cics.cpsm.bas.largecicsplex=true`.

Learn more ...

Service Enhanced adapter tracking for CICS Db2 applications

Available with APAR PH30252. The CICS Db2 attachment facility is enhanced to pass adapter data to Db2. If a CICS task that is accessing Db2 has adapter data in the CICS origin data, the adapter ID is passed as **appl-longname** and the adapter data is passed as an **accounting-string**. Db2 writes the data in its SMF accounting records and the data is also available online through the Db2 special registers CURRENT CLIENT_APPLNAME and CURRENT CLIENT_ACCTNG. This capability also requires Db2 12 with APAR PH31447 or higher.

With APAR PH49408, you can disable the passing of adapter origin data to Db2 by specifying the following feature toggle:

```
com.ibm.cics.db2.origindata=false
```

Learn more ...

Service Changes to CICSPlex SM sysplex optimized workload routing behavior

With APAR PH30768, the default behavior of CICSPlex SM workload management routing algorithms has been updated to increase the likelihood that work is routed to healthy, local target regions. This change applies only to the QUEUE and GOAL algorithms, not to the link neutral variants (LNQUEUE and LNGOAL).

Where a routing region might be subject to surges of extremely high frequency, short duration transactions, workload batching might occur. A new feature toggle, `com.ibm.cics.cpsm.wlm.surgeresist={true|false}`, has been introduced to mitigate these surges by reducing the likelihood that recently selected target regions are reselected. Enabling this feature toggle increases the average routing cost per transaction, but restores the routing behavior of CICSPlex SM before APAR PH30768 is applied.

Learn more ...

Service Messages reporting changes to APPC and IRC log names

Available with APAR PH03691.

DFHRS2112 messages are issued when log name mismatches are detected for connections using the APPC and IRC protocols. The message explanation provides advice about how to resynchronize any outstanding units of work but it can be difficult to work out what caused the mismatch and how to prevent a recurrence. To help you diagnose log name mismatches, the following three new messages that report changes to log names are introduced:

- DFHRM0240 reports the local log name that is set during CICS initialization and sent to a remote system when CICS establishes an APPC or IRC connection.
- DFHRM0241 reports a log name that has been set for an APPC or IRC connection.
- DFHRM0242 reports a log name that has been deleted for an APPC or IRC connection.

Service Enabling multiple client URIMAPs that point to the same endpoint

Available with APAR PH44683, multiple client URIMAPs that point to the same host, port and path can be installed and enabled in a CICS region. This enhancement removes the limitation that only one client URIMAP for an endpoint could be enabled in a CICS region. As best practice, always use a URIMAP by name.

Learn more ...

Service Prepare for a future release of CICS TS

Available with APAR PH54814 (supercedes APAR PH39798).

The DFHCSVC and DFHIRP modules for future CICS TS releases have been shipped as modules DFHNCSVC and DFHNIRP on current releases ahead of the general availability of the newest CICS TS release. If you wish to install the future release modules DFHCSVC and DFHIRP to fit in with your scheduled z/OS IPLs, follow the instruction here.

Minimum key size can be set during TLS handshakes for increased key strength

Service APAR PH50175 required

With the new feature toggle `com.ibm.cics.tls.minimumkeystrength` you can set a minimum key size for ECC, RSA, DSA, and Diffie-Hellman keys during TLS handshakes to increase your key strength.

This feature is also available in CICS TS 5.4 with APAR PH50175.

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 24	“Changes to installing” on page 23
“Changes to resource definitions” on page 26	“Changes to resource definitions” on page 26
“Changes to the CICS utilities” on page 27	“Changes to the CICS utilities” on page 27
“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 support” on page 42
“Changes to documentation” on page 55	“Changes to SIT parameters” on page 43
	“Changes to JVM profiles” on page 43
	“Changes to control tables” on page 44
	“Changes to CICS SPI” on page 44
	“Changes to CICS-supplied transactions” on page 46
	“Changes to CICS monitoring” on page 47
	“Changes to statistics” on page 48
	“Changes to user-replaceable programs” on page 49
	“Changes to global user exits and task-related user exits” on page 50
	“Changes to samples” on page 49
	“Changes to toggle-enabled features” on page 49
	“Changes to security” on page 50
	“Changes to CICS policies” on page 52
	“Changes to CICSPlex SM resource tables” on page 53
	“Changes to CICSPlex SM system parameters” on page 53
	“Changes to CICSPlex SM WUI server initialization parameters” on page 54
	“Changes to CICSPlex SM” on page 54
	“Changes to documentation” on page 55

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.
- In support for the feature toggle capability, the DFHIHFS0 job has been changed to create an empty `featuretoggle.properties` file in the `dfhconfig` directory.
- MEMLIMIT must be set to 10 GB or greater.
- Service **APAR PH39798**: Support for installing maintenance-supplied newest release CICS Type 3 SVC and DFHIRP modules. See Installing newest release CICS Type 3 SVC and DFHIRP modules supplied through maintenance.

