CICS Transaction Server for z/OS



Upgrading CICS TS for z/OS

Version 5 Release 4

CICS Transaction Server for z/OS



Upgrading CICS TS for z/OS

Version 5 Release 4

Note
Before using this information and the product it supports, read the information in "Notices" on page 197.

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

This PDF describes what's involved in upgrading your current environment to the new version of CICS® Transaction Server for z/OS®. It covers the upgrade from any supported version of CICS TS to the new version. This PDF is primarily aimed at application programmers and system programmers who need to understand the changes that are introduced between releases and plan the transition to a new release of CICS Transaction Server for z/OS.

This PDF:

- Introduces the considerations as you plan to upgrade
- Summarizes the changes that are introduced between releases of CICS Transaction Server for z/OS
- Lists the tasks that you must complete to upgrade your current environment to the new release of CICS Transaction Server for z/OS.

It focuses on the transition of what you have today in your CICS environment into the new release. After the upgrade, you probably want to exploit new features and capabilities that are provided in this release of CICS Transaction Server for z/OS. Information about these new features, and how to use them, is provided in the rest of the product documentation.

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. Upgrading

This section explains the impact of a new release of CICS Transaction Server for z/OS, and the actions that you need to take to migrate from your current release to the new release. This section is about moving what you have today to the new release. For information about extending what you have by exploiting new capabilities, see the other sections of the CICS documentation.

Approaching an upgrade

When you upgrade, you go through the following stages:

1. Assess the new release. Find information about the features of this release in What's New in the IBM Knowledge Center and the Announcement letter for the latest release of CICS TS for z/OS. This section assumes that you made this assessment and decided to upgrade from your current release.
2. Set up the upgrade project. This involves bringing together the team of stakeholders, understanding the drivers and constraints for your situation, and starting to build a plan of activities. Your project plan is iterative as you work through the detail of the upgrade. Find information about this stage in Chapter 2, “Planning to upgrade,” on page 3.
3. Check the prerequisites of the new release and compatibility with other products that you use. Find information about this stage in Chapter 2, “Planning to upgrade,” on page 3.
4. Review your regions, applications, vendor products, and service levels. You need up-to-date information about your whole configuration. This information helps you to identify the areas that are affected by the upgrade, and to confirm that your plan has full coverage. Find information about this stage in Chapter 2, “Planning to upgrade,” on page 3.
5. Assess the impact of changes to CICS. You need to find out what changed, so that you can map those changes to your configuration. Find information about the changes in Chapter 3, “Changes between releases,” on page 9.
6. Install the new version of CICS TS. Find information in Installing in the IBM Knowledge Center.
7. Upgrade your configuration. Find information in Chapter 4, “Upgrading to the new release,” on page 115.
8. Extend your environment by using new capabilities. After you stabilize your current configuration on the new release, you can start to take advantage of the new capabilities. Find out how in the CICS documentation; What's New in the IBM Knowledge Center provides links to further documentation for each of the new features.

More resources

Other resources that you might find useful, in addition to the product documentation in IBM Knowledge Center, include:

- CICS Support Portal
- Detailed system requirements for CICS Transaction Server for z/OS
- Business partner products and Vendor support for z/OS

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Chapter 2. Planning to upgrade

A significant part of the overall process of upgrading is planning. This section summarizes the preparation that helps you to upgrade CICS Transaction Server for z/OS.

You need to:

- Make sure that all the right people are involved in the plan
- Understand the drivers to upgrade, and the constraints on change, for your environment, and building this understanding into an upgrade strategy
- Check prerequisites of the new release and its compatibility with other products that you use
- Review your environment so that you can assess the impact of the new release and ensure that the plan for upgrade is complete
- Understand what changed between releases of CICS.

Your plan is iterative. The project team refines a plan of action and builds a critical path of activities as it finds out more about the tasks that are involved and the impact of changing the release of CICS.

Actions

Your current version	Action	Mandatory or optional?
ALL VERSIONS	Clarify the drivers for upgrade	Optional, but recommended
ALL VERSIONS	Consider the timing	Optional, but recommended
ALL VERSIONS	Build your upgrade project team	Optional, but recommended
ALL VERSIONS	Choose your edition of CICS TS for z/OS	Optional, but recommended
ALL VERSIONS	Check hardware and software prerequisites	Optional, but recommended
ALL VERSIONS	Check compatibility with other IBM products	Optional, but recommended
ALL VERSIONS	Check compatibility with vendor products	Optional, but recommended
ALL VERSIONS	Review your applications	Optional, but recommended
ALL VERSIONS	Review your CICS regions	Optional, but recommended
ALL VERSIONS	Review your vendor products	Optional, but recommended
ALL VERSIONS	Review the service level of CICS TS for z/OS	Optional, but recommended
ALL VERSIONS	Review the changes in CICS TS for z/OS	Optional, but recommended

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Your current version	Action	Mandatory or optional?
ALL VERSIONS	Develop your upgrade strategy	Optional. but recommended

ALL VERSIONS

Clarify the drivers for upgrade

Clarify what is driving the upgrade of CICS. Is it to keep current? Is it a desire to use a new capability? Is it an opportunity to upgrade only some of your regions, and use different releases for different business needs? Is it a requirement so that you can meet regulatory constraints? Is it part of a bigger upgrade strategy? Your reason affects both your choice of CICS release, and when and how you upgrade.

You can choose to run some of your regions at a newer level and leave some of them at your current level. This gives you flexibility to provide access to the latest features for some parts of your business, without having to plan an upgrade of the entire environment. See "Upgrading CICS to use multiple releases concurrently" on page 181 for an example.

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ALL VERSIONS

Consider the timing

When you think about the schedule for upgrade, factor in your deadlines and key business dates, and any windows of change for the business infrastructure.

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Build your upgrade project team

Upgrading is a collective effort. You need to make sure that the key stakeholders are ready to support the project. Gather a team that includes:

- Your technical representatives from roles such as system programming, application programming, security, and operations
- Business representatives for the lines of business that are affected by the upgrade
- Input from vendors or Business Partners whose products work with CICS.

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Choose your edition of CICS TS for z/OS

Version 5 of CICS Transaction Server for z/OS introduced two more editions: Developer Trial to allow for a limited trial and Value Unit Edition for running specific workloads under a different pricing model. As part of your planning, choose which editions to use.

Developer Trial
This edition is a no-charge evaluation version. It does not start the

single-version charge (SVC) clock. Use this edition to access and explore the new technology in the new release, without having to go through a full upgrade. You can upgrade from Developer Trial to either Value Unit Edition or the full product, without having to reinstall. There are some restrictions on this edition of the product; see Developer Trial for details.

For information about what is involved in moving from Developer Trial to a full edition, see Upgrading from Developer Trial.

Value Unit Edition
This runs on a qualified z Systems New Application License Charge (zNALC) LPAR. Consider this edition for eligible workloads, such as new Java workloads, that can qualify for a pricing model that is different from the full product. For more information about eligibility, see the CICS TS announcement letter on the IBM Offering Information web page.

For information about what is involved in moving from Developer Trial to a full version, see Upgrading from Developer Trial.

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Check hardware and software prerequisites

You can create a report that includes the requirements for your target release of CICS TS by entering the product name "CICS Transaction Server" and selecting the new version on the Detailed system requirements page. The report shows hardware, Hypervisor, and operating system requirements, and any requirements for supported software. You can choose to show only product releases, or include interim service fixes. The supported software report shows prerequisite levels for a broad range of IBM® products, including development tools, Java, databases, application servers, messaging products, event management, and problem determination tools.

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Check compatibility with other IBM products

You can create reports of the related software products that are supported by your target release of CICS TS on the Compatibility reports page. The same type of software compatibility information can also be found under the "Supported Software" tab of the Detailed system requirements for CICS TS. Any requirements, such as APARs that are needed to make the software compatible, are listed in the notes or additional information in the report.

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Check compatibility with vendor products

When you assess a product for its compatibility with your target release, it typically falls into one of three categories:

- It is supported without change on your target release.
- It requires a compatibility fix, either to CICS TS or to the product itself.
- It must be upgraded.

The IBM® Business Partner products that are supported at each CICS release from CICS TS 4.1 are listed at Business partner products. Vendor software products for z/OS shows the software developers who indicate that their products support levels of z/OS.

Always check with your vendor for definitive information on compatibility.

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Review your applications

Upgrading can affect applications. The application programming interface or system programming interface might change between releases. There are often changes in the behavior of key resources. Some programs, such as installed CICS exits, almost always need to be recompiled for a new release; other programs might benefit from a new version or being recompiled. Reviewing your applications helps you to answer such questions as:

- Which applications are hosted in this region?
- Which applications use these resources?
- Which applications are affected by this change?
- If I upgrade this region, which applications are affected?
- If I upgrade this application, which regions are affected?

CICS Interdependency Analyzer can help with application analysis.

For each application, create a checklist:

- Name
- Owners: business, development, and infrastructure
- Supplier: in-house or vendor
- Execution model: single region or multiple region
- Regions hosted
- Current release and target release
- Languages
- CICS components
- Resource definitions
- CICS exits
- Other products, applications, and services
- Automation
- Test suite: what testing is required before and after the upgrade?
- Offline and batch interactions

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Review your CICS regions

You need to know what is running in each of your current CICS regions. Make sure to include in your check, all regions, and even the regions that haven't been started for some time. If you have chosen to partially upgrade using a mix of

releases, review the implications of running CICS regions across mixed releases. CICS Interdependency Analyzer can be used to analyze regions.

- Check STEPLIB and DFHRPL libraries
- Check CSD lists. Check these lists against your running regions. Sometimes resources, such as LIBRARY definitions, are added dynamically.
- Check z/OS UNIX System Services and bundle definitions for application and platform resources
- Check CICSPlex® SM configuration
- Check CICS statistics and monitoring data: what transactions are running and which applications do they belong to?
- Does the application run across the TOR, AOR, FOR configuration of multiple regions? If so, consider the implications for transaction routing, function shipping, or DPL.

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Review your vendor products

You need information about the vendor products in your current environment.

- Check z/OS vendor compatibility information on Vendor support for z/OS.
- Check CICS vendor compatibility information.
- In addition, make the following checks:
  - The current version of vendor product supports the target CICS release and version
  - Are any PTFs required in the vendor product or in CICS?
  - Can a new version of vendor code be installed in current release?
  - What actions (Hold actions) need to occur: for example, recompiling exits, or upgrade steps

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Review the service level of CICS TS for z/OS

Organizations that are up-to-date with service typically encounter fewer problems during the upgrade process. Gather information about the service levels in your current environment.

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Review the changes in CICS TS for z/OS

A key part of upgrading is understanding the impact of changes from your current release. Changes between releases summarizes the changes to the externals of CICS TS across all in-service versions.

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ALL VERSIONS

Develop your upgrade strategy

You need to consider whether you plan to upgrade all regions at the same time, or phase your upgrade. We assume that minimum downtime is your goal, but there are various ways to approach the upgrade with this goal in mind.

Do you want to leave some regions running at your current release?
For example, if you have an application that cannot be run on your target release of CICS, or if you prefer to run some applications on a newer release and rapidly pick up new features for those applications, while leaving the rest of your environment in its current state. You can see an example of an upgrade that is based on this approach in "Upgrading CICS to use multiple releases concurrently" on page 181.

Will a workload run while the upgrade takes place?
There are a number of considerations if this is your strategy:

- Can your workload cope when the routing and/or target regions are closed down for upgrading? Are alternative target regions available to execute the work? Do the remaining routing and target regions have a sufficiently high MXT value to cater for the additional throughput?
- Does your environment contain an FOR? If so, when this is shut down for an upgrade, there will be no access to the files. Are the consequences of this loss of access fully understood?
- Does your environment have any QORs or regions which own DB2 or DBCTL connections (for example)? Are these regions single point of failure? What is the impact of closing these regions for upgrading?
- Will you prepare all the components for upgrade offline, before you take them down?
- How many CMASes per release of CICS TS are active on your LPAR? During migration, new CMASes may temporarily be added. The CMAS range is between 13 and 24, depending on the value you have set for MAXCAD. See this topic for more information Specifying each CMAS correctly in IEASYSxx.
- Are you aware of the potential impact of a phased migration on a running workload? You can see an example of an upgrade that is based on this approach in "Upgrading CICS with a running workload" on page 192.

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Chapter 3. Changes between releases

A key part of upgrading is understanding the impact of changes to CICS TS between versions or releases of the product. This section summarizes the changes between releases of CICS Transaction Server for z/OS .

Table 1 summarizes the major technologies that were introduced, and the functions that were discontinued in each release. Subsequent sections detail the changes by release to areas of CICS TS. For more information about these changes, see the CICS TS for z/OS What's New section for each release: 4.1, 4.2, 5.1, 5.2, 5.3, and This release.

Table 1. Major areas of technology change, by release of CICS TS for z/OS

Release	New	Discontinued
4.1	**Application support** Application bundles, application components, Java™ 6 **Integration** Events, Atom feeds, web services standards, integration support for IBM WebSphere® Service Registry and Repository, transaction routing over IPIC, IPV6, and identity propagation **Management** CICS Explorer®, RESTful API, improved WUI browser, optimized workload management, IBM MQ group attach, governance and SPI for resources, CICS monitoring improvements, and Discovery Library Adapter for CICS **Performance and scaling** XML system service parsing, JVM server runtime environment, and wild-branch diagnostic improvements	**Java** IBM SDK for z/OS JTE V1.4.2 and V1.5.0 **Management** DFHCSDUP MIGRATE command, CICSPlex SM WLMLOADCOUNT and WLMLOADTHRESH EYUPARMS
4.2	**Connectivity** Axis2 web services, web services offload, and HTTP and IP extensions **Events** System events, assured events, and lifecycle management **Java** Java 7, multi-threaded server, and OSGi packaging and management **Management** Transaction tracking, workload management, and password phrases **Scaling** Threadsafe enhancements, optimized threadsafe, and 64-bit exploitation	**Events** CICS Events for WebSphere Business Events SupportPac CB11

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Table 1. Major areas of technology change, by release of CICS TS for z/OS (continued)

Release	New	Discontinued
5.1	**Automation for application deployment** CICS TS build toolkit, DFHDPLOY utility, CICS TS plug-in for IBM UrbanCode™ Deploy **Events** Emission of events to multiple EP adapters **First-class applications and platforms** Container support for DPL bridge **Java** 64-bit Java, Java 7.0, Java 7.1, Java 8, and Feature Pack for Mobile Extensions **Liberty** Support for Java servlets and JSPs **Management** 2000 MXT, and TD threadsafe **Policies** Support for task rules	**Integration** DCE support **Java** EJB and CORBA support, JVM pool support, CCI Connector for CICS **Management** Message edit utility, DFHMEU
5.2	**First-class applications** Multi-versioning **Liberty** JAX-WS, JDBC type 4, JTA **Multiple editions** CICS Transaction Server, Value Unit Edition, Developer Trial **Policies** Enhancements to task rules **Security** SAML and Kerberos support, TLS 1.2 enforcement, and NIST-SP800-131a conformance	

Table 1. Major areas of technology change, by release of CICS TS for z/OS (continued)

Release	New	Discontinued
5.3	**First-class applications** Transaction resources as application entry points, channel delete, and recovery of application availability status **Java** IBM MQ classes for JMS, document constructor, and simplified log management **Liberty** CDI, local JMX connector and REST JMX connector, EJB Lite, managed beans, MongoDB, Monitor, OSGi console, database session persistence, LINK and START commands support invoking Java applications in Liberty, Java EE 7 Web profile, Java batch, Standard mode Liberty, Java EE messaging (JMS) and IBM MQ as a JMS provider **Note:** The `wab-1.0` feature was added to `cicsts:core-1.0` and `cicsts:standard-1.0` as it is used internally by CICS. As a result, all OSGi bundles with a Web-Context root will be treated by Liberty as web applications, and installed as such. **Management** New policy thresholds, transaction tracking for CICS-MQ bridge, DFHCSDUP COPY and LIST **Performance and scaling** Threadsafe commands, System z9® exploitation, tuning of HTTP connections **Policies** Enhancements to task rules **Security** AT-TLS, SIGNON TOKEN, REQUEST PASSTICKET, HTTP TRACE inactive by default	**Management** PASSWORD attribute on FILE resource, ACTJVMTCBS and MAXJVMTCBS on INQUIRE and SET DISPATCHER commands **Security** SSLV3 support

Table 1. Major areas of technology change, by release of CICS TS for z/OS (continued)

Release	New	Discontinued
5.4	**Applications** Asynchronous EXEC CICS API to extend programming language capabilities, API extensions for improved interoperability with batch applications, enhancements to web services support, Decision Server Insights event format **Liberty** Support for applications written to the Java EE 7 Full Platform specification, ability for a CICS program to invoke a Java EE application running in a Liberty JVM server Type 2 `cicsts_dataSource` and `cicsts:jdbc-1.0` are deprecated. You can use Liberty dataSource instead. For access to DB2 through CICS you can now use the default dataSource element for type 2 connectivity rather than the customized `cicsts_dataSource`. **Management** System autoinstall of program definitions for LE, enhanced management for applications that use IBM MQ, extended control of VSAM data set access in support of GDPS/Active-Active, support for the z/OS Workload Manager Health API, feature toggles to enable new features selectively, extensions to statistics and dump capabilities **Policies** Support for system rules, and new asynchronous requests task rule **Security** Support for Kerberos mutual authentication, CICS makes a RACF check by default before generating a PassTicket, 3270 IDS, IBM Health Checker for z/OS checks, new transactions for debugging applications in Production	**Management** System events (deprecated), CICSPlex SM Real-Time Analysis (RTA) (stabilized).

Changes to installing

This section summarizes the changes to installation across supported releases of CICS TS for z/OS.

Table 2. Changes to installing, by release of CICS Transaction Server for z/OS

V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
					All source changes are now made by source replacement. Source updates will no longer be made.

Table 2. Changes to installing, by release of CICS Transaction Server for z/OS (continued)

V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
					NEW: optional job, DFHIFTGS, tags the text files in the CICS USSHOME directory with the correct coded character set.
					CHANGED: DFHALLOC and DFHINST3 jobs create the ADFHMOD, SDFHAUTH, and SDFHLOAD data sets as PDSEs. CICS now requires these data sets to be PDSEs.
				CICS checks during initialization for the required level of hardware.	
				CICS checks during initialization that no CICS nucleus module comes from an earlier release than the release that is currently being started. This has an impact if you are using IBM HourGlass see DFHLD0110 during CICS TS 5.3 initialization when using HourGlass on dW Answers.	
				DFHRPL libraries and dynamic program LIBRARY concatenations can be put in the EAS of EAV DASD.	
			CICS TS comprises a base component and an activation module that is specific to the offering of CICS TS. Both must be installed.		
	Default size of auxiliary data sets changed from 1 cylinder to 25 cylinders, so the supplied SDFHINST JCL members DFHDEFDS, EYUCMSDS, and EYUCSYDS also changed.				
	The default location of JAVADIR is changed to support 64-bit JVM.				
			CICS use of 64-bit storage has increased, therefore MEMLIMIT might need to be increased to avoid `CICS SOS Above the Bar.`		MEMLIMIT must be set to 10 GB or greater.

Changes to CICS API

This section summarizes the changes to the CICS application interface of EXEC CICS commands across supported CICS releases. Use this information to plan the impact on applications of upgrading from one release to another.

Table 3. Changes to EXEC CICS commands, by release of CICS Transaction Server for z/OS

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
ASKTIME	**CHANGED:** Changed value: ABSTIME					
ASSIGN			**CHANGED:** New options: ASRAPSW16 and ASRAREGS64	**CHANGED:** New options: ERRORMSG, ERRORMSGLEN, LINKLEVEL, APPLICATION, MAJORVERSION, MICROVERSION, MINORVERSION, OPERATION, PLATFORM	**CHANGED**: New options: INPUTMSGLEN and ABOFFFSET	
BIF DEEDIT		**CHANGED:** Made threadsafe				
BIF DIGEST	**NEW**	**CHANGED:** Made threadsafe				
CHANGE PASSWORD		**CHANGED:** Made threadsafe				
CHANGE PHRASE		**NEW**				
CONVERTTIME	**CHANGED:** New value: RFC 3339 format					
DEFINE COUNTER and DEFINE DCOUNTER		**CHANGED:** Made threadsafe				**CHANGED:** New option: NOSUSPEND
DELAY				**CHANGED:** New value: MILLISECS		
DELETE		**CHANGED:** Made threadsafe for remote regions through IPIC				**CHANGED:** new INVREQ with RESP2 value of 57
DELETE CHANNEL					**NEW**	
DELETE CHANNEL (EXCI)						**NEW:** EXCI can issue in batch
DELETE CONTAINER (EXCI)						**NEW** EXCI can issue in batch
DELETE COUNTER and DELETE DCOUNTER		**CHANGED:** Made threadsafe				**CHANGED:** New option: NOSUSPEND
DELETEQ TD			**CHANGED:** Made threadsafe			
DELETEQ TS		**CHANGED:** Made threadsafe for remote regions through IPIC				
ENDBR		**CHANGED:** Made threadsafe for remote regions through IPIC				
EXEC DLI		**CHANGED:** Made threadsafe				

Table 3. Changes to EXEC CICS commands, by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
EXTRACT CERTIFICATE		**CHANGED:** Made threadsafe				
EXTRACT TCPIP	**CHANGED:** New values: CLNTADDR6NU, CLNTIPFAMILY, SRVRADDR6NU, SRVRIPFAMILY. Changed options: CADDRLENGTH, CLIENTADDR, SADDRLENGTH, and SERVERADDR to return IPv6 information.	**CHANGED:** Made threadsafe			**CHANGED**: new value, ATTLSAWARE, on SSLTYPE parameter.	
EXTRACT WEB	New value: HOSTTYPE. Changed value: HOST, to support IPv6 addresses.					
FETCH ANY						**NEW**
FETCH CHILD						**NEW**
FREE CHILD						**NEW**
FORMATTIME	**CHANGED:** New value: RFC 3339. New option: MILLISECONDS			**CHANGED:** New option: STRINGZONE		
FREEMAIN64			**NEW**			
GET CONTAINER (CHANNEL)			**CHANGED:** New value: BYTEOFFSET			
GET CONTAINER (EXCI)						**NEW:** EXCI can issue in batch
GET COUNTER and GET DCOUNTER		**CHANGED:** Made threadsafe				**CHANGED:** New option: NOSUSPEND
GET64 CONTAINER			**NEW**			
GETMAIN64			**NEW**			
INVOKE APPLICATION				**NEW**		
INVOKE SERVICE	**NEW**					
INVOKE WEBSERVICE	**DEPRECATED:** Use INVOKE SERVICE instead.					
LINK		**CHANGED:** Made threadsafe		**CHANGED:** Change of impact: command now operates in the application context.		
LINK (EXCI)						**CHANGED:** New option: CHANNEL
LOAD			**CHANGED:** Changed value: ENTRY			
MOVE CONTAINER (EXCI)						**NEW:** EXCI can issue in batch
PUT CONTAINER (CHANNEL)			**CHANGED:** New value: APPEND			

Table 3. Changes to EXEC CICS commands, by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
PUT CONTAINER (EXCI)						**NEW:** EXCI can issue in batch
PUT64 CONTAINER			**NEW**			
QUERY CHANNEL					**NEW**	
QUERY COUNTER and QUERY DCOUNTER		**CHANGED:** Made threadsafe				**CHANGED:** New option: NOSUSPEND
QUERY SECURITY		**CHANGED:** Made threadsafe. New option: EPADAPTER	**CHANGED:** New option: EPADAPTERSET			
READ		**CHANGED:** Made threadsafe for remote regions through IPIC				**CHANGED:** new INVREQ with RESP2 value of 57
READNEXT		**CHANGED:** Made threadsafe for remote regions through IPIC				**CHANGED:** new INVREQ with RESP2 value of 57
READPREV		**CHANGED:** Made threadsafe for remote regions through IPIC				**CHANGED:** new INVREQ with RESP2 value of 57
READQ TD			**CHANGED:** Made threadsafe			
READQ TS		**CHANGED:** Made threadsafe				
REQUEST PASSTICKET					**NEW**	
RESETBR		**CHANGED:** Made threadsafe for remote regions through IPIC				
REWIND COUNTER and REWIND DCOUNTER		**CHANGED:** Made threadsafe				**CHANGED:** New option: NOSUSPEND
REWRITE		**CHANGED:** Made threadsafe for remote regions through IPIC				**CHANGED:** new INVREQ with RESP2 value of 57
RUN TRANSID						**NEW**
SIGNAL EVENT	**NEW**					
SIGNOFF		**CHANGED:** Made threadsafe				
SIGNON		**CHANGED:** Made threadsafe and changed to support password phrases				
SIGNON TOKEN					**NEW**	
START			**CHANGED:** Change of impact to support identity propagation			
START CHANNEL			**CHANGED:** Change of impact to support identity propagation			
STARTBR		**CHANGED:** Made threadsafe for remote regions through IPIC				

Table 3. Changes to EXEC CICS commands, by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
SYNCPOINT		**CHANGED:** Made threadsafe				
SYNCPOINT ROLLBACK		**CHANGED:** Made threadsafe				
TRANSFORM DATATOJSON					**CHANGED:** Available with APAR PI54841.	**NEW**
TRANSFORM DATATOXML	**NEW**					
TRANSFORM JSONTODATA					**CHANGED:** Available with APAR PI54841.	**NEW**
TRANSFORM XMLTODATA	**NEW**					
UNLOCK		**CHANGED:** Made threadsafe for remote regions through IPIC				
UPDATE COUNTER and UPDATE DCOUNTER		**CHANGED:** Made threadsafe				**CHANGED:** New option: NOSUSPEND
VERIFY PASSWORD		**CHANGED:** Made threadsafe	**CHANGED:** Change of impact. Function is changed, dependent on SECVFYREQ and/or USRDELAY.			
VERIFY PHRASE		**NEW**	**CHANGED:** change of impact. Function is changed, dependent on SECVFYREQ and/or USRDELAY.			
VERIFY TOKEN				**NEW**	**CHANGED:** • ENCRYPTOKEN parameter returns a 4-byte encryption token when the TOKENTYPE is KERBEROS. • New options, OUTTOKEN and OUTTOKENLEN, are available with APAR PI56774	**CHANGED:** New options: OUTTOKEN and OUTTOKENLEN
WEB ENDBROWSE QUERYPARM	**NEW**					
WEB EXTRACT	**CHANGED:** New value: HOSTTYPE and existing value, HOST, is changed to support IPv6 addresses					

Table 3. Changes to EXEC CICS commands, by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
WEB OPEN	**CHANGED:** HOST option is changed to support IPv6 addresses. Description of HTTPRNUM and HTTPVNUM is changed					
WEB PARSE URL	**CHANGED:** New value: HOSTTYPE and existing value, HOST, is changed to support IPv6 addresses					
WEB READ QUERYPARM	**NEW**					
WEB READNEXT QUERYPARM	**NEW**					
WEB RECEIVE (Server)						**CHANGED:** The body of an HTTP server request can be received into 64-bit (above-the-bar) storage.
WEB SEND (Server)						**CHANGED:** The body of an HTTP server response can be sent from 64-bit (above-the-bar) storage.
WEB STARTBROWSE QUERYPARM	**NEW**					
WRITE		**CHANGED:** Made threadsafe for remote regions through IPIC			**CHANGED:** a CICS message is issued when an EXEC CICS WRITE command that is issued to a user-maintained table or shared data table fails because the data table is full.	**CHANGED:** new INVREQ with RESP2 value of 57
WRITE OPERATOR					**CHANGED:** Made threadsafe	
WRITEQ TD			**CHANGED:** Made threadsafe			
WRITEQ TS		**CHANGED:** Change of impact of MAIN and AUXILIARY options: IPIC support for function shipping between CICS TS 4.2 or later regions. Also made threadsafe for remote regions through IPIC				
WSACONTEXT BUILD	**NEW**					
WSACONTEXT DELETE	**NEW**					
WSACONTEXT GET	**NEW**					

Table 3. Changes to EXEC CICS commands, by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
WSAEPR CREATE	**NEW**					
XCTL			**CHANGED:** Change of impact, COMMAREA is now created above or below the line.			**CHANGED:** : New INVREQs with RESP2 values of 33 and 34.

Changes to the JCICS API

This section summarizes the changes to the packages, classes, and methods of the CICS Java class library (JCICS) API across supported CICS releases.

See also the list of deprecated packages, classes, fields, exceptions, and methods in Deprecated JCICS API.

Table 4. Changes to JCICS server package, by release of CICS Transaction Server for z/OS

Class	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
AbendError					**DEPRECATED**	
Application				**NEW**		
AsyncService AsyncServiceImpl						**NEW METHODS**: runTransactionId() getAny() freeChild()
Channel					**NEW METHODS**: getContainerCount() Channel.delete()	
ChildResponse						**NEW METHODS**: getCompletionStatus() getAbendCode() getChannel()
CICSExecutorService			**NEW**			
Future<ChildResponse>						**NEW METHODS:** get() isDone()
Container						**NEW METHOD**: getDatatype()
Document					**NEW CONSTRUCTOR**: docToken	
Event	**NEW**					
EventErrorException	**NEW**					

Table 4. Changes to JCICS server package, by release of CICS Transaction Server for z/OS (continued)

Class	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
HttpRequest	**NEW METHODS**: getHostType() getQueryParm() startBrowseQueryParm() getNextQueryParm() endBrowseQueryParm()					
HttpSession	**NEW METHOD**: getHostType()					
Program					**REMOVED**: All xctl methods. Applications that used these methods do not compile and throw a NoSuchMethodError if called.	
Task				**NEW METHOD**: getApplicationContext()		
TcpipRequest	**NEW METHODS**: getClientHostAddress6() getServerHostAddress6() getClientIpFamily() getServerIpFamily()					
UnknownCicsError					**DEPRECATED**	

Changes to compiler support

This section summarizes the changes to compilers that can be used for CICS applications, across supported CICS releases.

For a list of the versions of compilers that are supported, by programming language, see High-level language and compiler support.

Table 5. Changes to compilers, by release of CICS Transaction Server for z/OS

V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
			WITHDRAWN: The CICS translator no longer inserts REENTRANT into the compiler options for compiling PL/I.		

Table 5. Changes to compilers, by release of CICS Transaction Server for z/OS (continued)

V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
				NEW: • DFHZXTCL: translates, compiles, and link-edits EXCI COBOL application programs using the integrated CICS translator • DFHZXTDL: translates, compiles, and link-edits EXCI C application programs using the integrated CICS translator • DFHZXTEL: translates, compiles, and link-edits EXCI C++ application programs using the integrated CICS translator • DFHZXTPL: translates, compiles, and link-edits EXCI PL/I application programs using the integrated CICS translator	

Changes to the CICS assistants

This section summarizes the changes to CICS web services assistants across supported CICS releases. Use this information to plan the impact of upgrading from one release to another.

Table 6. Changes to assistants, by release of CICS Transaction Server for z/OS

Program	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHJS2LS						**CHANGED:** • New option, HYPHENS-AS-UNDERSCORES, on MAPPING-OVERRIDES • New option, FULL, on WIDE-COMP3 • Support for mapping level 4.1
DFHLS2JS						**CHANGED:** Support for mapping level 4.1
DFHLS2SC						**CHANGED:** Support for mapping level 4.1

Table 6. Changes to assistants, by release of CICS Transaction Server for z/OS (continued)

Program	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHLS2WS						**CHANGED:** • New parameters, PORT-NAME, BINDING-NAME, and SERVICE-NAME • Support for mapping level 4.1
DFHSC2LS						**CHANGED:** • New option, HYPHENS-AS-UNDERSCORES, on MAPPING-OVERRIDES • New option, FULL, on WIDE-COMP3 • Support for mapping level 4.1
DFHWS2LS						**CHANGED:** • New parameters, PORT-NAME, BINDING-NAME, and SERVICE-NAME • New option, FULL, on WIDE-COMP3 • Support for mapping level 4.1

Changes to SIT parameters

This section summarizes the changes to the system initialization parameters across supported CICS releases.

Table 7. Changes to system initialization by release of CICS Transaction Server for z/OS

Parameter	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
AKPFREQ			**CHANGED:** minimum value is now 50.			
APPLIID						
AUTORESETTIME			**CHANGED:** new default is IMMEDIATE.			
CONFDATA						
CSDLSRNO		**CHANGED:** number of LSR pools can now be up to 255.				
EDSALIM		**CHANGED:** minimum and default are changed to 48 MB.	**CHANGED:** default is changed to 800 MB.			**CHANGED:** minimum is changed to 64 MB.
EJBROLEPRFX			**REMOVED**			

Table 7. Changes to system initialization by release of CICS Transaction Server for z/OS (continued)

Parameter	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
ENCRYPTION	**CHANGED:** value STRONG now does not allow SSL version 3.0.	**CHANGED:** value STRONG now does not allow SSL version 3.0.	**CHANGED:** value STRONG now does not allow SSL version 3.0 **and** two new values, ALL and TLS12FIPS.	**CHANGED:** value STRONG now does not allow SSL version 3.0 **and** new value TLS12. **REMOVED:** TLS12FIPS value.	**DEPRECATED**: replaced by MINTLSLEVEL, although ENCRYPTION remains available for compatibility with previous releases. SSLV3 is removed as an option.	
FCQRONLY		**CHANGED:** change of impact, depending on whether the connections to FORs are MRO, ISC, or IPIC.				
HTTPSERVERHDR					**NEW**: sets the value for HTTP Server field	
HTTPUSRAGENTHDR					**NEW**: sets the value for HTTP User-Agent field	
ICVR						**CHANGED:** • Lower limit changed to 250 • Default value changed to 2000 • Sample table DFHSIT6$ changed to specify ICVR=5000 instead of 20000
ICVTSD			**CHANGED:** default value changed to zero.			
IIOPLISTENER			**REMOVED**			
INITPARM	**CHANGED:** you can no longer use INITPARM= DFHMQPRM to specify a default IBM MQ queue manager name and initiation queue name for the CICS-WebSphere MQ connection.					
JVMCCSIZE			**REMOVED**			
JVMCCSTART			**REMOVED**			
JVMLEVEL0TRACE			**REMOVED**			
JVMLEVEL1TRACE			**REMOVED**			
JVMLEVEL2TRACE			**REMOVED**			
JVMPROFILEDIR	**CHANGED:** default value is now the value in USSHOME followed by JVMProfiles subdirectory.			**CHANGED:** for JVM servers that are defined in CICS bundles, the location of the JVM profile is specified by the bundle.		
JVMUSERTRACE			**REMOVED**			
MAXJVMTCBS			**REMOVED**			

Table 7. Changes to system initialization by release of CICS Transaction Server for z/OS (continued)

Parameter	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
MAXOPENTCBS			**REMOVED:** CICS will set a value based on MXT	**CHANGED:** CICS will set a value based on MXT (recommended), or you can explicitly manage this parameter yourself.		**CHANGED:** The minimum value is changed to 32.
MAXSSLTCBS						**CHANGED:** Default value changed from 8 to 32. Sample table DFHSIT6$ changed to specify MAXSSLTCBS=32 instead of 8.
MINTLSLEVEL					**NEW:** replaces ENCRYPTION **CHANGED** with APAR: new parameter MINTLS10ONLY	**CHANGED:** new parameter MINTLS10ONLY
MNIDN	**NEW**					
MNSUBSYS						
MQCONN	**CHANGED:** CICS no longer uses INITPARM to provide information to start a connection.					
MSGCASE						
MXT			**CHANGED:** minimum, default, and maximum values are changed to 10, 500, and 2000.	**CHANGED:** default value is now 250.		
NISTSP800131A				**NEW**		
NONRLSRECOV						
NQRNL					**NEW**: specifies that z/OS global resource serialization uses RNL processing for enqueue and dequeue requests from CICS	
PRTYAGE			**CHANGED:** default value is now 1000 milliseconds.			
PSTRYPE	**CHANGED:** new value, NOPS.					
RACFSYNC			**NEW**			**CHANGED:** the RACFDB2SYNC option is removed and its functionality is included when RACFSYNC =YES is specified.

Table 7. Changes to system initialization by release of CICS Transaction Server for z/OS (continued)

Parameter	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
SECVFYFREQ			**NEW**			**REMOVED** **Note:** CICS updates the last used time once a day for each user ID that is used on a CICS region.
SNPRESET						**NEW:** allows preset userid terminals to share a single ACEE
SOTUNING					**NEW**: controls the performance tuning for HTTP connections	
SPCTR			**CHANGED:** new value of MP for managed platform domain.			
STATINIT			**CHANGED:** default value is now 010000 (1 hour).			
STATRCD			**CHANGED:** default value is now OFF.			
STGPROT					**CHANGED:** default value is now YES.	
STNTR			**CHANGED:** new value of MP for managed platform domain.			
TBEXITS			**CHANGED:** 4-byte GWA passed to an exit on enablement now comes from 31-bit storage.			
TCPIP						**CHANGED:** Default value changed from NO to YES. Sample table DFHSIT6$ changed to specify TCPIP=YES instead of NO.
TCTUALOC			**CHANGED:** default value changed to ANY.			
TDSUBTASK			**REMOVED**			
TRANISO			**CHANGED:** TRANISO no longer affects the use of 64-bit storage.			
TRTABSZ		**CHANGED:** when the internal trace table is in 64-bit storage, TRTABSZ no longer influences EDSALIM.			**CHANGED:** default changed to 12 MB.	

Table 7. Changes to system initialization by release of CICS Transaction Server for z/OS (continued)

Parameter	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
TRTRANSZ		**CHANGED:** default is now 1024 KB **and** recommendation to review your setting now that CICS uses 64-bit storage for the transaction dump trace table.				
TSMAINLIMIT		**NEW**				
UOWNETQL						
USRDELAY	**CHANGED:** new recommendation to check your settings if you run z/OS 1.11 or later. From z/OS 1.11, CICS is notified immediately if RACF® profile changes occur.					
USSCONFIG				**NEW**		
USSHOME	**NEW**					
WLMHEALTH						**NEW:**specifies parameters to be used on z/OS WLM Health API calls
XCFGROUP						
XEJB			**REMOVED**			
XHFS						
XPTKT	**NEW** with APAR	**NEW** with APAR	**NEW** with APAR	**NEW** with APAR	**NEW** with APAR. The default is changed to YES.	**NEW** The default is changed to YES.
XRES						

Changes to JVM profiles

The settings in JVM profiles change between releases. This section summarizes the changes to JVM profile options, across supported CICS releases.

The obsolete, changed, and new options in JVM profiles are summarized here. For more details about the options, see JVM profiles: options and samples. Note that the column for V4.1 is removed to give more space for the additional columns. There were no changes to JVM profiles in V4.1.

Table 8. New options in JVM profiles

Option	V4.2	V5.1	V5.2	V5.3	V5.4
DFH_UMASK					Applies for the lifetime of the JVM server, not only during start-up.
CICS_WLP_MODE				**TYPE:** Liberty JVM server	**NEW:** choose the level of integration between CICS and Liberty
CLASSPATH_PREFIX					
CLASSPATH_SUFFIX					
com.ibm.cics.jvmserver.override.ccsid		**TYPE:**All JVM Environments			

Table 8. New options in JVM profiles (continued)

Option	V4.2	V5.1	V5.2	V5.3	V5.4
com.ibm.cics.jvmserver.unclassified.tranid				**TYPE:** Liberty JVM server and OSGi JVM server	
com.ibm.cics.jvmserver.unclassified.userid				**TYPE:** Liberty JVM server and OSGi JVM server	
com.ibm.cics.jvmserver.wlp.autoconfigure		**TYPE:** Liberty JVM server and OSGi JVM server			
com.ibm.cics.jvmserver.wlp.server.host		**TYPE:** Liberty JVM server			
com.ibm.cics.jvmserver.wlp.server.http.port		**TYPE:** Liberty JVM server			
com.ibm.cics.jvmserver.wlp.server.name		**TYPE:** Liberty JVM server			
com.ibm.cics.jvmserver.wlp.jdbc.driver.location		**TYPE:** Liberty JVM server			
JAVA_PIPELINE	**TYPE:** Non OSGi (Axis 2)				
OSGI_BUNDLES	**TYPE:** OSGi JVM server				
OSGI_CONSOLE	**TYPE:** OSGi JVM server				
OSGI_FRAMEWORK_TIMEOUT	**TYPE:** OSGi JVM server				
JNDI_REGISTRATION			**TYPE:** OSGi JVM server		
SECURITY_TOKEN_SERVICE	**TYPE:** Non OSGi JVM server				
WSDL_VALIDATOR			**TYPE:** OSGi JVM server		
WLP_INSTALL_DIR		**TYPE:** Liberty JVM server			
WLP_OUTPUT_DIR		**TYPE:** Liberty JVM server			
WLP_USER_DIR		**TYPE:** Liberty JVM server			

Table 9. Changed and obsolete options in JVM profiles

Option	Status	CICS and Java launcher action	Replace with	Notes
&JVM_NUM	Obsolete	n/a	n/a	Pooled JVM option that is not supported in a JVM server.
-generate	Obsolete	n/a	n/a	Pooled JVM option that is not supported in a JVM server.
CICS_DIRECTORY	Obsolete	Java launcher uses the value of the **USSHOME** system initialization parameter	**USSHOME** system initialization parameter	Do not specify. CICS issues message DFHSJ0534 if found.
CICS_HOME	Obsolete	Java launcher uses the value of the **USSHOME** system initialization parameter	**USSHOME** system initialization parameter	Do not specify.
CLASSCACHE	Obsolete	n/a	n/a	Pooled JVM option that is not supported in a JVM server.
CLASSPATH	Replaced by equivalents	JVM does not start	CLASSPATH_SUFFIX - For non OSGi server	CICS issues message DFHSJ0523 if found.
ibm.jvm.shareable. application.class.path	Obsolete	CICS adds entries to standard classpath	For non OSGi server	Obsolete for Java 5 and later versions.
DISPLAY_JAVA_ VERSION		Accepted	n/a	Shows JVM version in CICS MSGUSR log.