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.
REQUEST ENCRYPTPTKT	**CHANGED:** • New INVREQ with RESP2 value 257, which indicates that the associated kerberos token originated from a system that does not support message confidentiality. • New NOTAUTH with RESP2 value 260, which indicates that the external security manager does not authorize a request to generate a PassTicket for this region.
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

*Table 3. Changes to **EXEC CICS** commands in this release (continued)*	
API	**This release**
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.
• CHANGE PASSWORD • CHANGE PHRASE • VERIFY PASSWORD • VERIFY PHRASE	Service **CHANGED with APAR:** • **APAR PH23078:** New NOTAUTH with RESP2 value of 1, indicating one or more required password or password phrase fields are blank. • **APAR PH31270:** New NOTAUTH with RESP2 value of 17, indicating that the USERID is not authorized to use the application.

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.

Table 4. Changes to JCICS API in this release (continued)		
Class	**Method**	**This release**
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**
DB2CONN	Service **CHANGED (APAR PI98569):** 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.
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.
URIMAP	Service **CHANGED (APAR PH44683):** Added support for enabling multiple client URIMAPs that point to the same endpoint (that is, the same host, port and path) in a CICS region.
MQINI(DFHMQINI)	**DEPRECATED:** Replaced with MQMONITOR(DFHQMINI).

Table 6. Changes to CICS resource definition groups in CICS TS 5.4	
Group	**This release**
DFH$EXCI	**CHANGED:** New program DFH$AXNS
DFH$NACT	**CHANGED:** File ACCTNAM now specifies RECORDSIZE(80) and KEYLENGTH(18).
DFHCOMPI	**NEW**
DFHEDF	**CHANGED:** • New TRANCLASS definition DFHEDFTO • New transactions: CEDG and CEDY
DFHEP	**CHANGED:** • New program DFHECEAQ • New transaction CEPR
DFHLE	**NEW**
DFHPGAIP	**CHANGED:** The default program for program autoinstall DFHPGAPG is changed from DATALOCATION(BELOW) to DATALOCATION(ANY).

Table 6. Changes to CICS resource definition groups in CICS TS 5.4 (continued)	
Group	**This release**
DFHWEB	**CHANGED:** • Program removed: DFHWBC00 • Program DFHWBUN now specifies CONCURRENCY(THREADSAFE).
DFHCOMPI	**NEW COMPATIBILITY GROUP**

Changes to the CICS utilities

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

Assistant	This release
DFHJS2LS	**CHANGED:** • New parameter DEFAULT-ARRAY-MAXITEMS • New option, HYPHENS-AS-UNDERSCORES, on MAPPING-OVERRIDES • New option, FULL, on WIDE-COMP3 • Support for mapping level 4.1 Service **CHANGED (APAR PI86039):** Added support for mapping level 4.2. • **MAPPING-LEVEL** and **MINIMUM-RUNTIME-LEVEL** now accept 4.2. • New parameters: **ADDITIONAL-PROPERTIES-DEFAULT**, **ADDITIONAL-PROPERTIES-MAX**, and **ADDITIONAL-PROPERTIES-SIZE**. Service **CHANGED (APAR PI88519):** Added support for mapping level 4.3. **MAPPING-LEVEL** and **MINIMUM-RUNTIME-LEVEL** now accept 4.3. Service **CHANGED (APAR PI91555):** JSON schema to high-level language mapping now supports `oneOf`, `anyOf`, `allOf` and `not` keywords.
DFHLS2JS	**CHANGED:** Support for mapping level 4.1 Service **CHANGED (APAR PI86039): MAPPING-LEVEL** and **MINIMUM-RUNTIME-LEVEL** now accept 4.2. Service **CHANGED (APAR PI88519):** Added support for mapping level 4.3. **MAPPING-LEVEL** and **MINIMUM-RUNTIME-LEVEL** now accept 4.3. Service **CHANGED (APAR PI95139):** 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:** Support for mapping level 4.1 Service **CHANGED (APAR PI86039): MAPPING-LEVEL** and **MINIMUM-RUNTIME-LEVEL** now accept 4.2. Service **CHANGED (APAR PI95139):** 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.

Table 8. Changes to the CICS web services assistants, XML assistants, and JSON assistants in this release (continued)

Assistant	This release
DFHLS2WS	**CHANGED:** • New parameters, PORT-NAME, BINDING-NAME, and SERVICE-NAME • Support for mapping level 4.1 Service **CHANGED (APAR PI86039):** **MAPPING-LEVEL** and **MINIMUM-RUNTIME-LEVEL** now accept 4.2. Service **CHANGED (APAR PI88519):** Added support for mapping level 4.3. **MAPPING-LEVEL** and **MINIMUM-RUNTIME-LEVEL** now accept 4.3. Service **CHANGED (APAR PI95139):** 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:** • New option, HYPHENS-AS-UNDERSCORES, on MAPPING-OVERRIDES • New option, FULL, on WIDE-COMP3 • Support for mapping level 4.1 Service **CHANGED (APAR PI86039):** Added support for mapping level 4.2. • **MAPPING-LEVEL** and **MINIMUM-RUNTIME-LEVEL** now accept 4.2. • New parameters: **ADDITIONAL-PROPERTIES-DEFAULT**, **ADDITIONAL-PROPERTIES-MAX**, and **ADDITIONAL-PROPERTIES-SIZE**. Service **CHANGED (APAR PI88519):** Added support for mapping level 4.3. **MAPPING-LEVEL** and **MINIMUM-RUNTIME-LEVEL** now accept 4.3.

Table 8. Changes to the CICS web services assistants, XML assistants, and JSON assistants in this release (continued)	
Assistant	**This release**
DFHWS2LS	**CHANGED:** • New parameters, PORT-NAME, BINDING-NAME, and SERVICE-NAME • New option, FULL, on WIDE-COMP3 • Support for mapping level 4.1 Service **CHANGED (APAR PI86039):** Added support for mapping level 4.2. • **MAPPING-LEVEL** and **MINIMUM-RUNTIME-LEVEL** now accept 4.2. • New parameters: **ADDITIONAL-PROPERTIES-DEFAULT**, **ADDITIONAL-PROPERTIES-MAX**, and **ADDITIONAL-PROPERTIES-SIZE**. Service **CHANGED (APAR PI88519):** Added support for mapping level 4.3. **MAPPING-LEVEL** and **MINIMUM-RUNTIME-LEVEL** now accept 4.3.

Changes to messages and codes

Table 9. Changes to messages and codes in this release		
New messages	**Changed messages**	**Removed messages**
	• DFH5275 is issued as a warning instead of an error. Its severity indicator is changed from E to W.	

Table 9. Changes to messages and codes in this release (continued)

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 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 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 failed because a value for MONUSERID was not specified. • DFHAM4966 indicates that an attempt to install the MQMONITOR resource failed because the current user is not a surrogate of MONUSERID. • DFHAM4967 indicates that obsolete LE definitions installed from a CEE group were installed and CICS will terminate. • DFHAS0001 indicates that an abend occurred. • DFHAS0002 indicates that a severe error occurred. • DFHAS0004 indicates that a possible loop was detected. • DFHAS0100 indicates that the asynchronous services domain initialization started. • DFHAS0101 indicates that the asynchronous services domain initialization ended.		

Table 9. 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 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 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 failed because a value for MONUSERID was not specified. • DFHCA4966 indicates that an attempt to install the MQMONITOR resource failed because the current user is not a surrogate of MONUSERID. • DFHCA4967 indicates that obsolete LE definitions installed from a CEE group were installed and CICS will terminate. • DFHEX0400 indicates that a PUT container request from an EXCI job was rejected because total storage allocated for the channel will exceed 5% of the **MEMLIMIT** value for the EXCI job. • Service DFHFC6045 (APAR PI97207) indicates that an invalid interval value was specified for transaction CFCT. • Service DFHFC6046 (APAR PI97207) indicates that CICS has detected that a VSAM file that is defined with the LOGREPLICATE attribute was opened.		

Table 9. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
• DFHH0001 indicates that potential security issues were identified in the access to the CEDA transaction. • DFHH0002 indicates that potential security issues were identified in the configuration of the spool. • DFHH0003 indicates that potential security issues were identified in the configuration of TDQs that are defined to the internal reader. • DFHH0200 indicates that CICS health checker rules cannot run because of error. • DFHH0301 indicates that no potential security issues were identified in the configuration of CEDA. • DFHH0302 indicates that no potential security issues were identified in the configuration of the spool. • DFHH0303 indicates that no potential security issues were identified in the configuration of TDQs that are defined to the internal reader.		

Table 9. 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. • Service DFHMP2018 (APAR PI88500) indicates that an invalid name or value was specified for a static data item in a policy rule. • 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 that a system rule defined in a policy that is installed in a single region is triggered. • DFHMP3010 indicates that a system rule defined in a policy that is installed on a platform is triggered.	• Service DFHMP0002 (APAR PI92806) is issued for errors that occurred in DFHMPST. • DFHMP2004 is no longer used to report BASESCOPE errors. • Service DFHMP2006 (APAR PI88500) is issued also if an event name contains invalid characters. • Service DFHMP3009 (APAR PI92806) 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. • Service DFHMP3010 (APAR PI92806) 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 9. Changes to messages and codes in this release (continued)		
New messages	**Changed messages**	**Removed messages**
• DFHMP3011 indicates that emission of policy events was suspended because event processing status is STOPPED. • DFHMP3012 indicates that emission of policy events was resumed after event processing is restarted.		

Table 9. Changes to messages and codes in this release (continued)		
New messages	**Changed messages**	**Removed messages**
• Service DFHMQ0126 (APAR PH22136) indicates that a temporary error occurred when a CKTI trigger monitor attempted to issue an MQOPEN of an initiation queue. The trigger monitor will retry in one minute. • Service DFHMQ0127 (APAR PH22136) indicates that a temporary error occurred when a CKTI trigger monitor attempted to issue an MQGET from an initiation queue. The trigger monitor will retry in one minute. • Service DFHMQ0128 (APAR PH22136) indicates that following a temporary error, a CKTI trigger monitor has resumed normal processing. • DFHMQ0370 indicates the maximum number of MQGET calls that an MQMONITOR can issue per second because the region's z/OS WLM health value 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 failed. • DFHMQ0391 indicates that a request to start the specified MQMONITOR was processed. • DFHMQ0392 indicates that a request to stop the specified MQMONITOR was processed. • Service DFHMQ0795 (APAR PH15075) indicates that the CICS-MQ bridge has retrieved a message that has been previously marked and the mark browse interval has expired. • Service DFHMQ0796 (APAR PH22136) indicates that following a temporary error, a CKBR bridge monitor has resumed normal processing.		