Table 9. Changed and obsolete options in JVM profiles (continued)

Option	Status	CICS and Java launcher action	Replace with	Notes
GC_HEAP_THRESHOLD	Obsolete	n/a	n/a	Pooled JVM option that is not supported in a JVM server.
ibm.jvm.crossheap.events	Obsolete	Java launcher ignores	n/a	Pooled JVM option that is not supported in a JVM server.
ibm.jvm.events.output	Obsolete	Java launcher ignores	n/a	Pooled JVM option that is not supported in a JVM server.
ibm.jvm.reset.events	Obsolete	Java launcher ignores	n/a	Pooled JVM option that is not supported in a JVM server.
ibm.jvm.resettrace.events	Obsolete	Java launcher ignores	n/a	Pooled JVM option that is not supported in a JVM server.
ibm.jvm.unresettable. events.level	Obsolete	Java launcher ignores	n/a	Pooled JVM option that is not supported in a JVM server.
IDLE_TIMEOUT	Obsolete	n/a	n/a	Pooled JVM option that is not supported in a JVM server.
INVOKE_DFHJVMAT	Obsolete	n/a	n/a	Pooled JVM option that is not supported in a JVM server.
JAVA_DUMP_OPTS	Withdrawn from sample profiles	Accepted	-Xdump	Deprecated in Java 5.
LEHEAPSTATS	Obsolete	n/a	n/a	Pooled JVM option that is not supported in a JVM server.
LIBPATH	Replaced by equivalents	CICS treats as LIBPATH_ SUFFIX	LIBPATH_SUFFIX (LIBPATH_PREFIX also available)	CICS issues message DFHSJ0538 if found. You do not need to specify directories for base library path, only directories that you add.
MAX_RESETS_ TO_GC	Obsolete	n/a	n/a	Pooled JVM option that is not supported in a JVM server.
OSGI_BUNDLES	Not supported in Liberty JVM server	Liberty JVM server does not enable with this option	n/a	Deploy OSGi bundles in a Liberty JVM server as part of an enterprise bundle archive (EBA) or as library bundles.
REUSE	Obsolete	n/a	n/a	Pooled JVM option that is not supported in a JVM server.
TMPREFIX	Obsolete	CICS prefixes to standard class path	CLASSPATH_PREFIX	CICS issues message DFHSJ0521 if found. Move classes with care.
TMSUFFIX	Obsolete	CICS places on standard class path	CLASSPATH_SUFFIX	CICS issues message DFHSJ0522 if found.
VERBOSE	Withdrawn from sample profiles	Accepted	-verbose:gc	Works as before if specified in old format.
Xcheck (JVM default is NO)	Withdrawn from sample profiles	Accepted	-Xcheck	Specify this option only if other than JVM default.
Xdebug (JVM default is NO)	Withdrawn from sample profiles	Accepted	-Xdebug (no value) to set debug on	Specify this option only if other than JVM default.
Xnoclassgc (JVM default is NO)	Withdrawn from sample profiles	Accepted	-Xnoclassgc (no value) to specify no class garbage collection	Specify this option only if other than JVM default
Xresettable=YES	Obsolete	JVM does not start	n/a	Pooled JVM option that is not supported in a JVM server.
Xverify (JVM default is remote)	Withdrawn from sample profiles	Accepted	n/a	Do not specify, use JVM default.
Xinitacsh	Obsolete	Java launcher ignores	Add value to -Xms	Pooled JVM option that is not supported in a JVM server.
Xinitth	Obsolete	Java launcher ignores	Add value to -Xms	Pooled JVM option that is not supported in a JVM server.
Xinitsh	Obsolete	Java launcher ignores	Add value to -Xms	Pooled JVM option that is not supported in a JVM server.

Undocumented options

Table 9 on page 27 lists only the options that were formerly used in the sample files that are supplied with CICS, together with the new options. Some options for JVM profiles and JVM properties files did not appear in the sample files that are supplied with CICS in previous CICS releases, but were documented in the CICS documentation. Some of these options are removed from the CICS documentation.

The `java.compiler` option is not documented because its primary use was to disable the Java just-in-time (JIT) compiler during the development process for applications in a resettable JVM. In a continuous JVM, this option is not required for that purpose.

The remaining undocumented options are still valid, but they can now be specified in the standard Java way (rather than in a special way for CICS), and so the documentation for the IBM 64-bit SDK for z/OS, Java Technology Edition and other Java documentation can be used. If you have any of these options in an existing JVM profile for CICS, they are still accepted.

The main categories of valid options that are not documented are as follows:

- The options that relate to assertions. You can find more information about programming with assertions, and about activating or deactivating assertions, at the Oracle Technology Network Java website.
- Various Java nonstandard options (beginning with `-X`), including `-Xmaxe` , `-Xmaxf` , `-Xmine` , `-Xminf` , `-Xrun`*`dllname`* , and `-Xrs` . You can find more information about these options in the Java SDK documentation, which is available from Resource Information for Java.
- Various JVM system properties, most of which must not be changed by users of the IBM JVM with CICS .

Changes to JVM profile symbols

&CONFIGROOT;
: When you use this symbol in a JVM profile, the absolute path of the directory where the JVM profile is located is substituted at run time.

&JVMNUM;
: This symbol is obsolete. If this symbol was used, for example, as part of the file name for a Java memory dump, CICS substituted the unique JVM number for it at run time. The symbol could be specified for any type of output from the JVM, and used in combination with the APPLID symbol (CICS region APPLID). The **-generate** option for `stdout` and `stderr` files provided the unique JVM number automatically.

&JVMSERVER;
: When you use this symbol in a JVM profile, the name of the JVMSERVER resource is substituted at run time. Use this symbol to create unique output or dump files for each JVM server.

&USSHOME;
: When you use this symbol in a JVM profile, the symbol is replaced with the value of the **USSHOME** system initialization parameter. Use this symbol to automatically pick up the home directory for z/OS UNIX where CICS supplies its libraries for Java and the Liberty technology.

For information about the other supported JVM profile symbols, see JVM profiles: options and samples.

Changes to resource definitions

This section summarizes the changes to the resource definitions across supported CICS releases. Use this information to plan the impact on resources of upgrading from one release to another.

Note: The REMOVED content in Table 10 and Table 11 on page 32 have been moved to compatibility groups DFHCOMPxxx; previous versions of modified resources are also in the compatibility groups.

Table 10 describes changes to resource definitions, by release of CICS Transaction Server for z/OS. These changes might affect user-defined resource definitions in user-defined groups.

Table 10. Changes to resource definitions, by release of CICS Transaction Server for z/OS

Resource	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
ATOMSERVICE attributes	**NEW**					
BUNDLE attributes	**NEW**					
CORBASERVER			**REMOVED**			
DB2CONN attributes/xref>				**CHANGED:** Change of impact: TCBLIMIT attribute now detects mismatch between TCBs and threads that are defined in pool and entry definitions.		
DJAR			**REMOVED**			
FILE attributes		**CHANGED:** New attribute, LSRPOOLNUM, and new value, REQUIRED on CONCURRENCY			**REMOVED:** PASSWORD attribute is obsolete.	
IPCONN attributes	**CHANGED:** New attribute, IDPROP, and changed attribute HOST		**CHANGED:** Changed attributes CIPHERS and NUMCIPHERS	**CHANGED:** New attribute, HA, and changed attribute APPLID		
JVMSERVER attributes	**NEW**					
LIBRARY attributes						
LSRPOOL attributes		**CHANGED:** New attribute, LSRPOOLNUM, and attribute made obsolete, LSRPOOLID				
MQCONN attributes	**NEW**					**CHANGED:** Changed attribute INITQNAME
MQMONITOR attributes						**NEW:** To define attributes for WebSphere MQ message consumers
PACKAGESET					**NEW**: CICS application resource which represents a DB2 collection	
PIPELINE attributes						

Table 10. Changes to resource definitions, by release of CICS Transaction Server for z/OS (continued)

Resource	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
PROGRAM attributes		**CHANGED:** New attribute, JVMSERVER, and new value of REQUIRED on CONCURRENCY	**CHANGED:** Attribute made obsolete: JVMPROFILE			**CHANGED:** The default value of DATALOCATION is changed from BELOW to ANY.
REQUESTMODEL			**REMOVED**			
TCPIPSERVICE attributes		**CHANGED:** New attributes, MAXPERSIST, and EXPIRYINT	**CHANGED:** New attribute SPECIFTCPS. Changed attributes, CIPHERS, NUMCIPHERS, and BACKLOG. For BACKLOG, default value is changed from 1 to zero. When zero is specified the value is taken from SOMAXCONN TCPIP configuration. ASSERTED is obsolete on AUTHENTICATE	**CHANGED:** Attributes made obsolete: DNSGROUP and GRPCRITICAL. IIOP is obsolete on TYPE.	**CHANGED**: ATTLSAWARE option added to the SSLTYPE parameter	
TERMINAL attributes	**CHANGED:** Change of impact: REMOTESYSTEM attribute for IP connections					
TRANSACTION attributes	**CHANGED:** Change of impact: REMOTESYSTEM attribute for IP connections					**CHANGED:** The default value of SPURGE and TPURGE is changed to YES. The default value of TASKDATALOC is changed to ANY.
TSMODEL attributes		**CHANGED:** New attribute, EXPIRYINT		**CHANGED:** New attribute EXPIRYINTMIN and obsolete attribute, EXPIRYINT		
URIMAP attributes	**CHANGED:** New attributes ATOMSERVICE and AUTHENTICATE. Changed attributes HOST and PATH. New value ATOM on USAGE. Change of impact: USAGE(HTTP) required for use with HTTP EP adapter.	**CHANGED:** New attribute, SOCKETCLOSE	**CHANGED:** Changed attributes CIPHERS and NUMCIPHERS. New value JVMSERVER on USAGE.			
WEBSERVICE attributes		**CHANGED:** New attribute: ARCHIVEFILE				

Table 11 on page 32 describes changes to CICS-supplied resource definition groups, by release of CICS Transaction Server for z/OS. It does not include compatibility groups DFHCOMPxxx. To view changes to compatibility groups by CICS TS release, see Table 12 on page 41.

Table 11. Changes to CICS-supplied resource definition groups excluding compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
Groups containing programs that specify JVM(NO)		**CHANGED:** Programs that specify JVM(NO) no longer have a default JVMPROFILE attribute.				
Groups containing files that specify LSRPOOLID(1) or LSRPOOLID(NONE)		**CHANGED:** The FILE attribute LSRPOOLID is obsolete and replaced with LSRPOOLNUM. Files that previously specified LSRPOOLID(1) now specifies LSRPOOLNUM(1). Files that previously specified LSRPOOLID(NONE) now specifies LSRPOOLNUM(NONE).				
DFH$AFLA			**CHANGED:** • Programs are changed from DATALOCATION(BELOW) to DATALOCATION(ANY). • Transactions are changed from TASKDATALOC(BELOW) to TASKDATALOC(ANY).			
DFH$AXIS		**NEW GROUP**		**CHANGED:** JVMSERVER definition DFH$AXIS is renamed DFHAXIS.		
DFH$CCI			**REMOVED**			
DFH$DB2		**CHANGED:** DB2CONN definition RCT1$ now specifies REUSELIMIT(1000).	**CHANGED:** • Programs removed: DFJ$DSDB, DFJ$DSPU, and DFJ$DSRE • Transactions removed: DSDB, DSPU, and DSRE			
DFH$EJB	**CHANGED:** TCPIPSERVICE definition EJBTCP1 is changed from BACKLOG(5) to BACKLOG(10) and specifies HOST(ANY).	**CHANGED:** TCPIPSERVICE definition EJBTCP1 now specifies MAXPERSIST(NO).	**REMOVED**			

Table 11. Changes to CICS-supplied resource definition groups excluding compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFH$EJB2	**CHANGED:** TCPIPSERVICE definition EJBTCP1 is changed from BACKLOG(5) to BACKLOG(10) and specifies HOST(ANY) and MAXPERSIST(NO).	**CHANGED:** DB2CONN definition DB2CON1 now specifies REUSELIMIT(1000).	**REMOVED**			
DFH$EPAG	**NEW GROUP**	**CHANGED:** TRANSACTION definition EPAT is changed from SHUTDOWN(DISABLED) to SHUTDOWN(ENABLED).				
DFH$EPCM	**CHANGED:** New bundle: EPBUND01					
DFH$EXBS	**CHANGED:** • New MAPSET definitions: DFH0XS1, DFH0XS2, and DFH0XS3 • New programs: DFH0XCMN, DFH0XODE, DFH0XSDS, DFH0XSOD, DFH0XSSM, DFH0XVDS, and DFH0XWOD					
DFH$EXCI						**CHANGED:** New program DFH$AXNS
DFH$EXWS	**CHANGED:** TCPIPSERVICE definition EXMPPORT is changed from BACKLOG(5) to BACKLOG(10) and from URM(NONE) to URM(DFHWBAAX), and specifies HOST(ANY).	**CHANGED:** TCPIPSERVICE definition EXMPPORT now specifies MAXPERSIST(NO).	**CHANGED:** TCPIPSERVICE definition EXMPPORT is changed from BACKLOG(10) to BACKLOG(0). EXMPPORT now specifies IPADDRESS(ANY).	**CHANGED:** The TCPIPSERVICE attribute GRPCRITICAL is obsolete and removed from EXMPPORT.		
DFH$IIOP	**CHANGED:** TCPIPSERVICE definitions IIOPNSSL and IIOPSSL are changed from BACKLOG(5) to BACKLOG(10) and specify HOST(ANY).	**CHANGED:** TCPIPSERVICE definitions IIOPNSSL and IIOPSSL specify MAXPERSIST(NO).	**REMOVED**			
DFH$JVM			**REMOVED**			

Table 11. Changes to CICS-supplied resource definition groups excluding compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFH$NACT						**CHANGED:** File ACCTNAM now specifies RECORDSIZE(80) and KEYLENGTH(18).
DFH$OSGI		**NEW GROUP**		**CHANGED:** • JMVSERVER definition DFH$JVMS is renamed DFHJVMS. • Programs DFJ£JHE1, DFJ£JHE2, DFJ£JPC1, DFJ£JPC2, DFJ£JPC3, DFJ£JPC4, DFJ£JTD1, DFJ£JTSC, DFJ£JTS1 and DFJ£JWB1 are changed to JMVSERVER(DFHJVMS). • Bundle JDBC added (moved from group DFH$WLP).		
DFH$SAML		**NEW GROUP**		**CHANGED:** The HFSFILE attribute for DOCTEMPLATE definition DFH0XSTI is changed.		
DFH$SOT	**CHANGED:** TCPIPSERVICE definitions ECI, HTTPNSSL, and HTTPSSL are changed from BACKLOG(5) to BACKLOG(10) and specify HOST(ANY).	**CHANGED:** TCPIPSERVICE definitions ECI, HTTPNSSL, and HTTPSSL now specify MAXPERSIST(NO).	**CHANGED:** TCPIPSERVICE definitions ECI, HTTPNSSL, and HTTPSSL are changed from BACKLOG(10) to BACKLOG(0); they now specify IPADDRESS(ANY).	**CHANGED:** The TCPIPSERVICE attribute GRPCRITICAL is obsolete and removed from ECI, HTTPNSSL, and HTTPSSL.		
DFH$STAT	**CHANGED:** New programs: DFH0STEP, DFH0STSA, DFH0STTS, and DFH0STWB					

Table 11. Changes to CICS-supplied resource definition groups excluding compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFH$WEB	**CHANGED:** • URIMAP definitions DFH$URI1 and DFH$URI4 now specify PORT(NO). • URIMAP definitions DFH$URI2 and DFH$URI3 now specify AUTHENTICATE(NO) and PORT(NO).	**CHANGED:** URIMAP definitions DFH$URI2 and DFH$URI3 now specify SOCKETCLOSE(0).				
DFH$WEB2	**NEW GROUP**	**CHANGED:** • New bundles: DFH$TSQB and DFH$TSQT • Programs removed: DFH$W2FD, DFH$W2FI, DFH$W2SD, DFH$W2TS and DFH0W2FA				
DFH$WLP			**NEW GROUP**	**CHANGED:** • JVMSERVER definition DFH$WLP is renamed DFHWLP. • Bundle JDBC has moved to group DFH$OSGI.		
DFH$WU	**CHANGED:** • New TCPIPSERVICE definition: DFH$WUTC • New URIMAP definition: DFH$WUUR	**CHANGED:** TCPIPSERVICE definition DFH$WUTC now specifies MAXPERSIST(NO).	**CHANGED:** TCPIPSERVICE definition DFH$WUTC is changed from BACKLOG(10) to BACKLOG(0); it now specifies IPADDRESS(ANY).	**CHANGED:** The TCPIPSERVICE attribute GRPCRITICAL is obsolete and removed from DFH$WUTC.		
DFHADET			**REMOVED**			
DFHADST			**REMOVED**			
DFHDBCTL		**CHANGED:** Programs DFHDBAT and DFHDBUEX are changed from CONCURRENCY(QUASIRENT) to CONCURRENCY(THREADSAFE).		**CHANGED:** File DFHDBFK is changed from LSRPOOLNUM(NONE) to LSRPOOLNUM(1).		
DFHDB2		**CHANGED:** Programs DSNTIAC and DSNTIA1 are changed from CONCURRENCY(QUASIRENT) to CONCURRENCY(THREADSAFE).	**CHANGED:** Program DFHD2EDF is changed from CONCURRENCY(QUASIRENT) to CONCURRENCY(THREADSAFE).		**CHANGED:** Program DFHD2SPS added as part of PACKAGESET support	

Table 11. Changes to CICS-supplied resource definition groups excluding compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHDCTG	**CHANGED:** • New TDQUEUE definitions: CECO, CEPO, CMLO, and CRLO • TDQUEUE definitions removed: CPLD and CPLI		**CHANGED:** New TDQUEUE definitions: CADS and CMPO			
DFHEDF			**CHANGED:** • Program DFHEDFX is changed from CONCURRENCY(QUASIRENT) to CONCURRENCY(THREADSAFE). • Programs DFHEIGDS,DFHEITAB, and DFHSMTAB are changed from DATALOCATION(BELOW) to DATALOCATION(ANY).			**CHANGED:** • New TRANCLASS definition: DFHEDFTO • New transactions: CEDG and CEDY
DFHEDP		**CHANGED:** Program DFHEDP is changed from CONCURRENCY(QUASIRENT) to CONCURRENCY(THREADSAFE).				
DFHEJBU			**REMOVED**			
DFHEP	**NEW GROUP**	**CHANGED:** • New programs: DFHECEAM, DFHECEAS, and DFHECEAT • New transactions: CEPQ and CEPT • Transaction CEPH is changed from DTIMOUT(NO) to DTIMOUT(5).	**CHANGED:** New transaction: CEPS			**CHANGED:** • New program: DFHECEAQ • New transaction: CEPR
DFHFCRL				**NEW GROUP**		
DFHFEPI			**CHANGED:** Program DFHEITSZ is changed from DATALOCATION(BELOW) to DATALOCATION(ANY).			
DFHIIOP			**REMOVED**			
DFHINQUI			**CHANGED:** Program DFHEITBS is changed from DATALOCATION(BELOW) to DATALOCATION(ANY).			

Table 11. Changes to CICS-supplied resource definition groups excluding compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHIPECI			**CHANGED:** Transaction CIEP is changed from TASKDATALOC(BELOW) to TASKDATALOC(ANY) and from PRIORITY(1) to PRIORITY(255).			
DFHISC		**CHANGED:** • Programs DFHCCNV and DFHUCNV are changed from CONCURRENCY(QUASIRENT) to CONCURRENCY(THREADSAFE). • Program DFHMIRS is changed from DATALOCATION(BELOW) to DATALOCATION(ANY) and from CONCURRENCY(QUASIRENT) to CONCURRENCY(THREADSAFE).	**CHANGED:** • Program DFHCHS is changed from DATALOCATION(BELOW) to DATALOCATION(ANY). • Transactions are changed from TASKDATALOC(BELOW) to TASKDATALOC(ANY).			
DFHISCIP	**CHANGED:** • New programs: DFHCIS4, DFHISLQP, DFHISREU, and DFHISRSP • New transactions: CISB, CISM, CISQ, CISU, and CIS4 • Transactions CISC and CISS now specify TASKDATAKEY(CICS) and DTIMOUT(30). • Transactions CISD, CISE, CISR, CIST, and CISX are changed from TASKDATAKEY(USER) to TASKDATAKEY(CICS). • New TSMODEL definition: DFHISLQ	**CHANGED:** • New profile: DFHCICSC • Transactions CISC and CISS are changed from PROFILE(DFHCICST) to PROFILE(DFHCICSC) and from DTIMOUT(30) to DTIMOUT(NO). • TSMODEL definition DFHISLQ now specifies EXPIRYINT(0).	**CHANGED:** • New programs: DFHISPHP and DFHISPRP • New transactions: CISP and CIS1	**CHANGED:** • Transaction CISE is changed from DTIMOUT(NO) to DTIMOUT(5). • The TSMODEL attribute EXPIRYINT is obsolete and removed from DFHISLQ; DFHISLQ now specifies EXPIRYINTMIN(0).		
DFHISCQ			**CHANGED:** Transaction CQPI and CQPO are changed from TASKDATALOC(BELOW) to TASKDATALOC(ANY).			

Table 11. Changes to CICS-supplied resource definition groups excluding compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHJAVA	**CHANGED:** • New programs: DFHSJJI, DFJCICS, DFJCICSB, DFJCZDTC, and DFJDESN • Program removed: DFHSJJML • Transaction removed: CJMJ		**CHANGED:** • Programs removed: DFHDLLOD, DFHEJDNX, DFHJVCVT, DFHSJGC, DFHSJPI, DFJCICS, DFJCICSB, DFJCZDTC, DFJDESN, DFJ1ESN, DFJ1ICS, DFJ1ICSB, DFJ1ZDTC • New program: DFHSJITL and DFHSJTHP • Transactions removed: CJGC and CJPI • New transactions: CJSA and CJSR	**CHANGED:** Program DFHSJTHP are changed from EXECKEY(USER) to EXECKEY(CICS) and from CONCURRENCY(QUASIRENT) to CONCURRENCY(REQUIRED).	**CHANGED:** New transaction: CJSU	
DFHLE						**NEW GROUP**
DFHMISC		**CHANGED:** Program DFHLETRU is changed from API(OPENAPI) to API(CICSAPI).				
DFHMQ			**CHANGED:** • New program: DFHMQBP3 • New transaction; CKBC			
DFHMROFA			**CHANGED:** • Programs DFH$AALL, DFH$ABRW, DFH$ACOM, DFH$AMNU, DFH$AREN and DFH$AREP are changed from DATALOCATION(BELOW) to DATALOCATION(ANY). • Transactions AADD, ABRW, AINQ, AMNU, AORD, AORQ, AREP and AUPD are changed from TASKDATALOC(BELOW) to TASKDATALOC(ANY).			

Table 11. Changes to CICS-supplied resource definition groups excluding compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHMROFD			**CHANGED:** Transactions AADD, ABRW, AINQ, AMNU, AORD, AORQ, AREP and AUPD are changed from TASKDATALOC(BELOW) to TASKDATALOC(ANY).			
DFHMSWIT			**CHANGED:** Transaction CMSG is changed from TASKDATALOC(BELOW) to TASKDATALOC(ANY).			
DFHOPER	**CHANGED:** New programs: DFHCEMNB and DFHCEMNC		**CHANGED:** Transactions CBAM, CEMT, CEOT, CEST, and CETR are changed from TASKDATALOC(BELOW) to TASKDATALOC(ANY).			
DFHPGAIP				**CHANGED:** Programs DFHPGADX, DFHPGAHX, DFHPGALX, and DFHPGAOX are changed from CONCURRENCY(QUASIRENT) to CONCURRENCY(THREADSAFE).		**CHANGED:** The default program for program autoinstall DFHPGAPG is changed from DATALOCATION(BELOW) to DATALOCATION(ANY).
DFHPIPE	**CHANGED:** • New programs: DFHMLBST, DFHWSADH, IXMI38DA, IXMI38D1, IXMI38IN, IXMI38UC, and IXM4C57 • Programs removed: IXMI33DA, IXMI33DI, IXMI33D1, IXMI33IN, IXMI33UC, and IXM4C56 • Program DFHPIVAL are changed from EXECKEY(USER) to EXECKEY(CICS).	**CHANGED:** • New programs: DFHJSON and DFHMLBSJ • Program removed: DFHPIEP	**CHANGED:** Program removed: DFHPIVAL			

Table 11. Changes to CICS-supplied resource definition groups excluding compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHPIVAL			**NEW GROUP**	**CHANGED:** To match the rename of JVMSERVER definition DFH$JVMS to DFHJVMS in group DFH$OSGI, program DFHPIVAL is changed to JVMSERVER(DFHJVMS).		
DFHRL	**NEW GROUP**					
DFHRMI			**CHANGED:** Transaction CRSY is changed from TASKDATALOC(BELOW) to TASKDATALOC(ANY).			
DFHRS	**NEW GROUP**					
DFHSAML		**NEW GROUP**				
DFHSIGN	**CHANGED:** Program DFHSFP is changed from RESIDENT(NO) to RESIDENT(YES).	**CHANGED:** • New MAPSET definition: DFHSNPE • New transaction: CESL	**CHANGED:** Transactions CESF, CESL, and CESN are changed from TASKDATALOC(BELOW) to TASKDATALOC(ANY).		**CHANGED:** Program DFHSFP is changed from RESIDENT(YES) to RESIDENT(NO).	
DFHSPI	**CHANGED:** Programs DFHZCTDX, DFHZDTDX, and DFHZPTDX are changed from STATUS(DISABLED) to STATUS(ENABLED) and from DATALOCATION(BELOW) to DATALOCATION(ANY).					
DFHSTAND	**CHANGED:** • New program: DFHSJITL • New transaction: CJSR		**CHANGED:** • Programs removed: DFHEJITL and DFHSJITL • Transactions CEJR and CJSR are removed • Transactions CSAC and CXCU are changed from TASKDATALOC(BELOW) to TASKDATALOC(ANY)			

Table 11. Changes to CICS-supplied resource definition groups excluding compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHWEB		**CHANGED:** TSMODEL definition DFHWEB now specifies EXPIRYINT(0).		**CHANGED:** The TSMODEL attribute EXPIRYINT is obsolete and removed from DFHWEB; DFHWEB now specifies EXPIRYINTMIN(0).		**CHANGED:** Program removed: DFHWBC00; Program DFHWBUN now specifies CONCURRENCY(THREADSAFE).
DFHWEB2	**NEW GROUP**					
DFHWSAT	**CHANGED:** URIMAP definition DFHRSURI now specifies PORT(NO).					
DFHWU	**NEW GROUP**	**CHANGED:** New program: DFHWUSRT				

Table 12 describes changes to compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS.

Table 12. Changes to compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHCOMPA		**REMOVED**				
DFHCOMPB			**REMOVED**			
DFHCOMPC				**CHANGED:** PIPELINE definitions removed: DFHWSATP and DFHWSATR		
DFHCOMPD	**NEW GROUP**			**CHANGED:** PIPELINE definitions removed: DFHWSATP and DFHWSATR		
DFHCOMPE		**NEW GROUP**		**CHANGED:** PIPELINE definitions removed: DFHWSATP and DFHWSATR		
DFHCOMPF			**NEW GROUP**	**CHANGED:** • PIPELINE definitions removed: DFHWSATP and DFHWSATR • Program removed: DFHPIEP		
DFHCOMPG				**NEW GROUP**		
DFHCOMPH					**NEW GROUP with APAR**	
DFHCOMPI						**NEW GROUP**
DFHCOMP1		**REMOVED**				
DFHCOMP2		**REMOVED**				
DFHCOMP3		**REMOVED**				
DFHCOMP4		**REMOVED**				

Table 12. Changes to compatibility groups DFHCOMPxxx, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHCOMP5		**REMOVED**				
DFHCOMP6		**REMOVED**				
DFHCOMP7		**REMOVED**				
DFHCOMP8		**REMOVED**				
DFHCOMP9	**CHANGED:** TCPIPSERVICE definition DFHADTCP specifies HOST(ANY).	**REMOVED**				

Changes to control tables

This section summarizes the changes to CICS control tables across supported CICS releases. For each CICS release, you must reassemble all tables by using the latest macros, even if there are no changes to the macros. From CICS TS 5.3 onwards CICS checks during initialization that the macro tables it is loading have been reassembled, and if they have not been reassembled, message DFHLD0110 is issued and CICS terminates.

Table 13. Changes to control tables, by release of CICS Transaction Server for z/OS

Table	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHDCT	**CHANGED:** Support for DFHCSDUP MIGRATE command withdrawn		**NO LONGER SUPPLIED**			
DFHMCT	**CHANGED:** Default on COMPRESS option is changed from NO to YES			**CHANGED:** • New performance class data fields added. These fields can be defined on INCLUDE and EXCLUDE on DFHMCT TYPE=RECORD • New COMPRESS option available on DFHMCT TYPE=INITIAL • 1PL link option DPLLIMIT added to DFHMCT TYPE=INITIAL	**CHANGED**: • TSQUEUE option includes information about requests to shared temporary storage queues on Control section—DFHMCT TYPE=INITIAL • Control data recording - DFHMCT TYPE=RECORD allows for the new DFHTEMP fields to count TS queue requests.	
DFHRCT	**CHANGED:** Support for DFHCSDUP MIGRATE command withdrawn					
DFHTCT	**CHANGED:** Support for DFHCSDUP MIGRATE command withdrawn					

Table 13. Changes to control tables, by release of CICS Transaction Server for z/OS (continued)

Table	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHTST	**CHANGED:** Support for DFHCSDUP MIGRATE command withdrawn					
DFHXCOPT						**CHANGED:** • The default for the **CICSSVC** parameter has changed from 0 to 216. • New parameter **LOCALCCSID** • The **TRACE** parameter has a new value of 3 to allow for level 3 tracing.

For information about SIT parameters, see Changes to SIT parameters

Changes to CICS SPI

This section summarizes the changes to system programming interface commands across supported CICS releases.

Table 14. Changes to system programming commands by release of CICS Transaction Server for z/OS

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
COLLECT STATISTICS			**CHANGED:** • For supported resource types and depending on context, statistics can be returned for private resources. • New options: APPLICATION, APPLMAJORVER, APPLMICROVER, APPLMINORVER, and PLATFORM • Options made obsolete: BEAN, CORBASERVER, JVMPOOL, JVMPROFILE, and REQUESTMODEL			
CREATE ATOMSERVICE	**NEW**					
CREATE BUNDLE	**NEW**					
CREATE CORBASERVER			**REMOVED**			
CREATE DJAR			**REMOVED**			

Table 14. Changes to system programming commands by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
CREATE FILE		**CHANGED:** • Option made obsolete: LSRPOOLID • New option: LSRPOOLNUM				
CREATE IPCONN				**CHANGED:** • New option: HA		
CREATE JVMSERVER	**NEW**					
CREATE LIBRARY						
CREATE LSRPOOL		**CHANGED:** • Option made obsolete: LSRPOOLID • New option: LSRPOOLNUM				
CREATE MQCONN	**NEW**	**CHANGED:** • New value: GROUPRESYNC on RESYNCMEMBER option				
CREATE MQMONITOR						**NEW**
CREATE PIPELINE						
CREATE PROGRAM		**CHANGED:** • New option: CONCURRENCY • New value: REQUIRED on CONCURRENCY option				
CREATE REQUESTMODEL			**REMOVED**			
CREATE TCPIPSERVICE	**CHANGED:** HOST replaces IPADDRESS option	**CHANGED:** • New option: MAXPERSIST		**CHANGED:** • New option: SPECIFICTCPS • Options made obsolete: DNSGROUP and GRPCRITICAL		
CREATE TSMODEL		**CHANGED:** • New option: EXPIRYINT		**CHANGED:** • New option: EXPIRYINTMIN		
CREATE URIMAP		**CHANGED:** • New option: SOCKETCLOSE				
CSD ADD	**NEW**					
CSD ALTER	**NEW**					
CSD APPEND/xref>	**NEW**					
CSD COPY	**NEW**					
CSD DEFINE	**NEW**					
CSD DELETE	**NEW**					
CSD DISCONNECT	**NEW**					
CSD ENDBRGROUP	**NEW**					
CSD ENDBRLIST	**NEW**					
CSD ENDBRRSRCE	**NEW**					

Table 14. Changes to system programming commands by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
CSD GETNEXTGROUP	**NEW**					
CSD GETNEXTGROUP	**NEW**					
CSD GETNEXTRSRCE	**NEW**					
CSD INQUIREGROUP	**NEW**					
CSD INQUIRELIST	**NEW**					
CSD INQUIRERSRCE	**NEW**					
CSD INSTALL	**NEW**		**CHANGED:** • Options made obsolete: CORBASERVER, DJAR, and REQUESTMODEL			
CSD LOCK	**NEW**					
CSD REMOVE	**NEW**					
CSD RENAME	**NEW**					
CSD STARTBRGROUP	**NEW**					
CSD STARTBRLIST	**NEW**					
CSD STARTBRRSRCE	**NEW**					
CSD UNLOCK	**NEW**					
CSD USERDEFINE	**NEW**					
DISCARD ATOMSERVICE	**NEW**					
DISCARD BUNDLE	**NEW**					
DISCARD CORBASERVER			**REMOVED**			
DISCARD DJAR			**REMOVED**			
DISCARD ENQMODEL					**THREADSAFE**	
DISCARD IPCONN	**NEW**					
DISCARD EVENTBINDING	**NEW**					
DISCARD JOURNALMODEL					**THREADSAFE**	
DISCARD JOURNALNAME					**THREADSAFE**	
DISCARD JVMSERVER	**NEW**					
DISCARD LIBRARY	**NEW**					
DISCARD MQCONN	**NEW**					
DISCARD MQMONITOR						**NEW**
DISCARD PROGRAM				**THREADSAFE**		
DISCARD REQUESTMODEL			**REMOVED**			
DISCARD TCPIPSERVICE					**THREADSAFE**	
DISCARD TDQUEUE					**THREADSAFE**	
DISCARD TRANCLASS					**THREADSAFE**	
DISCARD TRANSACTION				**THREADSAFE**		
DISCARD TSMODEL					**THREADSAFE**	

Table 14. Changes to system programming commands by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
ENABLE PROGRAM command			**CHANGED:** • Change of impact of option OPENAPI • New options: GALOCATION and REQUIRED			
EXTRACT STATISTICS			**CHANGED:** • New options: APPLICATION, APPLMAJORVER, APPLMICROVER, APPLMINORVER, AVAILSTATUS, PLATFORM • For supported resource types and depending on context, statistics can be returned for private resources. **THREADSAFE**			**CHANGED:** New options: ASYNCSERVICE, LASTRESETABS and MQMONITOR
INQUIRE ASSOCIATION	**CHANGED:** • New options: CLIENTLOC, SRVRIPFAMILY replaces IPFAMILY for new programs, CLNTIPFAMILY, DNAME, and REALM	**CHANGED:** • New options: ODADPTRID, ODADPTRDATA1, ODADPTRDATA2, ODADPTRDATA3, PHAPPLID, PHCOUNT, PHNETWORKID, PHSTARTTIME, PHTASKID, PHTRANSID		**CHANGED:** • New options: ACAPPLNAME, ACMAJORVER, ACMICROVER, ACMINORVER, ACOPERNAME, ACPLATNAME		**CHANGED:** • New options: PTCOUNT, PTSTARTTIME, PTTASKID, PTTRANSID
INQUIRE ASSOCIATION LIST	**CHANGED:** • New options: DNAME, REALM, DNAMELEN, and REALMLEN					
INQUIRE ATOMSERVICE	**NEW**	**CHANGED:** • New options: URIMAP and XMLTRANSFORM				
INQUIRE BEAN			**REMOVED**			
INQUIRE BUNDLE	**NEW**		**CHANGED:** • New options: BUNDLEID, MGMTPART, MAJORVERSION, MICROVERSION, MINORVERSION	**CHANGED:** • New option: AVAILSTATUS		
INQUIRE BUNDLEPART	**NEW**		**CHANGED:** • New value on PARTCLASS option: ENTRYPOINT	**CHANGED:** • New option: AVAILSTATUS		
INQUIRE CAPDATAPRED		**NEW**				
INQUIRE CAPINFOSRCE		**NEW**				

Table 14. Changes to system programming commands by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
INQUIRE CAPOPTRED		**NEW**				
INQUIRE CAPTURESPEC	**NEW**	**CHANGED:** • New options: CURRPGM. CURRPGMOP, CURRTRANID, CURRTRANIDOP, CURRUSERID, CURRUSERIDOP, NUMDATAPRED, NUMINFOSRCE, NUMOPTPRED, PRIMPRED, PRIMPREDOP, PRIMPREDTYPE	**CHANGED:** • New value on PRIMPREDTYPE option: MESSAGEID			
INQUIRE CLASSCACHE		**THREADSAFE**	**REMOVED**			
INQUIRE CORBASERVER			**REMOVED**			
INQUIRE DB2CONN		**CHANGED:** • Newoption: REUSELIMIT				
INQUIRE DISPATCHER	**CHANGED:** • New options: ACTTHRDTCBS and MAXTHRDTCBS	**CHANGED:** • Change of impact of options: MAXOPENTCBS and MAXXPTCBS now represent limits set automatically by CICS		**CHANGED:** Options made obsolete: ACTJVMTCBS and MAXJVMTCBS **THREADSAFE**		
INQUIRE DJAR			**REMOVED**			
INQUIRE DOCTEMPLATE			**CHANGED:** • New option: CACHESIZE			
INQUIRE DSNAME			**CHANGED:** • New option: LOGREPSTATUS			**CHANGED:** New CVDA, RREPL on AVAILABILITY option
INQUIRE EPADAPTER		**NEW**	**CHANGED with APAR PI55133:** New CVDA, DSIE on DATAFORMAT option.	**CHANGED with APAR PI55133:** New CVDA, DSIE on DATAFORMAT option.	**CHANGED with APAR PI55134:** New CVDA, DSIE on DATAFORMAT option.	**CHANGED:** New CVDA, DSIE on DATAFORMAT option. New CVDA, TDQUEUE on ADAPTERTYPE option.
INQUIRE EPADAPTERSET			**NEW**			
INQUIRE EPADAPTINSET			**NEW**			
INQUIRE ENQMODEL					**THREADSAFE**	
INQUIRE EVENTBINDING	**NEW**	**CHANGED:** • New option: EPADAPTER	**CHANGED:** • New options: EPADAPTERRES and EPADAPTERSET			
INQUIRE EVENTPROCESS	**NEW**	**CHANGED:** • New option: SCHEMALEVEL				