Table 9. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
• 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.		
• Service DFHRM0240 (APAR PH03691) indicates the local log name that is set during CICS initialization and sent to a remote system when CICS establishes an APPC or IRC connection. • Service DFHRM0241 (APAR PH03691) indicates a log name that has been set for an APPC or IRC connection. • Service DFHRM0242 (APAR PH03691) indicates a log name that has been deleted for an APPC or IRC connection. • Service DFHSI1591 (APAR PI97207) indicates that an attempt to attach transaction CFCT failed and that CICS is terminated with a dump.		

Table 9. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
• Service DFHSJ0007 (APAR PH24443) indicates that an unexpected signal has been received by the JVM server. • Service DFHSJ0008 (APAR PH24443) indicates that the JVM server has unexpectedly terminated and is now in an unusable state. • Service DFHSJ0938 (APAR PH22887) indicates that the JVM server failed to start. • DFHSJ1204 indicates that while installing an application in a Liberty JVM server, CICS did not register a linkable service because the same program name as another linkable service was specified. • DFHSJ1205 indicates that while installing an application in a Liberty JVM server, CICS did not register a linkable service because the same program name as another linkable service was specified. • DFHSJ1206 indicates an attempt to link to an application in a Liberty JVM server failed and provides a reason code. • DFHSJ1207 indicates an attempt to link to a program in a Liberty JVM server failed because no linkable service is defined for this program name. • DFHSJ1208 indicates that while installing an application in a Liberty JVM server, an existing PROGRAM definition is installed for the program that is not suitable for use with a linkable service, and indicates the reason why. • Service DFHSJ1400 (APAR PI92676) indicates that the Liberty JVM server failed to start because no default Liberty angel process is available.	• Service DFHSJ1007 (APAR PH12280) is updated to reflect changed system action when CICS detects that an abend has left a JVM in an inconsistent state. • Service DFHSJ1208 (APAR PI86767) indicates that while installing an application in a Liberty JVM server, an existing PROGRAM definition is installed for the program that is not suitable for use with a linkable service, and indicates the reason why.	

Table 9. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
• Service DFHSJ1401 (APAR PI92676) indicates that the Liberty JVM server failed to start because the named Liberty angel process is unavailable. • Service DFHSJ1402 (APAR PI92676) 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. • Service DFHSJ1403 (APAR PI92676) 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. • Service DFHSJ1404 (APAR PI92676) 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.		
	• DFHSO1001 includes new error codes to identify NMI errors when CICS attempts to obtain TCPIPSERVICE resource statistics.	
• DFHTF0200 indicates that the 3270 datastream received from a terminal emulator client attempted to override a protected field.	• Service DFHTF0200 (APAR PH25397) has been updated to explain how to correctly process the decimal field position that is returned with the message.	
• DFHWU4033 indicates that multiple OVERRIDEWARNINGCOUNT expressions were found in the URI.	• DFHWU4302 includes new information about using the OVERRIDEWARNINGCOUNT URI parameter to bypass the warning count limit.	

Table 9. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
• Service EYUBM0349W (APAR PH00907) indicates that the specified resource definition for the named CICSplex cannot be found in the data repository. • Service EYUCP0208E (APAR PH17586) indicates that the delete and re-add of a CMAS failed. • Service EYUCS0109I (APAR PH00375) indicates that the connection to the specified CMAS could not be completed. • EYUVC1030E indicates that an invalid user name or password was used. • 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 CICSPlex SM Simulated Security is switched off.	• 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 9. Changes to messages and codes in this release (continued)

New messages	Changed messages	Removed messages
• Service EYUVS0215E (APAR PI87691) indicates that an attempt to create the named JVM server failed. • Service EYUVS0216I (APAR PI87691) indicates that the CMCI JVM server has been successfully installed. • Service EYUVS0218E (APAR PI87691) indicates that the named CMCI JVM server has been installed but could not be enabled. • Service EYUVS0219I (APAR PI87691) indicates that the named CMCI JVM server has been installed and enabled successfully for CMCI. • Service EYUVS0220E (APAR PI87691) indicates that an attempt to disable and discard an existing CMCI JVM server failed. • Service EYUVS0223I (APAR PH01554) indicates that the CICSPlex SM WUI region is waiting for an installed CMCI JVM server to become enabled.		

Table 10. 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 11. 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.

Table 11. Changes to compiler support in this release (continued)	
Compiler	**This release**
z/OS V2.1 XL C/C++	V1.13 is withdrawn from service.