Table 14. Changes to system programming commands by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
INQUIRE EXITPROGRAM			**CHANGED:** • New value: REQUIRED on CONCURRENTST option			
INQUIRE FILE		**CHANGED:** • New options: LSRPOOLNUM • Option made obsolete: LSRPOOLID				
INQUIRE IPCONN	**CHANGED:** • New options: CLIENTLOC, PARTNER, IDPROP, HOSTTYPE, IPRESOLVED, IPFAMILY • New values on HOST option	**CHANGED:** • New option: MIRRORLIFE		**CHANGED:** • New option: HA	**CHANGED**: the value in the PARTNER option on the INQUIRE IPCONN command is affected by the new system initialization parameter, HTTPUSRAGENTHDR.	
INQUIRE IRC						
INQUIRE JOURNALMODEL					**THREADSAFE**	
INQUIRE JOURNALNAME					**THREADSAFE**	
INQUIRE JVM		**THREADSAFE**	**REMOVED**			
INQUIRE JVMPOOL		**THREADSAFE**	**REMOVED**			
INQUIRE JVMPROFILE		**THREADSAFE**	**REMOVED**			
INQUIRE JVMSERVER	**NEW**	**CHANGED:** • New options: CURRENTHEAP, GCPOLICY, INITHEAP, MAXHEAP, OCCUPANCY, PID	**CHANGED:** • New option: PROFILEDIR			
INQUIRE LIBRARY				**CHANGED:** • New options: APPLICATION, APPLMAJORVER, APPLMICROVER, APPLMINORVER, AVAILSTATUS, PLATFORM		
INQUIRE MONITOR	**CHANGED:** • New options: DPLLIMIT, IDNTYCLASS • Change of default on COMPRESSST option to COMPRESS			**THREADSAFE**		
INQUIRE MQCONN	**NEW**	**CHANGED:** • New value: GROUPRESYNC on RESYNCMEMBER option				
INQUIRE MQMONITOR						**NEW**

Table 14. Changes to system programming commands by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
INQUIRE MQINI	**NEW**					
INQUIRE MVSTCB				**THREADSAFE**		
INQUIRE NETNAME						
INQUIRE OSGIBUNDLE		**NEW**				
INQUIRE OSGISERVICE		**NEW**				
INQUIRE PIPELINE				**CHANGED:** • New option: MSGFORMAT		
INQUIRE PROGRAM		**CHANGED:** • New option: JVMSERVER • New value:REQUIRED on CONCURRENCY option	**CHANGED:** • New option: ENTRYPOINT ENTRYPOINT changed to support non-LE 64-bit assembler programs	**CHANGED:** • New options: RESIDENCY, APPLICATION, APPLMAJORVER, APPLMICROVER, APPLMINORVER, PLATFORM **THREADSAFE**		**CHANGED:** New option REPLICATION and new CVDA value, DYNAMIC on CHANGEAGENT and INSTALLAGENT
INQUIRE REQID					**CHANGED:** INTERVAL and TIME options are no longer mutually exclusive.	
INQUIRE REQUESTMODEL			**REMOVED**			
INQUIRE RRMS					**THREADSAFE**	
INQUIRE STATISTICS				**THREADSAFE**		
INQUIRE STORAGE					**THREADSAFE**	
INQUIRE STREAMNAME					**THREADSAFE**	
INQUIRE SUBPOOL					**THREADSAFE**	
INQUIRE SYSDUMPCODE						**CHANGED:** • New options: DSPLIST and JOBLIST
INQUIRE SYSTEM			**CHANGED:** • New options: ETDSASIZE, GCDSASIZE, GSDSASIZE, GUDSASIZE	**CHANGED:** • New options: MESSAGECASE, MVSSMFID, MVSSYSNAME **THREADSAFE**	**CHANGED:** • New value on CICSTSLEVEL to reflect latest version, release, or modification number. New value on RELEASE to reflect latest level of CICS code.	**CHANGED:** • New option: REGIONUSERID
INQUIRE TASK					**THREADSAFE**	
INQUIRE TASK LIST					**THREADSAFE**	
INQUIRE TCLASS					**THREADSAFE**	
INQUIRE TCPIP					**THREADSAFE**	

Table 14. Changes to system programming commands by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
INQUIRE TCPIPSERVICE	**CHANGED:** • New options: HOST, HOSTTYPE, IPRESOLVED, IPFAMILY	**CHANGED:** • New options: MAXPERSIST		**CHANGED:** • New options: GENERICTCPS, SPECIFICCPS • New values: BUNDLE on INSTALLAGENT • Options made obsolete: DNSGROUP, DNSSTATUS, and GRPCRITICAL	**THREADSAFE**	
INQUIRE TDQUEUE					**THREADSAFE**	
INQUIRE TEMPSTORAGE		**NEW**				
INQUIRE TERMINAL	**CHANGED:** • New option: REMOTESYSTEM					
INQUIRE TRACEDEST			**THREADSAFE**			
INQUIRE TRACEFLAG			**THREADSAFE**			
INQUIRE TRACETYPE	**CHANGED:** • New option: FLAGSET		**THREADSAFE**			
INQUIRE TRANCLASS					**THREADSAFE**	
INQUIRE TRANSACTION	**CHANGED:** • New option: REMOTESYSTEM			**THREADSAFE**	**CHANGED:** • New options: APPLICATION, APPLMAJORVER, APPLMICROVER, APPLMINORVER, AVAILSTATUS, OPERATION, PLATFORM	
INQUIRE TSMODEL		**CHANGED:** • New option: EXPIRYINT		**CHANGED:** • New option: EXPIRYINTMIN	**THREADSAFE**	
INQUIRE TSPOOL					**THREADSAFE**	
INQUIRE TSQUEUE		**CHANGED:** • New option: EXPIRYINT		**CHANGED:** • New option: EXPIRYINTMIN	**THREADSAFE**	
INQUIRE UOW					**THREADSAFE**	
INQUIRE UOWENQ					**THREADSAFE**	
INQUIRE UOWLINK				**CHANGED:** • New option: PORT		
INQUIRE URIMAP	**CHANGED:** • New options: AUTHENTICATE, ATOMSERVICE, HOSTTYPE, IPRESOLVED, IPFAMILY, PORT • New value: on HOST option	**CHANGED:** • New options: SOCKETCLOSE and SOCKPOOLSIZE	**CHANGED:** • New value: JVMSERVER on USAGE option	**CHANGED:** • New options: APPLICATION, APPLMAJORVER, APPLMICROVER, APPLMINORVER, AVAILSTATUS, OPERATION, PLATFORM		
INQUIRE VTAM	**CHANGED:** • New option: PSTYPE					

Table 14. Changes to system programming commands by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
INQUIRE WEB					**THREADSAFE**	
INQUIRE WEBSERVICE		**CHANGED:** • New option: ARCHIVEFILE		**CHANGED:** • New values: DISABLED, DISABLING on STATE option		**CHANGED:** MAPPINGLEVEL and MINRUNLEVEL now accept 4.1
INQUIRE WLMHEALTH						**NEW**
INQUIRE WLPSERVICE						**REMOVED**
INQUIRE WORKREQUEST			**REMOVED**			
INQUIRE XMLTRANSFORM	**NEW**					
PERFORM CLASSCACHE		**THREADSAFE**	**REMOVED**			
PERFORM CORBASERVER			**REMOVED**			
PERFORM DJAR			**REMOVED**			
PERFORM JVMPOOL		**THREADSAFE**	**REMOVED**			
PERFORM SECURITY					**THREADSAFE**	
PERFORM SHUTDOWN						**CHANGED:** • New option: RESTART
PERFORM SSL			**NEW**		**THREADSAFE**	
PERFORM STATISTICS			**CHANGED:** • Options made obsolete: BEAN, CORBASERVER, JVMPOOL, JVMPROFILE, and REQUESTMODEL	**CHANGED:** New DSECTs supplied to format status information for private program, program definition, JVM program, or library resource types.	**OBSOLETE**: the options BEAN, CORBASERVER, JVMPOOL, JVMPROFILE, and REQUESTMODEL are obsolete.	**CHANGED:** New options: ASYNCSERVICE and MQMONITOR
RESYNC ENTRYNAME		**THREADSAFE**				
SET ATOMSERVICE	**NEW**					
SET BUNDLE	**NEW**			**CHANGED:**	**CHANGED:** • New option: AVAILSTATUS	**CHANGED:** • New option: COPY, PHASEIN
SET CLASSCACHE		**THREADSAFE**	**REMOVED**			
SET CORBASERVER			**REMOVED**			
SET DB2CONN		**CHANGED:** • New option: REUSELIMIT				
SET DISPATCHER			**CHANGED:** • Option made obsolete: MAXJVMTCBS	**THREADSAFE**	**CHANGED:** Options made obsolete: ACTJVMTCBS and MAXJVMTCBS	**CHANGED:** RUNAWAY option accepts a new, lower limit of 250
SET DOCTEMPLATE						
SET DSNAME						**CHANGED:** New CVDA, RREPL on AVAILABILITY option
SET ENQMODEL					**THREADSAFE**	
SET EPADAPTER		**NEW**				
SET EPADAPTERSET			**NEW**			

Table 14. Changes to system programming commands by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
SET EVENTBINDING	**NEW**					
SET EVENTPROCESS	**NEW**					
SET FILE		**CHANGED:** • Option made obsolete: LSRPOOLID • New option: LSRPOOLNUM		**CHANGED:** • Change of impact: to change the status of a FILE resource that is defined and installed in a CICS bundle, change the status of the CICS bundle or application with which it is deployed.		
SET JOURNALNAME					**THREADSAFE**	
SET JVMPOOL		**THREADSAFE**	**REMOVED**			
SET JVMSERVER	**NEW**			**CHANGED:** • Change of impact: to change the status of a FILE resource that is defined and installed in a CICS bundle, change the status of the CICS bundle or application with which it is deployed.		
SET MONITOR	**CHANGED:** • New options: DPLLIMIT, FILELIMIT, IDNTYCLASS, and TSQUEUELIMIT		**THREADSAFE**			
SET MQCONN	**NEW**	**CHANGED:** • New value: GROUPRESYNC on RESYNCMEMBER option				
SET MQMONITOR						**NEW**
SET PROGRAM			**CHANGED:** • New option: OPERATION	**THREADSAFE**		**CHANGED:** New option REPLICATION
SET STATISTICS			**CHANGED:** Default changed on INTERVAL option to 010000 (1 hour)	**THREADSAFE**		
SET SYSDUMPCODE						**CHANGED:** • New options: DSPLIST and JOBLIST

Table 14. Changes to system programming commands by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
SET SYSTEM			**CHANGED:** • Change of value: maximum value on MAXTASKS option to 2000 and minimum to 10	**THREADSAFE**		**CHANGED:** RUNAWAY option accepts a new, lower limit of 250
SET TASK			**THREADSAFE**			
SET TCLASS					**THREADSAFE**	
SET TCPIP					**THREADSAFE**	
SET TCPIPSERVICE				**CHANGED:** • Option made obsolete: DNSSTATUS • Change of impact: to change the status of a FILE resource that is defined and installed in a CICS bundle, change the status of the CICS bundle or application with which it is deployed.	**THREADSAFE**	
SET TEMPSTORAGE		**NEW**				
SET TDQUEUE					**THREADSAFE**	
SET TRACEDEST			**THREADSAFE**			
SET TRACEFLAG			**THREADSAFE**			
SET TRACETYPE	**CHANGED:** • New option: FLAGSET		**THREADSAFE**			
SET TRANCLASS					**THREADSAFE**	
SET TRANSACTION				**THREADSAFE**		**CHANGED:** RUNAWAY option accepts a new, lower limit of 250
SET TSQUEUE					**THREADSAFE**	
SET UOW					**THREADSAFE**	
SET VTAM	**CHANGED:** • Change of impact: does not allow change to PSDINTERVAL, PSDINTHRS, PSDINTMINS, and PSDINTSECS to nonzero when parameter NOPS in effect					
SET WEB					**THREADSAFE**	
SET WLMHEALTH						**NEW**
SET WORKREQUEST			**REMOVED**			
SET XMLTRANSFORM	**NEW**					

Changes to CICS-supplied transactions

This section summarizes the changes to the CICS-supplied transactions across supported CICS releases.

For information about the changes to the CICS master terminal transaction CEMT, see "Changes to CEMT."

Table 15. Changes to CICS-supplied transactions by release of CICS Transaction Server for z/OS. Transactions without a link either have no operator interface or have been removed. The program and CSD group, and security category for these transactions are shown in List of CICS transactions.

Transaction	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
CEDG						**NEW**
CEDY						**NEW**
CEPD	**NEW**					
CEPF		**NEW**				
CEPH	**NEW**					
CEPM	**NEW**					
CEPQ	**NEW**					
CEPS			**NEW**			
CEPT	**NEW**					
CESL		**NEW**				
CFCR				**NEW**		
CHCK						
CIRP		**REMOVED**				
CIRR		**REMOVED**				
CJGC	**REMOVED**					
CJGC		**REMOVED**				
CJPI		**REMOVED**				
CJSA			**NEW**			
CJSU					**NEW**	
CKBC			**NEW**			
CMPE						
CREA		**REMOVED**				
CREC		**REMOVED**				
CWWU	**NEW**					
CW2A	**NEW**					

Changes to CEMT

This section summarizes the changes to the CICS master terminal transaction, CEMT, across supported CICS releases. Use this information to plan the impact of upgrading from one release to another.

For information about changes to other transactions, see "Changes to CICS-supplied transactions."

Table 16. Changes to CEMT by release of CICS Transaction Server for z/OS

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
All CEMT			**CHANGED:** Change of storage location			

Table 16. Changes to CEMT by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
CEMT DISCARD commands	**CHANGED:** New commands: CEMT DISCARD ATOMSERVICE, CEMT DISCARD BUNDLE, CEMT DISCARD JVMSERVER, CEMT DISCARD MQCONN		**CHANGED:** Commands removed: CEMT DISCARD CORBASERVER, CEMT DISCARD DJAR, CEMT DISCARD REQUESTMODEL			**NEW:** New command: CEMT DISCARD MQMONITOR
All CEMT INQUIRE	**CHANGED:** Change of layout					
CEMT INQUIRE ATOMSERVICE	**NEW**	**CHANGED:** New options: URIMAP, XMLTRANSFORM				
CEMT INQUIRE BEAN			**REMOVED**			
CEMT INQUIRE BUNDLE	**NEW**		**CHANGED:** New options: BUNDLEID, MAJORVERSION, MICROVERSION, MINORVERSION	**CHANGED:** New option: AVAILSTATUS		
CEMT INQUIRE CLASSCACHE	**CHANGED:** PROFILE option made obsolete		**REMOVED**			
CEMT INQUIRE CORBASERVER	**CHANGED:** • New values: IPv6 addresses on HOST option • New option: IPRESOLVED		**REMOVED**			
CEMT INQUIRE DISPATCHER	**CHANGED:** New options: ACTTHRDTCBS and MAXTHRDTCBS		**CHANGED:** Change of impact: MAXOPENTCBS and MAXXPTCBS	**CHANGED:** • Options made obsolete: ACTJVMTCBS, MAXJVMTCBS • You can now set the options for MAXOPENTCBS and MAXXPTCBS.		
CEMT INQUIRE DOCTEMPLATE						
CEMT INQUIRE DSAS			**CHANGED:** New values: ETDSASIZE, GCDSASIZE, GSDSASIZE, GUDSASIZE			
CEMT INQUIRE DSNAME			**CHANGED:** New option: LOGREPSTATUS			**CHANGED:** New option RREPL
CEMT INQUIRE EPADAPTER		**NEW**	**CHANGED with APAR PI55133:** Support added for the new DSIE XML format.	**CHANGED with APAR PI55133:** Support added for the new DSIE XML format.	**CHANGED with APAR PI55134:** Support added for the new DSIE XML format.	**CHANGED:** Support added for the new DSIE XML format.
CEMT INQUIRE EPADAPTERSET			**NEW**			

Table 16. Changes to CEMT by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
CEMT INQUIRE EVENTBINDING	**NEW**	**CHANGED:** New option: EPADAPTER	**CHANGED:** New options: EPADAPTERRES and EPADAPTERSET			
CEMT INQUIRE EVENTPROCESS	**NEW**	**CHANGED:** New option: SCHEMALEVEL				
CEMT INQUIRE FILE						
CEMT INQUIRE IPCONN	**CHANGED:** New options: IPRESOLVED, IDPROP	**CHANGED:** New options: MIRRORLIFE				
CEMT INQUIRE IRC						
CEMT INQUIRE JVM			**REMOVED**			
CEMT INQUIRE JVMPOOL			**REMOVED**			
CEMT INQUIRE JVMPROFILE			**REMOVED**			
CEMT INQUIRE JVMSERVER	**NEW**	**CHANGED:** New options: CURRENTHEAP, GCPOLICY, INITHEAP, MAXHEAP, OCCUPANCY, PID	**CHANGED:** New option: PROFILEDIR	**CHANGED:** Change of impact of PROFILEDIR		
CEMT INQUIRE LIBRARY						
CEMT INQUIRE MONITOR	**CHANGED:** New options: DPLLIMIT, IDNTYCLASS					
CEMT INQUIRE MQCONN	**NEW**	**CHANGED:** New value: GROUPRESYNC on RESYNCMEMBER option				
CEMT INQUIRE MQINI	**NEW**					**REMOVED** Replaced by CEMT INQUIRE MQMONITOR
CEMT INQUIRE MQMONITOR						**NEW**
CEMT INQUIRE PIPELINE						
CEMT INQUIRE PROGRAM		**CHANGED:** New option: JVMSERVER New value: OREQUIRED on CONCURRENCY option	**CHANGED:** New options: APPLICATION, APPLMAJORVER, APPLMICROVER, APPLMINORVER, OPERATION, and PLATFORM	**CHANGED:** New option: RESIDENCY		
CEMT INQUIRE REQUESTMODEL			**REMOVED**			
CEMT INQUIRE SYDUMPCODE						**CHANGED:** New options: DSPLIST and JOBLIST
CEMT INQUIRE SYSTEM	**CHANGED:** New option: MQCONN					**CHANGED:** New option: REGIONUSERID

Table 16. Changes to CEMT by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
CEMT INQUIRE TCPIPSERVICE	**CHANGED:** • New value: IPv6 addresses on HOST option • New option: IPRESOLVED	**CHANGED:** New option: MAXPERSIST				
CEMT INQUIRE TEMPSTORAGE		**NEW**				
CEMT INQUIRE TERMINAL	**CHANGED:** Change of impact: REMOTESYSTEM option					
CEMT INQUIRE TRANSACTION	**CHANGED:** Change of impact of REMOTESYSTEM option				**CHANGED:** New options: APPLICATION, APPLMAJORVER, APPLMICROVER, APPLMINORVER, AVAILSTATUS, OPERATION, PLATFORM	
CEMT INQUIRE TSMODEL				**CHANGED:** Option made obsolete: EXPIRYINT New option: EXPIRYINTMIN (replacing EXPIRYINT)		
CEMT INQUIRE TSQNAME				**CHANGED:** Option made obsolete: EXPIRYINT New option: EXPIRYINTMIN (replacing EXPIRYINT)		
CEMT INQUIRE TSQNAME				**CHANGED:** Option made obsolete: EXPIRYINT New option: EXPIRYINTMIN (replacing EXPIRYINT)		
CEMT INQUIRE URIMAP	**CHANGED:** New options: AUTHENTICATE, ATOMSERVICE, IPRESOLVED, PORT New values: IPv6 on HOST option, ATOM on USAGE option	**CHANGED:** New options: SOCKETCLOSE and SOCKPOOLSIZE	**CHANGED:** New value: JVMSERVER on USAGE option	**CHANGED:** New options: APPLICATION, APPLMAJORVER, APPLMICROVER, APPLMINORVER, AVAILSTATUS, OPERATION, PLATFORM		
CEMT INQUIRE VTAM	**CHANGED:** New option: PSTYPE					
CEMT INQUIRE WEBSERVICE		**CHANGED:** New option: ARCHIVEFILE		**CHANGED:** New values: DISABLING and DISABLED on STATE option		
CEMT INQUIRE WLMHEALTH						**NEW**

Table 16. Changes to CEMT by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
CEMT INQUIRE DISPATCHER	**NEW**					
CEMT PERFORM CLASSCACHE			**REMOVED**			
CEMT PERFORM DUMP				**CHANGED:** New option: DUMPCODE		
CEMT PERFORM JVMPOOL			**REMOVED**			
CEMT PERFORM SHUTDOWN						**CHANGED:** New option: RESTART
CEMT PERFORM SSL			**NEW**			
CEMT PERFORM STATISTICS			**CHANGED:** Options made obsolete: BEAN, CORBASERVER, JVMPOOL, JVMPROFILE, and REQUESTMODEL			**CHANGED:** New options: MQMONITOR and ASYNCSERVICE
	NEW					
CEMT SET BUNDLE	**NEW**			**CHANGED:** New options: AVAILABLE and UNAVAILABLE	**CHANGED:** New option: PHASEIN	
CEMT SET CLASSCACHE			**REMOVED**			
CEMT SET DISPATCHER			**CHANGED:** Option made obsolete: MAXJVMTCBS			
CEMT SET DOCTEMPLATE						
CEMT SET DISPTACHER						**CHANGED:** RUNAWAY option accepts a new, lower limit of 250
CEMT SET DSNAME						**CHANGED:** New option RREPL
CEMT SET EPADAPTER		**NEW**				
CEMT SET EPADAPTERSET			**NEW**			
CEMT SET EVENTBINDING	**NEW**					
CEMT SET EVENTPROCESSING	**NEW**					
CEMT SET IPCONN						
CEMT SET JVMPOOL			**REMOVED**			
CEMT SET JVMSERVER	**NEW**					
CEMT SET MONITOR	**CHANGED:** New options: DPLLIMIT FILELIMIT, IDNTYCLASS, and TSQUEUELIMIT					
CEMT SET MQCONN	**NEW**	**CHANGED:** New value: GROUPRESYNC on RESYNCMEMBER option				

Table 16. Changes to CEMT by release of CICS Transaction Server for z/OS (continued)

Command	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
CEMT SET MQMONITOR						**NEW**
CEMT SET PIPELINE						
CEMT SET PROGRAM			**CHANGED:** New option: OPERATION			
CEMT SET STATISTICS			**CHANGED:** Change of default value: INTERVAL option			
CEMT SET SYDUMPCODE						**CHANGED:** New options: DSPLIST and JOBLIST
CEMT SET SYSTEM			**CHANGED:** Change of value: maximum value of MAXTASKS option			**CHANGED:** RUNAWAY option accepts a new, lower limit of 250
CEMT SET TEMPSTORAGE		**NEW**				
CEMT SET TSQUEUE						
CEMT SET WLMHEALTH						**NEW**
CEMT SET XMLTRANSFORM	**NEW**					

Changes to CICS monitoring

This section summarizes the changes to monitoring across supported CICS releases. It includes changes to performance class data, exception class data, transaction class data, identity class data, MCT and DFH$MOLS. Use this information to plan the impact of upgrading from one release to another.

Table 17. Changes to performance class data, by release of CICS Transaction Server for z/OS

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
All						
DFHCHNL			**CHANGED:** Fields changed to include data from the new GET64 CONTAINER and PUT64 CONTAINER commands: PGGETCCT, PGPUTCCT, PGGETCDL, PGPUTCDL, PGCRECCT			

Table 17. Changes to performance class data, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHCICS	**NEW:** New fields: EICTOTCT, TIASKTCT, TIOTCT, BFTOTCT, ECSIGECT, ECEFOPCT, ECEVNTCT, OCLIPADR,	**NEW:** New fields: OADID, OADATA1, OADATA2, OADATA3, PHNTWKID, PHAPPLID, PHSTART, PHTRANNO, PHTRAN, PHCOUNT, ECSEVCCT, NCGETCT	**NEW:** New field: MPPRTXCD		**NEW**: new field, NCGETCT, to count the number of EXEC CICS GET COUNTER and GET DCOUNTER requests issued by a task.	**NEW:** New fields: MPSRACT, MPSRECT, PTCOUNT, PTSTARTTIME, PTTASKID, PTTRANSID **CHANGED:**OTRANFLG field has new transaction origin type for asynchronous transactions: X'16' ASRUNTRAN
DFHDATA		**CHANGED:** • New fields: WMQASRBT	**CHANGED:** • Field DB2WAIT is obsolete			
DFHDEST			**NEW:** New fields: TDILWTT and TDELWTT			
DFHEJBS			**REMOVED**			
DFHFILE			**NEW:** New fields: FCXCWTT and FCVSWTT			
DFHPROG	**CHANGED:** PGMNAME now contains the target application program name					**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
DFHSOCK	**CHANGED:** • CLIPADDR 318: replaces field 244.	**NEW:** • New fields: ISALWTT, SOCIPHER				
DFHSTOR			**NEW:** New fields: SC64CGCT, SC64CHWM, SC64UGCT, SC64UHWM, SC64SGCT, SC64GSHR, SC64FSHR			

Table 17. Changes to performance class data, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHTASK	**CHANGED:** • New TCB modes TP and T8 are added for USRDISPT, MSDISPT, MSCPUT • New TCB mode TP only is added to KY8DISPT, KY8CPUT • New values in bytes 4 TRANFLAG field (4.1 and 3.2), new value in byte 5 (4.1), bit 3 added to byte 2 (3.2). EXCMNTRF changed to match (3.2) • New fields: MAXTTDLY, T8CPUT, JVMTHDWT	**CHANGED:** • New TP MODES are added for TUSRCPUT, DSTCBHWM, MSDISPT, MSCPUT	**CHANGED:** New Fields: ROMODDLY, SOMODDLY, CECMCHTP, CECMDLID, MAXTASKS, CURTASKS, CPUTONCP, OFFLCPUT, ACAPPLNM, ACPLATNM, ACMAJVER, ACMINVER, ACMICVER, ACOPERNM		**NEW**: New field 429, DSAPTHWT, for the dispatcher to allocate pthread wait time. **CHANGED:** JVMTHDWT no longer applies for Liberty.	**NEW:**New fields: ASTOTCT, ASRUNCT, ASFTCHCT, ASFREECT, SFTCHWT, ASRNATWT, and LPARNAME **CHANGED:**TRANFLAG field has new transaction origin type for asynchronous transactions: X'16' Asynchronous services domain (AS)-run transaction
DFHTEMP					**CHANGED:** New fields: TSGETSCT, TSPUTSCT TSTOTCT includes the count for the new TSGETSCT and TSPUTSCT fields.	
DFHTERM			**NEW:** New field: TCALWTT			

Table 17. Changes to performance class data, by release of CICS Transaction Server for z/OS (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHWEBB	**CHANGED:** • Number of QUERYPARM requests issued by the user task is added to the count for WBREADCT (read) and WBTOTWCT (read), and WBBRWCT (browse) • Number of EXEC CICS INVOKE SERVICE requests that are issued by the user task is added to the count for WBIWBSCT • New fields: WBURIMNM, WBPIPLNM, WBATMSNM, WBSVCENM, WBSVOPNM, WBPROGNM, WBSFCRCT, WBSFTOCT, WBISSFCT, WBSREQBL, WBSRSPBL, MLXSSTDL, MLXMLTCT, WSACBLCT, WSACGTCT, WSAEPCCT, WSATOTCT					

Table 18. Changes to exception class data, by release of CICS Transaction Server for z/OS

	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
EXCMNRID			**CHANGED:** New values: GUDSA, GSDSA, rule_id			
EXCMNTRF						
XCMNTYP			**CHANGED:** New value: X'0004			

Table 19. Changes to transaction resource class data, by release of CICS Transaction Server for z/OS.

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
All TS queues					**CHANGED:** The length of the transaction resource record is extended by 120 bytes	
MNR_ID_TRNGRPID		**NEW**				
MNR_PHD_APPLID		**NEW**				
MNR_PHD_ATTACH_TIME		**NEW**				
MNR_PHD_COUNT		**NEW**				
MNR_PHD_NETWKID		**NEW**				

Table 19. Changes to transaction resource class data, by release of CICS Transaction Server for z/OS. (continued)

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
MNR_PHD_TRANNUM		**NEW**				
MNR_PHD_TRANID		**NEW**				
MNR_PTD_ATTACH_TIME						**NEW**
MNR_PTD_TRANNUM						**NEW**
MNR_PTD_TRANID						**NEW**
MNR_PTD_COUNT						**NEW**
MNR_TSQUEUE_PUT					**CHANGED** No longer counts the number of GET and PUT requests to a shared TS queue	
MNR_TSQUEUE_GET					**CHANGED**: No longer counts the number of GET and PUT requests to a shared TS queue	
MNR_TSQUEUE_GET_SHR					**NEW**: Counts the number of GET and PUT requests to a shared TS queue	
MNR_TSQUEUE_GET_ITEML					**CHANGED**: No longer includes the length of items written to a shared TS queue	
MNR_TSQUEUE_GET_SHR_ITEML					**NEW**: Includes the length of items written to a shared TS queue	
MNR_TSQUEUE_PUT_AUXQ_ITEML					**CHANGED** No longer counts the number of GET and PUT requests to a shared TS queue	
MNR_TSQUEUE_PUT_AUXQ					**CHANGED**: No longer counts the number of GET and PUT requests to a shared TS queue	
MNR_TSQUEUE_PUT_SHR					**NEW**: Counts the number of GET and PUT requests to a shared TS queue	
MNR_TSQUEUE_PUT_ITEML					**CHANGED**: No longer includes the length of items written to a shared TS queue	
MNR_TSQUEUE_PUT_SHR_ITEML					**NEW**: Includes the length of items written to a shared TS queu	

Table 20. Changes to identity class data, by release of CICS Transaction Server for z/OS

Group	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
MNI_PHD_NETWKID		**NEW**				
MNI_PHD_APPLID		**NEW**				
MNI_PHD_ATTACH_TIME		**NEW**				
MNI_PHD_TRANNO		**NEW**				
MNI_PHD_TRANID		**NEW**				
MNI_PHD_COUNT		**NEW**			Y	
MNI_PTD_ATTACH_TIME						**NEW**
MNI_PTD_TRANNUM						**NEW**
MNI_PTD_TRANID						**NEW**
MNI_PTD_COUNT						**NEW**

Table 21. Changes to the Monitoring Control Table (MCT), by release of CICS Transaction Server for z/OS

V4.1	V4.2	V5.1	V5.2	V5.3	V5.4

Changes to CICS statistics

This section summarizes the changes to statistics across supported CICS releases. Use this information to plan the impact of upgrading from one release to another.

The changes are reflected in the reports produced by DFHSTUP, the statistics formatting utility program.

Table 22. Changes to statistics, by release of CICS Transaction Server for z/OS

Type	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
All (data section, DFHSTIDS)	**CHANGED:** New values: STIRLR, STIW2R, STIMLR, STISJS, STIPGD, STIECG, STIECR, STIEPG, and STIECC	**CHANGED:** New value: STIEPR		**CHANGED:** New values: STILDY, STILDP, STIPGP, and STIPGE		
Asynchronous services						**NEW**
Atom feed	**NEW**					
Bundle	**CHANGED:** New DSECT					
CorbaServer			**REMOVED**			
Document templates						
Enterprise beans			**REMOVED**			
Event processing	**CHANGED:** New CAPTURESPEC, EVENTBINDING, and EVENTPROCESS	**CHANGED:** New EPADAPTER				
Identity class						
IPCONN						
JVM pool			**REMOVED**			
JVM profile			**REMOVED**			
JVM program				**CHANGED:** New resource statistics for private Java programs		
JVM server	**NEW**					

Table 22. Changes to statistics, by release of CICS Transaction Server for z/OS (continued)

Type	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
LIBRARY				**CHANGED:** Resource statistics for private LIBRARY resources		
Monitoring domain					**NEW**: Three new fields, MNGCPUT, MNGTONCP, and MNGOFLCP, to show the accumulated transaction CPU time for each completed transaction	
Pipeline definition					**NEW**: Indicates the optimization attribute for a PIPELINE that uses a configuration file that contains a provider_pipeline_json element.	
Program				**CHANGED:** New program loader statistics for private programs		
Program definition	**NEW**			**CHANGED:** Resource definition statistics for private programs		
Requestmodel			**REMOVED**			
TCP/IP					**NEW**: Fields that show the effects of performance tuning for HTTP connections	**NEW:** Fields to show the use of inbound and outbound sockets
Transactions					**NEW**: XMR_TRAN_ENTRYPOINT field that identifies a transaction as an application entry point	
Transient data					**NEW**: TQRPNITM field that reports the peak depth of the transient data queue	
URIMAP definitions					**NEW**: WBG_URIMAP_DIRECT_ATTACH field that reports the number of HTTP requests that are processed by direct alias attach instead of through the CWXN transaction.	
WebSphere MQ monitor						**NEW**
XMLTRANSFORM	**NEW**					
z/OS Communications Server (VTAM®)						**CHANGED**: New fields added for the BMS 3270 validation program.

Changes to the CICS utilities

This section summarizes the changes to the CICS-supplied utilities across supported CICS releases. Use this information to plan the impact of upgrading from one release to another.

Table 23. Changes to CICS utilities, by release of CICS Transaction Server for z/OS

Utility	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFH0STAT	**CHANGED:** • Data Tables Storage report includes storage totals for each data table in the report. • New parameter, DPLLIMIT, in the System Status Report • Changes for printing: three panels for selecting reports to be printed, new COBOL modules, changes to selection of statistics.	**CHANGED:** Uses the INQUIRE TEMPSTORAGE command, which is subject to command-security checking	**CHANGED:** Storage above 2 GB report includes new fields that relate to 64-bit storage use in the GDSA.	**CHANGED:** DFH0STAT does not report any private resources for applications that are deployed on platforms, and it does not identify programs that are declared as application entry points.		**CHANGED:** • New fields added to TCP/IP report and TCP/IP services report • WebSphere MQ monitors report added
DFH0STXD	**NEW**					
DFHCSDUP	**CHANGED:** • MIGRATE withdrawn (4.1) • Support for definition signature fields on EXTRACT sample programs: DFH$CRFA, DFH$CRFP, DFH0CRFC, DFH$FORA, DFH$FORP, DFH0FORC, DFH0CBDC, DFH$DB2T and DFH$SQLT • New option: SIGSUMM on LIST,		**CHANGED:** Support for changes to CSD resource definitions		**CHANGED:** • Report data sets produced by the LIST function of DFHCSDUP now include release information for the CSD • New command, COPY, to copy a single resource definition from one group to another • New options: BEFORE and AFTER on ADD, resource type on COPY	
DFHCSVCU			**NEW**			
DFHDUxxx	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier	
DFHJAIU (JVM Application Isolation Utility)			**REMOVED**			
DFHMEU			**REMOVED**			
DFHMNDUP						**CHANGED:** Specifying a 2 digit year on the **DATE** and **JOBDATE** control parameters now defines a date in the twenty-first century.

Table 23. Changes to CICS utilities, by release of CICS Transaction Server for z/OS (continued)

Utility	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFH$MOLS						**CHANGED:** Specifying a 2 digit year on the DATE control parameter now defines a date in the twenty-first century.
DFHPDxxx	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier. Also changes to formatting of DFHMQINI CICS MQINI and EXCI dump
DFHSTUP	**CHANGED:** New parameter, DPLLIMIT, in Interval, End of Day, Requested, and Summary reports for transaction resource monitoring.		**CHANGED:** Maximum number of CICS regions (APPLIDs) that the DFHSTUP utility can process is increased from 520 to 2000.	**CHANGED:** Support for new statistics		**CHANGED:** • New fields added to TCP/IP global and service statistics • WebSphere MQ monitor statistics added • New option MQMONITOR on **SELECT TYPE** and **IGNORE TYPE** control parameters • Specifying a 2 digit year on the **DATE** control parameter now defines a date in the twenty-first century.
DFHTUxxx	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier	**CHANGED:** Renamed with new release identifier	
The DFH0IPCC migration utility					**CHANGED**: creates USERAUTH attribute on the IPCONN definition if a CONNECTION has ATTACHSEC values of LOCAL, IDENTIFY, or VERIFY.	
Automate the deployment and undeployment of CICS applications with the DFHDPLOY utility					**NEW**: provides a set of commands that can be used in a script to deploy, undeploy, and set the state of CICS applications and CICS bundles.	
Using the ESSS Information Display Utility (EYU9XENF)					**CHANGED**: shows the job ID or task ID or each connection to the ESSS, and the level of the ESSS program.	

Changes to global user exits and task-related user exits

This section summarizes the changes to user exits across supported CICS releases. It covers GLUEs and changes to the TCB indicators in DFHUEPAR. Use this information to plan the impact of upgrading from one release to another.

Table 24. Changes to global user exits by release of CICS Transaction Server for z/OS

Global user exit	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
All			**CHANGED:** Choice of global work area storage location through ENABLE PROGRAM Increase to UEPXSTOR storage			
Backout exit programs			**CHANGED:** Global work area storage allocation			
XEPCAP		**NEW**				
XFCRLSCO	**NEW**					
XISQLCL	**NEW**					
XMEOUT					**Changed**: change to application version format affecting UEPINSA	
XPCFTCH			**CHANGED:** New fields on UEPPCDS parameter: PCUE_AMOD, PCUE_AMOD_31, PCUE_AMOD_64			
XRSINDI			**CHANGED:** New values UEIDEPAS, UEIDMPPP , UEIDWARB and UEIDEBAB for UEPIDTYP parameter	**CHANGED:** New parameters: UEPAPCTXT and UEPAPPTK	**CHANGED:** New values UEIDEARB and UEIDPKST for UEPIDTYP parameter New parameter: UEPPLATTK	
XSNON					**NEW**: new parameter, UEPSGTYP, identifies if the SIGNON was by USERID or TOKEN.	
XSRAB		**CHANGED:** New fields on UEPERROR parameter: SRP_ADDITIONAL_REGS, SRP_ADDITIONAL_REGS_STATE, SRP_CICS_GP64_REGS, SRP_SYSTEM_GP64_REGS, SRP_FP_REGS, and SRP_FPC_REG	**CHANGED:** New fields on UEPERROR parameter: SRP_CICS_ERROR_DATA, SRP_SYSTEM_ERROR_DATA			
XWBAUTH	**CHANGED:** Support for IPv6 addressing	**CHANGED:** Support for HTTP EP adapter				
XWBOPEN	**CHANGED:** Support for IPv6 addressing					
XWBSNDO	**CHANGED:** Support for IPv6 addressing	**CHANGED:** Support for HTTP EP adapter				
XWSPRROI	**NEW**					

Table 24. Changes to global user exits by release of CICS Transaction Server for z/OS (continued)

Global user exit	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
XWSPRRWI	**NEW**					
XWSPRRWO	**NEW**					
XWSRQROI	**NEW**					
XWSRQROO	**NEW**					
XWSRQRWI	**NEW**					
XWSRQRWO	**NEW**					
XWSRQROI	**NEW**					
XWSSRROO	**NEW**					
XWSSRRWI	**NEW**					
XWSSRRWO	**NEW**					

Table 25. Changes to the TCB indicators in DFHUEPAR, by release of CICS Transaction Server for z/OS

V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
OBSOLETE: UEPTJ8 (J8), UEPTJ9 (J9), UEPTJM (JM), **NEW:** UEPTTP (TP), UEPTT8 (T8)				**CHANGED:**UERTSOTR (T8 for Liberty threads)	

Changes to CICS XPI

This section summarizes the changes to the exit programming interface across supported CICS releases. Use this information to plan the impact of upgrading from one release to another.

Reassembling global user exit programs

The CICS global user exit programming interface is sensitive to both the release of CICS and settings in CICS. Even if there are no changes to the externals of the programming interface, changes to the internal workings of CICS can affect structures that are used by the CICS global user exit programming interface. As a consequence, you should reassemble global user exit programs for each CICS release.

Effect of multiple releases on user exits

A global user exit or task-related user exit might be assembled by using CICS libraries from one CICS release and make an XPI call on a system that runs a different CICS release. In this situation, successful transfer of control from the exit to the correct CICS module to handle that XPI call depends on the combination of CICS releases that are used to assemble the call and to make the call, and on whether the XPI call itself is release-sensitive. Release-sensitive XPI calls are available only from Version 4.1.

Table 26 shows the effect of different combinations of CICS release and the release-sensitivity of the call.

Table 26. User exits with different CICS releases

CICS release of the libraries that are used to assemble the XPI call	Release-sensitive XPI call? (from V4.1 only)	CICS system that the XPI call is made on	Result
5.2, 5.1, 4.2, or 4.1	Yes	Any supported CICS release	Control transfers to the correct CICS module for the XPI call

Table 26. User exits with different CICS releases (continued)

CICS release of the libraries that are used to assemble the XPI call	Release-sensitive XPI call? (from V4.1 only)	CICS system that the XPI call is made on	Result
5.2, 5.1, 4.2	No	5.2, 5.1, 4.2	Control transfers to the correct CICS module for the XPI call
5.2, 5.1, 4.2	No	4.1, 3.2, 3.1	Unpredictable result
4.1	No	5.2, 5.1, 4.2, or 4.1	Control transfers to the correct CICS module for the XPI call
4.1	No	3.2 or 3.1	Unpredictable result
3.2 or 3.1	No	5.2, 5.1, 4.2, or 4.1	Back-level XPI call detected, and user exit fails
3.2	No	3.2	Control transfers to the correct CICS module for the XPI call
3.2	No	3.1	Unpredictable result
3.1	No	3.2 or 3.1	Control transfers to the correct CICS module for the XPI call

Changes to the XPI functions

Table 27. Changes to CICS XPI by release of CICS Transaction Server for z/OS

Functional area	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
All	**CHANGED:** By replacing the CALL XPI parameter with the RELSENSCALL XPI parameter, an XPI call assembled by using the CICS TS 4.1 libraries can execute successfully on all currently supported CICS releases.					
Bind channel					**NEW**: DFHPGCHX - to bind a channel to a task.	
Business application manager	**NEW:** INQUIRE_ACTIVATION call					
Enqueue	**CHANGED:** New ENQUEUE_TYPE option is added to ENQUEUE and DEQUEUE					

Table 27. Changes to CICS XPI by release of CICS Transaction Server for z/OS (continued)

Functional area	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
Loader			**CHANGED:** • REQUIRED_AMODE option of the DEFINE_PROGRAM call can specify the addressing mode of non-Language Environment (LE) AMODE(64) assembler programs • The size of the PROGRAM_TOKEN and NEW_PROGRAM_TOKEN options is increased 4 bytes to 8 bytes. This change affects DFHLDLDX calls: ACQUIRE_PROGRAM, DEFINE_PROGRAM, and RELEASE_PROGRAM			
Kernel domain			**CHANGED:** Changes to the parameter list structure for functions on the KEDS gate. You must reassemble any exit programs that use START_PURGE_PROTECTION and STOP_PURGE_PROTECTION.			
Monitoring			**NEW and CHANGED:** New INQUIRE_APP_CONTEXT call now returns the current application context for the most recent application that was set onto the task			
Program management			**CHANGED:** REQUIRED_AMODE option of the SET_PROGRAM call specifies the addressing mode of non-LE AMODE(64) assembler programs. SPECIFIED_AMODE option of the GET_NEXT_PROGRAM and INQUIRE_PROGRAM calls, and the CURRENT_AMODE option of the INQUIRE_CURRENT_PROGRAM call, now return the addressing mode of non-Language Environment (LE) AMODE(64) assembler programs	**CHANGED:** New options on the INQUIRE_PROGRAM and START_BROWSE_PROGRAM calls to inquire on private programs for applications that are deployed on platforms.		

Table 27. Changes to CICS XPI by release of CICS Transaction Server for z/OS (continued)

Functional area	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
Set tracking data					**NEW**: DFHMNTDX - to set the transaction tracking origin data tag for the issuing task.	
State data access			**CHANGED:** DSA option of the INQ_APPLICATION_DATA call now returns the address of the head of the dynamic storage chain as a 64-bit address.			
Storage control						

Changes to CICS user-replaceable programs

This section summarizes the changes to user-replaceable programs across supported CICS releases. Use this information to plan the impact of upgrading from one release to another. For each CICS release, you must reassemble all user-replaceable programs, even if you have not changed them.

Table 28. Changes to user replaceable programs, by release of CICS Transaction Server for z/OS

Program	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
Analyzer programs	**CHANGED:** New fields for IPv6 addressing: wbra_client_ipv6_address and wbra_server_ipv6_address					
Converter programs	**CHANGED:** New fields for IPv6 addressing: decode_client_ipv6_address and decode_client_ipv6_address_string					
DFHBMSX	**NEW with APAR**	**NEW with APAR**	**NEW with APAR**	**NEW with APAR**	**NEW with APAR**	**NEW**
DFHDSRP		**CHANGED:** New tokens in DFHDYPDS copybook: DYRUOWAF, DYRFUNC 7 = End_UOW, DYRLUOWID, DYRNUOWID		**CHANGED:** • New tokens in DFHDYPDS copybook: DYRCLOUD, DYRPLATFORM. DYRAPPLICATION, DYRAPPLVER, DYRAPPLMAJOR, DYRAPPLMINOR, DYRAPPLMICRO, and DYROPERATION • DYRVER token is incremented by 1		
DFHDYP		**CHANGED:** A threadsafe program can function-ship a DPL request by using dynamic routing to ship the request to another region				
DFHEJDNX			**REMOVED**			
DFHEJEP			**REMOVED**			

Table 28. Changes to user replaceable programs, by release of CICS Transaction Server for z/OS (continued)

Program	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHISAIP						
DFHJVMAT			**REMOVED**			
DFHJVMRO			**REMOVED**			
DFHJVMRO			**REMOVED**			
DFHPEP	**CHANGED:** New fields: PEP_COM_BEAR, fields to support the extended z/Architecture MVS™ linkage conventions.					
DFHPGADX (and DFHPGAHX, DFHPGALX, and DFHPGAOX)				**CHANGED:** Resource definitions for the following programs now specify CONCURRENCY(THREADSAFE)		
DFHWBEP	**CHANGED:** New fields for IPv6 addressing: wbep_client_ipv6_address_len, wbep_client_ipv6_address, wbep_server_ipv6_address_len, and wbep_server_ipv6_address					
DFHXCURM			**CHANGED:** New parameter: URMXCFG			
DYRABNLC					**Changed:** This is now set when connections are unavailable to DB2®, IMS™, IBM MQ, or VSAM RLSS	
EYU9WRAM		**CHANGED:** New tokens: WCOM_DYRLUOW, WCOM_DYRNUOW Changed tokens: WCOM_AFF_TYPE has a new value of WCOM_AFF_LOCKED. WCOM_AFF_LIFE has a new value of WCOM_AFF_UOW		**CHANGED:** New tokens: WCOM_APPL_CONTEXT, WCOM_PLATFORM, WCOM_APPLICATION, WCOM_APPLVER, WCOM_APPLMAJORVER, WCOM_APPLMINORVER, WCOM_APPLMICROVER, WCOM_OPERATION Changed tokens: WCOM_FILL3 has a new value of WCOM_VERSION		
EYU9XLOP		**CHANGED:** New tokens: WTRA_UOWOPT, WTRA_LOCUOWID, WTRA_NETUOWID		**CHANGED:** New tokens: WTRA_APPL_CONTEXT, WTRA_PLATFORM, WTRA_APPLICATION, WTRA_APPLVER, WTRA_APPLMAJORVER, WTRA_APPLMINORVER, WTRA_APPLMICROVER, WTRA_OPERATION Changed tokens: WTRA_FILL1 has a new value of WTRA_VERSION		

Table 28. Changes to user replaceable programs, by release of CICS Transaction Server for z/OS (continued)

Program	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
EP adapters		**CHANGED:** Must now honor the EPAP_RECOVER flag in the DFHEP.ADAPTPARM container. EPCX_PROGRAM in the DFHEP.CONTEXT container is not set for system events.				

Changes to messages and codes

This section summarizes the changes to messages and codes across supported CICS releases.

Table 29. Changes to CICS messages, by release of CICS Transaction Server for z/OS

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFH51xx	**NEW:** DFH5137	**CHANGED:** DFH5120 DFH5123 to DFH5125				
DFH52xx	**NEW:** DFH5297	**NEW:** DFH5208 DFH5209 **CHANGED:** DFH5273				
DFH55xx	**NEW:** DFH5559 DFH5560					

Table 29. Changes to CICS messages, by release of CICS Transaction Server for z/OS (continued)

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFH7xxx (DFHExP)			**NEW:** DFH7040 DFH7042 DFH7045 DFH7049 DFH7051 DFH7052 DFH7056 DFH7062 DFH7064 DFH7068 to DFH7073 DFH7079 DFH7081 DFH7087 to DFH7116 DFH7021 DFH7031 DFH7211 DFH7212 DFH7214 DFH7223 DFH7224 DFH7227 DFH7231 DFH7234 DFH7236 DFH7261 DFH7265 DFH7266 DFH7280 **CHANGED:** DFH7054 DFH7089		**REMOVED:** DFH7006	
DFHACnnnn						
DFHADnnnn			**REMOVED:** DFHAD0201 to DFHAD0209 DFHAD0210 to DFHAD0216 DFHAD0231 DFHAD0232 DFHAD0261 to DFHAD0269 DFHAD0270 to DFHAD0273			
DFHAMnnnn	**NEW:** DFHAM4936 DFHAM4946 **CHANGED:** DFHAM4834 DFHAM481 DFHAM4921	**NEW:** DFHAM4807 **CHANGED:** DFHAM4843 DFHAM4868 DFHAM4943 DFHAM4944	**NEW:** DFHAM4947 DFHAM4954 **CHANGED:** DFHAM4952 **REMOVED:** DFHAM4921 to DFHAM4927	**NEW:** DFHAM4961 **CHANGED:** DFHAM4952 **CHANGED with APAR:** DFHAM4865	**NEW:** DFHAM4961 **CHANGED with APAR:** DFHAM4865	**NEW:** DFHAM4900 DFHAM4962 to DFHAM4967
DFHAPnnnn	**NEW:** DFHAP0702 DFHAP0703 DFHAP0708 DFHAP1301 DFHAP1600 to DFHAP1603	**NEW:** DFHAP1605 **REMOVED:** DFHAP1600 to DFHAP1603	**NEW:** DFHAP1900 to DFHAP1903 **REMOVED:** DFHAP1217	**CHANGED:** DFHAP1903	**NEW:** DFHAP0006	

Table 29. Changes to CICS messages, by release of CICS Transaction Server for z/OS (continued)

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHASnnnn						**NEW:** DFHAS0001 DFHAS0002 DFHAS0004 DFHAS0100 DFHAS0101
DFHBRnnnn	**NEW:** DFHBR0509	**CHANGED:** DFHBR0412				
DFHCAnnnn	**NEW:** DFHCA4800 to DFHCA4803 DFHCA4805 DFHCA4809 to DFHCA4820 DFHCA4823 to DFHCA4825 DFHCA4828 to DFHCA4834 DFHCA4836 to DFHCA4843 DFHCA4850 to DFHCA4854 DFHCA4857 to DFHCA4860 DFHCA4863 DFHCA4866 DFHCA4867 DFHCA4869 DFHCA4871 to DFHCA4881 DFHCA4883 to DFHCA4885 DFHCA4887 to DFHCA4918 DFHCA4920 to DFHCA4946 DFHCA4999 DFHCA5137 DFHCA5559 DFHCA5560	**NEW:** DFHCA4807 DFHCA5208 DFHCA5209 **CHANGED:** DFHCA4833 DFHCA4843 DFHCA4800 to DFHCA4999 DFHCA5120 DFHCA5123 DFHCA5540 DFHCA5544 to DFHCA5634 **REMOVED:** DFHCA5161 DFHCA5274 DFHCA5292 DFHCA5603	**NEW:** DFHCA4948 to DFHCA4951 DFHCA4953 DFHCA4864 DFHCA4865 **CHANGED:** DFHCA4952 **REMOVED:** DFHCA4921 to DFHCA4927	**NEW:** DFHCA4864 DFHCA4865 **CHANGED:** DFHCA4952 **CHANGED with APAR:** DFHCA4865	**NEW:** DFHCA4961 **CHANGED with APAR:** DFHCA4865	**NEW:** DFHCA4900 DFHCA4962 to DFHCA4967 **CHANGED:** DFHCA4865
DFHCCnnnn	**NEW:** DFHCC0106		**NEW:** DFHCC0107			
DFHCEnnnn		**NEW:** DFHCE3554 **CHANGED:** DFHCE3503 DFHCE3504				
DFHCFnnnn						
DFHCSnnnn			**NEW:** DFHCS0001 to DFHCS0007			
DFHCZnnnn				**REMOVED:** DFHCZ0357 to DFHCZ0362		
DFHDBnnnn	**NEW:** DFHDB2212	**CHANGED:** DFHDB2005 DFHDB2057 DFHDB2066			**NEW:** DFHDB2080 DFHDB2083 DFHDB2084 DFHDB2087 to DFHDB2089 DFHDB8300 to DFHDB8311 **CHANGED:** DFHDB2003	

Table 29. Changes to CICS messages, by release of CICS Transaction Server for z/OS (continued)

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHDDnnnn						
DFHDHnnnn		**NEW:** DFHDH0300				
DFHDSnnnn	**NEW:** DFHDS0007					
DFHDUnnnn	**NEW:** DFHDU0218			**CHANGED:** DFHDU0203		
DFHECnnnn	**NEW:** DFHEC0001 DFHEC0002 DFHEC0004 DFHEC1000 to DFHEC0009 DFHEC2100 DFHEC3100 to DFHEC3108 DFHEC3110 DFHEC4007 DFHEC4008 DFHEC4111 DFHEC4112 DFHEC4117 DFHEC4120 to DFHEC4123	**NEW:** DFHEC1011 to DFHEC1013 DFHEC1016 DFHEC1022 to DFHEC1024 DFHEC1026 DFHEC3111 DFHEC3112 DFHEC4006 DFHEC4009 DFHEC4010 DFHEC4113 DFHEC4118 to DFHEC4123 **CHANGED:** DFHEC1001 to DFHEC1003 DFHEC1009 DFHEC4007 to DFHEC4009 DFHEC4111 DFHEC4117 **REMOVED:** DFHEC1010 DFHEC4112	**NEW:** DFHEC1027 to DFHEC1032 **CHANGED:** DFHEC1013		**CHANGED:** DFHEC1013	**NEW:** DFHEC4130 to DFHEC4135
DFHEJnnnn		**CHANGED:** DFHEJ0101	**REMOVED:** DFHEJ0101 DFHEJ0102 DFHEJ5001 to DFHEJ5009 DFHEJ5010 to DFHEJ5019 DFHEJ5020 to DFHEJ5029 DFHEJ5030 DFHEJ5031 DFHEJ5036 to DFHEJ5041 DFHEJ5043 to DFHEJ5062 DFHEJ5101 to DFHEJ5114 DFHEJ600 DFHEJ6001			
DFHEPnnnn	**NEW:** DFHEP0001 DFHEP0002 DFHEP0101 DFHEP0102 DFHEP0113 to DFHEP0121 DFHREP1001 to DFHEP1002 DFHEP2001 to DFHEP2003 DFHEP2005	**NEW:** DFHEP0120 to DFHEP0123 DFHEP1000 to DFHEP1003 DFHEP2001 to DFHEP2003 DFHEP2005 **CHANGED:** DFHEP0114 DFHEP0117 DFHEP0118	**NEW:** DFHEP1004 to DFHEP1006 DFHEP2006 DFHEP2007 **CHANGED:** DFHEP1001 to DFHEP1003		**CHANGED:** DFHEP2003 DFHEP2007	

Table 29. Changes to CICS messages, by release of CICS Transaction Server for z/OS (continued)

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHEXnnnn	**NEW:** DFHEX0005					**NEW:** DFHEX0400
DFHFCnnnn	**NEW:** DFHFC0209 DFHFC0210 DFHFC6039	**CHANGED:** DFHFC0202 to DFHFC0204 DFHFC0206 DFHFC0207 DFHFC0150 to DFHFC0512 DFHFC0157 DFHFC0164 to DFHFC0169 DFHFC0177 DFHFC0179 DFHFC0300 to DFHFC0303 DFHFC0308 to DFHFC0311 DFHFC0951 DFHFC0979 DFHFC3010 **REMOVED:** DFHFC0112	**NEW:** DFHFC0543 DFHFC0557 DFHFC6040	**NEW:** DFHFC6000 DFHFC6042 to DFHFC6044	**NEW:** DFHFC0432 DFHFC6044	
DFHIInnnn	**NEW:** DFHII1039		**REMOVED:** all DFHIInnn			
DFHIRnnnn		**CHANGED:** DFHIR3789				
DFHISnnnn	**NEW:** DFHIS0100 DFHIS1032 to DFHIS1041 DFHIS3040 DFHIS3041 **CHANGED:** DFHIS1011 DFHIS2001 DFHIS2009 DFHIS2010 **REMOVED:** DFHIS0003 DFHIS0004 DFHIS0006 DFHIS1024	**NEW:** DFHIS1042 DFHIS3031 DFHIS3032 **CHANGED:** DFHIS1035	**NEW:** DFHIS1050 to DFHIS1052 DFHIS2300 DFHIS2031 **REMOVED:** DFHIS003 to DFHIS006 DFHIS1024 DFHIS1038 DFHIS1054			
DFHKEnnnn	**NEW:** DFHKE0106 DFHKE0997		**NEW:** DFHKE0217	**NEW:** DFHKE0007 DFHKE0108 DFHKE0119	**NEW:** DFHKE0108 DFHKE0109	

Table 29. Changes to CICS messages, by release of CICS Transaction Server for z/OS (continued)

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHLDnnnn	**NEW:** DFHLD0731		**NEW:** DFHLD0850 to DFHLD0852 **CHANGED:** DFHLD0503W DFHLD0513W DFHLD0525W DFHLD0850	**NEW:** DFHLD0508I DFHLD0509I DFHLD0510I DFHLD0514WI DFHLD0515E DFHLD0516I DFHLD0517W DFHLD0518I DFHLD0526I DFHLD0527I DFHLD0528W DFHLD0557I DFHLD0558I DFHLD0733 to DFHLD0746 **CHANGED:** DFHLD0503 DFHLD0513 DFHLD0525 DFHLD0850	**NEW:** DFHLD0110 DFHLD0519	
DFHLGnnnn	**NEW:** DFHLG0195 to DFHLG0197		**NEW:** DFHLG0789			
DFHMEnnnn	**NEW:** DFHME0141	**NEW:** DFHME0103 DFHME0213 DFHME0215 DFHME0217 DFHME0218 DFHME0220 DFHME0222 DFHME0223 DFHME0225 DFHME0232 DFHME0237 DFHME0240 **CHANGED:** DFHME0101 DFHME0503	**CHANGED:** DFHME0006			
DFHMLnnnn	**NEW:** DFHML0001 DFHML0002 DFHML0100 DFHML0500 to DFHML0510	**NEW:** DFHML0101 DFHML0600 to DFHML0605 DFHML0609 DFHML0610				
DFHMNnnnn						**NEW:** DFHMN0011 DFHMN0115
DFHMPnnnn			**NEW:** DFHMP001 DFHMP002 DFHMP0100 DFHMP0101 DFHMP1001 to DFHMP1002 DFHMP1004 DFHMP1005 DFHMP2003 to DFHMP2012 DFHMP3001 to DFHMP3006 **CHANGED:** DFHMP2006	**NEW:** DFHMP1007 DFHMP1008 **CHANGED:** DFHMP2006	**NEW:** DFHMP3007 DFHMP3008 **CHANGED:** DFHMP2003 DFHMP2004	**NEW:** DFHMP2014 to DFHMP2017 DFHMP2020 to DFHMP2023 DFHMP3009 to DFHMP3012 **CHANGED:** DFHMP2004

Table 29. Changes to CICS messages, by release of CICS Transaction Server for z/OS (continued)

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHMQnnnn	**NEW:** DFHMQ0209 DFHMQ0210 DFHMQ0218 DFHMQ0303 DFHMQ0317 DFHMQ0320 DFHMQ0324 DFHMQ0325 DFHMQ0792 DFHMQ2064 DFHMQ2100 to DFHMQ2103 DFHMQ2107 to DFHQM2109 **CHANGED:** DFHMQ0453	**NEW:** DFHMQ2065 DFHMQ2066 **CHANGED:** DFHMQ0308 DFHMQ0309 DFHMQ0320 DFHMQ0749 **REMOVED:** DFHMQ0212 to DFHMQ0217	**CHANGED with APAR:** DFHMQ0331 DFHMQ0334	**NEW:** DFHMQ0793 **CHANGED with APAR:** DFHMQ0331 DFHMQ0334	**NEW:** DFHMQ0245 DFHMQ0793 **CHANGED with APAR:** DFHMQ0331 DFHMQ0334	**NEW:** DFHMQ0370 DFHMQ0371 DFHMQ0390 DFHMQ0391 DFHMQ0392
DFHMQnnnn (continued)						
DFHMUnnnn			**REMOVED:** all DFHMUnnnn messages			
DFHMVnnnn			**REMOVED:** DFHMV0001			
DFHNCnnnn						
DFHPAnnnn		**NEW:** DFHPA1949	**CHANGED:** DFHPA1909	**CHANGED:** DFHPA1909		**NEW:** DFHPA1950 to DFHPA1958
DFHPGnnnn		**CHANGED:** DFHPG0101 to DFHPG0103 DFHPG0201 DFHPG0209 DFHPG0210	**NEW:** DFHPG0300 to DFHPG0307 **CHANGED:** DFHPG0304 DFHPG0305 DFHPG0306	**NEW:** DFHPG0111 to DFHPG0114 DFHPG0221 DFHPG0224 DFHPG0226 to DFHPG0230 DFHPG0308 to DFHPG0314 DFHPG0500 to DFHPG0503 **CHANGED:** DFHPG0304 to DFHPG0306 DFHPG0113	**NEW:** DFHPG0114 DFHPG0313 DFHPG0314 DFHPG0503 **CHANGED:** DFHPG0113	

Table 29. Changes to CICS messages, by release of CICS Transaction Server for z/OS (continued)

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHPInnnn	**NEW:** DFHPI0116 to DFHPI0119 DFHPI0450 to DFHPI0457 DFHPI0514 DFHPI0727 DFHPI0732 DFHPI0733 DFHPI0800 DFHPI0917 DFHPI0999 DFHPI1000 DFHPI1020 DFHPI2000 to DFHPI2012 DFHPI2015 to DFHPI2016 DFHPI2018 to DFHPI2027 DFHPI9033 to DFHPI9039 DFHPI9664 to DFHPI984 DFHPI9800 to DFHPI9823 **CHANGED:** DFHPI0119 DFHPI0400 DFHPI0515 DFHPI0720 DFHPI0911 DFHPI0997	**NEW:** DFHPI0603 DFHPI0728 DFHPI0729 DFHPI0734 to DFHPI0736 DFHPI0905 DFHPI0906 DFHPI9685 to DFHPI9688 DFHPI9691 to DFHPI6714 **CHANGED:** DFHPI0400 DFHPI0403 DFHPI0720 DFHPI0997 DFHPI1007 to DFHPI1010 DFHPI9506 DFHPI5253	**NEW:** DFHPI0404 **CHANGED:** DFHPI0400 DFHPI0516 DFHPI1007 to DFHPI1010	**NEW:** DFHPI0200 to DFHPI0204 DFHPI0220 to DFHPI0222 DFHPI9715 to DFHPI9724 **CHANGED:** DFHPI0516 DFHPI0914 DFHPI1007 to DFHPI110 DFHPI0997	**CHANGED:** DFHPI0997	
DFHRDnnnn	**NEW:** DFHRD0128 to DFHRD0131	**CHANGED:** DFHRD0107				
DFHREGxx			**REMOVED:** All DFHREGxx messages			
DFHRLnnnn	**NEW:** DFHRL0001 DFHRL0002 DFHRL0101 to DFHRL0121	**NEW:** DFHRL0122 **CHANGED:** DFHRL0103	**NEW:** DFHRL0124 to DFHRL0132 **CHANGED:** DFHRL0013 DFHRL0115 DFHRL0128	**NEW:** DFHRL0133 to DFHRL0135 **CHANGED:** DFHRL0115 DFHRL0128		
DFHRMnnnn	**NEW:** DFHRM0402 to DFHRM0405		**NEW:** DFHRM0100			
DFHRSnnnn	**NEW:** DFHRS001 DFHRS002		**NEW:** DFHRS0007			
DFHRTnnnn		**NEW:** DFHRT4424 **CHANGED:** DFHRT4418				
DFHSInnnn			**NEW:** DFHSI1600 DFHSI1601 **REMOVED:** DFHSI8444			

Table 29. Changes to CICS messages, by release of CICS Transaction Server for z/OS (continued)

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHSJnnnn	**NEW:** DFHSJ0004 DFHSJ0207 DFHSJ0910 to DFHSJ0918 DFHSJ1001 to DFHSJ1006 **REMOVED**: DFHSJ0504 DFHSJ0513 DFHSJ0519 DFHSJ0520 DFHSJ0540 DFHSJ0701 to DFHSJ0709 DFHSJ0801 to DFHSJ0803	**NEW:** DFHSJ010 to DFHSJ0103 DFHSJ0210 to DFHSJ0215 DFHSJ0540 to DFHSJ0542 DFHSJ0600 DFHSJ1007and DFHSJ1008 DFHSJ1100 to DFHSJ1002 DFHSJ1104 to DFHSJ1106 **CHANGED:** DFHSJ0201 to DFHSJ0205 DFHSJ0534 to DFHSJ0537 DFHSJ0904 DFHSJ0911 DFHSJ1004 DFHSJ1006	**NEW:** DFHSJ0216 DFHSJ0921 to DFHSJ0923 **CHANGED:** DFHSJ0914 DFHSJ1100 to DFHSJ1106 **REMOVED:** DFHSJ0206 DFHSJ0501 to DFHSJ0503 DFHSJ0505 to DFHSJ0512 DFHSJ0514 to DFHSJ0518 DFHSJ0521 to DFHSJ0540 DFHSJ0900	**NEW:** DFHSJ1200 DFHSJ1203 **CHANGED:** DFHSJ0914 DFHSJ091 DFHSL1105 **REMOVED:** DFHSJ0902	**NEW:** DFHSJ1107 to DFHSJ1110 **CHANGED:** DFHSJ0911 DFHSJ1105 **NEW with APAR** DFHSJ1204 to DFHSJ1208	**NEW:** DFHSJ1204 to DFHSJ1208
DFHSMnnnn		**REMOVED:** DFHSM0603	**NEW:** DFHSM0137 to DFHSM0140 **CHANGED:** DFHSM0602		**NEW:** DFHSM0121	
DFHSNnnnn		**REMOVED:** DFHSN1150 DFHSN1250				
DFHSOnnnn	**NEW:** DFHSO0118 DFHSO0139 DFHSO0133 DFHSO0134	**NEW:** DFHSO0135 **CHANGED:** DFHSO0102 DFHSO0106 DFHSO0111 DFHSO0117 DFHSO0123	**NEW:** DFHSO0136	**NEW:** DFHSO0137 DFHSO0140 **CHANGED:** DFHSO0145 DFHSO0146 **CHANGED with APAR:** DFHSO0123	**NEW:** DFHSO0147 **CHANGED with APAR:** DFHSO0123	**CHANGED:** DFHSO1001
DFHSRnnnn			**CHANGED:** DFHSR0622		**NEW:** DFHSR0002	
DFHSTnnnn						
DFHTAnnnn			**NEW:** DFHTA0100 DFHTA0101			
DFHTCnnnn		**CHANGED:** DFHTC2536				
DFHTDnnnn		**NEW:** DFHTD1290 **CHANGED:** DFHTD1217 DFHTD1221 DFHTD1278				
DFHTFnnnn	**NEW with APAR:** DFHTF0200	**NEW with APAR:** DFHTF0200	**NEW with APAR:** DFHTF0200	**NEW with APAR:** DFHTF0200	**NEW with APAR:** DFHTF0200	**NEW:** DFHTF0200

Table 29. Changes to CICS messages, by release of CICS Transaction Server for z/OS (continued)

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHTInnnn			**NEW:** DFHTI0102 DFHTI0103 DFHTI0200 DFHTI0201			
DFHTMnnnn		**NEW:** DFHTM1718 DFHTM1719				
DFHTRnnnn		**NEW:** DFHTR0119 DFHTR0122 to DFHTR0124 DFHTR1004	**CHANGED:** DFHSR0622 **REMOVED:** DFHTR0101 DFHTR0102		**NEW:** DFHTR0130 DFHTR0131 DFHTR0140 DFHTR0141 DFHTR3004	
DFHTSnnnn		**NEW:** DFHTS1601 to DFHTS1608	**CHANGED:** DFHTS1605			
DFHUPnnnn						
DFHUSnnnn	**NEW:** DFHUS0100	**NEW:** DFHUS0300 **CHANGED:** DFHUS0100				
DFHW2nnnn	**NEW:** DFHW20001 DFHW20002 DFHW20004 DFHW20006 DFHW20100 DFHW20101 DFHW20110 DFHW20111 DFHW20120 to DFHW20133 DFHW20141 DFHW20142 DFHW20151	**NEW:** DFHW20134 to DFH20137 DFHW20161				
DFHWBnnnn	**NEW:** DFHWB0763 DFHWB0764		**NEW:** DFHWB0800 to DFHWB0802	**CHANGED:** DFHWB0800	**NEW:** DFHWB0804 to DFHWB0808 DFHWB1580 to DFHWB1582	
DFHWUnnnn	**NEW:** DFHWU0910 to DFHWU0920 DFHWU4001 to DFHWU4003 DFHWU4005 to DFHWU4022 DFHWU4025 to DFHWU4027 DFHWU4029 to DFHWU4032 DFHWU4300 to DFHWU4302 DFHWU4400 to DFHWU4402 DFHWU4500 DFHWU5000 to DFHWU5002	**NEW:** DFHWU002 DFHWU004 DFHWU2100	**CHANGED:** DFHWU4001 **REMOVED:** DFHWU4015 DFHWU4023 DFHWU4024			**NEW:** DFHWU4033 **CHANGED:** DFHWU4302
DFHXCnnnn						
DFHXMnnnn			**NEW:** DFHXM0600 to DFHXM0603	**CHANGED:** DFHXM0600	**NEW:** DFHXM0604 to DFHXM0611	
DFHXQnnnn						

Table 29. Changes to CICS messages, by release of CICS Transaction Server for z/OS (continued)

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFHXSnnnn					**NEW:** DFHXS1206 DFHXS1500	
DFHZCnnnn	**CHANGED:** DFHZC2352 DFHZC2401 DFHZC2405 DFHZC2411 DFHZC2417 DFHZC2419 DFHZC2422 DFHZC2432 DFHZC2433 DFHZC2447 DFHZC2449 DFHZC2450 DFHZC2456 DFHZC2458 DFHZC2488 DFHZC3205 DFHZC3418 DFHZC3418 to DFHZC3420 DFHZC3433 DFHZC3442 DFHZC3444 DFHZC3461 DFHZC3480 DFHZC3482 DFHZC3499 DFHZC4904 to DFHZC4906 DFHZC4919 DFHZC4920 DFHZC4922 DFHZC4924 DFHZC4925 DFHZC4926 DFHZC4937 DFHZC4938 DFHZC4941 DFHZC4942					

Table 30. Changes to CICSPlex SM messages, by release of CICS Transaction Server for z/OS

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
EUYNLnnnn			**NEW:** EYUNL0152W			
EYUNXnnnn						**CHANGED:** • EYUNX0157 renamed to EYUXL0157 • EYUNX0158 renamed to EYUXL0158 • EYUNX0159 renamed to EYUXL0159
EYUPMnnnn			**NEW:** EYUPM007I EYUPM008I			
EYUPMnnnn			**NEW:** EYUPP007I EYUPP008I			

Table 30. Changes to CICSPlex SM messages, by release of CICS Transaction Server for z/OS (continued)

Message	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
EYUVCnnnn						**NEW:** EYUVC1031I EYUVC1030E **REMOVED:** EYUVC1003 EYUVC1004 EYUVC1005 EYUVC1006
EYUWInnnn			**NEW:** EYUWI0011E EYUWI0012E **CHANGED:** EYUWI0020 EYUWI0021 EYUWI0080 EYUWI0081 EYUWI0082 EYUWI0083 EYUWI0084 EYUWI0085 EYUWI0090			
EUYWMnnnn			**CHANGED:** EYUWM0400 EYUWM0401 EYUWM0402 EYUWM0420 EYUWM0421 EYUWM0422 EYUWM0423 EYUWM0424 EYUWM0425 EYUWM0426 EYUWM0427 EYUWM0428 EYUWM0429 EYUWM0430 EYUWM0431 EYUWM0432 EYUWM0433 EYUWM0503 EYUWM0504 EYUWM0505 EYUWM0506 EYUWM0507 EYUWM0508			
EYUXDnnnn			**NEW:** EYUXD0718E EYUXD0719I EYUXD0720E			

Table 31. Changes to CICS codes, by release of CICS Transaction Server for z/OS

Codes	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
AAxx	**NEW:** AALA AALC AAM4		**NEW:** AALB			**NEW:** AASA
ABxx	**NEW with APAR:** ABSX	**NEW:** ABRP **NEW with APAR:** ABSX	**REMOVED:** ABX9 **NEW with APAR:** ABSX	**NEW with APAR:** ABSX	**NEW with APAR:** ABSX	**NEW:** ABSX
ACxx	**NEW:** ACRQ	**NEW:** ACSO				

Table 31. Changes to CICS codes, by release of CICS Transaction Server for z/OS (continued)

Codes	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
ADxx		**NEW:** ADDK			**NEW:** AD31-AD33 AD35-39 AD4A	
AExx	**NEW:** AECA AECC AECO AECY AECZ AEPD AEPM	**NEW:** AECE AECM	**NEW:** AEE0-3 AEZZ **REMOVED:** AECY AECZ			**NEW:** AEZ2
AFxx	**NEW:** AFDK		**NEW:** AFDN AFDL	**NEW:** AFDO AFDP		
AIxx	**NEW:** AIPM AIPN AIPO AIPP AIPR	**NEW:** AITN	**NEW:** AINT AINU AIPS AIPT AITO **REMOVED:** AII1 AII5 AIIA AIID AIIP AIIT			
AJxx		**NEW:** AJST	**REMOVED:** AJAA AJAB AJAC AJAD AJAE AJAF AJAG			
AKxx	**NEW:** AKEJ					
ALxx	**NEW:** ALIL					
AMxx	**REMOVED:** AMQL		**NEW:** AMPB			**NEW:** AMPC AMPD
APxx			**NEW:** APGD APGE			
ASxx	**NEW:** ASJO	**NEW:** ASJ7 ASJS	**REMOVED:** ASJC ASJD ASJE ASJF ASJG ASJJ ASJK ASJL ASJM ASJN ASJR ASJ1 ASJ3 - ASJ5 ASJ6 ASJ8 ASRK			

Table 31. Changes to CICS codes, by release of CICS Transaction Server for z/OS (continued)

Codes	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
AWxx	**NEW:** AW2A AW2B				**NEW**: AWBD	
AXxx	**NEW:** AXFN AXFV		**NEW**: AXFZ	**NEW:** AXSE AXSF AXSG		**NEW:** AXSB
04xx						**NEW:** 0416 to 0419

Table 32. Changes to HTTP status codes, by release of CICS Transaction Server for z/OS

V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
New HTTP status codes for Atom feeds: • 201 Created • 409 Conflict Changed HTTP status codes: • 400 Bad Request • 403 Forbidden • 404 Not Found • 412 Precondition Failed • 500 Resource Error • 503 Service Unavailable					

Changes to samples

This section summarizes the changes to sample programs, sample resource definitions, and sample service routines across supported CICS releases. Use this information to plan the impact of upgrading from one release to another.

Table 33. Changes to sample programs, by release of CICS Transaction Server for z/OS

Type	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
FILEA (DFH$AALL, DFH$ABRW, DFH$ACOM, DFH$AMNU, DFH$AREP, and DFH$AREN)		**CHANGED:** • Changed to AMODE(64) and using relative addressing: DFH$AALL, DFH$ABRW, DFH$ACOM, DFH$AMNU, and DFH$AREN • Changed to use relative addressing, but is AMODE(31): DFH$AREP				
DFH$APDT		**NEW**				
DFH$DB2			**CHANGED:** JDBC samples removed: CICSDataSource, CICSDataSourcePublish, CICSDataSourceRetract and CICSjdbcDataSource			
DFH$DCTD			**REMOVED**			
DFH$DCTR			**REMOVED**			
DFH$DCTS			**REMOVED**			

Table 33. Changes to sample programs, by release of CICS Transaction Server for z/OS (continued)

Type	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
DFH$DPLY					**NEW:** annotated DFHDPLOY JCL to deploy, undeploy, and optionally set a sample bundle and application in a CICSplex. The sample is supplied in CICSTS53.CICS.SDFHSAMP.	
DFH$EJB			**REMOVED**			
DFH$EJB2			**REMOVED**			
DFH$IIOP			**REMOVED**			
DFH$MOLS						
DFH$PCTA			**CHANGED:** To include the ETDSA, GCDSA, and GUDSA			
DFH$UMOD						**CHANGED:** CPSM module names updated in the sample
DFH$WUTC	**CHANGED:** New sample TCP/IP service definition					
DFH$WUUR	**CHANGED:** New sample URI map definition					
DFH$W2S1	**CHANGED:** New C atom feed sample service routine					
DFH$XISL	**CHANGED:** New IPIC sample					
DFHWLP			**CHANGED:** Sample JVMSERVER resource definition			
DFH0EPAC		**CHANGED:** • New custom EP adapter sample (COBOL) • Changed to set the default CICS TS queue (TSQ) for system events to userid.SYSTEM.				
DFH0STEP		**CHANGED:** • New custom EP adapter sample (COBOL) • Changed to collect and print new event processing statistics				
DFH0WBCO						
DFH0WBHO						
DFH0WBPO						
DFH0W2F1	**CHANGED:** New COBOL atom feed sample service routine					

Changes to CICSPlex SM

This section summarizes the changes to CICSPlex SM across supported CICS releases. If you do not use CICSPlex SM, you can ignore this topic.

Table 34. Changes to CICSPlex SM installation and definition, by release of CICS Transaction Server for z/OS

V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
	NEW: MASTASKPROT system initialization parameter controls whether the CICSPlex SM API, Web User Interface (WUI), and CICS Management Client Interface (CMCI) are allowed to perform actions or set attribute values for CICSPlex SM MAS agent tasks with transaction IDs COIE, COI0, CONA, or CONL.				
CHANGED: TCPIPSSLCERT CICSPlex SM WUI server initialization parameter now has a case sensitive specified value.					
		CHANGED: EYU9XDBT utility now enables you to export and import complete CICSPlex SM data repository backups, at the level of a CMAS or a CICSPlex context. EYU9XDBT also reports more summary data for each command processed.			
CHANGED: The size of the Common Work Area has increased to 2048 bytes.					
CHANGED: The product number used in Tivoli® NetView® SNA Generic Alerts changed to 5655S97.		**CHANGED:** The product number used in Tivoli NetView SNA Generic Alerts changed to 5655Y04.			