Changes to SIT parameters

Table 12. 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.
KERBEROSUSER	Service **NEW (APAR PI85443):** Specifies the user ID associated with the Kerberos service principal for the CICS region.
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.
SECVFYFREQ	**REMOVED:** CICS updates the last used time once a day for each user ID that is used on a CICS region.
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	**NEW:** Instructs CICS to perform a RACF check before it generates a PassTicket. The default value is changed from NO to YES.

Changes to JVM profiles

Table 13. Changes to JVM profiles in this release	
Option	**This release**
_DFH_UMASK	**CHANGED:** Applies for the lifetime of the JVM server, not only during startup.
CICS_WLP_MODE	**NEW:** Choose the level of integration between CICS and Liberty.
com.ibm.cics.jvmserver.cmci.user.agent.allow.list	Service **NEW with APAR, compatible with:** Liberty JVM server
com.ibm.cics.jvmserver.cmci.user.agent.allow.list.monitor.interval	Service **NEW with APAR, compatible with:** Liberty JVM server
com.ibm.cics.jvmserver.trace.specification	Service **NEW with APAR, compatible with:** All JVM Environments
com.ibm.ws.zos.core.angelName	Service **CHANGED (APAR PI92676):** Specify a named angel process for the Liberty JVM server to connect to upon startup.

Table 13. Changes to JVM profiles in this release (continued)	
Option	**This release**
com.ibm.ws.zos.core.angelRequired	Service **NEW (APAR PI92676):** Enforce the requirement to connect to the Liberty angel process when the Liberty JVM server is being enabled.
PURGE_ESCALATION_TIMEOUT	Service **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 14. 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. Service **CHANGED with APAR:** The EXCI SURROGCHK parameter has been removed. Surrogate checking is always done. Specifying SURROGCHK=YES in the EXCI options table, DFHXCOPT, is accepted for compatibility.

Changes to CICS SPI

Table 15. 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 Service **CHANGED (APAR PH42306):** Enhanced support for Liberty. The association data user ID value now reflects the final user ID value used in secure Liberty transactions, instead of the initial user ID.
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
INQUIRE EPADAPTER	**CHANGED:** New CVDA's: DSIE on DATAFORMAT option and TDQUEUE on ADAPTERTYPE option

Table 15. Changes to the system programming interface commands in this release (continued)	
Command	**This release**
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:** MAPPINGLEVEL and MINRUNLEVEL now accept the value 4.1. Service **CHANGED (APAR PI86039):** MAPPINGLEVEL and MINRUNLEVEL now accept the value 4.2. Service **CHANGED (APAR PI88519):** MAPPINGLEVEL and MINRUNLEVEL now accept the value 4.3.
INQUIRE WLMHEALTH	**NEW:** To retrieve information about the z/OS WLM health indicators set for a CICS address space.
INQUIRE XMLTRANSFORM	**CHANGED:** MAPPINGLEVEL and MINRUNLEVEL now accept the value 4.1. Service **CHANGED (APAR PI86039):** MAPPINGLEVEL and MINRUNLEVEL now accept the value 4.2. Service **CHANGED (APAR PI88519):** MAPPINGLEVEL and MINRUNLEVEL now accept the value 4.3.
PERFORM SHUTDOWN	**CHANGED:** New option RESTART, to enable the MVS Automatic Restart Manager (ARM) to restart a CICS region if the region shuts down normally.
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

Table 15. Changes to the system programming interface commands in this release (continued)	
Command	**This release**
SET TASK	Service **CHANGED (APAR PI98569):** 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.
SET TRANSACTION	**CHANGED:** RUNAWAY option accepts a new, lower limit of 250
SET WLMHEALTH	**NEW:** To change the z/OS WLM health value process settings of a CICS address space server.

Changes to CICS-supplied transactions

Table 16. 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.
CEMT - main 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 Service **CHANGED (APAR PI98569):** CEMT SET TASK: 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.
CFCT	Service **NEW (APAR PI97207):** Provides tie-up records for VSAM files to a replication log at specified intervals.
CHCK	**NEW:** Health Checker long running system task
CKBR	Service **CHANGED (APAR PH22136):** CKBR now handles temporary errors that occur when issuing MQOPEN and MQGET requests. Rather than terminating, CKBR will retry every minute for up to an hour. If the error is not resolved after an hour, the monitor transaction will then terminate.

Table 16. Changes to CICS-supplied transactions in this release (continued)	
Transaction	**This release**
CKTI	**CHANGED:** CKTI now handles abends produced when starting user transactions. If an abend occurs when the CKTI transaction attempts to start the user transaction, rather than terminating, CKTI will now send the trigger message to the dead-letter queue, and trigger monitor processing continues. Service **CHANGED (APAR PH22136):**CKTI now handles temporary errors that occur when issuing MQOPEN and MQGET requests. Rather than terminating, CKTI will retry every minute for up to an hour. If the error is not resolved after an hour, the monitor transaction will then terminate.
CMPE	**NEW:** Policy deferred rule evaluation task
COHT, COIE, COIR, COI0, CONA, COND, CONH, CONL, CONM, COWC	**CHANGED** to Category 1 transactions