Table 35. Changed CICSPlex SM views

Transaction Server for z/OS Release	Changed CICS resource type or function	Corresponding changed CICSPlex SM views
5.4	Support for WebSphere MQ: **WebSphere MQ monitors** added to views	1. **CICS operations views > DB2, DBCTL and WebSphere MQ operations views**
5.4	Support for z/OS WLM health: new fields added to views	1. **Active workload views > Active target regions** 2. **Active workload views > Active workload target distribution factors** 3. **CICS operations views > CICS region operations views > MVS workload management**
5.4	VSAM data set for files: new value RREPL for the AVAILABILITY attribute	1. **CICS operations views > File operations views > Physical data sets for files views**
5.2	WEBSERVICE resources in CICS bundles	1. **CICS operations views > TCP/IP service operations views > Web services**

Table 35. Changed CICSPlex SM views (continued)

Transaction Server for z/OS Release	Changed CICS resource type or function	Corresponding changed CICSPlex SM views
5.1	CICS monitoring: new fields added or obsolete fields made invalid in new releases	1. **CICS operations views > Task operations views > Active tasks** 2. **CICS operations views > Task operations views > Completed tasks** 3. **Monitoring views > Transaction monitoring views > Local or dynamic**
5.1	CICS system: changed MAXTASKS input value	**CICS operations views > CICS region operations views > CICS regions**
5.1	Domain subpool storage: GUDSA and GSDSA are now supported	**CICS operations > CICS region operations views > Domain subpool**
5.1	Dynamic storage areas: GUDSA and GSDSA are now supported	**CICS operations > CICS region operations views > Dynamic storage areas**
5.1	Event processing: EP adapter sets	**CICS operations views > Application operations views > Event binding**
5.1	JVMs: manual start up, and changes to termination	**CICS operations views > Enterprise Java component operations views > JVM pool**
5.1	JVMs: withdrawal of pooled JVMs	1. **CICS operations views > CICS region operations views > CICS regions** 2. **Monitoring views > Transaction monitoring views > Local or dynamic** 3. **CICS operations views > Task operations views > Active tasks** 4. **CICS operations views > Task operations views > Completed tasks**
5.1	JVM servers	1. **CICS operations views > CICS region operations views > CICS regions** 2. **EYUSTARTCICSRGN.DETAILED > Logging and journaling activity > Monitor status** 3. **CICS operations views > Task operations views** 4. **CICS operations views > Enterprise Java component operations views > JVM servers**
5.1	Loader information: RO TCB load fields	1. **CICS operations views > CICS region operations views > Loader information** 2. **CICS operations views > CICS region operations views > Loader by dynamic storage area**
5.1	MVS workload manager statistics	**CICS operations views > CICS region operations views > MVS workload management**
5.1	Platform and region type details	**SM Administration Views > System Group Definitions**
5.1	SSL connections: SSL rebuild and cipher identification	1. **CICS operations views > CICS region operations views > CICS regions** 2. **CICS operations views > Task operations views > Active tasks** 3. **CICS operations views > Task operations views > Completed tasks**
5.1	Task storage: GCDSA and GUDSA are now supported	**CICS operations > CICS region operations views > Task subpool**
4.2	Client HTTP connections	1. **CICS operations views > TCP/IP service operations views > URI maps** 2. **Administration views > Basic CICS resource administration views > Resource definitions > URI mapping definitions**
4.2	Dynamic workload management improvements	1. **Active workload views > Active workloads** 2. **Active workload views > Transaction groups** 3. **Active workload views > Transaction group affinities** 4. **Active workload views > Active routing regions** 5. **Administration views > Workload manager administration views > Specifications** 6. **Administration views > Workload manager administration views > Transaction group definitions**
4.2	Event processing: capture specifications	**CICS operations views > Application operations views > Event capture specifications**

Table 35. Changed CICSPlex SM views (continued)

Transaction Server for z/OS Release	Changed CICS resource type or function	Corresponding changed CICSPlex SM views
4.2	Event processing: assured events	1. **CICS operations views > Application operations views > Event processing** 2. **CICS operations views > Application operations views > Event binding** 3. **CICS operations views > Application operations views > Event capture specifications** 4. **CICS operations views > Task operations views > Completed tasks** 5. **CICS operations views > Task operations views > Active tasks**
4.2	Event processing: system events	1. **CICS operations views > Application operations views > Event processing** 2. **CICS operations views > Application operations views > Event capture specifications**
4.2	TCP/IP	**CICS operations views > TCP/IP service operations views > TCP/IP services**
4.2	TCPIPSERVICE resource definition attributes	**Administration views > Basic CICS resource administration views > Resource definitions > TCP/IP service definitions**
4.2	Temporary storage queues: automatic deletion	1. **Administration views > CICS resource definitions > Temporary storage model definitions** 2. **CICS operations views > Temporary storage queue (TSQ) operations views > Temporary storage queues, Shared queues, Temporary storage queues, Models**
4.2	Temporary storage queues: limit for main storage	**CICS operations views > Temporary storage queue (TSQ) operations views > Global temporary storage statistics**
4.1	Bundles	1. **Administration views > Basic CICS resource administration views > Resource definitions** 2. **CICS operations views** 3. **CICS Bundles view**
4.1	Configuring z/OS Communications Server persistent sessions support	**CICS operations views > CICS region operations views > CICS regions**
4.1	Event processing: HTTP EP adapter	**CICS operations views > Application operations views > Event processing**
4.1	Identity propagation	1. **CICS operations views > Task operations views > Task association information** 2. **CICS operations views > CICS region operations views > CICS regions** 3. **Administration views > Monitor administration views > Definitions**
4.1	IPv6	1. **CICS operations views > TCP/IP service operations views > IPIC connections** 2. **CICS operations views > Task operations views > Task association information**
4.1	Java programs: use count and JVM profile	**CICS operations views > Program operations views > Programs**
4.1	Monitoring details: new DPLLIMIT field, DPLLIMIT, FILELIMIT, and TSQLIMIT values can be set	**CICS Regions > CICS system name > Monitoring and statistics details > Monitoring details**
4.1	SYSLINK objects that support IPIC connections	1. **Administration views > Basic resource administration views** 2. **Administration views > Fully functional resource administration views** 3. **Administration views > Basic CICS resource administration views > CICS system links and related resources > System link definitions** 4. **Administration views > Basic CICS resource administration views > CICS system links and related resources > CICS system definitions** 5. **Administration views > Basic CICS resource administration views > System link definitions > MASs known to CICSplex**

Table 35. Changed CICSPlex SM views (continued)

Transaction Server for z/OS Release	Changed CICS resource type or function	Corresponding changed CICSPlex SM views
4.1	Workload management improvements	1. **Active workload views** 2. **Active workload views > Active workloads** 3. **Active workload views > Active routing regions** 4. **Active workload views > Active workload target distribution factors** 5. **Active workload views > CICSplex definitions** 6. **Active workload views > CICS system definitions** 7. **Active workload views > Active MASs in CICSplex** 8. **CICSPlex SM operations views > CMASs managing CICSplex** 9. **Administration views > CMAS configuration administration views > CMAS in CICSplex definitions**
4.1	XMLTRANSFORM resources	1. **CICS operations views > CICS region operations views > Request statistics processing** 2. **EYUSTARTCICSRGN.DETAILED > Monitoring and statistics details > Statistics details > Request statistics processing**
4.1	z/OS Communications Server and partner system information	**CICS operations views > TCP/IP service operations views > IP connections**
4.1	z/OS Communications Server information	**CICS operations views > Task operations views > Task association information**

Table 36. New or changed CICSPlex SM views and resource tables

CICS Transaction Server for z/OS Release	Resource type or function	CICSPlex SM views	CICSPlex SM resource tables
5.4	New attributes in HTASK for previous transaction tracking	**CICS operations views > Task operations views > Completed tasks**	HTASK
5.4	WebSphere MQ monitor	**CICS operations views > DB2, DBCTL and WebSphere MQ operations views > WebSphere MQ monitors**	MQMON
5.4	MQMONITOR definitions	**Administration views > Basic CICS resource administration views** or **Fully functional Business Application Services (BAS) administration views > Resource definitions > WebSphere MQ monitor definitions**	MQMONDEF
5.4	MQMONITOR resources in a resource group	**Administration views > Basic CICS resource administration views** or **Fully functional Business Application Services (BAS) administration views > Resource definitions in a resource group**	MQMINGRP
5.4	Topology base table for WebSphere MQ monitor resource table	Not applicable	CRESMQMN
5.4	New attributes added for z/OS WLM health support	**Active workload views > Active workload target distribution factors Active workload views > Active target regions CICS operations views > CICS region operations views > MVS workload management**	WLMAWAOR WLMATARG MVSWLM
5.4 (available in 5.3 with APAR PI55134 and in 5.1 and 5.2 with APAR PI55133)	DSIE value for DATAFORMAT attribute of EPADAPT resource table	**CICS operations views > Application operations views > Event processing adapter**	EPADAPT

Table 36. New or changed CICSPlex SM views and resource tables (continued)

CICS Transaction Server for z/OS Release	Resource type or function	CICSPlex SM views	CICSPlex SM resource tables
5.3	Topology base table for DB2 packageset resource table	Not applicable	CRESDB2P
5.3	DB2 packagesets	Not applicable	DB2PKGST
5.3	CPSM notification resource table for resource map events for DB2 packagesets	Not applicable	ERMCDB2P
5.3	Liberty JVM server LINK enabled services	Not applicable	WLPSERV
5.1	Applications	Not applicable	APPLCTN
5.1	Application definitions	Not applicable	APPLDEF
5.1	Event processing adapter sets	Not applicable	EPADSET
5.1	Event processing adapters in an event processing adapter set	Not applicable	EPAINSET
5.1	Management parts	Not applicable	MGMTPART
5.1	Platforms	Not applicable	PLATFORM
5.1	Policy rule information	Not applicable	RULE
5.1	Platform definitions	Not applicable	PLATDEF
5.1	Topology base table for event processing adapter sets resource table	Not applicable	CRESEPAS
4.2	Data predicates for a capture specification	**CICS operations views** > **Application operations views** > **Event capture specification data predicates**	EVCSDATA
4.2	Event processing adapter	**CICS operations views** > **Application operations views** > **Event processing adapter**	CRESEPAD, EPADAPT
4.2	Information sources for a capture specification	**CICS operations views** > **Application operations views** > **Event capture specification information sources**	EVCSINFO
4.2	Option predicates for a capture specification	**CICS operations views** > **Application operations views** > **Event capture specification option predicates**	EVCSOPT
4.2	OSGi bundles	Not applicable	OSGIBUND
4.2	OSGi services	Not applicable	OSGISERV
4.1	Atom feeds	**CICS operations views** > **TCP/IP service operations views** > **Atomservice definitions**	ATOMSERV

Table 36. New or changed CICSPlex SM views and resource tables (continued)

CICS Transaction Server for z/OS Release	Resource type or function	CICSPlex SM views	CICSPlex SM resource tables
4.1	ATOMSERVICE resource definitions	**Administration views** > **Basic CICS resource administration views** and **Resource definitions** > **Atomservice definitions**	ATOMDEF
4.1	ATOMSERVICE resources in a resource group	**Administration views** > **Basic CICS resource administration views** > **Resource definitions in a resource group**	ATMINGRP
4.1	Bundles	**CICS operations views** > **Applications** > **Bundles**	BUNDLE, CRESBUND
4.1	BUNDLE resource definitions	**Administration views** > **Basic CICS resource administration views** and **Resource definitions** > **BUNDLE definitions**	BUNDDEF
4.1	BUNDLE resources in a resource group	**Administration views** > **Basic CICS resource administration views** > **Resource definitions in a resource group**	BUNINGRP
4.1	Event capture specifications	**Application operations views** > **Event capture specification**	CRESEVCS, EVCSPEC
4.1	Event bindings	**Application operations views** > **Event bindings**	CRESEVBD, EVNTBIND
4.1	Event processing	**Application operations views** > **Global event processing attributes**	EVNTGBL
4.1	JVM servers	**CICS operations views** > **Enterprise Java operations views** > **JVM servers**	JVMSERV
4.1	JVMSERVER resource definitions	**Administration views** > **Basic CICS resource administration views** > **Resource definitions** > **JVMSERVER definitions**	JVMSVDEF
4.1	JVMSERVER resources in a resource group	**Administration views** > **Basic CICS resource administration views** > **Resource definitions in a resource group**	JMSINGRP
4.1	MQCONN resource definitions	**Administration views** > **Basic CICS resource administration views** and **Resource definitions** > **WebSphere MQ connection definitions**	MQCONDEF
4.1	MQCONN resources in a resource group	**Administration views** > **Basic CICS resource administration views** > **Resource definitions in a resource group**	MQCINGRP
4.1	System link definitions	**Administration views** > **Basic CICS resource administration views** > **CICS system links and related resources**	SYSLINK (existing resource table)
4.1	Target region for one or more active workloads	**Active workload views** > **Target region distribution statistics**	WLMATARG
4.1	WebSphere MQ connection definition with MQCONN resource	**CICS operations views** > **DB2, DBCTL and WebSphere MQ operations views** > **WebSphere MQ Connection**	MQCON

Table 36. New or changed CICSPlex SM views and resource tables (continued)

CICS Transaction Server for z/OS Release	Resource type or function	CICSPlex SM views	CICSPlex SM resource tables
4.1	WebSphere MQ connection with dynamically created MQINI resource	**CICS operations views** > **DB2, DBCTL and WebSphere MQ operations views** > **WebSphere MQ initiation queue**	MQINI
4.1	XMLTRANSFORM resources	**Application operations views** > **XMLTRANSFORM resources**	XMLTRANS

Table 37. Obsolete CICSPlex SM views, resource tables, and attributes

CICS Transaction Server for z/OS Release	Resource type or function	CICSPlex SM views	CICSPlex SM resource tables
5.4	WLPSERV resource table	Not applicable	The WLPSERV resource table is obsolete. A `GET` operation on the WLPSERV resource table returns `NOTFOUND`
4.2	CICS region operations view	**CICS region operations views** > **Dynamic storage area global - CICSSTOR** The fields Number of GCDSA cushion releases and Cushion limit are displayed as "Not applicable".	The corresponding SMSATBCUSHRE and SMSATBCUSHLI attributes in the CICSSTOR resource table return "Not applicable" for regions from CICS Transaction Server.

Table 38. New BAS definition objects

CICS Transaction Server for z/OS Release	BAS object	What is it?
5.4	MQMONDEF	CICS definition that describes an MQMONITOR resource.
5.4	MQMINGRP	BAS definition that describes the membership of an MQMONITOR definition (MQMONDEF) in a resource group.
4.1	ATOMDEF	CICS definition that describes an ATOMSERVICE resource.
4.1	ATMINGRP	BAS definition that describes the membership of an ATOMSERVICE definition (ATOMDEF) in a resource group.
4.1	BUNDDEF	CICS definition that describes a BUNDLE resource.
4.1	BUNINGRP	BAS definition that describes the membership of a BUNDLE definition (BUNDDEF) in a resource group.
4.1	JVMSVDEF	CICS definition that describes a JVMSERVER resource.
4.1	JMSINGRP	BAS definition that describes the membership of a JVMSERVER definition (JVMSVDEF) in a resource group.
4.1	MQCONDEF	CICS definition that describes an MQCONN resource.
4.1	MQCINGRP	BAS definition that describes the membership of an MQCONN definition (MQCONDEF) in a resource group.

Table 39. Changes to CICSPlex SM transactions, by release of CICS Transaction Server for z/OS

V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
CHANGED: COVC front panel: The Current® Status, Time, Applid, and Date fields have moved by one line down the screen COVC status screen. Please review any automated processes that use these fields.				**CHANGED:** HTASK and Task resource tables include counts for requests to a named counter server	**CHANGED:** 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.
CHANGED: COVC status panel has a new field, TCP/IP Family, that displays whether the address of the connected region is an IPv4 or IPv6 address.					
CHANGED: The ClientIp field of the COVC user sessions panel now displays IPv6 addresses. The IPv6 address extends over two lines, which reduces the number of users visible per page (to a minimum of three users, if they all have IPv6 addresses). IPv4 addresses are displayed on a single line.					
NEW: CICSPlex SM transaction, WMWD. This transaction is listed in the CSD group EYU$CDEF and must be defined to your external security manager.					
NEW: CICSPlex SM transaction, XZLT. This transaction is listed in the CSD group EYU$CDEF and must be defined to your external security manager.					

Table 40. Changes to CICSPlex SM parameters by release of CICS Transaction Server for z/OS

Parameter	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
CASNAME	**REMOVED**					
MASTASKPROT		**NEW:** Added by APAR PM75983. Specifies whether CPSM MAS agent tasks can be controlled through the CPSM API, WUI, and CMCI.	**NEW:** Added by APAR PM79038.			
RESTART						**NEW:** Specifies that, if the CICS region shuts down normally, it is to be restarted by MVS Automatic Restart Manager (ARM).

Table 40. Changes to CICSPlex SM parameters by release of CICS Transaction Server for z/OS (continued)

Parameter	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
SECRPTLVL	**NEW:** Added by APAR PM42117. Controls the level of detail available to a client API task when a response of NOTPERMIT with reason USRID is returned by a request.					
WLMLCUSH			**NEW:** Specifies the percentage of extra pre-allocated storage that CICSPlex SM WLM list management uses in addition to the value of MAXTASK at region initialization.			
WLMLOADCOUNT	**REMOVED**					
WLMLOADTHRSH	**REMOVED**					

Table 41. Changes to CICSPlex SM WUI server initialization parameters, by release of CICS Transaction Server for z/OS

Parameter	V4.1	V4.2	V5.1	V5.2	V5.3	V5.4
CMCIAUTH			**NEW:** Added by APAR PI37543. Specifies the settings for the CMCI TCPIPSERVICE AUTHENTICATE attribute.	**NEW:** Added by APAR PI37543.		
CMCIPORT	**NEW:** Specifies the TCP/IP port number that is allocated to CMCI.					
CMCISSL			**NEW:** Added by APAR PI37543. Specifies the settings for the CMCI TCPIPSERVICE SSL attribute.	**NEW:** Added by APAR PI37543.		
TCPIPADDRESS	**CHANGED:** Now supports IPv6.					

Changes to toggle-enabled features

This section lists toggle-enabled features that you can choose to use in your CICS region. It also summarizes changes in support for toggle-enabled features across supported CICS releases. Use this information to plan the impact of upgrading from one release to another.

Note: Feature toggling is not supported in CICS releases earlier than V5.4.

Table 42 on page 98 uses the following convention in the release columns for summarizing changes in support:

Blank Not available in this release, or no longer enabled by the feature toggle.

APAR number.
Available if the APAR is applied.

Available
Available with this release.

CHANGED
Available but changed in this release.

CHANGED with *APAR number*
Available with this release, but changed with this APAR.

BASE The feature is made a base function in this release. It is not enabled by the feature toggle any more.

REMOVED
The feature has been removed in this release.

Table 42. Changes to toggle-enabled features list by release of CICS Transaction Server for z/OS

Feature name	Feature toggle	V5.4
BMS 3270 Intrusion Detection Service	`com.ibm.cics.bms.ids`	Available

Related tasks:

Specifying feature toggles
New features are delivered to in-service CICS releases to enhance CICS capabilities. Usually these new features are disabled by default. To enable and use new features in your CICS region, you must configure a feature toggle file featuretoggle.properties in the USSCONFIG directory of the CICS region. In the featuretoggle.properties file, you specify feature toggles to switch on or off new features. Some features also have configuration options.

Summary of changes from end-of-service releases

This section summarizes the changes that were made to CICS externals and interfaces in Version 3.2. Use this information, in conjunction with the summaries of changes in later versions, to plan the impact on applications of upgrading from Version 3.1. This information is here to support migration, during periods of extended service, from releases of CICS TS that have been generally withdrawn from service.

For more information about these changes, see the CICS TS Version 3.2 What's New .

Changes to installing

- CICS region user ID requires read access to each VSAM catalog for files for which CICS has installed file definitions.
- Integration of CICSPlex® SM and CICS installation: EYUISTAR process is obsolete and merged into the DFHISTAR process.
- APPLID of the CICS region must be unique across sysplex (or XRF-specific).
- MEMLIMIT must be set to 6 GB or greater.

Changes to the CICS API

Table 43. Changes to EXEC CICS commands in CICS TS Version 3.2

Command	Change
DOCUMENT CREATE	**CHANGED:** New error condition: NOTAUTH if resource security for document templates is active in the CICS region.
DOCUMENT DELETE	**NEW**
DOCUMENT SET	**CHANGED:** New error condition: NOTAUTH if resource security for document templates is active in the CICS region.
FORMATTIME	**CHANGED:** New value: STRINGFORMAT
GET CONTAINER (CHANNEL)	**CHANGED:** New value: INTOCODEPAGE
PUT CONTAINER (CHANNEL)	**CHANGED:** New value: FROMCODEPAGE
QUERY SECURITY	**CHANGED:** Change of impact. Can now determine if user has access to resource definitions for document templates.
READ	**CHANGED:** New option: XRBA
READNEXT	**CHANGED:** New option: XRBA
READPREV	**CHANGED:** New option: XRBA
RESETBR	**CHANGED:** New option: XRBA
STARTBR	**CHANGED:** New value: XRBA
WAIT JOURNALNAME	**CHANGED:** Made threadsafe
WAIT JOURNALNUM	**CHANGED:** Made threadsafe
WRITE JOURNALNAME	**CHANGED:** Made threadsafe
WEB CONVERSE	**CHANGED:** Made threadsafe and new option: DOCSTATUS
WEB EXTRACT	**CHANGED:** New options REALM and REALMLEN
WEB RETRIEVE	**CHANGED:** Change of impact: if WEB SEND command specifies DOCDELETE on DOCSTATUS, the WEB RETRIEVE command cannot retrieve the document
WEB SEND CLIENT	**CHANGED:** New option to specify authentication credentials
WEB SEND (Server)	**CHANGED:** New values: AUTHENTICATE, PASSWORDLEN, PASSWORD, USERNAME, USERNAMELEN, DOCSTATUS
WRITE	**CHANGED:** New value: XRBA
WRITE JOURNALNUM	**CHANGED:** Made threadsafe

Changes to the JCICS API

Table 44. Changes to the JCICS API in CICS TS Version 3.2

Class	Change
All	**CHANGED**: ClientCodepage is changed to Characterset

Table 44. Changes to the JCICS API in CICS TS Version 3.2 (continued)

Class	Change
Container	**CHANGED**: • Support for data type of CHAR. • NotAuthorised Exception can be thrown on create, append, and insert.
Document	**NEW METHOD**: delete() **NEW VERSION** of sendDocument() **CHANGED**: NotAuthorised Exception can be thrown on create, append, and insert.
HttpClientRequest	**NEW METHODS** • setAuthenticate() • setUserName() • setPassword() • setContainer() **NEW EXCEPTIONS** for sendDocument()
HttpRequest	**NEW METHODS**: • setContainer() • setChannel() • getContentAsContainer() • getBodyCharset()
HttpResponse	**NEW METHODS**: • setContainer() • setChannel() • getContentAsContainer() • getBodyCharset() **NEW VERSION** of sendDocument().
Webservice	**CHANGED**: NotAuthorised. Exception can be thrown on invoke.

Changes to compiler support

- Support for pre-Language Environment compilers withdrawn:
  - Withdrawn JCL procedures: DFHEITVL, DFHEXTVL, DFHEBTVL, DFHEITCL, DFHEXTCL, DFHEITPL, DFHEXTPL, DFHEBTPL, DFHEITDL and DFHEXTDL
  - Obsolete CICS translator options: ANS185, LANGLVL, FE
- support for OO COBOL, including both Java™ classes and COBOL classes withdrawn.

Changes to SIT parameters

Table 45. Changes to SIT parameters in CICS TS Version 3.2

Parameter	Change
APPLID system initialization parameter	**CHANGED:** APPLID must be unique in the sysplex.

Table 45. Changes to SIT parameters in CICS TS Version 3.2 (continued)

Parameter	Change
CONFDATA system initialization parameter	**CHANGED:** now also applies to initial input data received on IPIC connections (IS data).
ENCRYPTION system initialization parameter	**CHANGED:** value STRONG now does not allow SSL version 3.0.
FCQRONLY system initialization parameter	**NEW**
MNSUBSYS	**REMOVED**
MSGCASE system initialization parameter	**CHANGED:** now also applies to messages displayed by the CICSPlex SM message domain.
NONRLSRECOV system initialization parameter	**NEW**
TRTABSZ system initialization parameter	**CHANGED:** default is changed to 4096 KB.
UOWNETQL system initialization parameter	**CHANGED:** on VTAM=NO regions, UOWNETQL is now used as the default NETWORKID of this CICS region.
XCFGROUP system initialization parameter	**NEW**
XHFS system initialization parameter	**NEW**
XRES system initialization parameter	**NEW**

Changes to JVM profiles

Table 46. Changes to JVM profiles in CICS TS Version 3.2

Option	Change
CLASSPATH_PREFIX	**TYPE:** All JVM Environments
CLASSPATH_SUFFIX	**TYPE:** All JVM Environments
DISPLAY_JAVA_VERSION	**TYPE:** All JVM Environments
JAVA_DUMP_TDUMP_PATTERN	**TYPE:** All JVM Environments
LIBPATH_PREFIX	**TYPE:** All JVM Environments
LIBPATH_SUFFIX	**TYPE:** All JVM Environments

Changes to resource definitions

Table 47. Changes to resources and resource groups in CICS TS Version 3.2

Resource or group	Change
IPCONN attributes	**NEW**
LIBRARY attributes	**NEW**
PIPELINE attributes	**CHANGED:** New attribute: RESPWAIT
TCPIPSERVICE attributes	**CHANGED:** New attribute REALM. New values IPIC on PROTOCOL and NO on URM
DFH$EXBS	**CHANGED:** New programs: DFH0XCFG and DFH0XGUI

Table 47. Changes to resources and resource groups in CICS TS Version 3.2 (continued)

Resource or group	Change
DFH$EXWS	**CHANGED:** • PIPELINE definitions EXPIPE01 and EXPIPE02 now specify RESPWAIT(DEFT). • New program: DFH0XCUI
DFH$SDAP	**REMOVED**
DFH$WBSN	**CHANGED:** Program DFH$WB1C is moved to group DFH$WEB.
DFH$WEB	**NEW**
DFHDCTG	**CHANGED:** • New TDQUEUE definitions: CISL, CISO, CKQQ, CMQM, and CSLB • TDQUEUE definition CSSL now specifies RECORDSIZE(136) and BLOCKSIZE(140).
DFHISCIP	**NEW**
DFHJAVA	**CHANGED:** • New programs: DFHSJGC and DFHSJPI • New transactions: CJGC and CJPI
DFHMQ	**NEW**
DFHOPER	**CHANGED:** • New MAPSET definitions: DFHCMNH and DFHCMNM • New programs: DFHCEMNA, DFHCEMND, DFHLDMAP, DFHLDMHF, and DFHLDMHS • New transactions: CEMN and CLDM
DFHPIPE	**CHANGED:** • New programs: IXMI33DA, IXMI33DI, IXMI33D1, IXMI33IN, and IXMI33UC • Programs removed: DFHPIXE, IXMI26D1, and IXMI26UC
DFHWEB	**CHANGED:** Transaction CWXN now specifies RESSEC(YES).
DFHWSAT	**CHANGED:** PIPELINE definitions DFHWSATP and DFHWSATR now specify RESPWAIT(DEFT).

Changes to the CICS SPI

Table 48. Changes to CICS system programming interface in CICS TS Version 3.2

Command	Change
CREATE IPCONN	**NEW**
CREATE LIBRARY	**NEW**

Table 48. Changes to CICS system programming interface in CICS TS Version 3.2 (continued)

Command	Change
CREATE PIPELINE	**CHANGED:** New option: RESPWAIT
CREATE TCPIPSERVICE	**CHANGED:** New option: REALM
ENABLE PROGRAM command	**CHANGED:** Change of impact of options: QUASIRENT and THREADSAFE for GLUEs and TRUEs
EXTRACT STATISTICS	**CHANGED:** New values on RESTYPE option: DOCTEMPLATE, IPCONN, LIBRARY, MQCONN
INQUIRE ASSOCIATION	**NEW**
INQUIRE ASSOCIATION LIST	**NEW**
INQUIRE FILE	**CHANGED:** New option: RBATYPE **THREADSAFE**
INQUIRE IPCONN	**NEW**
INQUIRE IRC	**CHANGED:** New option: XCFGROUP
INQUIRE JVM	**CHANGED:** Change in value: RESET no longer returned on REUSEST option
INQUIRE JVMPROFILE	**CHANGED:** Change in value: RESET no longer returned on REUSEST option
INQUIRE LIBRARY	**NEW**
INQUIRE MONITOR	**CHANGED:** • Option made obsolete: SUBSYSTEMID • New option: COMPRESSST
INQUIRE MVSTCB	**CHANGED:** • New syntax • Options made obsolete: ELEMENTLIST, LENGTHLIST, and SUBPOOLLIST
INQUIRE NETNAME	**CHANGED:** New option: AIDCOUNT
INQUIRE PIPELINE	**CHANGED:** • New options: CIDDOMAIN. MODE, MTOMNOXOPST, MTOMST, RESPWAIT, SENDMTOMST, SOAPLEVEL, SOAPRNUM, SOAPVNUM, XOPDIRECTST, XOPSUPPORTST
INQUIRE PROGRAM	**CHANGED:** New options: LIBRARY and LIBRARYDSN
INQUIRE SUBPOOL	**CHANGED:** New value on DSANAME option: GCDSA
INQUIRE SYSTEM	**CHANGED:** New options: MEMLIMIT, SOSABOVEBAR, SOSABOVELINE, SOSBELOWLINE
INQUIRE TASK	**CHANGED:** New options: IPFACILITIES and IPFLISTSIZE
INQUIRE TCPIPSERVICE	**CHANGED:** • New option: REALM • New values: IPIC on PROTOCOL option

Table 48. Changes to CICS system programming interface in CICS TS Version 3.2 (continued)

Command	Change
INQUIRE TERMINAL	**CHANGED:** New option: AIDCOUNT
INQUIRE WEB	**THREADSAFE**
INQUIRE WEBSERVICE	**CHANGED:** • New options: CCSID, MAPPINGLEVEL, MAPPINGRNUM, MAPPINGVNUM, MINRUNLEVEL, MINRUNRNUM, MINRUNVNUM, XOPDIRECTST, XOPSUPPORTST
PERFORM JVMPOOL	**NEW**
PERFORM STATISTICS RECORD	**CHANGED:** New options: DOCTEMPLATE, LIBRARY, IPCONN, and MQCONN
SET DOCTEMPLATE	**NEW**
SET IPCONN	**NEW**
SET JVMPOOL	**CHANGED:** Option made obsolete: TERMINATE
SET LIBRARY	**NEW**
SET MONITOR	**CHANGED:** New option: COMPRESSST
SET PIPELINE	**CHANGED:** New option: RESPWAIT
SET TSQUEUE	**CHANGED:** Change of impact: maximum number of TS queues that can be deleted by single SET TSQUEUE or SET TSQNAME is 32766
SET WEB	**THREADSAFE**

Changes to CICS-supplied transactions

Table 49. Changes to CICS-supplied transactions in CICS TS Version 3.2

Transaction	Change
CEMN	**NEW and CHANGED:** • New functions: DPL resource limit, Identity class, changing values for DPLLIMIT, FILELIMIT, and TSQUEUELIMIT • Change of display: split into a primary panel and a second options panel
CETR	**NEW and CHANGED:** • New options: setting the MP domain standard and special trace levels, TA domain keyword • Screen removed: Pooled JVMs Trace Options
CKQC	**CHANGED:** Change of impact: default settings are now taken from the MQCONN resource definition
CRTE	**CHANGED:** New support for transaction routing over an IPIC connection

Table 49. Changes to CICS-supplied transactions in CICS TS Version 3.2 (continued)

Transaction	Change
CSFE	**CHANGED:** Now allows the status of DEBUG parameters to be queried

Changes to CEMT

Table 50. Changes to CEMT in CICS TS Version 3.2

CEMT	Change
CEMT DISCARD commands	**CHANGED:** New commands: CEMT DISCARD IPCONN, CEMT DISCARD LIBRARY
CEMT INQUIRE CLASSCACHE	**CHANGED:** RESET no longer returned on REUSEST option
CEMT INQUIRE DOCTEMPLATE	**CHANGED:** New option: SIZE
CEMT INQUIRE DSAS	**CHANGED:** • Option made obsolete: SOSSTATUS • New options: MEMLIMIT, SOSABOVEBAR, SOSABOVELINE and SOSBELOWLINE
CEMT INQUIRE FILE	**CHANGED:** New option: RBATYPE
CEMT INQUIRE IPCONN	**NEW and CHANGED:** New value: IPv6 addresses on HOST option
CEMT INQUIRE IRC	**CHANGED:** New option: XCFGROUP
CEMT INQURE JVM	**CHANGED:** RESET no longer returned by REUSEST option
CEMT INQUIRE LIBRARY	**NEW**
CEMT INQUIRE MONITOR	**CHANGED:** • Option made obsolete: SUBSYSTEMID • New option: COMPRESSST and value default changed
CEMT INQUIRE PIPELINE	**CHANGED:** New options: CIDDOMAIN, MODE, MTOMNOXOPST, MTOMST, RESPWAIT, SENDMTOMST, SOAPLEVEL, XOPDIRECTST, XOPSUPPORTST
CEMT INQUIRE PROGRAM	**CHANGED:** Change of impact: USECOUNT option displays a use count for Java™ programs
CEMT INQUIRE SYSTEM	**CHANGED:** New options: SOSABOVEBAR, SOSABOVELINE, and SOSBELOWLINE Option made obsolete: SOSSTATUS
CEMT INQUIRE TCPIPSERVICE	**CHANGED:** • New value: IPIC on PROTOCOL option • New option: REALM
CEMT INQUIRE WEBSERVICE	**CHANGED:** New options: CCSID, MAPPINGLEVEL, MINRUNLEVEL, XOPDIRECTST, XOPSUPPORTST

Table 50. Changes to CEMT in CICS TS Version 3.2 (continued)

CEMT	Change
CEMT PERFORM JVMPOOL	**NEW**
CEMT PERFORM STATISTICS	**CHANGED:** New options: DOCTEMPLATE, IPCONN, LIBRARY, and MQCONN
CEMT SET DOCTEMPLATE	**NEW**
CEMT SET IPCONN	**NEW**
CEMT SET JVMPOOL	**CHANGED:** Option deprecated: TERMINATE
CEMT SET MONITOR	**CHANGED:** New options: COMPRESS and NOCOMPRESS
CEMT SET PIPELINE	**CHANGED:** New option: RESPWAIT
CEMT SET PROGRAM	**CHANGED:** Change of value: ALL is limited to 32766
CEMT SET TSQUEUE	**CHANGED:** The number of queues that are affected when the ALL option is in effect is limited to 32766.
CEMT SET TSQNAME	**CHANGED:** The number of queues that are affected when the ALL option is in effect is limited to 32766.

Changes to CICS monitoring

Default value of Monitoring Control Table (MCT) is changed from RMI=NO to RMI=YES. There are the following changes to the monitoring sample program, DFH$MOLS:

- Clock fields in the format ddd hh:mm:ss.000000.
- New option, DPL, on the RESOURCE control statement.
- UNLOAD control statement can be used only with monitoring data for CICS TS V3.2 onwards.

Table 51. Changes to performance class data in CICS TS Version 3.2

Group	Change
All	**CHANGED:** • Data compression for SMF 110 records, including a new field in product header SMFMNCRL • Increased precision and capacity of monitoring clocks
DFHCICS	**NEW:** New fields: OAPPLID, OSTART, OTRANNUM, OTRAN, OUSERID, OUSERCOR, OTCPSVCE, OPORTNUM, OCLIPORT, OTRANFLAG, OFCTYNME
DFHDOCH	**NEW:** New field: DHDELCT
DFHSOCK	**NEW:** • New fields: ISALLOCT, ISIOWTT, ISIPICNM, CLIPPORT

Table 51. Changes to performance class data in CICS TS Version 3.2 (continued)

Group	Change
DFHTASK	**CHANGED:** • New values added to byte 2 (3.2). E • Change of impact of JVMRTIME (3.2)

Table 52. Changes to exception class data in CICS TS Version 3.2

Group	Change
EXCMNTRF	**CHANGED:**EXCMNTRF changed to match

Changes to CICS statistics

Table 53. Changes to CICS statistics in CICS TS Version 3.2

Type	Change
All (data section, DFHSTIDS)	**CHANGED:** New values: STILDB, STIMQG, STIISR, and STIDHD
Document templates	**CHANGED:** New DSECT: DFHDHDDS
Identity class	**NEW**
IPCONN	**NEW**
LIBRARY	**NEW**
WebSphere MQ Connection	**NEW**

Changes to CICS utilities

Table 54. Changes to CICS utilities in CICS TS Version 3.2

Utility	Change
DFH0STAT	**CHANGED:** • Displays 4-digit hours in time fields, and time to six decimal places (down to 1 microsecond) • New report for LIBRARY resources
DFHDUxxx	**CHANGED:** Renamed with new release identifier
DFHPDxxx	**CHANGED:** Renamed with new release identifier
DFHTUxxx	**CHANGED:** Renamed with new release identifier

Changes to global user exits and task-related user exits

Table 55. Changes to global user exit points in CICS TS Version 3.2

User exit	Change
XAPADMGR	**NEW**
XEIIN	**CHANGED:** New parameter: UEP_EI_PBTOK
XEIOUT	**CHANGED:** New parameter: UEP_EI_PBTOK

Table 55. Changes to global user exit points in CICS TS Version 3.2 (continued)

User exit	Change
XEISPIN	**CHANGED:** New parameter: UEP_EI_PBTOK
XEISPOUT	**CHANGED:** New parameter: UEP_EI_PBTOK
XFCFRIN	**CHANGED:** New value: UEP_FC_XRBA returned on UEP_FC_RECORD_ID_TYPE parameter New return codes on UEP_FC_REASON: UEP_FC_REASON_KSDS_AND_XRBA and UEP_FC_REASON_NOT_EXTENDED
XFCFROUT	**CHANGED:** New value: UEP_FC_XRBA returned on UEP_FC_RECORD_ID_TYPE parameter New return codes on UEP_FC_REASON: UEP_FC_REASON_KSDS_AND_XRBA and UEP_FC_REASON_NOT_EXTENDED
XFCREQ	**CHANGED:** New value: X'08' (XRBA) can be returned in FC_EIDOPT8
XFCREQC	**CHANGED:** New value: X'08' (XRBA) can be returned in FC_EIDOPT8
XISQUE	**NEW**
XMEOUT	**CHANGED:** New parameters: UEPCPID, UEPCPDOM, UEPCPNUM, UEPCPSEV
XPCERES	**CHANGED:** New parameter: UEP_PC_PBTOK
XPCREQ	**CHANGED:** New parameter: UEP_PC_PBTOK
XPCREQC	**CHANGED:** New parameter: UEP_PC_PBTOK
XRMIIN	**CHANGED:** New parameter: UEP_PC_PBTOK
XRMIOUT	**CHANGED:** New parameter: UEP_PC_PBTOK
XWBAUTH	**NEW**
XWSPRROO	**NEW**

Changes to CICS XPI

New output parameter, SOS_ABOVE_THE_BAR, is added to INQUIRE_SHORT_ON_STORAGE.

Changes to CICS user-replaceable programs

There is a new program, DFHISAIP.