Changes to CICS monitoring

Table 17. 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 FIELDS:** MPSRACT, MPSRECT, PTSTART, PTTRANNO, PTTRAN, and PTCOUNT **CHANGED:** OTRANFLG field has new transaction origin type for asynchronous transactions: X'16' ASRUNTRAN Service **CHANGED (APAR PH42306):** Field 089 (USERID) is changed for Liberty such that the user ID value now reflects the final user ID value used in secure Liberty transactions, instead of the initial user ID.
DFHTASK group	**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

Table 17. Changes to monitoring data in this release (continued)	
Data	**This release**
Transaction resource class data	**NEW FIELDS:** MNR_PTD_ATTACH_TIME, MNR_PTD_TRANNUM, MNR_PTD_TRANID, and MNR_PTD_COUNT
Identity class data	**NEW FIELDS:** MNI_PTD_ATTACH_TIME, MNI_PTD_TRANNUM, MNI_PTD_TRANID, and MNI_PTD_COUNT

Changes to statistics

Table 18. 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)
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 19. 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.
DFHWBOPT	Service **NEW (APAR PH16992):** Handler program that can be invoked to process HTTP OPTIONS requests.

Changes to samples

Table 20. Changes to the samples provided with CICS in this release	
Sample	**This release**
DFH$MOLS	**CHANGED:** Specifying a 2 digit year on the DATE control parameter now defines a date in the twenty-first century.
DFH$UMOD	**CHANGED:** CICSPlex SM module names updated in the sample.
DFH0STEP	**CHANGED:** Changed to collect and print new asynchronous services statistics.

Changes to toggle-enabled features

Table 21. Changes to toggle-enabled features in this release	
Feature toggle	**This release**
`com.ibm.cics.bms.ids={true|false}`	**NEW:** Allows CICS to detect if a 3270 emulator has invalidly modified a protected field generated by a BMS map. See BMS 3270 Intrusion Detection Service.
`com.ibm.cics.cmci.jvmserver={true|false}`	Service **NEW (APAR PI87691):** Allows you to set up the CMCI without the CMCI JVM server. See Configuring the CMCI JVM server.
`com.ibm.cics.cpsm.bas.largecicsplex={true|false}`	Service **NEW (APAR PH19761):** Allows you to constrain large resource deployments lists for BAS to a single data space instead of spreading across multiple data spaces.
`com.ibm.cics.cpsm.wlm.botrsupd.enabled={true|false}`	Service **NEW (APAR PH14812):** Allows you to disable updates to the Coupling Facility when the task load falls below the lower tier threshold of the CICSPlex SM tuning parameter, **B0TRSUPD**.

Table 21. Changes to toggle-enabled features in this release (continued)	
Feature toggle	**This release**
com.ibm.cics.cpsm.wlm.surgeresist={true|false}	Service **NEW (APAR PH30768):** When applied to CICSPlex SM WLM routing regions, this feature toggle takes effect for the QUEUE and GOAL WLM algorithms when using CICSPlex SM sysplex optimized workload routing. It has no effect when applied to target regions. When the feature toggle is set to true, surges of extremely high frequency, short duration transactions can be mitigated by reducing the likelihood that recently selected target regions are reselected. Enabling this feature toggle increases the average routing cost per transaction, but restores the routing behavior of CICSPlex SM before APAR PH30768 is applied. See Changes to CICSPlex SM sysplex optimized workload routing behavior.
com.ibm.cics.db2.origindata={true|false}	Service **NEW (APAR PH49408):** Gives you the option to disable the passing of adapter origin data to Db2 for adapter tracking.
com.ibm.cics.http.options.handler={program_name}	Service **NEW (APAR PH16992):** Allows you to specify the name of the HTTP Options handler program. See HTTP method reference for CICS web support.
com.ibm.cics.rls.delete.ridfld={true|false}	Service **NEW (APAR PH07596):** Enables surrogate user checking for spool commands.
com.ibm.cics.tls.minimumkeystrength={1024|2048}	Service **NEW (APAR PH50175):** Sets the minimum key size allowed during TLS handshakes.

Changes to global user exits and task-related user exits

Table 22. Changes to global user exits and task-related user exits in CICS TS 5.4

Exit	This release
XDUREQ	**CHANGED:** New parameters UEPDLISI and UEPJLISI
XDUREQC	**CHANGED:** New parameters UEPDLISO and UEPJLISO
XRSINDI	**CHANGED:** New value UEIDMQMN for UEPIDTYP parameter

Changes to security

Table 23. Changes to security in CICS TS 5.4	
Area	**This release**
Identification	• **NEW:** MQMONITOR MONUSERID • **NEW with APAR PI85443:** KERBEROSUSER system initialization parameter

Table 23. Changes to security in CICS TS 5.4 (continued)

Area	This release
Authentication	• **CHANGED:** The default of XPTKT system initialization parameter is changed from NO to YES. • **NEW:** Kerberos mutual authentication • **NEW with APAR PI87691:** CICS Explorer support for MFA • **NEW with APAR PI91554:** Liberty options `oauth-2.0`, JWT and OpenID Connect • **NEW with APAR PI92676:** Wait for angel at JVM server startup • **NEW with APAR PI98174:** Multiple Liberty servers per CICS region using an angel
Integrity	**CHANGED:** Support for IBM z/OS Communications Server IDS
Confidentiality	• **NEW with APAR PH20063:** SNI support in CICS TS communications with an HTTP server over TLS connections • **NEW with APAR PH50175:** Sets the minimum key size allowed during TLS handshakes
Auditing	**NEW:** Support for IBM Health Checker for z/OS
Performance	**NEW:** Preset user ID on a terminal can share ACEE
Deprecated and removed	• **REMOVED:** SECVFYFREQ system initialization parameter • **REMOVED with APAR PH09898:** Surrogate checking is always done. Specifying SURROGCHK=YES in the EXCI options table, DFHXCOPT, is accepted for compatibility.

Table 24. Changes to RACF classes related to command security in CICS TS 5.4. These changes are new resource identifiers for SPI commands. See CICS resources subject to command security checking and Resource and command check cross-reference for a list of all of the SPI commands and the RACF ACCESS required for each one.

Command	This release
CREATE MQMONITOR DISCARD MQMONITOR INQUIRE MONITOR SET MONITOR	**NEW**: resource identifier MQMON
SET PROGRAM	**NEW**: resource identifier REPLICATION. ACCESS(ALTER) is required for REPLICATION option.
INQUIRE SYSDUMPCODE SET SYSDUMPCODE	**NEW**: resource identifier SYSDUMPCODE. ACCESS(CONTROL) is required for SET with JOBLIST option.
INQUIRE WLMHEALTH SET WLMHEALTH	**NEW**: resource identifier WLMHEALTH. Requires APAR PI84397.

Table 25. Changes to RACF classes related to CICS user IDs in CICS TS 5.4

User ID	This release
Region user ID	**CHANGED:** Security for submitting a JCL job to the internal reader.
KERBEROSUSER	**NEW with APAR PI85443**

Table 26. Changes to other RACF classes in CICS TS 5.4

Class	Profile	This release
PTKTDATA	IRRPTAUTH.*applid.userid*	**NEW** XPTKT system initialization parameter
SURROGAT	*userid*.DFHEXCI	**NEW with APAR PH09898**

Changes to CICS policies

Table 27. Changes to CICS policies in CICS TS 5.4

Change	This release
All system rules Support for static data capture items and event names for policy events	**NEW with APAR PI88500**
Bundle available status system rule	**NEW with APAR PI92806**
Bundle enable status system rule	**NEW with APAR PI92806**
Db2 connection status system rule	**NEW**
File open status system rule	**NEW**
File enable status system rule	**NEW**
IPIC connection status system rule	**NEW with APAR PI92806**
Message system rule	**NEW**
MRO connection status system rule	**NEW with APAR PI92806**
Program enable status system rule	**NEW with APAR PI92806**
Transaction abend system rule	**NEW**
Transaction class tasks system rule	**NEW**
User tasks system rule	**NEW**
All task rules	**RENAMED:** CICS policy task threshold rules are renamed to policy task rules.
All task rules Support for setting Transaction ID and User ID conditions for task rules	**NEW with APAR PH26145**
All task rules Support for static data capture items and event names for policy events	**NEW with APAR PI88500**

Changes to CICSPlex SM resource tables

Table 28. 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
CRESMQMN	**NEW:** A CICSPlex SM Topology Manager object that describes an instance of a MQMONITOR definition in a CICS system.
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
MQMON	**NEW:** A CICS resource that describes an IBM MQ monitor in an active CICS system being managed by CICSPlex SM.
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 29. Changes to the system parameters used by CICSPlex SM in this release

System parameter	This release
CACHEDSNUM	**NEW with APAR PH00673:** For use under the direction of IBM Support.
RESTART	**NEW**
STALLASYCNT	**NEW:** to enable the tracking and STALL detection of asynchronous tasks.

Table 29. Changes to the system parameters used by CICSPlex SM in this release (continued)	
System parameter	**This release**
STALLASYTSK	**NEW:** to enable the tracking and STALL detection of asynchronous tasks.

Changes to CICSPlex SM WUI server initialization parameters

Table 30. Changes to the WUI server initialization parameters used by CICSPlex SM in this release	
WUIPARM parameter	**This release**
TCPIPHOSTNAME	Service **DEPRECATED (APAR PH47103):** The hostname of the WUI server is the name of the host where the WUI is executing. It is no longer set by the **TCPIPHOSTNAME** WUI initialization parameter. The WUI uses relative URLs, and not embedded host names. **TCPIPHOSTNAME** is still required, but the value is ignored. This parameter is retrained for compatibility and will be removed in a later release.
TCPIPHTTPHOST	Service **DEPRECATED (APAR PH47103):** The hostname of the WUI server is the name of the host where the WUI is executing. The WUI uses relative URLs, and not embedded host names. If a value is specified on **TCPIPHTTPHOST**, it is ignored. This parameter is retrained for compatibility and will be removed in a later release.
TCPIPSSL	Service **CHANGED (APAR PI94706):** New value ATTLSBASIC, to support Application Transparent Transport Layer Security (AT-TLS).

Changes to CICSPlex SM

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 CICSPlex SM 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.