Changes to CICS messages and codes

Table 56. Changes to messages and codes in CICS TS Version 3.2

Messages or codes	Change
DFHACnnnn	**CHANGED:** DFHAC2216, DFHAC2234, DFHAC2235, DFHAC2246, DFHAC2247
DFHAMnnnn	**NEW:** DFHAM4812, DFHAM4813, DFHAM4817, DFHAM4878, DFHAM4885, DFHAM4913, DFHAM4914, DFHAM418, DFHAM4934, DFHAM4935, DFHAM4999 **CHANGED:** DFHAM4834, DFHAM4851, DFHAM4889, DFHAM4898, DFHAM4920, DFHAM4928
DFHAPnnnn	**NEW:** DFHAP1500 **CHANGED:** DFHAP1300
DFHCAnnnn	**NEW:** DFHACA5553 to DFHCA5558 **CHANGED:** DFHCA5147, DFHCA5190, DFHCA5272, DFHCA5288
DFHCFnnnn	**NEW:** DFHCF0123
DFHDBnnnn	**CHANGED:** DFHDB2063
DFHDDnnnn	**NEW:** DFHDD0004, DFHDD0006
DFHEJnnnn	**CHANGED**: DFHEJ0601
DFHFCnnnn	**NEW:** DFHFC0119, DFHFC0517 to DFHFC0519, DFHFC6037, DFHFC6038, DFHFC6040, DFHFC6041 **CHANGED:** DFHFC0312, DFHFC6018, DFHFC6026, DFHFC0631, DFHFC0634
DFHIInnnn	**CHANGED:** DFHII1013
DFHISnnnn	**NEW:** DFHIS0001 to DFHIS0004, DFHIS0006, DFHIS0998, DFHIS1000 to DFHIS1031, DFHIS2000 to DFHIS2003, DFHIS2006, DFHIS2008 to DFHIS2011, DFHIS3000 to DFHIS3011, DFHIS4000, DFHIS5000 to DFHIS5003, DFHIS6000 to DFHIS6007, DFHIS6010
DFHKEnnnn	**NEW:** DFHKE1798
DFHLDnnnn	**NEW:** DFHLD0109, DFHLD0205, DFHLD0206, DFHLD0501 to DFHLD0507, DFHLD0512, DFHLD0513, DFHLD0521 to DFHLD0525, DFHLD0555, DFHLD0556, DFHLD0701 to DFHLD0704, DFHLD0710 to DFHLD0713, DFHLD0715, DFHLD0720 to DFHLD0725, DFHLD0730, DFHLD0800 to DFHLD0812
DFHMEnnnn	**NEW:** DFHME0140
DFHMNnnnn	**NEW:** DFHMN0112

Table 56. Changes to messages and codes in CICS TS Version 3.2 (continued)

Messages or codes	Change
DFHMQnnnn	**NEW:** DFHMQ0107 to DFHMQ0114, DFHMQ0116 to DFHMQ0124, DFHMQ0211to DFHMQ0214, DFHMQ0216, DFHMQ0217, DFHMQ0220 to DFHMQ0223, DFHMQ0230, DFHMQ0232, DFHMQ0235 to DFHMQ0237, DFHMQ0239 to DFHMQ0244, DFHMQ0300 to DFHMQ0302, DFHMQ0304 to DFHMQ0316, DFHMQ0318, DFHMQ0319, DFHMQ0321 to DFHMQ0323, DFHMQ0326, DFHMQ0331 to DFHMQ0334, DFHMQ0336, DFHMQ0341 to DFHMQ0345, DFHMQ0350, DFHMQ0351, DFHMQ0360 to DFHMQ0366, DFHMQ0369, DFHMQ0380 to DFHMQ0389, DFHMQ0400 to DFHMQ0412, DFHMQ0414 to DFHMQ0416, DFHMQ0418, DFHMQ0420 to DFHMQ0425, DFHMQ0430 to DFHMQ0434, DFHMQ0439, DFHMQ0440, DFHMQ0443, DFHMQ0451 to DFHMQ0453, DFHMQ0455 to DFHMQ0462, DFHMQ0480, DFHMQ0481, DFHMQ0500 to DFHMQ0506, DFHMQ0700, DFHMQ0702 to DFHMQ0705, DFHMQ0707, DFHMQ0710 to DFHMQ0721, DFHMQ0724, DFHMQ0725, DFHMQ0729 to DFHMQ0740, DFHMQ0745 to DFHMQ0751, DFHMQ0753 to DFHMQ0764, DFHMQ0766 to DFHMQ0791 **CHANGED:** CICS-MQ messages changed from CSQCxxx to DFHMQ0xxx
DFHNCnnnn	**NEW:** DFHNC0123 **CHANGED:** DFHNC0944
DFHPAnnnn	**NEW:** DFHPA1946
DFHPInnnn	**NEW:** DFHPI0115 to DFHPI0118, DFHPI0403, DFHPI0511 to DFHP0514, DFHPI0602, DFHPI0721 to DFHPI0726, DFHPI0731 to DFHPI0733, DFHPI0801, DFHPI0917, DFHPI0996 to DFHPI0997, DFHPI1000, DFHPI1007 to DFHPI1010, DFHPI1100 to DFHPI1004, DFHPI9010 to DFHPI9032, DFHPI9035 to DFHPI9039, DFHPI9500 to DFHPI9507, DFHPI9509 to DFHPI9663, DFHPI9668, DFHPI9676 **CHANGED:** DFHPI0301, DFHPI0400, DFHPI0401, DFHPI0700, DFHPI0704, DFHPI07015, DFHPI0716, DFHPI0720, DFHPI0730, DFHPI1001, DFHPI1002 **REMOVED:** DFHPI0999
DFHRDnnnn	**NEW:** DFHRD0126, DFHRD0127
DFHRLnnnn	**CHANGED:** DFHRL0119
DFHSInnnn	**NEW:** DFHSI8421, DFHSI8445, DFHSI8431 **CHANGED:** DFHSI1519

Table 56. Changes to messages and codes in CICS TS Version 3.2 (continued)

Messages or codes	Change
DFHSJnnnn	**NEW:** DFHSJ0206, DFHSJ0521 to DFHSJ0539, DFHSJ0709 **CHANGED:** DFHSJ0201 to DFHSJ0205, DFHSJ0501 to DFHSJ0503, DFHSJ0505, DFHSJ0507 to DFHSJ0509, DFHSJ0511 to DFHSJ0516, DFHSJ0520, DFHSJ0706 to DFHSJ0708, DFHSJ0801 to DFHSJ0803
DFHSMnnnn	**NEW:** DFHSM0601 to DFHSM0603, DFHSM0606, DFHDSM0607
DFHSOnnnn	**NEW:** DFHSO128 to DFHSO0132 **CHANGED**: DFHSO0123
DFHSTnnnn	**NEW:** DFHST0236
DFHTCnnnn	**NEW:** DFHTC1600 **CHANGED**: DFHTC2534
DFHTDnnnn	**NEW:** DFHTD0247, DFHTD0386
DFHTInnnn	**NEW:** DFHTI0100, DFHTI0101
DFHUPnnnn	**CHANGED:** DFHUP0203
DFHWBnnnn	**NEW:** DFHWB0154, DFHWB0364, DFHWB0756 to DFHWB0762, DFHWB1560, DFHWB1570 **CHANGED:** DFHWB0101, DFHWB0151, DFHWB0731, DFHWB0734
DFHXCnnnn	**CHANGED**: DFHXC6646
DFHXQnnnn	**NEW:** DFHXQ0123
DFHXSnnnn	**NEW:** DFHXS1116 **CHANGED:** DFHXS1115
DFHZCnnnn	**NEW:** DFHZC3403, DFHZC6312 **CHANGED:** DFHZC3205, DFHZC5908, DFHZC5939, DFHZC5978, DFHZC5983
AAxx	**NEW:** AALY, AALZ, AAM3
ADxx	**NEW:** ADCF
AExx	**NEW:** AEZY
AFxx	**NEW:** AFCI, AFDI
AIxx	**NEW:** AIPA, AIPB, AIPC, AIPD, AIPE, AIPF, AIPG, AIPH, AIPI, AIPJ, AIPK, AIPL, AITJ, AITK, AITL, AITM
AKxx	**NEW:** AKEX
AMxx	**NEW:** AMQA

Changes to samples

Table 57. Changes to samples in CICS TS Version 3.2

Sample	Change
DFH$MOLS	**NEW:** • DPL option on RESOURCE • IDN option on PRINT • EXPAND control statement • Format of clock field

Table 57. Changes to samples in CICS TS Version 3.2 (continued)

Sample	Change
DFH$WB1A	**CHANGED:** Verification program for CICS web support (assembler)
DFH$WB1C	**CHANGED:** Verification program for CICS web support (C)
DFH$WBCA	**CHANGED:** Chunking client sample (assembler)
DFH$WBCC	**CHANGED:** Chunking client sample (C)
DFH$WBHA	**CHANGED:** Chunking server sample (assembler)
DFH$WBHC	**CHANGED:** Chunking server sample (C)
DFH$WBPA	**CHANGED:** Pipelining sample (assembler)
DFH$WBPC	**CHANGED:** Pipelining sample (C)
DFH0WBCO	**CHANGED:** Chunking client sample (COBOL)
DFH0WBHO	**CHANGED:** Chunking server sample (COBOL)
DFH0WBPO	**CHANGED:** Pipelining sample (COBOL)

Changes to CICSPlex SM

The libraries SEYUMLIB, SEYUPLIB, and SEYUTLIB and all their contents are no longer shipped with CICS Transaction Server. The product number used in Tivoli NetView SNA Generic Alerts changed to 5655M15.

Table 58. Changed CICSPlex SM views in CICS TS Version 3.2

Changed CICS resource type or function	Corresponding changes to CICSPlex SM
Document deletion	1. **CICS operations views > Task operations views > Active tasks** 2. **CICS operations views > Task operations views > Completed tasks**
Document template statistics and refresh (newcopy) function	**CICS operations views > Document template operations views > Document template**
IPIC	1. **CICS operations views > Enterprise Java component operations views > CorbaServers** 2. **CICS operations views > Task operations views > Task association information** 3. **CICS operations views > TCP/IP service operations views > TCP/IP services** 4. **CICS operations views > TCP/IP service operations views > URI maps** 5. **Administration views > CICS resource definitions > URI mapping definitions** 6. **CICS operations views > Task operations views > Work requests**
JVMs: withdrawal of resettable mode	1. **CICS operations views > Enterprise Java component operations views > JVM pool** 2. **CICS operations views > Enterprise Java component operations views > JVM profile** 3. **CICS operations views > Enterprise Java component operations views > JVM status** 4. **CICS operations views > Enterprise Java component operations views > JVM Class Cache status**
LIBRARY resources	**CICS operations views > Program operations views > Program**

Table 58. Changed CICSPlex SM views in CICS TS Version 3.2 (continued)

Changed CICS resource type or function	Corresponding changes to CICSPlex SM
Storage information for MVS TCBs	1. **CICS operations views** > **CICS region operations views** > **MVS TCBs** 2. **CICS operations views** > **CICS region operations views** > **Global MVS TCB information** 3. **CICS operations views** > **CICS region operations views** > **MVS storage areas**
XCF group ID	**CICS regions** > **region name**

Table 59. New CICSPlex SM views and resource tables in CICS TS Version 3.2

Resource type or function	CICSPlex SM views	CICSPlex SM resource tables
Association data for tasks	**CICS operations views** > **Task operations views** > **Task association data**	TASKASSC
CMASs and CICSplexes (this view was previously supported only by the EUI)	**Administration views** > **CMAS configuration administration views** > **CMAS in CICSplex definitions**	CPLXCMAS (existing resource table)
Historical data for tasks	**CICS operations views** > **Task operations views** > **Completed tasksEYUSTARTHTASK**, **EYUSTARTMASHIST** , and **EYUSTARTTASKRMI**	HTASK (existing resource table) MASHIST TASKRMI
IPIC connection	**CICS operations views** > **Connection operations views** > **IP connections**	IPCONN
LIBRARY	**CICS operations views** > **Program operations views** > **Program** > **LIBRARYs**	LIBRARY
LIBRARY data set names	**CICS operations views** > **Program operations views** > **Program** > **LIBRARYs including DFHRPL** > **LIBRARY name** > **Number of DSNAMEs**	LIBDSN, LIBRARY
LIBRARY definitions in a resource group	**Administration views** > **Basic CICS resource administration views** > **Resource definitions in a resource group**	LIBINGRP
LIBRARY resource definitions	**Administration views** > **Basic CICS resource administration views** and **Resource definitions** > **LIBRARY definitions**	LIBDEF
Task element storage	**EYUSTARTTASKESTG**	TASKESTG
Task file usage	**EYUSTARTTASKFILE**	TASKFILE
Task temporary storage queue usage	**EYUSTARTTASKTSQ**	TASKTSQ
Transient data queues (this view was previously supported only by the EUI)	**CICS operations views** > **Transient data queue (TDQ) operations views** > **Topology data for transient data queue**	CRESTDQ (existing resource table)
WebSphere MQ connection	**CICS operations views** > **DB2, DBCTL and WebSphere MQ operations views** > **WebSphere MQ connections**	MQCONN

Table 60. New BAS definition objects in CICS TS Version 3.2

BAS object	What is it?
IPCINGRP	BAS definition that describes the membership of an IPIC connection definition (IPCONDEF) in a resource group.
IPCONDEF	CICS definition that describes an IPIC connection.
LIBINGRP	BAS definition that describes the membership of a LIBRARY definition (LIBDEF) in a resource group.
LIBDEF	CICS definition that describes a LIBRARY resource.

Chapter 4. Upgrading to the new release

This section tells you how to migrate your CICS environment to a new release, or from Developer Trial to another edition. Each section covers a different aspect of a CICS configuration and summarizes the actions that you need to take to upgrade from one release to another. Icons indicate the versions to which an action applies.

In the kind of complex, enterprise-scale environments that include CICS Transaction Server for z/OS, there are many dependencies to consider. The upgrade must be accommodated on top of regular operations, with minimal impact to Production systems. For CICS TS for z/OS, the ability to skip multiple releases increases the complexity of the upgrade process.

Upgrading from CICS TS Developer Trial

You can upgrade CICS regions from Developer Trial to a full version of either CICS TS or Value Unit Edition (VUE) without having to reinstall.

If you are upgrading toValue Unit Edition, first make sure that you meet the conditions for eligible workloads. For details about eligibility, see the CICS TS announcement letter on the IBM Offering Information web page.

Upgrade actions

Your current version	Action	Mandatory or optional?
V5.1 V5.2 V5.3	"Install the activation module" on page 116	Mandatory
V5.1 V5.2 V5.3	"Replace the SDFHDEV library" on page 116	Mandatory
V5.1 V5.2 V5.3	"Start the CICS region" on page 116	Mandatory

V5.1 V5.2 V5.3

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Install the activation module

Install the activation module for either CICS TS or Value Unit Edition. For instructions, see Installing the CICS TS activation module. You don't need to install the base module because you can use the libraries that you installed for Developer Trial.

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V5.1 V5.2 V5.3

Replace the SDFHDEV library

Replace the SDFHDEV library in the STEPLIB of the CICS TS JCL for the CICS region with the SDFHLIC library for CICS TS , or with the SDFHVUE library for Value Unit Edition.

- The SDFHLIC or SDFHVUE library must be APF-authorized.
- If you use coupling facility data table servers, temporary storage servers, region status servers, or named counter servers, also add the SDFHLIC or SDFHVUE library to the STEPLIB of the JCL for each of the servers.

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Start the CICS region

Start the CICS region. To validate your installation, in the console view, read the initial active messages:

- Message DFHTI0200 and message DFHTI0201 , which are issued when you start a Developer Trial region, should *not* be displayed.
- For Value Unit Edition only, message DFHTI0102 confirms that you are running Value Unit Edition on a zNALC LPAR. Message DFHTI0103 is issued if you are running on a non-zNALC LPAR. You must either reconfigure your LPAR to be a zNALC LPAR, or reinstall on a zNALC LPAR.

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Upgrading CICS Explorer

This section summarizes the actions you might need to upgrade CICS Explorer.

You must install a new copy of CICS Explorer Version 5.4 before you can work with CICS regions at CICS TS Version 5.4. CICS Explorer is backwards compatible with older versions of CICS TS.

Upgrade actions

Your current CICS Explorer version	Action	Mandatory or optional?
ALL VERSIONS	“Back up your CICS Explorer workspace” on page 117	Optional, but advisable
ALL VERSIONS	“Install CICS Explorer” on page 117	Optional

Back up your CICS Explorer workspace

Before you upgrade or install a new copy of CICS Explorer, it is advisable to back up your CICS Explorer workspace so that you can restore the workspace to a previous version, if required.

When you upgrade to CICS Explorer Version 5.3 from Version 5.2 or earlier, if you need to work with CICS Explorer Version 5.2 or earlier, you must back up your existing workspace before you upgrade.

For details, see Taking a backup of the CICS Explorer workspace in the CICS Explorer product documentation.

Install CICS Explorer

If your current version of CICS Explorer is Version 5.2 or earlier, you must install a new copy of CICS Explorer. You cannot just upgrade CICS Explorer because earlier versions of CICS Explorer use a different version of Eclipse.

For more information, see Installing in the CICS Explorer product documentation.

Upgrading CICSPlex SM

This section tells you how to upgrade CICSPlex SM. If you have CICSPlex SM, upgrade CICSPlex SM before you take action on the other areas of your CICS configuration. If you don't have CICSPlex SM, you can skip this section.

Upgrade actions

Your current version	Action	Mandatory or optional?
ALL VERSIONS	Check compatibility requirements for different levels of CICSPlex SM	Mandatory
ALL VERSIONS	Back up your configuration	Optional, but strongly recommended
ALL VERSIONS	“Upgrade a maintenance point CMAS” on page 120	Mandatory
ALL VERSIONS	Upgrade a WUI and the contents of the WUI server repository (EYUWREP)	Mandatory
ALL VERSIONS	“Upgrade a non-maintenance point CMAS” on page 127	Mandatory
ALL VERSIONS	Upgrade a CICSPlex SM managed CICS system (MAS)	Mandatory
ALL VERSIONS	Upgrade API programs	Mandatory
ALL VERSIONS	Back out of a CICS upgrade (for CICSPlex SM users only)	Mandatory **only** when backing out of an upgrade
ALL VERSIONS	Upgrade the Region Status Server (for Sysplex Optimized Workload users only)	Mandatory

Your current version	Action	Mandatory or optional?
ALL VERSIONS	Update consumers of Tivoli NetView SNA Generic Alerts (for Tivoli NetView users only)	Mandatory
ALL VERSIONS	Recompile your programs to match the current release of CICSPlexSM (for programs that connect to a previous release of CICSPlexSM only)	For programs that connect to a previous release of CICSPlex SM only. Optional, but strongly recommended

ALL VERSIONS

Check compatibility requirements for different levels of CICSPlex SM

You can run this release of CICSPlex SM and earlier releases concurrently, but you must take account of a number of conditions for compatibility.

PTFs When you apply service to CICSPlex SM, PTFs that are applied to the ESSS are not intended to be downward-compatible with earlier maintenance levels at the same release. This means that all CMASes, MASes, WUI Server regions and API programs must run at the same maintenance level as the ESSS for their release. Otherwise, abends, data corruption and unexpected results might occur. See Designing your CICSPlex SM environment for additional considerations about the configuration of CICSPlex SM components. When you apply PTFs to CICSPlex SM, it is essential that all ++HOLD ACTION items associated with the SMP/E maintenance are followed carefully.

CMAS

You can run a CMAS at Version 5.4 that connects to a CMAS running at a supported level of CICS TS. However:

- A CICS TS for z/OS, Version 5.4 CICSPlex SM CMAS runs only in a CICS system at Version 5.4
- In a CICSplex that consists of CMASs at the latest level and at one or more earlier levels, the maintenance point CMAS must be at the latest level. So, when a CICSplex contains CMASs at more than one level, the first CMAS that you upgrade to Version 5.4 must be the maintenance point.
- You cannot view all resources of a CICS TS for z/OS, Version 5.4 region using a CMAS running at an earlier release

MAS For a CMAS and a MAS (including those MASs that act as Web User Interface servers) to communicate, they must be running at the same release of CICSPlex SM. For a maintenance point CMAS at the latest release to communicate with a CICS region that runs an earlier release, the maintenance point CMAS must be at the latest release. Connect the maintenance point CMAS to the back-level MAS through a CMAS that runs the same level. For example, a MAS running Version 5.2 is connected to a CMAS that also runs Version 5.2. This CMAS is connected, in turn, to the maintenance point CMAS that runs the latest level. Communication between the maintenance point CMAS at the latest level and the back-level MAS is through the back-level CMAS to which the maintenance point CMAS is connected.

CICS systems (MASs) running at a supported level of CICS TS can be connected to CICSPlex SM Version 5.4 . To be connected to CICSPlex SM Version 5.4 , CICS systems must use the CICSPlex SM Version 5.4 MAS agent, so they must have the CICSPlex SM Version 5.4 libraries in their CICS JCL. For a CICS system that runs CICS TS for z/OS, Version 3.1 , you must also apply the compatibility APAR PK17360 to the CICS system. If you are using the API or WUI to manage MASs connected to a CMAS at an earlier release, make sure that the MASs are managed indirectly from the Version 5.4 CMAS:

- We recommend that WUI servers run at the latest release. If they are not, they cannot see any of the resources of the latest release. If you have a mix of releases, we recommend that only the WUI at the latest release is used to define or alter resources.
- If you require access to the latest fields from the MAS that run the latest release, through a program that uses the CICSPlex SM API, ensure that the API programs connect to a CMAS that runs the latest release. If the API programs connect to a CMAS that runs an earlier release, resource tables that contain new or updated fields for the new release are not returned to the API program.

WUI server

A WUI server at an earlier release that is connected to a CMAS at an earlier release can retrieve data from a MAS connected to a Version 5.4 CMAS, if the CMAS participates in the management of the CICSplex. However, the WUI server cannot retrieve data about resource types that were not available in the earlier release.

If you want to create any of the following CICSPlex SM objects, you must create them using a WUI server that is running at the same CICSPlex SM release level as the maintenance point CMAS:

- CPLEXDEF (CICSPlex definition)
- CMTCMDEF (CMAS to CMAS link definition)
- CSYSGRP (system group definition)
- PERIODEF (time period definition)
- MONSPEC (monitor specification)
- MONGROUP (monitor group)
- MONDEF (monitor definition)
- RTAGROUP (RTA group)
- RTADEF (RTA definition)
- WLMSPEC (WLM specification)
- WLMGROUP (WLM group)
- WLMDEF (WLM definition)
- TRANGRP (transaction group)

Similarly, if you use the API, EYU9XDBT or BATCHREP batched repository update facilities to create these objects, make sure that these too execute at the same CICSPlex SM release level as the maintenance point CMAS.

Workload management (from CICS TS V4.2)

If you are using workload management, to use the unit of work (UOW) affinities that are introduced in CICS TS for z/OS, Version 4.2 , the CMAS that owns the workload must be at the Version 4.2 level, or later.

Workload function is controlled by the CMAS that owns a workload. The workload owner is assigned to the CMAS that manages the first started

TOR that causes the workload to be initialized. If the workload is not shown as ACTIVE, the first started TOR associated with the workload causes its associated CMAS to be the workload owner. If the workload-owning CMAS is not at the Version 4.2 level or later, any UOW affinity definitions cannot be honored, which means that affinities are not correctly created and obeyed, and are denied to any other CMASs that later join the workload, even if those CMASs are at the Version 4.2 level or later.

To ensure that UOW affinities can be exploited by a workload:

1. Ensure that the existing workload is cloned to a new name, and that any required UOW affinity definitions are applied to the new name.
2. Ensure that the first TOR that is started for the new name is at the Version 4.2 level or later. This causes UOW affinities to be honored by any other region that joins the workload name that is at the Version 4.2 level or later. If any regions that are at earlier release levels join the workload, they are not able to use the UOW affinity function, and must continue to make routing decisions based on the standard workload routing algorithms.

If you believe that your defined UOW affinities are not being implemented, use the **System ID of workload owner** hyperlink in any of the WUI workload runtime views to determine the CICSPlex SM version of the workload-owning CMAS. If the `CPSM version of CMAS` attribute is not at least at the 0420 level, the workload is not capable of exploiting any defined UOW affinities.

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Back up your CICSPlex SM configuration

We strongly recommend that you back up of your JCL, CLISTs, CMAS data repositories, and WUI data repositories. If you need to abandon the upgrade, it is possible to return to the level of CICSPlex SM that you had at the start of the upgrade by following the guidance in “Back out of a CICS upgrade ” on page 131.

Note: Although it is recommended that you keep back ups of your CMAS data repositories, do not use the back up to back out the CMAS upgrade. Instead, reconfigure the upgraded data repository for the original release according to the guidance in “Back out of a CICS upgrade ” on page 131. Failure to do this might result in CMASs becoming isolated.

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Upgrade a maintenance point CMAS

You must upgrade your CICSPlex SM CMAS to Version 5.4 at the same time as you upgrade the CICS system on which it runs. A CICSPlex SM CMAS runs only in a CICS system of the same release level. During startup, the CMAS checks the CICS release level and stops with message EYUXL0142 if the release does not match.

In a CICSplex that consists of CMASs at the Version 5.4 level and at one or more earlier levels, the maintenance point CMAS must be at the Version 5.4 level. So,

when a CICSplex contains CMASs at more than one level, the first CMAS upgraded to Version 5.4 must be the maintenance point. To upgrade the maintenance point CMAS, follow all the steps below.

1. If the MP CMAS is running, stop it. You can continue to execute a workload in the CICSplex while the MP CMAS is down. The running workload should not be affected by the absence of the MP CMAS, but you should not make any changes to definitions while the MP CMAS is down.
2. Upgrade the CICS modules to Version 5.4. For more information about dynamically updating DFHIRP, see Upgrading MRO.
3. In the z/OS image that contains the CMAS, check that the IEASYSxx member of the SYS1.PARMLIB library that you use for z/OS initialization includes the **MAXCAD** and **NSYSLX** parameters, with an appropriate value. Specifying each CMAS correctly in IEASYSxx in the IBM Knowledge Center explains what values are suitable. If you are running both a previous release and Version 5.4 of CICSPlex SM, an Environment Services System Services (ESSS) space is started for each release, so you might need to modify the **NSYSLX** value.
4. Authorize the Version 5.4 libraries by adding them to the list of APF-authorized libraries in the appropriate PROGxx or IEAAPFxx member in SYS1.PARMLIB. See Authorizing the CICS and CICSPlex SM libraries in the IBM Knowledge Center.
5. Update the MVS linklist with the Version 5.4 modules that are required for CICS and CICSPlex SM. See Installing CICS-required modules in the MVS linklist.
6. Upgrade the CSD file that the CMAS uses with the Version 5.4 group of resource definitions and CICS startup group list. You do not need to do an additional upgrade that uses a release-dependent set of definitions for CICSPlex SM. CICS supplies a job that is called DFHCOMDS in the XDFHINST library, which is created when you run DFHISTAR. This job assumes that a completely new CSD is created and initialized. It is likely that you prefer to copy the CSD that the CMAS currently uses, and upgrade this copy. Here is an example of a job that does that:

   ```
   //DFHCSDUP JOB MSGCLASS=A,NOTIFY=&SYSUID,CLASS=A
   //*
   //* UPGRADE THE CSD TO 5.3
   //*
   //CSDADD1  EXEC PGM=DFHCSDUP,REGION=2000K,PARM='CSD(READWRITE)'
   //SYSPRINT DD SYSOUT=A
   //STEPLIB  DD DISP=SHR,DSN=BLD.CICSDEV.INCCUR.SDFHLOAD
   //DFHCSD   DD DSN=CTSSVT.JCA.BANK1.CICS700.DFHCSD,DISP=SHR
   //SYSIN    DD *
     UPGRADE REPLACE
   /*
   //
   ```

7. If you modified the default resource definitions for your earlier release (these definitions are supplied by CICSPlex SM in the EYU$CDEF sample, which contains definitions for a CMAS), manually upgrade your modified resource definitions by using the equivalents in the EYU$CDEF sample for Version 5.4.

   The safest way is to copy the upgraded default resource definitions and reapply your modifications. It is important to upgrade your modified definitions to ensure that they are defined correctly with non-default values for attributes that are new. If you fail to upgrade modified definitions, CICS assigns default values to any new attributes. The default values might be inappropriate for your requirements.
8. Use the EYU9XDUT utility to upgrade the data repository (EYUDREP data set) for the CMAS to Version 5.4. It is very important that you upgrade the

data repository file itself instead of a copy of the data repository. Failure to do this can cause CMAS isolation issues when the CMAS is restarted at the new level. For information about how to upgrade the data repository, see Creating the CICSPlex SM data repository. The conversion utility copies the contents of the existing data repository to a newly allocated data repository. The existing data repository is not modified.

Note: After you upgrade the data repository for the CMAS, the next time the CMAS is started it must point to the upgraded EYUDREP data set. If it does not, data repository updates can be lost. This loss can lead to incorrect results, which can include other CMASs isolating themselves when they connect to this CMAS. After the upgrade, if you choose to roll back to the version that you upgraded from, use the EYU9XDUT utility with PARM=('TARGETVER=*original version number*') to downgrade the upgraded data repository for the CMAS. Failure to do this might result in CMASs becoming isolated.

9. Delete, redefine, and initialize the CICS local catalog and global catalog by using the DFHCCUTL and the DFHRMUTL utility programs. If you used DFHISTAR to install CICS, it creates a library that is called XDFHINST. This library contains member DFHDEFDS. DFHDEFDS creates the LCD and GCD files and initializes them. It also creates the other files that CICS requires, such as DFHTEMP, DFHINTRA, and DFHLRQ.
10. Check the CICSPlex SM system parameters that are referenced by the EYUPARM DD statement. If the CASNAME system parameter is present, delete it. For information about these parameters, see CICSPlex SM system parameters in the IBM Knowledge Center.
11. Check that the CICS system initialization parameter GRPLIST references the CICS supplied default startup group list, DFHLIST, and any CSD groups that contain resource definitions that were modified.
12. Cold start the upgraded MP CMAS.

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Upgrade a WUI and the contents of the WUI server repository (EYUWREP)

A Web User Interface server and the CMAS to which it connects must be at the highest level of CICSPlex SM and CICS in the CICSplex. They must be at the same level as the maintenance point CMAS. Web User Interface servers that have not yet been upgraded to the same level as the maintenance point CMAS can be used, but they might return unreliable results until you upgrade them.

A Web User Interface server can connect only to a CMAS at the same release level. Before you upgrade a Web User Interface server, you must upgrade the CMAS to which it connects, using the instructions in "Upgrade a non-maintenance point CMAS" on page 127. If the CMAS to which the Web User Interface server connects is not the maintenance point CMAS, you must also upgrade the maintenance point CMAS before you start the Web User Interface server and the CMAS to which it connects. Upgrade the Web User Interface server to Version 5.4 before you start any other MASs, so that it is ready to manage the upgraded MASs.

A CICS system that acts as a Web User Interface server is a local MAS. However, when you upgrade a Web User Interface server, you must upgrade both the

CICSPlex SM MAS agent and the CICS region to Version 5.4. In other MASs, you can upgrade only the CICSPlex SM MAS agent, and you are not required to upgrade the CICS region.

If you use CICS Explorer, after you upgrade the WUI server, you must upgrade CICS Explorer. This is because the CICS Explorer relies on the WUI server to return data. You can upgrade the CICS Explorer at any time; see the instructions in Applying maintenance to CICS Explorer.

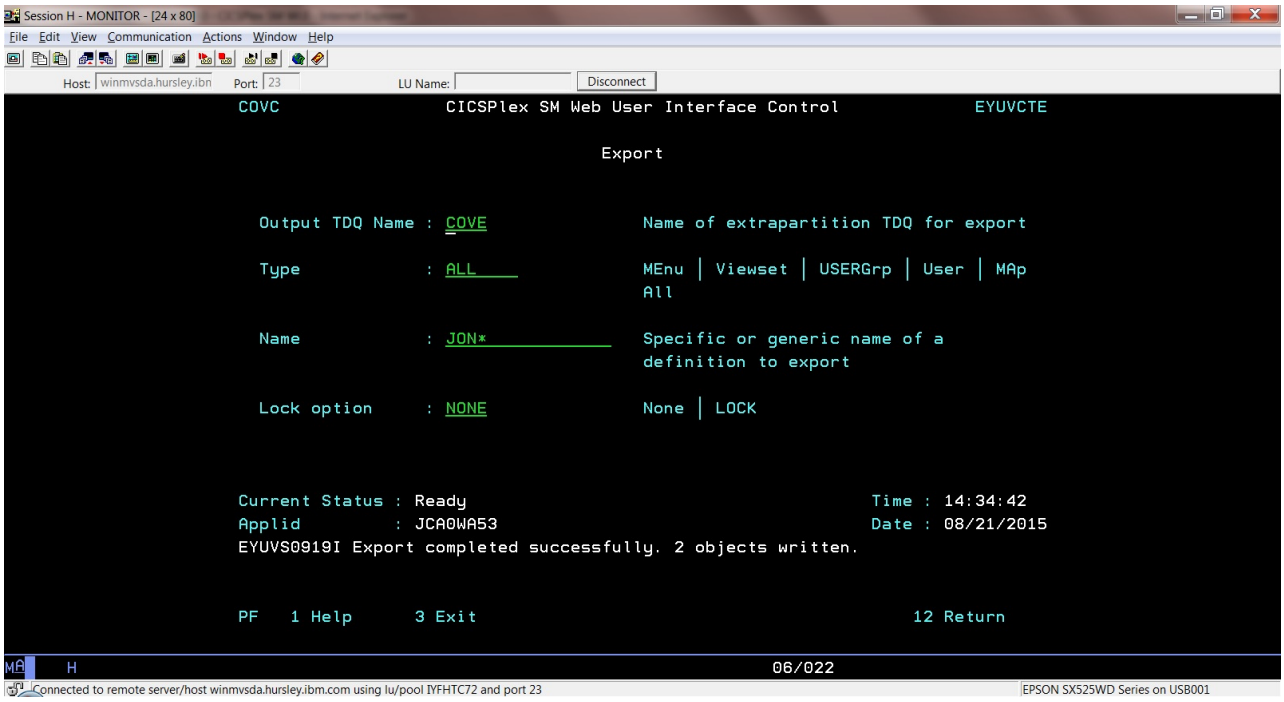
1. Create a new set of WUI files, or upgrade a copy of your existing WUI files to the latest release.

   If you used DFHISTAR, the XDFHINST library that it creates contains member EYUWUIDS. When EYUWUIDS is run, it creates a new WUI Server repository (EYUWREP) and some new import (EYUCOVI) and export (EYUCOVE) files to use later if you tailored or used your own WUI view or menus. EYUWUIDS also creates the WUIs, the trace, dump, INTRA TD, LCD, GCD, LRQ, and CSD files.
2. If you copy your own files, the WUI Server Repository file (EYUWREP) must be created empty. It will be populated in a later step. If you tailored the WUI, for example with your own menus, views or usergrps, to preserve these changes after the upgrade, export and re-import the artifacts from the current WUI. You can use the COVC transaction to do the export and import. If you use only the IBM-supplied WUI menus and views, you can skip the remainder of this step.

   Using the EYUCOVE (export) dataset that was previously created by EYUWUIDS, apply the COVE file to the WUI start up JCL for the WUI that you are exporting from. For example:

   ```
   //EYUCOVI  DD DSN=hlq.EYUCOVI,DISP=SHR
   //EYUCOVE  DD DSN=hlq.EYUCOVE,DISP=SHR
   ```

   With the WUI running at the original version, you are ready to export to the EYUCOVE dataset. Do this with the COVC transaction, by selecting the “Export” option. On the “Output TD Queue name”, specify COVE. The Type can be MENU, VIEWSET, USERGRP, USER, MAP, or specify ALL if you want to extract all of your artifacts together. This example exports to COVE all artifacts that begin with the characters JON*:



After the data is exported, you must import it. This is done later during the step to "Upgrade the contents of the Web User Interface server repository (EYUWREP)" on page 125.

3. Authorize the Version 5.4 CICS and CICSPlex SM libraries. See Authorizing the CICS and CICSPlex SM libraries.
4. If you use the link pack area (LPA), decide when you plan to replace the previous release modules in the LPA with the Version 5.4 modules. Every CICSPlex SM module that is installed in the LPA can be used only by the release of CICSPlex SM to which it relates.
   a. If you put the Version 5.4 modules in the LPA immediately, change your previous release MASs to use the previous release modules from the STEPLIB and DFHRPL concatenations, instead of the LPA.
   b. If you put the Version 5.4 modules in the LPA at the end of the upgrade process, make sure your upgraded MASs are using the Version 5.4 modules from the STEPLIB and DFHRPL concatenations instead of the LPA, then change them to use the LPA when you replace the modules.

   For more information, see Controlling the use of modules from the LPA in the IBM Knowledge Center.
5. Upgrade the CSD file that is used by the WUI with the Version 5.4 group of resource definitions and CICS startup group list. You do not need to carry out an additional upgrade that uses a release-dependent set of definitions for CICSPlex SM. CICS supplies a job that is called DFHCOMDS in the XDFHINST library, which is created when you run DFHISTAR. This job assumes that a completely new CSD is created and initialized. It is likely that you prefer to copy the CSD that the WUI currently uses, and upgrade this copy. Here is an example of a job that does that:

```
//DFHCSDUP JOB MSGCLASS=A,NOTIFY=&SYSUID,CLASS=A
//*
//* UPGRADE THE CSD TO 5.3
//*
//CSDADD1  EXEC PGM=DFHCSDUP,REGION=2000K,PARM='CSD(READWRITE)'
//SYSPRINT DD SYSOUT=A
```

```
//STEPLIB  DD DISP=SHR,DSN=BLD.CICSDEV.INCCUR.SDFHLOAD
//DFHCSD   DD DSN=CTSSVT.JCA.BANK1.CICS700.DFHCSD,DISP=SHR
//SYSIN    DD *
  UPGRADE REPLACE
/*
//
```

6. If you modified the dynamically-created resource definitions for your earlier release that were supplied by CICSPlex SM in the EYU$WDEF sample, manually upgrade your modified resource definitions by using the equivalents in the EYU$WDEF sample for Version 5.4.

   The safest way to upgrade the resource definitions is to copy the Version 5.4 resource definitions and reapply your modifications. It is important to upgrade your modified definitions to ensure that they are defined correctly with non-default values for attributes that are new. If you do not upgrade your modified definitions, CICS assigns default values to any new attributes. These values might be inappropriate for CICS-supplied resource definitions.
7. Edit the JCL used to start the Web User Interface server, changing library names for the previous release of CICSPlex System Manager to the Version 5.4 names. For information about the MAS startup JCL, see Changing startup JCL before starting a MAS in the IBM Knowledge Center.
8. Check that the CICS system initialization parameter **EDSALIM** is specified for the CICS region, and set it to a value of 800 MB. 800 MB is the default EDSALIM value for a CICS region in Version 5.1 and later. You can tune this value in a similar way to tuning CICS storage in a CMAS. System initialization parameters can be specified before startup in the following locations:
   - In the system initialization table that is specified in the DFHSITxx load module whose suffix (xx) is specified as a SIT= system initialization parameter.
   - In the PARM parameter of the EXEC PGM=DFHSIP statement.
   - In the SYSIN data set defined in the startup job stream.
9. Check that the CICS system initialization parameter **CPSMCONN=WUI** is specified for the CICS region. This system initialization parameter initializes the CICS region as a Web User Interface server and dynamically creates the required resource definitions for CICSPlex SM.
10. Check that the CICS system initialization parameter **GRPLIST** references the CICS-supplied default startup group list, DFHLIST, any CSD groups that contain resource definitions that you modified, and the lists of definitions for your own applications.
11. Ensure that you deleted, redefined, and initialized the CICS local catalog and global catalog by using the DFHCCUTL and the DFHRMUTL utility programs.
12. If you use MAS history recording, define new history data sets by using the EYUJHIST sample job. If you prefer to upgrade your existing history data sets, you can also do this by using the EYUJHIST sample job and following the upgrading instructions, which are supplied as comments, in the sample. The EYUJHIST sample is supplied uncustomized in the TDFHINST library, and customized by DFHISTAR in the XDFHINST library. Remember to edit the MAS startup JCL to include the history data sets.

Upgrade the contents of the Web User Interface server repository (EYUWREP)

This step is needed only if you have tailored the WUI, for example, menus, views, and usergrps. If you use only the IBM-supplied menus and views, you can skip this step.

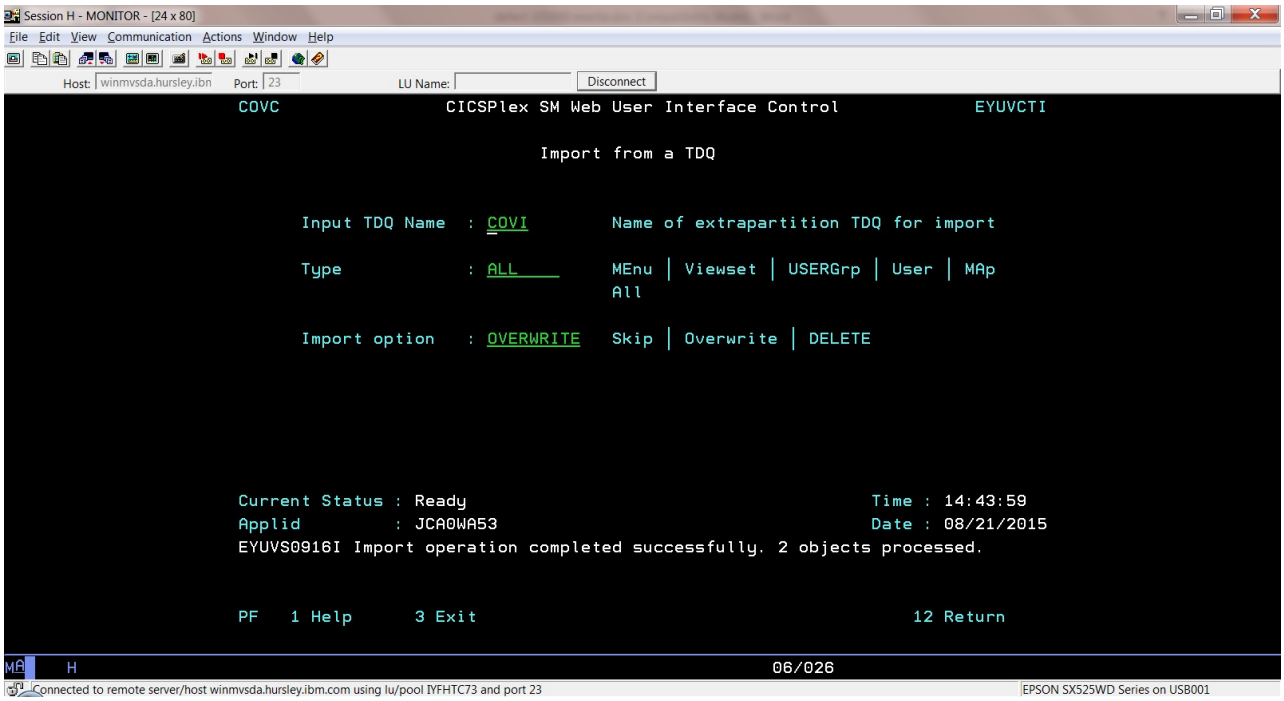
With each release of CICS, internal Web User Interface repository record versions might be incremented to enable the new features in view definitions. For this reason, if your existing Web User Interface repository contains customized view sets or menus, you must upgrade your view set and menu definitions.

The previous steps to upgrade a WUI server included a step to use the export function of the COVC transaction to export your existing view set and menu definitions from the Web User Interface server repository to an export file. When you upgrade the Web User Interface server repository to Version 5 4 , you can import a view set and menu definitions from a previous release into your new Web User Interface server repository. You do not need to make any changes to existing customized views and menus, but you can consider modifying or creating new view sets to take into account the new attributes and resources at the next release level.

1. When you have exported to the COVE file, amend the Version 5 4 WUI start up JCL so that the exported dataset becomes the DD name that is used for the COVI (import) file. For example:

   ```
   //EYUCOVI  DD DSN=hlq.EYUCOVE,DISP=SHR
   ```

2. Start the Version 5.4 WUI.
3. Use the COVC **Import from a TDQ** option to import the view set and menu definitions from the COVI dataset. On the Input TD Queue name, specify COVI. The Type can be MENU, VIEWSET, USERGRP, USER, MAP or use ALL if you want to import all of your artifacts together. Specify the OVERWRITE option to harden the changes. The following example imports ALL changes from COVI:



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Upgrade a non-maintenance point CMAS

You must upgrade your CICSPlex SM CMAS to Version 5.4 at the same time as you upgrade the CICS system on which it runs. A CICSPlex SM CMAS runs only in a CICS system of the same release level. During startup, the CMAS checks the CICS release level and stops with message EYUXL0142 if the release does not match.

You can upgrade a non-MP CMAS at the same time as the MP CMAS, or, if you are planning a phased migration, you can upgrade the non-MP CMAS later. If you run a a workload during the upgrade, note that non-Sysplex Optimized workloads continue, but information about the region health might be unavailable while the CMAS is down. This can impact routing decisions during this time. For Sysplex Optimized workloads, region information should continue to be obtained from the coupling facility during the time that the CMAS is down.

When you upgrade a CMAS that is not a maintenance point CMAS, all of the CICSplex records are removed from its data repository. The CMAS cannot connect to its MASs, or join MASs connected to other CMASs, until it reconnects to its maintenance point, at which point its data repository is resynchronized for the CICSplex. Both the maintenance point and non-maintenance point issue EYULOG messages EYUCP0203I and EYUCP0204I. The data repository synchronize is not complete until both CMASs issue both messages. Depending on the number of records in the CICSplex, the maintenance point usually takes longer than the non-maintenance point. This means that the time between the two messages on the non-maintenance point is short, but the time between the two messages on the maintenance point is longer.

To upgrade a CMAS that is not a maintenance point:

- Check that the maintenance point CMAS for the CICSplex is upgraded, restarted, and available in every CICSplex where the CMAS is a member. Remove the CMAS from any CICSplex where the maintenance point CMAS is still at an earlier level. If the CMAS is started in a CICSplex that has a maintenance point CMAS at an earlier level, message EYUCP0012E is issued. In an environment with multiple interconnecting CICSplexes, this message and message EYUTS0012E can be issued repeatedly.
- Take down each non-maintenance point CMAS
- Follow the steps 2 - 12 below for each CMAS.

1. Stop the non-MP CMAS.
2. If you have not already done so as part of the MP CMAS upgrade, upgrade the CICS modules to Version 5.4. For more information about dynamically updating DFHIRP, see Upgrading MRO.
3. In the z/OS image that contains the CMAS, check that the IEASYSxx member of the SYS1.PARMLIB library that you use for z/OS initialization includes the **MAXCAD** and **NSYSLX** parameters, with an appropriate value. Specifying each CMAS correctly in IEASYSxx in the IBM Knowledge Center explains what values are suitable. If you are running both a previous release and Version 5.4 of CICSPlex SM, an Environment Services System Services (ESSS) space is started for each release, so you might need to modify the **NSYSLX** value.
4. Authorize the Version 5.4 libraries by adding them to the list of APF-authorized libraries in the appropriate PROGxx or IEAAPFxx member in SYS1.PARMLIB. See Authorizing the CICS and CICSPlex SM libraries in the IBM Knowledge Center.

5. If you have not already done so as part of the MP CMAS upgrade, update the MVS linklist with the Version 5.4 modules that are required for CICS and CICSPlex SM. See Installing CICS-required modules in the MVS linklist in the IBM Knowledge Center.
6. If the non-MP CMAS uses a different CSD to the MP CMAS, upgrade the CSD file that the CMAS uses with the Version 5.4 group of resource definitions and CICS startup group list. You do not need to do an additional upgrade that uses a release-dependent set of definitions for CICSPlex SM. CICS supplies a job that is called DFHCOMDS in the XDFHINST library, which is created when you run DFHISTAR. This job assumes that a completely new CSD is created and initialized. It is likely that you prefer to copy the CSD that the CMAS currently uses, and upgrade this copy. Here is an example of a job that does that:

```
//DFHCSDUP JOB MSGCLASS=A,NOTIFY=&SYSUID,CLASS=A
//*
//* UPGRADE THE CSD TO 5.3
//*
//CSDADD1  EXEC PGM=DFHCSDUP,REGION=2000K,PARM='CSD(READWRITE)'
//SYSPRINT DD SYSOUT=A
//STEPLIB  DD DISP=SHR,DSN=BLD.CICSDEV.INCCUR.SDFHLOAD
//DFHCSD   DD DSN=CTSSVT.JCA.BANK1.CICS700.DFHCSD,DISP=SHR
//SYSIN    DD *
  UPGRADE REPLACE
/*
//
```

7. If you modified the default resource definitions for your earlier release (these definitions are supplied by CICSPlex SM in the EYU$CDEF sample, which contains definitions for a CMAS), manually upgrade your modified resource definitions by using the equivalents in the EYU$CDEF sample for Version 5.4.

   The safest way is to copy the upgraded default resource definitions and reapply your modifications. It is important to upgrade your modified definitions to ensure that they are defined correctly with non-default values for attributes that are new. If you fail to upgrade modified definitions, CICS assigns default values to any new attributes. The default values might be inappropriate for your requirements.
8. Use the EYU9XDUT utility to upgrade the data repository (EYUDREP data set) for the CMAS to Version 5.4. It is very important that you upgrade the data repository file itself instead of a copy of the data repository. Failure to do this can cause CMAS isolation issues when the CMAS is restarted at the new level. For information about how to upgrade the data repository, see Creating the CICSPlex SM data repository in the IBM Knowledge Center. The conversion utility copies the contents of the existing data repository to a newly allocated data repository. The existing data repository is not modified.

   Note: After you upgrade the data repository for the CMAS, the next time the CMAS is started it must point to the upgraded EYUDREP data set. If it does not, data repository updates can be lost. This loss can lead to incorrect results, which can include other CMASs isolating themselves when they connect to this CMAS. After the upgrade, if you choose to roll back to the version that you upgraded from, use the EYU9XDUT utility with PARM=('TARGETVER=*original version number*') to downgrade the upgraded data repository for the CMAS. Failure to do this might result in CMASs becoming isolated.
9. Delete, redefine, and initialize the CICS local catalog and global catalog by using the DFHCCUTL and the DFHRMUTL utility programs. If you used DFHISTAR to install CICS, it creates a library that is called XDFHINST. This

library contains member DFHDEFDS. DFHDEFDS creates the LCD and GCD files and initializes them. It also creates the other files that CICS requires, such as DFHTEMP, DFHINTRA, and DFHLRQ.

10. Check the CICSPlex SM system parameters that are referenced by the EYUPARM DD statement. If the CASNAME system parameter is present, delete it. For information about these parameters, see CICSPlex SM system parameters.
11. Check that the CICS system initialization parameter GRPLIST references the CICS supplied default startup group list, DFHLIST, and any CSD groups that contain resource definitions that were modified.
12. Check that the maintenance point CMAS for the CICSplex is running in every CICSplex where the CMAS is a member. Perform a cold start of the upgraded CMAS.
13. Allow the upgraded CMAS to synchronize repository with the other CMASs in the network. EYULOG messages EYUCP0203I and EYUCP0204I are issued when the repository synchronization begins and completes.

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ALL VERSIONS

Upgrade a CICSPlex SM managed CICS system (MAS)

When you upgrade a CICSPlex SM MAS to CICSPlex SM Version 5.4, you might choose to upgrade only the CICSPlex SM MAS agent. You are not required to upgrade the CICS region to Version 5.4 at the same time.

Before you upgrade a CICSPlex SM MAS to CICSPlex SM Version 5.4, you must upgrade the CICSPlex SM CMAS to which it connects. You must also upgrade the Web User Interface server for the CICSplex.

1. If you use the link pack area (LPA), decide when you plan to replace the previous release modules in the LPA with the Version 5.4 modules. Every CICSPlex SM module that is installed in the LPA can be used only by the release of CICSPlex SM to which it relates. Every CICSPlex SM module installed in the LPA can be used only by the release of CICSPlex SM to which it relates.
   a. If you put the Version 5.4 modules in the LPA immediately, change your previous release MASs to use the previous release modules from the STEPLIB and DFHRPL concatenations, instead of the LPA.
   b. If you put the Version 5.4 modules in the LPA at the end of the upgrade process, make sure your upgraded MASs are using the Version 5.4 modules from the STEPLIB and DFHRPL concatenations instead of the LPA, then change them to use the LPA when you replace the modules.

   For more information, see Controlling the use of modules from the LPA in the IBM Knowledge Center.
2. In the JCL that is used to start the MAS, replace the previous release SEYUAUTH library name in the STEPLIB concatenation, and the previous release SEYULOAD library name in the DFHRPL concatenation, with the Version 5.4 SEYUAUTH and SEYULOAD library names. The Version 5.4 SEYUAUTH library must be authorized for APF, which you did when you upgraded the CMAS, but the SEYULOAD library must not be authorized. For information about the MAS startup JCL, see Changing startup JCL before starting a MAS in the IBM Knowledge Center.

3. Check that the CICS system initialization parameter **EDSALIM** is specified for the CICS region, and set it to a value of 800 MB. 800 MB is the default EDSALIM value for a CICS region in Version 5.4. System initialization parameters can be specified before startup in the following locations:
   - In the system initialization table that is specified in the DFHSITxx load module whose suffix (xx) is specified as a SIT= system initialization parameter.
   - In the PARM parameter of the EXEC PGM=DFHSIP statement.
   - In the SYSIN data set defined in the startup job stream.
4. If you use MAS history recording, define new history data sets by using the EYUJHIST sample job. If you prefer to upgrade your existing history data sets, you can also do this using the EYUJHIST sample job and following the upgrading instructions, which are supplied as comments, in the sample. The EYUJHIST sample is supplied uncustomized in the TDFHINST library, and customized by DFHISTAR in the XDFHINST library. Remember to edit the MAS startup JCL to include the history data sets.
5. If you also want to upgrade the CICS region to Version 5.4 at this time. You must upgrade the CSD for CICS as instructed, but you do not need to do any additional upgrade to your CSD to obtain the resource definitions for CICSPlex SM because all CICSPlex SM resources are defined and installed dynamically.
6. Before you can start the MAS at the latest level, there are still some steps that need to be considered. See “Upgrading CICS regions” on page 133 for instructions to activate the license file, and to delete, define, and initialize global and local catalogs at the latest level. When you *are* ready to start the MAS, ensure that it is cold-started.

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ALL VERSIONS

Upgrade CICSPlex SM API programs

CICSPlex SM API programs that were written to run in a MAS at a previous release can be run in a Version 5.4 MAS. You can either continue to access the data that is provided by the previous release or access the new data available from Version 5.4. For information about using API programs with different releases of CICSPlex SM , see Compatibility between releases of CICSPlex SM in the IBM Knowledge Center.

If you modified your application programs to call EYU9XLOP using the EYUAWTRA commarea, recompile and link-edit them using the latest version.

When you upgrade from a release earlier than Version 5.2, note that the following EYUDA general values are added for the CICSPlex SM API:

- AVAILABLE (778)
- UNAVAILABLE (779)
- SOMEAVAIL (780)

The number of records that are returned by CICSPlex SM API programs querying the WLMAWTOR (Active routing regions) resource increased because WLMAWTOR now includes extra statistical information about units of work as a result of the new key attribute RPTINGCMAS (Reporting CMAS name).

For each TOR in a workload, a WLMAWTOR record is returned from every CMAS that takes part in the workload; that is, every CMAS that manages a TOR in the

workload. API programs querying WLMAWTOR, therefore, have more records to process. The number to process depends on the end of unit-of-work count. Existing API applications are unaffected if the first record in the result set is treated as the only record.

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V3.1

Delete previous CICSPlex SM release definitions from CSD files

If you are upgrading from CICS TS for z/OS, Version 3.1 or an earlier release, when you successfully upgrade all your systems to CICSPlex SM Version 5.4, delete the definitions for previous versions and releases from the CSD of each CMAS and MAS.

From CICS TS for z/OS, Version 3.2 onwards, the CICS resource definitions for CICSPlex SM are created dynamically, so you no longer need to delete those definitions after the upgrade.

1. Issue the DFHCSDUP UPGRADE command and specify module EYU9R*xxx*, where *xxx* is the release number for the previous release; for example, EYU9R310 for Version 3.1. This module is supplied in CICSTS54.CPSM.SEYULOAD. For example:

```
//CSDUP   EXEC PGM=DFHCSDUP
//STEPLIB  DD  DSN=cics.index.SDFHLOAD,DISP=SHR
//         DD  DSN=cpsm.index.SEYULOAD,DISP=SHR
//DFHCSD   DD  DSN=cics.dfhcsd,DISP=SHR
//SYSPRINT DD  SYSOUT=*
//SYSIN    DD  *
 UPGRADE USING(EYU9Rxxx
)
 /*
```

   When this JCL is run, EYU9R*xxx* attempts to delete all the groups and group lists for that CICSPlex SM version from the CSD. However, because not all of the items that the job attempts to delete are defined in the CSD, DFHCSDUP gives a return code of 04.
2. Use the DFHCSDUP SYSPRINT output to check the results of the deletions. The output lists the items that were deleted and the items that were not found.

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ALL VERSIONS

Back out of a CICS upgrade

If you experience issues with your upgrade you might need to back out and reinstate the previous version. If you use CICSPlex SM there are some important actions, in addition to reverting to the previous version, that you must consider:

- Make sure you return your data repository back to the way it was before the upgrade. Use the EYU9XDUT job with parameter **targetver** to reconfigure the data repository to the previous release for you. For more information, see Creating the CICSPlex SM data repository in the IBM Knowledge Center .

  Note: If you use a backup of your data repository rather than reconfiguring it, you risk isolating your CMAS.
- If you reinstate to the previous release all the CMASes on your LPAR for the new release, you might want to terminate your ESSS address base. Terminating

is not necessary if you are planning to IPL. For instructions, see Stopping the ESSS (TERMINATE) in the IBM Knowledge Center.

ALL VERSIONS

Upgrade the Region Status Server (for Sysplex Optimized Workload users only)

The Region Status Server is a standard CICS Coupling Facility Data Table (CFDT) server that is reserved for CICS Region Status recording and reporting. Any upgrade to the CFDT Server function also applies to the RS Server. To upgrade the RS Server, follow the advice in "Upgrade the CICS data sharing servers" on page 134.

ALL VERSIONS

Update consumers of Tivoli NetView SNA Generic Alerts (for Tivoli NetView users only)

When you upgrade to a new version of CICS TS, the GDS MSU segment for the CICS TS product identifier changes within SNA Generic Alerts generated by CICSPlex SM.

"Product Set ID" (`X'10'`) MS common subvector is a "Product ID" (`X'11'`) common subvector that identifies the product as IBM Software (`X'04'`). It contains a "Product Number" (`X'08'`) Product ID subfield that identifies the product number. See Changes to CICSPlex SM for the product numbers used in different versions of CICS Transaction Server for z/OS.

If you use Tivoli NetView automation processing routines based on SNA Generic Alert headers identifying the product identifier, you will need to update your automation table processing to check for the new version of CICS TS to continue to process the SNA Generic Alerts.

For information about routing alerts using a Message Automation Table, see Writing Automation Table Statements to Automate MSUs in the Tivoli NetView for z/OS documentation.

ALL VERSIONS

Recompile your programs to match the current release of CICSPlex SM

This applies only to programs that connect to a previous release of CICSPlex SM.

API programs that specify a CRITERIA string to limit the size of a result set on a GET or PERFORM OBJECT request, or use the SPECIFY FILTER verb, can experience the increase in CMAS CPU and ESSS storage. Batch job run times might also increase.

You are not required to recompile your CICSPlex SM API programs when you upgrade to the new release. However, if you do not recompile affected programs, the CMAS has to convert the records from the current release format to the level specified on the VERSION keyword on the CONNECT verb. This transformation process is highly intensive for CPU and storage when the result set is very large, for example, 300,000 - 500,000 records. Increases are observed in most cases when a criteria string is used to filter the result set; for example, specifying a criteria for the PROGRAM object by using the NAME key for a specific or generic program.

In this case, CICSPlex SM has to retrieve all program objects and return them to the CMAS where the API is connected, transform the records to the version of the API, and then apply the filtering.

If you recompile your programs to specify the VERSION keyword to match the current release of CICSPlex SM, this conversion does not take place, and storage and CPU consumption do not increase significantly.

Upgrading CICS regions

This section summarizes the actions to take to migrate any CICS region from one release to another. Other sections go through the actions to take for other elements of a CICS environment.

Upgrade actions

Your current version	Action	Mandatory or optional?
ALL VERSIONS	"Upgrade the CICS data sharing servers" on page 134	Recommended
V3.1 V3.2 V4.1 V4.2	APF-authorize the CICS activation modules	Mandatory
ALL VERSIONS	Redefine and initialize the local and global catalogs	Mandatory
ALL VERSIONS	Enable z/OS conversion services	Optional
ALL VERSIONS	Upgrade the CSD	Mandatory
ALL VERSIONS	Upgrade user-modified, CICSCICS-supplied resource definitions	Mandatory
ALL VERSIONS	Upgrade your copies of CICS-supplied resource definitions	Mandatory
ALL VERSIONS	Reassemble all your macro tables	Mandatory
ALL VERSIONS	Review DSA size limits	Mandatory
ALL VERSIONS	Review MEMLIMIT	Mandatory
ALL VERSIONS	Review program and transaction definitions	Mandatory
ALL VERSIONS	Review the system dump data set size	Mandatory
ALL VERSIONS	"Review the use of MQCONN" on page 139	Recommended

Your current version	Action	Mandatory or optional?
V5.1 V5.2 V5.3	“Upgrade programs that process policy events” on page 139	Mandatory
V3.1 V3.2 V4.1 V4.2 V5.1	Migrate the DFHLRQ data set	Mandatory

ALL VERSIONS

Upgrade the CICS data sharing servers

You should periodically upgrade the three CICS data sharing servers: temporary storage data sharing, coupling facility data tables, and named counters. Upgrade the data sharing servers before you upgrade the clients. As a result, a new server should always support old clients in a fully compatible way, including mixtures of client levels. Although upgrades are not a requirement if no functional changes have been made in the new release of the product, it is still recommended that you upgrade the shared data server to the new release. When you have upgraded the shared data servers, CICS can then be upgraded as a client of the servers.

V3.1 V3.2 V4.1 V4.2

APF-authorize the CICS activation modules

CICS TS V5 introduced activation modules for each edition: base, Developer Trial, and Value Unit Edition. At the start of upgrading your regions, you must:

- APF-authorize the SDFHLIC or SDFHVUE library.
- Add the SDFHLIC or SDFHVUE library in the STEPLIB of the CICS TS JCL.
- If you use coupling facility data table servers, temporary storage servers, region status servers, or named counter-servers, also add the SDFHLIC or SDFHVUE library to the STEPLIB of the JCL for each of the servers.

ALL VERSIONS

Redefine and initialize the local and global catalogs

For each CICS region, you must delete, redefine, and initialize the DFHLCD and DFHGCD data sets:

- Delete your existing data sets.
- Define and initialize new local and global catalogs, following the instructions in Defining the global catalog and Defining the local catalog. Make sure that you use the DFHRMUTL and DFHCCUTL utility programs or the CICS-supplied JCL DFHDEFDS from your target version of CICS TS.

- Start the CICS regions with an initial start, by using the START=INITIAL parameter.

ALL VERSIONS

Enable z/OS conversion services

Optionally, at the start of upgrading your regions to obtain the benefits of z/OS conversion services for data conversion, you must enable the z/OS conversion services and install a conversion image that specifies the conversions that you want CICS to perform. For example, your system might require support for the conversion of UTF-8 or UTF-16 data to EBCDIC.

For the instructions to set up and configure conversions that are supported through the operating system services, see z/OS Unicode Services User's Guide and Reference.

If z/OS conversion services are not enabled, CICS issues a message. If such a message is issued when you start a CICS region that is expected to use the z/OS conversion services, an IPL is necessary to enable these services. If you do not need the z/OS conversion services, you can suppress that message.

ALL VERSIONS

Upgrade the CSD

If you have resource definitions in your CSD that support other IBM products, such as z/OS, you might also need to upgrade these definitions when you start the upgrade of your regions. If you need to share your upgraded CSD with different CICS releases, the CSD must be at the highest release, and compatibility groups must be specified in the correct order. For more information, especially if you are using DFHLIST, see CSD compatibility between different CICS releases for details.

To upgrade the CSD, you have two alternatives:

1. Upgrade the CICS-supplied definitions in your CSD to the latest level. To do this upgrade, run the DFHCSDUP utility program with the UPGRADE command.
2. Define a new CSD by using DFHCSDUP INITIALIZE command.

In CICS TS 4.2 or below, if you have the LE resource definitions in your CSD that support other IBM products, upgrade these definitions as required. For example, if you upgrade z/OS release, you must upgrade your LE resource definitions to the new z/OS level by deleting and replacing the CSD group that contains them. The LE resource definitions are in the SCEESAMP library in member CEECCSD. Figure 1 is an example of how to delete and replace the CSD group that contains the LE definitions. For CICS TS 5.1 and above, this is not required as the LE definitions are system-autoinstalled by CICS, provided that the required maintenance which adds autoinstall capability for LE definitions is applied. For CICS/TS V5.4 the system autoinstall capability is part of the base product.

```
//JOBNAME  JOB 1,userid,
//         NOTIFY=userid,CLASS=n,MSGLEVEL=(n,n),MSGCLASS=n
/*JOBPARM SYSAFF=sysid
/*  Remove Old Language Environment group
//CSDUP1   EXEC PGM=DFHCSDUP,REGION=2M,PARM='CSD(READWRITE)'
//STEPLIB  DD DSN=CICSTS54.CICS.SDFHLOAD,DISP=SHR
//DFHCSD   DD DSN=CICSTS54.CICSHURS.DFHCSD,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSABOUT DD SYSOUT=*
//SYSABEND DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSIN    DD *
 DELETE GROUP(CEE)
/*
//*
//CSDUP2   EXEC PGM=DFHCSDUP,REGION=2M,PARM='CSD(READWRITE)'
//STEPLIB  DD DSN=CICSTS54.CICS.SDFHLOAD,DISP=SHR
//DFHCSD   DD DSN=CICSTS54.CICSHURS.DFHCSD,DISP=SHR
//SYSPRINT DD SYSOUT=*
//SYSABOUT DD SYSOUT=*
//SYSABEND DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSIN    DD DSN=SYS1.ZOS113.SCEESAMP(CEECCSD),DISP=SHR
//
```

Figure 1. Sample job for additional CSD modification

ALL VERSIONS

Upgrade user-modified, CICS-supplied resource definitions

If you modified any of the CICS-supplied resource definitions in your current release of CICS TS, you must upgrade them at the start of upgrading your regions. This action ensures that they are defined correctly with any new values or attributes.

To upgrade the CSD, you have two alternatives:

1. Confirm whether your CSD contains any user-modified, CICS-supplied resource definitions. Use the DFHCSDUP SCAN command to compare the CICS-supplied resource definitions with any user-modified versions. The DFHCSDUP SCAN command searches for the CICS-supplied version of a specified resource name of a specific resource type and compares it with any other resource definition of the same name and type. DFHCSDUP reports any differences that it finds between the CICS-supplied definition and a user-modified version. If you copied and changed the name of a CICS-supplied definition, the SCAN command permits you to specify the changed name as an alias.
2. Copy the upgraded CICS-supplied definitions and reapply your modifications. This action is the safest way to upgrade your definitions and is necessary because the DFHCSDUP UPGRADE command does not operate on your own groups, or on CICS groups that you copied.
3. If the CICS region uses CICSPlex SM, manually upgrade any of the dynamically created CICSPlex SM resource definitions that you modified in your previous release, by using the equivalents in Version 5.4. The dynamically created resource definitions and their attributes are in the following members of the SEYUSAMP sample library:
   - EYU$CDEF contains the default resource definitions for a CMAS.
   - EYU$MDEF contains the default resource definitions for a MAS.
   - EYU$WDEF contains the default resource definitions for a WUI server.

ALL VERSIONS

Upgrade your copies of CICS-supplied resource definitions

If you made copies of CICS-supplied resource definitions, you might need to change your copies to match the changes that are made to the supplied definitions for this release, when you start upgrading your regions. DFHCSDUP UPGRADE does not operate on CICS groups that you copied. To help you, member DFH$CSDU in library SDFHSAMP contains ALTER commands that you can apply by using the CSD utility program DFHCSDUP.

1. Review your resource definitions to determine whether you copied any CICS-supplied definitions.
2. Review DFH$CSDU to determine whether the changes that it contains apply to your resource definitions.
3. Make any necessary changes to DFH$CSDU. It is advisable to make a copy of DFH$CSDU and apply any changes to the copy.
4. Run DFHCSDUP with your modified version of DFH$CSDU as input. As supplied, the ALTER commands in DFH$CSDU specify `GROUP(*)`, which means that DFHCSDUP attempts to change resources in the CICS-supplied groups. This action is not permitted and results in message DFH5151. You can ignore this message.

As an example, program DFHD2EDF is now defined as CONCURRENCY(THREADSAFE). Therefore, DFH$CSDU contains the following command:

```
ALTER PROGRAM(DFHD2EDF) GROUP(*) CONCURRENCY(THREADSAFE)
```

When you run DFHCSDUP, the attribute is added to the definitions of program DFHD2EDF in all groups. Other attributes that are not mentioned in DFH$CSDU are unchanged.

ALL VERSIONS

Reassemble all your macro tables

When you start to upgrade your regions, all your macro tables must be reassembled by using the macros supplied with the new release. During CICS initialization, CICS detects if a macro table is not reassembled, so issues a message DFHLD0110, or DFHFC0110 for File Control table (FCT), and CICS terminates.

ALL VERSIONS

Review DSA size limits

It is not advisable to set the size of individual dynamic storage areas (DSAs), and usually it is not necessary, if you want to do this you must apply it to each CICS region, as necessary. However, it is possible to set the size of some DSAs by using the CDSASZE, UDSASZE, RDSASZE, ECDSASZE, EUDSASZE, ESDSASZE, and ERDSASZE system initialization parameters. All of these parameters defaults to 0. The limit of storage that is available for DSAs in 24-bit storage is specified by the DSALIM SIT parameter. Allow at least 256 KB for each DSA in 24-bit storage for which you have not set a size. The limit of storage available for DSAs in 31-bit storage is specified by the EDSALIM SIT parameter. Allow at least 1 MB for each DSA in 31-bit storage for which you have not set a size. You cannot set individual DSA in 64-bit storage.

For example, CDSASZE sets the size of the CICS dynamic storage area (CDSA), and ECDSASZE specifies the size of the extended CICS dynamic storage area

(ECDSA). The default value for these parameters is 0, indicating that the size of the DSA can change dynamically. If you specify a nonzero value, the DSA size is fixed. If you specify DSA size values that in combination do not allow sufficient space for the remaining DSAs, CICS fails to initialize.

ALL VERSIONS

Review MEMLIMIT

Review your calculation of the value of the z/OS MEMLIMIT parameter to make sure that it provides sufficient 64-bit (above-the-bar) storage for the upgraded CICS region. For more information, see Estimating, checking, and setting MEMLIMIT.

ALL VERSIONS

Review program and transaction definitions

Defaults of the following resource attributes are changed in CICS Transaction Server for z/OS, Version 5 Release 4. This change will have different impact on resources depending on the way the resources are defined. You should review your resource definitions to ensure that the specification of these new defaults is appropriate.

Resources	New attribute defaults
Program definition	DATALOCATION(ANY)
Transaction definition	SPURGE(YES) TASKDATALOC(ANY) TPURGE(YES)

Resources already defined via CEDA, CPSM BAS, DFHCSDUP or a bundle are unaffected, but new definitions will default to the new value.

Resources installed through the **EXEC CICS CREATE** command will use the new default.

For program autoinstall, the default model program DFHPGAPG now specifies `DATALOCATION(ANY)`. If you do not specify `DATALOCATION` in a program autoinstall exit, nor do you specify your own program to be used as a model in the exit, you should review whether the specification of `DATALOCATION(ANY)` is appropriate. If not, choose one of the following ways to prevent `DATALOCATION` from defaulting to `ANY`:

- Specify the name of your own program to be used as the model in an autoinstall exit.
- Copy the definition of DFHPGAPG to your own group and alter the DATALOCATION setting. Ensure that the definition is installed after group DFHPGAIP.

Only AMODE(24) programs need to use `DATALOCATION(BELOW)`. CICS issues a DFHPG0104 warning message when it loads an AMODE(24) program defined with `DATALOCATION(ANY)`.Specify `DATALOCATION(BELOW)` explicitly for definitions of AMODE(24) programs instead of using the default value.

Only transactions that execute AMODE(24) programs need to use `TASKDATALOC(BELOW)`. CICS abends transactions with an AEZC abend code if an AMODE(24) program is run under a transaction that runs with`TASKDATALOC(ANY)`.Specify `TASKDATALOC(BELOW)` explicitly when you define

transactions that execute AMODE(24) programs instead of using the default value.

ALL VERSIONS

Review the use of MQCONN

The introduction of the MQMONITOR resource in CICS TS 5.4 enhances the control and security associated with MQ connections. CICS now differentiates between the userID under which the transaction that is monitoring the MQ queue runs (the MONUSERID) and the userID under which the initiated transactions run. This userID (the USERID) is used by default, unless it is otherwise provided. This has implications for any MQMONITOR resources that are dynamically created when an MQCONN is installed.

In CICS TS 5.3 and earlier releases, when an MQCONN specifying the INITQNAME attribute is installed, a MQINI resource is dynamically created. This MQINI resource uses, for transactions started by the initiation queue, the userID under which the MQCONN was installed. In CICS TS 5.4, when an MQCONN specifying the INITQNAME attribute is installed, it now creates a MQMONITOR resource called DFHMQINI. This MQMONITOR resource uses either the PLTPI user or, if not available, the region userid as the MQMONITOR MONUSERID. However, for transactions started by the initiation queue, the userID is the MQMONITOR USERID, which defaults to the default CICS user.

To avoid a change in user associated with the transactions that are started by the initiation queue, you must:

- Remove the INITQNAME from the MQCONN resource definition
- Create an MQMONITOR with the following attributes:
  - MONUSERID and USERID attributes set to the appropriate userIDs
  - QNAME to match the INITQNAME that was previously specified in the MQCONN resource definition.

ALL VERSIONS

Review the system dump data set size

CICS now supports dumping of multiple address spaces and data spaces on the **SET SYSDUMPCODE** command. Certain system dump codes, such as LG0772, SO0113 and SO1000, have been added to the CICS system dump code table during CICS initialization, and more dump codes might be added to the table in the future.

As a result of this change, more data might be dumped during a system dump. Therefore, you should increase the system dump data set size to ensure sufficient storage is allocated to contain dumped data.

V5.1 V5.2 V5.3

Upgrade programs that process policy events

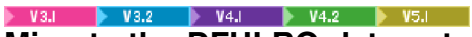
The order of the capture data items in policy events is changed in CICS Transaction Server for z/OS, Version 5 Release 4, therefore you must upgrade any programs that process policy events as follows:

- Any program that processes CFE format policy events emitted by the TS, TD or IBM MQ EP adapters must be recompiled.
- Any program that is started by the transaction start EP adapter or any custom EP adapters must be modified, to change the container names that are

referenced in the source to pick up each capture data item. The following table lists the changes to the container names for each capture data item in CICS TS 5.4:

Capture data item name	Container name in previous releases	Container name in CICS TS 5.4
policy_name	DFHEP.DATA.00001	DFHEP.DATA.00006
rule_name	DFHEP.DATA.00002	DFHEP.DATA.00007
rule_type	DFHEP.DATA.00003	DFHEP.DATA.00009
rule_category	DFHEP.DATA.00004	DFHEP.DATA.00022
rule_operator	DFHEP.DATA.00005	DFHEP.DATA.00023
rule_threshold	DFHEP.DATA.00006	DFHEP.DATA.00024
current_count	DFHEP.DATA.00007	DFHEP.DATA.00025
platform_name	DFHEP.DATA.00008	DFHEP.DATA.00016
application_name	DFHEP.DATA.00009	DFHEP.DATA.00017
application_version_major	DFHEP.DATA.00010	DFHEP.DATA.00018
application_version_minor	DFHEP.DATA.00011	DFHEP.DATA.00019
application_version_micro	DFHEP.DATA.00012	DFHEP.DATA.00020
operation	DFHEP.DATA.00013	DFHEP.DATA.00021
bundle_name	DFHEP.DATA.00014	DFHEP.DATA.00010
bundle_version_major	DFHEP.DATA.00015	DFHEP.DATA.00011
bundle_version_minor	DFHEP.DATA.00016	DFHEP.DATA.00012
bundle_version_micro	DFHEP.DATA.00017	DFHEP.DATA.00013
bundle_id	DFHEP.DATA.00018	DFHEP.DATA.00014
task_id	DFHEP.DATA.00019	DFHEP.DATA.00002
transaction_id	DFHEP.DATA.00020	DFHEP.DATA.00003
user_id	DFHEP.DATA.00021	DFHEP.DATA.00004
program_name	DFHEP.DATA.00022	DFHEP.DATA.00005
policy_user_tag	DFHEP.DATA.00023	DFHEP.DATA.00015

For more information about the capture data items, see Data captured for a policy event.



Migrate the DFHLRQ data set

If outstanding BTS activities for BTS processes exist in CICS, you migrate the contents of your local request queue data set, DFHLRQ. You can use a utility such as IDCAMS COPY to update the new data set with the contents of the DFHLRQ data set from your current release. You must apply this to each CICS region, as necessary.

CSD compatibility between different CICS releases

You can share the CICS system definition data set (CSD) between different CICS releases by using the appropriate compatibility groups. This section shows the compatibility groups that are required when you migrate from one release to another.

Most releases of CICS change the CICS-supplied groups of resource definitions that are included in the DFHLIST group list. The old versions of the CICS resource definitions are retained in compatibility groups. If you share the CSD between different CICS releases, these compatibility groups are needed to support earlier releases.

After you upgrade a CSD, if you plan to share the CSD with earlier releases of CICS, include the appropriate DFHCOMP*x* compatibility groups in your startup group list. Table 61 shows you which DFHCOMP*x* groups to include for each earlier release.

Do not attempt to share a CSD with a CICS region that is running at a higher release level than the CSD.

You must install the compatibility groups in the correct order, as shown in the table. For example, to run a CICS TS 4.1 region with a CSD that is upgraded to CICS TS 5.2, add the DFHCOMPG compatibility group, followed by the DFHCOMPF compatibility group, followed by the DFHCOMPE compatibility group, to the end of your group list.

Language Environment® definitions in CEE group are supplied in the CEECCSD and CEECCSDX members of the SCEESAMP library. For CICS TS 4.2 and below, CEE group is part of list DFHLIST. For CICS TS 5.1 and above, CEE group is not required and is not part of DFHLIST.

Table 61. Required compatibility groups for earlier releases of CICS

	CICS TS 5.4 CSD	**CICS TS 5.3 CSD**	**CICS TS 5.2 CSD**	**CICS TS 5.1 CSD**	**CICS TS 4.2 CSD**	**CICS TS 4.1 CSD**
Shared with CICS TS 5.4	None	Do not share	Do not share	Do not share	Do not share	Do not share
Shared with CICS TS 5.3	DFHCOMPI	None	Do not share	Do not share	Do not share	Do not share
Shared with CICS TS 5.2	DFHCOMPI DFHCOMPH	DFHCOMPH	None	Do not share	Do not share	Do not share
Shared with CICS TS 5.1	DFHCOMPI DFHCOMPH DFHCOMPG	DFHCOMPH DFHCOMPG	DFHCOMPG	None	Do not share	Do not share
Shared with CICS TS 4.2	DFHCOMPI DFHCOMPH DFHCOMPG DFHCOMPF CEE	DFHCOMPH DFHCOMPG DFHCOMPF CEE	DFHCOMPG DFHCOMPF CEE	DFHCOMPF CEE	None	Do not share
Shared with CICS TS 4.1	DFHCOMPI DFHCOMPH DFHCOMPG DFHCOMPF DFHCOMPE CEE	DFHCOMPH DFHCOMPG DFHCOMPF DFHCOMPE CEE	DFHCOMPG DFHCOMPF DFHCOMPE CEE	DFHCOMPF DFHCOMPE CEE	DFHCOMPE	None

Compatibility group DFHCOMPI

Group DFHCOMPI is required for compatibility with CICS Transaction Server for z/OS, Version 5 Release 3.

Table 62. Contents of compatibility group DFHCOMPI

Resource type	Name
PROGRAM	DFHWBUN

Compatibility group DFHCOMPH

Group DFHCOMPH is required for compatibility with CICS Transaction Server for z/OS, Version 5 Release 2.

Table 63. Contents of compatibility group DFHCOMPH

Resource type	Name
PROGRAM	DFHSFP

Compatibility group DFHCOMPG

Group DFHCOMPG is required for compatibility with CICS Transaction Server for z/OS, Version 5 Release 1.

Table 64. Contents of compatibility group DFHCOMPG

Resource type	Name
PROGRAM	DFHPGADX DFHPGAHX DFHPGALX DFHPGAOX DFHPIEP

Compatibility group DFHCOMPF

Group DFHCOMPF is required for compatibility with CICS Transaction Server for z/OS, Version 4 Release 2.

Table 65. Contents of compatibility group DFHCOMPF

Resource type	Name
FILE	DFHADEM
MAPSET	DFHADMS
PROFILE	DFHCICSI

Table 65. Contents of compatibility group DFHCOMPF (continued)

Resource type	Name
PROGRAM	DFHADDRM DFHADJR DFHADWB0 DFHADWM0 DFHADWM1 DFHADWM2 DFHADWM3 DFHADWM4 DFHADWM5 DFHADWM6 DFHADWT0 DFHADWT1 DFHADWT2 DFHADWT3 DFHADWT4 DFHADWT5 DFHCHS DFHDLLOD DFHD2EDF DFHEDFX DFHEIGDS DFHEITAB DFHEITBS DFHEITSZ DFHEJDNX DFHEJEP DFHEJITL DFHIIRRS DFHJVCVT DFHLETRU DFHPIVAL DFHSJGC DFHSJPI DFHSMTAB DFHXOPUS DFJCICS DFJCICSB DFJCZDTC DFJDESN DFJIIRP DFJIIRQ DFJ1ESN DFJ1ICS DFJ1ICSB DFJ1ZDTC

Table 65. Contents of compatibility group DFHCOMPF (continued)

Resource type	Name
TRANSACTION	CBAM CDFS CEHP CEHS CEJR CEMT CEOT CESF CESL CESN CEST CETR CIEP CIRP CIRR CJGC CJPI CLQ2 CLR2 CLS2 CLS3 CLS4 CMPX CMSG CPMI CQPI CQPO CREA CREC CRSQ CRSR CRSY CRTE CSAC CSHR CSMI CSM1 CSM2 CSM3 CSM5 CSNC CSSF CVMI CXCU CXRT

Compatibility group DFHCOMPE

Group DFHCOMPE is required for compatibility with CICS Transaction Server for z/OS, Version 4 Release 1.

Table 66. Contents of compatibility group DFHCOMPE

Resource type	Name
PROGRAM	DFHMIRS DFHCCNV DFHUCNV DSNTIAC DSNTIA1 DFHEDP DFHDBAT DFHDBUEX DFHPIEP

Upgrading security

This section summarizes the actions that relate to security when you migrate from one release of CICS to another.