Service Changes to CICSPlex SM sysplex optimized workload routing behavior
(APAR PH30768) The default behavior of CICSPlex SM workload management routing algorithms has been updated to increase the likelihood that work is routed to healthy, local target regions. This change applies only to the QUEUE and GOAL algorithms, not to the link neutral variants (LNQUEUE and LNGOAL).

Change in how the MAS agent user ID is determined
Beginning with CICS TS V5.4, the MAS agent user ID is always the CICS region user ID. PLTPIUSR no longer matters in determining the MAS agent user ID.

Service Changes to CICSPlex SM sysplex optimized workload routing behavior
(APAR PH30768) The default behavior of CICSPlex SM workload management routing algorithms has been updated to increase the likelihood that work is routed to healthy, local target regions. This change applies only to the QUEUE and GOAL algorithms, not to the link neutral variants (LNQUEUE and LNGOAL). See Changes to CICSPlex SM sysplex optimized workload routing behavior for details.

Record size increase of EYUHIST* data sets

The record size of EYUHIST* data sets is increased from RECORDSIZE(3460 3464) to RECORDSIZE(3536 3540). The EYUJHIST sample is updated to reflect this change.

COxx 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 execute as CICS system tasks.

Service CICSPlex SM BAS

NEW (APAR PH19761): It is disabled by default.

The CICSPlex SM BAS component is now able to use all available BAS data space storage by spreading large resource deployment lists for BAS across multiple data spaces instead of being constrained to a single data space. This feature is controlled by the feature toggle `com.ibm.cics.cpsm.bas.largecicsplex`.

Changes to documentation

Changes to PDF

CICS TS 5.4 made extensive changes to the organization of documentation in PDF and those changes are explained here. Some PDF manuals were renamed to reflect the terminology used in IBM Documentation. Some PDF manuals were reorganized to make them shorter and more modular, or to merge multiple volumes into one single volume. Table 31 on page 55 shows the changes.

Table 31. Changes to name or organization of the PDF manuals at CICS TS 5.4

PDF	Change for CICS TS 5.4
Application Programming Guide	Renamed to *Developing CICS Applications*.
Application Programming Reference	Renamed to *API (EXEC CICS) Reference*.
CICSPlex SM Resource Tables Reference	Combined into a single volume.
Customization Guide	• Renamed to *Developing CICS System Programs*. • XPI reference section split into a separate PDF called *XPI Function Reference*. • User exit reference section split into a separate PDF called *Global User Exit Reference*.
External Interfaces Guide	Information about EXCI split into a separate PDF called *Using EXCI with CICS*.
Installation Guide	Renamed to *Installing CICS TS for z/OS*.
Operations and Utilities Guide	• Renamed to *Administering CICS*. • Utilities reference section split into a separate PDF called *Utilities Reference*.
Messages and Codes	• Codes split into a separate PDF called *CICS Codes*. • Messages combined into a single volume.
Performance Guide	• Monitoring data reference section split into a separate PDF called *Monitoring Data Reference*. • Statistics reference section split into a separate PDF called *Statistics Reference*.

Table 31. Changes to name or organization of the PDF manuals at CICS TS 5.4 (continued)	
PDF	**Change for CICS TS 5.4**
Problem Determination Guide	Renamed to *Troubleshooting CICS*.
Recovery and Restart Guide	Included in *Administering CICS*.
Resource Definition Guide	• Guidance information is included in *Configuring CICS TS for z/OS*. • Resource reference section split into a separate PDF called *Resource Reference*.
Supplied Transactions	• Guidance information is included in *Administering CICS*. • Renamed to *Supplied Transactions Reference*.
System Definition Guide	• Renamed to *Configuring CICS TS for z/OS*. • Parameter reference section split into a separate PDF called *System Initialization Parameter Reference*.

PDFs are delivered in IBM Documentation, not in IBM Publications Center.

PDFs no longer have manual numbers.

PDFs have descriptive filenames instead of codes.

The following PDFs are stabilized and no longer produced:

- *Business Transaction Services*
- *CICSPlex SM Managing Resource Use*
- *CICSPlex SM Web User Interface Guide*
- *Debugging Tools Interfaces Reference*
- *Diagnosis Reference*
- *Distributed Transaction Programming Guide*
- *External Interfaces Guide*
- *Front End Programming Interface User's Guide*
- *Internet Guide*
- *Trace Entries*

Online and offline documentation

- **NEW:** IBM Documentation Offline is now automatically translated.
- **CHANGED:** Upgrading information is provided in full in the latest CICS TS product documentation.

CICS Explorer

CHANGED: CICS Explorer documentation is published independently from the CICS TS documentation.

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Programming interface information

IBM 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 (CICS TS 5.4) are included in the following sections of the online product documentation:

- Developing applications
- Developing system programs
- Securing overview
- Developing for external interfaces
- Application development reference
- Reference: system programming
- Reference: connectivity

Information that is NOT intended to be used as a Programming Interface of CICS TS 5.4, 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 TS 5.4 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
- Front End Programming Interface Guide
- IMS Database Control Guide
- Installation Guide
- Security Guide
- CICS Transactions
- CICSPlex System Manager (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 TS 5.4, 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

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