Your current version	Action	Mandatory or optional?
V4.2 V5.1	"Reconfigure to use SAML support in the base product"	Mandatory, if you are using SAML support
V4.1 V4.2 V5.1	"Check security permissions on CICS bundles" on page 146	Optional, if you use bundles
V4.2 V5.1 V5.2	"Review the impact of extensions to command and resource security checks" on page 146	Mandatory
ALL VERSIONS	" Review settings for programs that are used as application entry points" on page 147	Optional
ALL VERSIONS	"Define new RACF category 1 transactions to the ESM" on page 147	Mandatory
ALL VERSIONS	"Adapt applications to changed ESM output from VERIFY PASSWORD" on page 147	Mandatory

V4.2 V5.1

Reconfigure to use SAML support in the base product

In previous releases, support for SAML was provided by CICS TS Feature Pack for Security Extensions V1.0. From CICS TS 5.2, this function is incorporated into CICS and the feature pack is not supported.

1. Copy your STS configuration file to a new location on z/OS UNIX to use with the new CICS release.
2. Upgrade your `java.policy` file.

a. If you are using a user `java.policy` file, copy it to a new location on z/OS UNIX to use with the new CICS release.
b. Update the following rule to refer to the new CICS root directory.

```
:// All permissions granted to CICS codesource protection domain
grant codeBase "file://USSHOME//-" {
permission java.security.AllPermission;
};
```

where *USSHOME* is the name and path of the root directory for CICS Transaction Server files on z/OS® UNIX.

3. Remove the rule that applies to the feature pack files:

```
grant codeBase "file:fp_dir-" {  permission java.security.AllPermission;
       };
```

where *fp_dir* is the Feature Pack installation directory.

4. Upgrade your JVM profile. Perform the following additional steps:
   a. Delete the CLASSPATH_SUFFIX line from your JVM server profile.
   b. If you are using a user `java.policy` file, update the java.security.policy property to refer to the new location of this file.
5. When no CICS instances are using it, uninstall the feature pack.

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V4.1 V4.2 V5.1

Check security permissions on CICS bundles

For resources that are dynamically created by CICS bundles, no additional CICS command security checks and resource security checks take place for those resource types, either when the resources are dynamically created at bundle installation time, or when you manipulate the resources by making changes to the CICS bundle. You need authority only to perform the actions on the CICS bundle, or for bundles that are installed with applications and platforms, to perform the actions on the application or platform with which the CICS bundle was deployed. However, CICS command security and resource security for the individual resource types do apply when you inquire on the dynamically created resources, or if you manipulate the dynamically- created resources directly.

If you used CICS bundles in earlier CICS releases, check the security permissions that you gave to users for those bundles. Depending on how you set up security for CICS bundles, users with authority to act on individual CICS bundles might now be able to act on new or existing resources that are dynamically created as part of the installation of a bundle. Ensure that the levels of authority for BUNDLE resources are still appropriate.

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V4.2 V5.1 V5.2

Review the impact of extensions to command and resource security checks

Command security applies if CMDSEC(YES) is specified for the CICS region. Resource security applies if RESSEC(YES) is specified for the CICS region. Releases of CICS extend the resource types, their resource identifiers, and associated commands that are subject to command security checking and resource security checking. Check the resources and commands that are changed.

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Review settings for programs that are used as application entry points

If you use program security by setting XPPT=YES, review the security settings for any programs that you declare as application entry points. If you apply security measures to individual PROGRAM resources, for applications that are deployed on platforms, secure the programs that are declared as application entry points, but do not secure other programs in the applications.

The security settings that you specify for a program that is part of an application deployed on a platform apply to both public and private programs, and do not take into account the version of the application. Programs that are declared as an application entry point must have a unique PROGRAM resource name in your environment. However, if you secure programs that run at a lower level in the application, programs with the same names might be running in different applications, which can lead to unforeseen consequences. In this situation, a user might have permission to access a program that is declared as an application entry point, but not have permission to access a program that runs at a lower level in the application because the security settings from another instance of the program name are in effect. Consider the security measures that you apply to a program that is declared as an application entry point program, as applying to the whole application.

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Define new RACF category 1 transactions to the ESM

Category 1 transactions include some CICS internal system transactions. You must define these transactions to your external security manager, and authorize the CICS region user ID to use them, so that CICS can initialize successfully when it is running with security enabled (SEC=YES). For a list of CICS transactions that are category 1, see Category 1 transactions.

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Adapt applications to changed ESM output from VERIFY PASSWORD

This action applies to CICS TS Version 3 and 4.1, to Version 4.2 only if you have not applied APAR PI21865 and to Version 5 only if you have not applied APAR PI21866.

When you issue the EXEC CICS VERIFY PASSWORD command, CICS enforces the revoked status of a user ID or a user's group connection. The method that CICS uses to verify the password is more efficient, but you might notice changes to the output that is produced when verification takes place. CICS attempts to verify a password by using a RACROUTE REQUEST=EXTRACT request to the external security manager. If the password cannot be verified by using this method, CICS uses a RACROUTE REQUEST=VERIFYX request. Before CICS Transaction Server for z/OS, Version 3 Release 1, CICS always used the RACROUTE REQUEST=VERIFYX request, which is more expensive.

The output that is produced by the external security manager is different for the old and new methods of verifying a password. If your application programs relied on the output that is produced by the old method, you need to change them so that they do not depend on this output. The differences are:

- ESMRESP and ESMREASON codes are not supplied by the external security manager for the new method of verifying a password by using a RACROUTE REQUEST=EXTRACT call. These codes are produced only if CICS needs to use the RACROUTE REQUEST=VERIFYX call. Your application programs must always check the EIBRESP and EIBRESP2 values that are returned by the EXEC CICS VERIFY PASSWORD command and not rely on the ESMRESP and ESMREASON codes.
- Message ICH70002I is not produced by the external security manager for the new method of verifying a password. The message is produced only if CICS needs to use the RACROUTE REQUEST=VERIFYX call. The SETR PASSWORD(WARN(nn)) option must also be active in the external security manager for the message to be produced. Your application programs must therefore not rely on receiving this message.

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Upgrading file control

This section covers the actions to take to migrate file control resources when you upgrade from one release of CICS to another.

Upgrade actions

Your current version	Action	Mandatory or optional?
V4.1 V4.2	“Change file and transaction resource definitions”	Mandatory
V4.1 V4.2	“Adapt to changes in LSR pool settings” on page 149	Optional

Change file and transaction resource definitions

If transaction isolation is active, and a program attempts to issue a file control write or update request against a file where the VSAM data set associated with the file uses VSAM nonshared resources (NSR), the program abends with the abend code AFDK. Requests to read or browse the file that do not attempt to update the file in any way do not result in an abend.

To avoid this situation, choose one of the following solutions:

- If the file requires transaction isolation, change the FILE resource definition so that the file uses either VSAM record-level sharing (RLS) or VSAM local shared resources (LSR). RLSACCESS(YES) specifies that CICS opens the file in RLS mode. LSRPOOLNUM(*number*) specifies the number of an LSR pool to be used by the VSAM data set associated with the file.

- If the file does not require transaction isolation, change the TRANSACTION resource definition to specify ISOLATE(NO). Setting this value causes the individual transaction to run without transaction isolation.

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Adapt to changes in LSR pool settings

Before CICS TS for z/OS, Version 4.2, you specified the number of the LSR (local shared resource) pool in FILE and LSRPOOL resource definitions by using the LSRPOOLID attribute, which has values in the range 1 - 8. From CICS TS for z/OS, Version 4.2, the value that is specified for LSRPOOLID in existing FILE and LSRPOOL resource definitions is transferred to the new option LSRPOOLNUM, which has values in the range 1 - 255.

If you share a CSD
: Releases up to Version 4.2 only recognize LSRPOOLID, so, if you share a CSD with earlier releases of CICS, use the compatibility mode in CEDA and DFHCSDUP to set a value for LSRPOOLID. If you specify a value for LSRPOOLNUM, it is used only in this release.

If you use BAS to install a file or LSR pool definition
: In CICSPlex SM Business Application Services (BAS), if you install a FILE or LSRPOOL definition that specifies an LSR pool number greater than 8 into CICS TS for z/OS, Version 4.1 or earlier, the default value of 1 is used. You can use CICSPlex SM to specify a number in the range 1 - 8.

Existing programs that use the commands **EXEC CICS CREATE FILE**, **EXEC CICS CREATE LSRPOOL**, **EXEC CICS CSD DEFINE FILE**, **EXEC CICS CSD DEFINE LSRPOOL**, **EXEC CICS CSD ALTER FILE**, or **EXEC CICS CSD ALTER LSRPOOL** with the LSRPOOLID attribute continue to work correctly. CICS substitutes the value in LSRPOOLNUM for the value in LSRPOOLID when the command is run.

Batch jobs that use the CICS system definition utility program (DFHCSDUP) and issue the commands **ALTER FILE**, **DEFINE FILE**, **ALTER LSRPOOL**, or **DEFINE LSRPOOL** with the LSRPOOLID attribute continue to work correctly. When compatibility mode is used, CICS uses the value in the LSRPOOLID attribute as the number of LSR pools. When compatibility mode is not used, CICS substitutes the value in LSRPOOLNUM for the value in LSRPOOLID.

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Upgrading the Java environment

If you run Java applications in CICS, whether OSGi, Axis2, or Liberty, you have some changes to make when you upgrade your version of CICS.

Before you start upgrading the Java environment, first upgrade the CICS regions, as described in Upgrading CICS regions.

Upgrade actions

Your current version	Action	Mandatory or optional?
V4.1 V4.2	Upgrade the IBM SDK for z/OS	Mandatory
ALL VERSIONS	Check your programs for deprecated APIs	Optional, but recommended
ALL VERSIONS	Review your JVM profiles for new settings	Mandatory
V4.1 V4.2	If you have not already migrated to OSGi, change your Java applications to run in a JVM server	Mandatory, if you haven't already migrated to OSGi
V4.1 V4.2	Check whether applications that run in a JVM server depend on IBM or vendor classes in the supplied JRE	Mandatory, if you haven't already migrated to OSGi
V4.1 V4.2	Check that MEMLIMIT allows sufficient storage for 64-bit JVMs	Mandatory, if you haven't already migrated to OSGi
V4.1 V4.2	Change applications that use EJBs or stateless CORBA objects	Mandatory
V5.1	If you use the CICS Liberty security feature, check for restrictions	Mandatory
V5.1	Import classes from JCICS API or IByteBuffer	Mandatory
V5.1	If you use the CICS Liberty security feature and do not use autoconfigure, define your own SAF registry.	Mandatory

Upgrade the IBM SDK for z/OS

CICS runs Java applications that use the IBM 64-bit SDK for z/OS, Java Technology Edition, Version 7, Version 7 Release 1 or Version 8. CICS supports only the 64-bit version of the SDK and not the 31-bit version. If you are using an earlier version, such as Java Version 1.4.2, Version 5, or Version 6, or any 31-bit version, you must replace this version with a supported version.

Download and install the IBM 64-bit SDK for z/OS, Java Technology Edition, Version 7, Version 7 Release 1 or Version 8 from Java Standard Editions Products on z/OS , then make the necessary changes in your CICS environment. If you encounter problems see Troubleshooting Java applications.

1. Check that any Java programs that use the Java Native Interface (JNI), including vendor products, can run with the 64-bit version of the SDK.

2. Ensure that your applications are threadsafe, and repackage your JARs as OSGi bundles. Deploy the OSGi bundles within a CICS bundle to zFS, making sure that you specify the correct target JVMSERVER resource. For more information see JVM server runtime environment.

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Check your programs for deprecated APIs

Java Standard Editions Products on z/OS gives details about any compatibility issues between the Java APIs, and compatibility issues that are specific to the IBM SDK for z/OS. Check your Java programs for compatibility issues between the supported IBM SDK for z/OS and previous versions. Make any changes that are required to enable your programs to run with the supported versions.

In addition, the following CICS JCICS APIs have been deprecated or removed:

- In Version 5.3, JCICS class library methods Program.xctl(), xctl(byte[] CA) and xctl(Channel chan) are removed. A Java developer switching their target platform to Version 5.3 will see an Eclipse error saying the methods do not exist, and the application will not compile. An application compiled against a target platform for a previous version of CICS will result in a Java runtime exception.
- In Version 5.2, JCICS class library methods Program.xctl(), xctl(byte[] CA), and xctl(Channel chan) are depreciated. A Java developer switching their target platform to Version 5.2 will see an Eclipse warning marker saying the method is depreciated. The application will successfully compile and run.
- In Version 5.1, the CCI Connector for CICS is obsolete and is no longer available. If you have any Java applications that use this deprecated interface, you must change the application. You can use the JCICS Link() method in the Program class instead.
- In Version 5.1, CICS applications that run in an OSGi framework can use the JCICS API to create threads that start CICS tasks on T8 TCBs. These tasks can use JCICS to access CICS services. The CICSExecutorService class in JCICS provides an implementation of the Java ExecutorService interface. Use this class instead of the Thread.start() method.

To avoid potential problems with deprecated APIs, develop all new Java programs for the latest release of CICS using an application development environment that supports the same version of Java as the environment used by CICS. If the older environment does not use APIs that are removed in the newer version of Java or CICS, you can still run code that was compiled with an older version of Java in the new runtime environment. For details, refer to the **Target Platform** setting when you use the CICS Explorer® SDK.

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Review your JVM profiles for new settings

Settings in JVM profiles change from release-to-release so you must upgrade all your JVM profiles. A good practice is to use the sample JVM profiles that come with the latest release, and reapply any customization that you made to those JVM profiles in previous releases.

Note: From CICS TS v5.3 the default location of output files is relative to the directory structure `WORK_DIR/<applid>/<jvmserver>` rather than `WORK_DIR`. The default output file names, previously prefixed with <applid>.<jvmserver>, are no longer prefixed.

Note: From CICS TS v5.2 all JVM profiles located on zFS must have a `.jvmprofile` suffix.

For more information about the sample profiles, see JVM profiles: options and samples. For a summary of the changes to the JVM profiles, see Changes to JVM profiles .

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V3.1 V3.2 V4.1 V4.2

If you have not already migrated to OSGi, change your Java applications to run in a JVM server

Because pooled JVMs are not supported, you must migrate your existing Java applications to run in a JVM server. The JVM server is a multithreaded environment that uses an OSGi framework, so you must ensure that your applications are threadsafe and comply with the OSGi specification. You can use the CICS Explorer SDK to repackage the applications as OSGi bundles and deploy them to run in a JVM server.

There are three possible ways to repackage a Java application as one or more OSGi bundles. Each option is explained in full detail in the SDK help, and is summarized in the following procedure.

1. Check that the Java application is threadsafe. The IBM website developerWorks® has useful information about Java: http://www.ibm.com/developerworks/java/ .
2. Check that the Java application does not use the System.exit() Java method. If this method is used, both the JVM server and CICS shut down.
3. Package the Java application as one or more OSGi bundles by either conversion, injection or wrapping, ready for running in the JVM server environment.

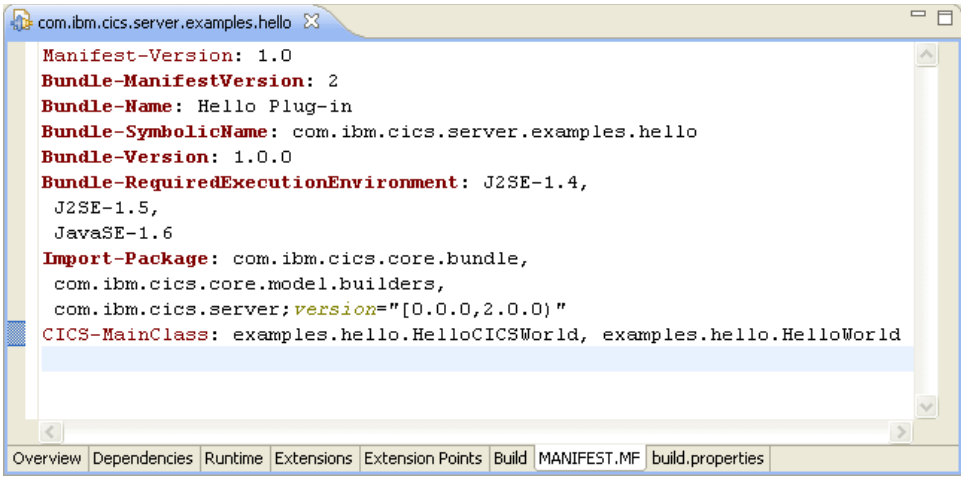
   Conversion
   If you already have an Eclipse Java project for the Java application, you can convert the project to an OSGi plug-in project. This method is the preferred best practice.

   Injection
   Create an OSGi plug-in project and import the contents of the existing JAR file. This method is useful when the application is already threadsafe and no refactoring or recompiling is required.

   Wrapping
   Create an OSGi plug-in project and import an existing binary JAR file. This method is useful in situations where there are licensing restrictions or where the binary file cannot be extracted.
4. Add the CICS-MainClass declaration to the project manifest. Right-click the project name and select **PDE Tools** > **Open Manifest** .

   The following example is the manifest file from the CICS Hello Examples project. The sample contains two classes, HelloCICSWorld and HelloWorld , which are both declared in the manifest file in the CICS-MainClass declaration.

You must add a CICS-MainClass declaration for each class that is used in your application.



5. Deploy the OSGi bundle in a CICS bundle to the zFS file system. Specify the target JVMSERVER resource in the plug-in resource file of the CICS bundle.

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Check whether applications that run in a JVM server depend on IBM or vendor classes in the supplied JRE

If you are running Java applications in a JVM server, check whether the applications use IBM or vendor classes that are available in the JRE. The OSGi framework has stricter rules for loading classes from the JRE, and you might need to change your applications to run them in a JVM server in this release.

You do not need to do this for the CICS Java classes, as the JCICS classes are automatically made available in the OSGi framework.

Any package that is prefixed with `java` is loaded by the OSGi framework as required by the application. If an application uses an IBM or vendor package that is supplied with the JRE, such as `org.xml.sax` , you can follow the procedure outlined below to make these classes available. If you do not change the application, transactions abend with an AJ05 code and `java.lang.ClassNotFoundException` errors are written to the JVM server error log and CICS system log.

1. Change the application to add an import for the exported package in the appropriate OSGi bundle manifest. Each OSGi bundle that requires a class from an IBM or vendor package must declare the package in the manifest.
2. If you still receive the `java.lang.ClassNotFoundException` exception for the vendor or JRE package, then you must extend the JVM property `org.osgi.framework.system.packages.extra` to contain your required package, for example:

   ```
   -Dorg.osgi.framework.system.packages.extra=org.xml.sax,org.xml.sax.helpers
   ```
3. Restart the JVM server to pick up the properties change.
4. Deploy the updated application bundle to CICS.

Note:

From v5.3 the preferred way to declare your applications use of JRE packages is to use the **system packages extra** property with an explicit `Import` statement in the manifest of the application, in favor of adding packages to bootdelegation.

These packages were previously available without an import statement:

- org.ietf.jgss
- org.omg.*
- org.w3c.*
- org.xml.*

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Check that MEMLIMIT allows sufficient storage for 64-bit JVMs

Set the value for the z/OS **MEMLIMIT** parameter equal to or greater than 6 GB. The default value in z/OS for **MEMLIMIT** is 2 GB.

CICS requires a **MEMLIMIT** value of 10 GB; any additional use by applications or JVMs should be allowed for with a larger value of **MEMLIMIT**. If you attempt to start a CICS region with a **MEMLIMIT** value that is less than 10 GB, message `DFHSM0602` is issued, a system dump with the dump code KERNDUMP is produced, and CICS terminates.

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

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Change applications that use EJBs or stateless CORBA objects

CICS support for enterprise beans (Enterprise JavaBeans, or EJBs) and CICS support for the CORBA architecture (using stateless CORBA objects) are no longer provided in CICS Transaction Server. If you are running enterprise beans or stateless CORBA object applications in CICS in the pooled JVM environment, you must migrate your applications to run in the JVM server environment, and you must use standard functions of the IBM 64-bit SDK for z/OS, Java Technology Edition for intercommunication between components.

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If you use the CICS Liberty security feature, check for restrictions

If you use the CICS Liberty security feature, check whether you need to make changes for the following restrictions:

- The Liberty Angel process must be started.
- Only one Liberty JVM server can be run per region with the CICS Liberty security feature enabled.

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Import classes from JCICS API or IByteBuffer

The JCICS API packaging is changed; the `dfjcics.jar` and `dfjoutput.jar` files are replaced by a set of OSGi bundles that run in a JVM server. If you use classes from the JCICS API or the IByteBuffer class, you must import the relevant package into your OSGi bundle manifest when you package a Java application as an OSGi bundle. The following OSGi bundles are provided with CICS:

File name	OSGi bundle symbolic name	Description
`com.ibm.cics.samples.jar`	com.ibm.cics.samples	Samples for redirecting System.out and System.err. Replaces the `dfjoutput.jar` file.
`com.ibm.cics.server.jar`	com.ibm.cics.server	The JCICS API. Replaces the `dfjcics.jar` file.
`com.ibm.record.jar`	com.ibm.record	The Java API for legacy programs that use IByteBuffer from the Java Record Framework that came with VisualAge®. Previously in the `dfjcics.jar` file.

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If you use the CICS Liberty security feature and do not use autoconfigure, define your own SAF registry.

The Liberty profile server uses a user registry to authenticate a user and retrieve information about users and groups to perform security-related operations, including authentication and authorization. Unless you are using the new distributed identity feature, you must define the System Authorization Facility (SAF) registry as follows:

```
<safRegistry id="saf"/>
```

If you are using autoconfigure, this is defined for you.

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Upgrading applications

Existing applications typically continue to run in a later version of CICS.

Upgrade actions

Your current version	Action	Mandatory or optional?
ALL VERSIONS	Modify routing programs to tolerate channels	Mandatory

ALL VERSIONS

Modify routing programs to tolerate channels

If you use a user-written dynamic routing program or distributed routing program for workload management, rather than CICSPlex SM, you must modify your

program to handle the new values that it might be passed in the DYRLEVEL, DYRTYPE, and DYRVER fields of the DFHDYPDS communications area. This modification is required even if you do not intend to implement channels and containers in your own applications.

Upgrading applications, platforms, and bundles

If you use platforms, applications, and CICS bundles, you have some changes to make when you upgrade your version of CICS.

Upgrade actions

Your current version	Action	Mandatory or optional?
V5.1	Declare application entry points for PROGRAM and LIBRARY resources	Mandatory
V5.1	Make applications and CICS bundles available	Mandatory
V5.1	Ensure that operation names are unique	Mandatory
V5.2	If your application has URIMAP resource and URIMAP entry point in different CICS bundles, review the change in availability	Optional

V5.1

Declare application entry points for PROGRAM and LIBRARY resources

From CICS TS 5.2, applications that are deployed on platforms must declare application entry points for all the resources, such as PROGRAM or LIBRARY resources, that are access points to the application. Application entry points control users' access to different versions of an application that is deployed on a platform. An application that defines a PROGRAM or LIBRARY resource cannot be made available to callers in regions later than CICS TS 5.2 regions unless it declares an application entry point for that resource.

Application entry points only control users' access to the resources that are specified in the application entry points. If an application includes any public resources that are not named as application entry points, when the application is installed and enabled, these resources can be accessed by other applications that are installed on the platform or in the CICS region, regardless of the availability status of the application. Private resources for an application version cannot be accessed by other applications.

For information about declaring application entry points, see Defining application entry points in the CICS Explorer product documentation.

V5.1

Make applications and CICS bundles available

From CICS TS 5.2, for applications that are deployed on platforms, you can install and verify the installation of an application version before you make the application version available to users of the platform. As a consequence, you must

take an additional step to make available the applications that are deployed on platforms in CICS regions from CICS TS 5.2. After you install and enable the application, perform the **Make Available** action in the CICS Explorer to make the application available to users. You can make an installed application version available or unavailable in the Cloud Explorer view, or in the application descriptor editor for installed applications.

From CICS TS 5.2, stand-alone CICS bundles that contain application entry points must also be made available. After you install and enable the CICS bundle, you set the CICS bundle to available. To do this, perform the **Make Available** action in the CICS Explorer, or use the AVAILSTATUS option on the **EXEC CICS SET BUNDLE** command. CICS bundles that are deployed with platform bundles, or added to a platform, do not require the **Make Available** and **Make Unavailable** actions because these actions are performed on the application entry points for applications.

Before you disable or discard an application that is deployed on a platform in CICS regions from CICS TS 5.2, you must perform the **Make Unavailable** action in the CICS Explorer . Before you disable or discard a stand-alone CICS bundle that contains application entry points, you must perform the **Make Unavailable** action in the CICS Explorer , or use the AVAILSTATUS option on the **EXEC CICS SET BUNDLE** command to set the status of the CICS bundle to UNAVAILABLE.

If your platform includes any CICS regions that are still at CICS TS 5.1, the **Make Available** and **Make Unavailable** actions are not required or supported for applications or stand-alone CICS bundles installed in those CICS regions. In CICS TS 5.1 regions, applications or stand-alone CICS bundles are assumed to be available when they are enabled with the **Enable** action, and unavailable when they are disabled with the **Disable** action, as was the case for all applications in CICS TS 5.1.

V5.1

Ensure that operation names are unique

Each application entry point names an operation. For example, you can declare application entry points for create, read, update, or delete operations in the application. In CICS regions from CICS TS 5.2, an operation name must now be unique within an application. An application cannot be made available to callers in regions later than CICS TS 5.2 if it contains duplicate operation names. Operation names are case-sensitive, so you can use operation names that are differentiated only by case, such as “browse” and “Browse”.

V5.2

If your application has URIMAP resource and URIMAP entry point in different CICS bundles, review the change in availability

If you have applications where the URIMAP resource and URIMAP entry point are in different CICS bundles in the application, you might want to take action to control the availability of the URIMAP resource.

In CICS TS 5.2, the availability of the application does not restrict the work that comes in through the enabled URIMAP resource. So, you can apply or remove the application context by making the application available and unavailable, without affecting the work that runs through the URIMAP. In CICS TS 5.3, the URIMAP resource adheres to the application availability. So, work stops coming through the URIMAP resource when the application is made unavailable.

This behavior is appropriate for most situations. However, if you want to preserve the CICS TS 5.2 behavior of the URIMAP resource that is defined as an entry point (that is, it does not change its availability in line with the availability of the application), then define the URIMAP resource outside the CICS application.

Upgrading connections

This section tells you how to upgrade connections between CICS systems, and between CICS and other systems.

Upgrading IPIC

This section tells you how to upgrade IPIC connections between CICS systems when you migrate from one release of CICS to another.

Upgrade actions

Your current version	Action	Mandatory or optional?
V4.1 V4.2	"Upgrade CSD to pick up changes to IPIC service definitions"	Mandatory
ALL VERSIONS	"Review selection behavior for IPCONN and CONNECTION resources across releases of CICS"	Mandatory

Upgrade CSD to pick up changes to IPIC service definitions

In CICS Transaction Server for z/OS, Version 5 Release 1, the IPIC service transactions were redefined to run in CICS key. You must upgrade the CSD to the latest level of resource definitions, supplied with your release, to pick up the changes to the IPIC service task resource definitions. See "Upgrade the CSD" on page 135.

ALL VERSIONS

Review selection behavior for IPCONN and CONNECTION resources across releases of CICS

If both an APPC or MRO connection and an IPIC connection exist between two CICS® regions, and both have the same name, the IPIC connection takes precedence. However, if your terminal-owning region (TOR) and application-owning region (AOR) are in CICS systems that are using different levels of CICS, the rules can differ.

An APPC or MRO connection is defined with the CONNECTION resource. An IPIC connection is defined with the IPCONN resource.

If both CONNECTION resources and IPCONN resources are active in a CICS region, CICS searches for an IPIC connection first, so that when resources with the same name exist, the preference for an IPCONN resource can be maintained. However, if an IPCONN resource is not available, CICS attempts to route over an APPC or MRO connection by using a CONNECTION resource. If the request fails, a SYSID error is returned to the application that scheduled the request. For more information about how IPIC overrides default connections, see Changes to resources.

Table 67 and Table 68 show how the resources are used depending on the level of CICS installed at the communicating regions, the availability of resources, and the intercommunication method that is being used.

Table 67. Selection behavior for IPCONN and CONNECTION resources with TOR and AOR communications

Version of CICS in TOR or routing region	Status of IPCONN resource	CICS TS 3.2 AOR			CICS TS 4.1 AOR			CICS TS 4.2, 5.1, 5.2, or 5.3 AOR		
		DPL	Asynchronous processing and transaction routing	Enhanced Routing	DPL	Asynchronous processing and transaction routing	Enhanced Routing	DPL	Asynchronous processing and transaction routing	Enhanced Routing
CICS TS 3.2	Acquired	IPIC connection	APPC or MRO connection	APPC or MRO connection	IPIC connection	APPC or MRO connection	APPC or MRO connection	IPIC connection	APPC or MRO connection	APPC or MRO connection
	Released	Request rejected	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection
CICS TS 4.1	Acquired	IPIC connection	APPC or MRO connection	APPC or MRO connection	IPIC connection	IPIC connection	APPC or MRO connection	IPIC connection	IPIC connection	APPC or MRO connection
	Released	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection
CICS TS 4.2, 5.1, 5.2 or 5.3	Acquired	IPIC connection	APPC or MRO connection	APPC or MRO connection	IPIC connection	IPIC connection	APPC or MRO connection	IPIC connection	IPIC connection	IPIC connection
	Released	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection

Table 68. Selection behavior for IPCONN and CONNECTION resources with AOR and ROR communications

Version of CICS in the AOR	Status of IPCONN resource	CICS TS 3.2 or 4.1 ROR				CICS TS 4.2, 5.1, 5.2, or 5.3 ROR			
		File control	Transient data	Temporary storage	DL/I	File control	Transient data	Temporary storage	DL/I
CICS TS 3.2	Acquired	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection
	Released	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection
CICS TS 4.1	Acquired	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection
	Released	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection
CICS TS 4.2, 5.1, 5.2, or 5.3	Acquired	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	IPIC connection	IPIC connection	IPIC connection	APPC or MRO connection
	Released	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection	APPC or MRO connection

Upgrading MRO

This section tells you about the changes that you need to make to MRO connections when you migrate from one release of CICS to another.

These steps assume that RACF is your external security manager (ESM).

Upgrade actions

Your current version	Action	Mandatory or optional?
ALL VERSIONS	Install and test DFHCSVC	Mandatory
ALL VERSIONS	Install and test DFHIRP	Mandatory
ALL VERSIONS	Define DFHAPPL.applid profiles in the RACF FACILITY class	Optional
ALL VERSIONS	Test MRO	Optional

ALL VERSIONS

Install and test DFHCSVC

Install the CICS SVC routine, DFHCSVC, in the LPA, and specify a new CICS SVC number for this routine in the MVS SVCPARM table. Co-existence is not recommended or necessary: DFHCSVC is compatible with earlier releases and the latest CICS TS version supports all the earlier releases of CICS . If, however, the new DFHCSVC must coexist with an older version, rename one of them so that both versions can be installed in the LPA. Test the new SVC on stand-alone CICS regions, without using any MRO. You can do this running the CICS IVP, DFHIVPOL.

Find information about installing DFHCSVC here: Installing CICS modules in the MVS link pack area in the IBM Knowledge Center.

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ALL VERSIONS

Install and test DFHIRP

For MRO, the interregion communication program DFHIRP is installed in the link pack area (LPA). The CICS TS for z/OS, Version 5.4 DFHIRP module is compatible with earlier releases, and works with all releases of CICS. However, the CICS TS for z/OS, Version 5.4 version of DFHIRP, required for multiple XCF group support, can be used only on z/OS Version 1.7 or later. DFHIRP can be used only from the LPA. So, in an MVS image you can have only one version of the module that is named DFHIRP and this version must be at the *highest* release level of the CICS regions that run in that MVS image.

In a Parallel Sysplex®, where MRO communication between MVS images is through XCF/MRO, the DFHIRP programs that are installed in the different MVS images can be at different release levels. However, the DFHIRP in an MVS image must still be installed from the *highest* release of CICS running in that MVS image. For example, a CICS TS 3.2 DFHIRP can communicate with a CICS TS for z/OS, Version 5.4 DFHIRP across XCF/MRO, but the CICS regions that run in the MVS with the CICS TS 3.2 DFHIRP cannot be later than CICS TS 3.2.

Install the CICS interregion communication program, DFHIRP, in a suitable LPA library. If your strategy is to quiesce all users of DFHIRP on the z/OS image that is being upgraded, you can use the dynamic LPA function to replace DFHIRP. To

update DFHIRP dynamically, perform the steps below. If you do not follow these steps, you must IPL MVS with the **CLPA** option. Failing to shut down all users of DFHIRP during the upgrade process can cause incompatibility between control blocks and result in abends.

1. Quiesce all users of DFHIRP. For example, WebSphere EXCI, CTG EXCI, all CICS regions, including any CMASs, must either be shutdown or logged off from MRO/XM. All other work that uses EXCI must be shut down.

   Important: The process described here does not include upgrading CICSPlex SM to the CICS TS 5.4 level. For more information, see Upgrade a CMAS .
2. Update LPA modules DFHCSVC, DFHDSPEX, DFHDUMPX, DFHIRP, DFHSSEN and DFH99SVC with the dynamic LPA facility. Specify the **ADD** verb.
3. Run the CICS TS 5.4 supplied utility DFHCSVCU to update the z/OS SVC table as documented in Running the DFHCSVCJ job in the IBM Knowledge Center.
4. Restart MRO by either setting IRC connected in all running CICS regions or restarting the CICS regions.
5. Dynamic changes are discarded by an IPL, so you must schedule an IPL for a convenient time to ensure that all dynamically-applied changes are correctly applied to the z/OS system libraries.

Test your production MRO CICS regions, under your existing release of CICS, but use the new SVC number and the new DFHIRP. For this test, run without any logon or bind-time security checking: that is, do not define any RACF FACILITY class profiles.

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ALL VERSIONS

Define DFHAPPL.*applid* profiles in the RACF FACILITY class

You can define the DFHAPPL.*applid* profiles in the RACF FACILITY general resource class to control access to the CICS APPLID. When the profiles are ready for all the MRO regions, test the production regions again with the new SVC and DFHIRP, this time use the FACILITY class profiles for logon and bind-time security checking.

Any CICS region without a specific DFHAPPL.*applid* profile, or applicable generic profile, permits all logon and connect requests. For more information, see Responses from the system authorization facility (SAF).

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ALL VERSIONS

Test MRO

If the production MRO regions successfully log on to the new IRP with the new SVC, and bind-time security checking works successfully, use the new DFHIRP and SVC for the production regions. When the production regions run successfully under the CICS SVC and IRP, you can initialize and test some CICS Transaction Server regions with MRO. These test regions can coexist in the same MVS image as the production regions, all using the same SVC and IRP.

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Upgrading connections with WebSphere MQ

If you use the CICS-WebSphere MQ adapter, bridge, trigger monitor, or API crossing exit to connect CICS® to WebSphere® MQ, you have some changes to make when you upgrade your version of CICS.

Upgrade actions

Your current version	Action	Mandatory or optional?
ALL VERSIONS	Specify the new versions of WebSphere MQ libraries in the STEPLIB and DFHRPL concatenation	Mandatory
V4.1	Exploit new WebSphere MQ Version 7 API calls	Optional
V4.1 V4.2 V5.1 V5.2 V5.3	"Replace existing mechanisms for managing instances of CKTI transactions with MQMONITOR resources" on page 163	Optional
V3.2 V4.1 V4.2 V5.1 V5.2 V5.3	"Replace existing mechanisms for managing instances of CKBR transactions with MQMONITOR resources" on page 164	Optional

ALL VERSIONS

Specify the new versions of WebSphere MQ libraries in the STEPLIB and DFHRPL concatenation

You must replace the existing versions of the WebSphere MQ libraries with the new ones in the STEPLIB and DFHRPL concatenation in your CICS procedure.The libraries are *thlqual* .SCSQAUTH, *thlqual* .SCSQCICS, and *thlqual* .SCSQLOAD, where *thlqual* is the high-level qualifier for the WebSphere MQ libraries. The SCSQAUTH library is included in both concatenations, but the SCSQLOAD library and the optional SCSQCICS library are included in the DFHRPL concatenation only. Include the WebSphere MQ libraries after the CICS libraries to ensure that the correct code is used.

V4.1

Exploit new WebSphere MQ Version 7 API calls

New or changed CICS applications that use the new API calls in WebSphere MQ Version 7 must be link-edited with the WebSphere MQ API stub modules that are shipped with CICS .

The new API calls are MQBUFMH, MQCB, MQCTL, MQCRTMH, MQDLTMH, MQDLTMP, MQINQMP, MQMHBUF, MQSETMP, MQSTAT, MQSUB, and MQSUBRQ. These Version 7 API calls are only supported in CICS when you use the stubs shipped with CICS , not the stubs shipped with WebSphere MQ. New and existing CICS applications that do not use the Version 7 API calls can use the stubs shipped with CICS or WebSphere MQ.

If you use the new Version 7 API calls MQCB and MQCTL for asynchronous message consumption by CICS applications, you must code your program using information given in the CICS documentation, in addition to the WebSphere MQ programming documentation. The requirements for asynchronous message consumption in a CICS environment are listed in Asynchronous message consumption and callback routines in the IBM Knowledge Center.

Replace existing mechanisms for managing instances of CKTI transactions with MQMONITOR resources

To complement the existing MQCONN resource, CICS TS 5.4 introduced the MQMONITOR resource definition and new EXEC CICS and CEMT commands for the CICS-WebSphere MQ monitor.

Before CICS TS 5.4, you cannot start more than one instance of CKTI against the same initiation queue from a single CICS subsystem. When the MQ connection is disconnected and then reconnected, CKTI has to be manually restarted.

The new MQMONITOR resource provides a better mechanism for managing instances of CKTI transactions. It is recommended that you replace existing mechanisms for managing instances of CKTI transactions with MQMONITOR resources. The benefits are as follows:

- You can have more than one MQMONITOR resource monitoring an MQ initiation queue. Any number of MQMONITOR resources can be defined and installed in a CICS region.
- An MQMONITOR can be configured to start the associated transaction (for example, CKTI) automatically when the MQ connection is established. Using the MQMONITOR resource removes the need to use the CKQC transaction to start and stop monitors manually.
- Configuration options include the ability to specify a transaction ID to be used by the monitor, the user ID under which a monitor task runs, and the user ID to be used by the monitor to start the application tasks if an alternative user ID is not provided by the application. These options allow better security controls.

Follow Setting up a MQMONITOR resource for the CICS-WebSphere MQ bridge to define and install an MQMONITOR for monitoring an MQ initiation queue.

You can use new **EXEC CICS** and **CEMT** commands to work with the MQMONITOR resource definition. You can also use the **SET MQMONITOR** command to start and stop a CICS-WebSphere MQ monitor, as an alternative to issuing CKQC commands.

Replace existing mechanisms for managing instances of CKBR transactions with MQMONITOR resources

The recommended method of controlling the CICS-WebSphere MQ bridge transaction CKBR is to use an MQMONITOR resource. Doing so allows the bridge to automatically restart when the connection to the WebSphere MQ manager is established.

Follow this procedure to set up an MQMONITOR for the CICS-WebSphere MQ bridge.

Upgrading web services

This section tells you how to upgrade the web services that you use in CICS Transaction Server for z/OS. These could be JSON or SOAP in CICS TS or the ATOM feeds in the CA8K SupportPac for Version 3.

Upgrading JSON web services

If you use JSON web services, you have some changes to make when you upgrade your version of CICS.

Upgrade actions

Your current version	Action	Mandatory or optional?
V4.1 V4.2 V5.1	Change the JCL that calls the JSON assistant	Mandatory
V4.1 V4.2 V5.1	Exploit the data mapping of COBOL OCCURS clauses	Optional
V4.1 V4.2 V5.1	Enable the transformation of UTF-16 data	Optional

V4.1 V4.2 V5.1

Change the JCL that calls the JSON assistant

In previous releases, the JSON assistant batch jobs DFHJS2LS and DFHLS2JS were provided as part of CICS TS Feature Pack for Mobile Extensions. These functions are now incorporated into CICS TS, so you must change any JCL that calls the assistant.

1. Change the JCL procedure library where DFHJS2LS or DFHLS2JS are located. From CICS TS 5.2, these batch jobs are in the `HLQ.XDFHINST` library.

2. Review the values of the symbolic parameters **JAVADIR**, **PATHPREF**, and **USSDIR**. From CICS TS 5.2, you might not need to specify them at all because the DFHJS2LS and DFHLS2JS procedures are customized by DFHISTAR. For more information about these parameters, see DFHJS2LS: JSON schema to high-level language conversion for request-response services in the IBM Knowledge Center and DFHLS2JS: High-level language to JSON schema conversion for request-response services in the IBM Knowledge Center.

V4.1 V4.2 V5.1

Exploit the data mapping of COBOL OCCURS clauses

CICS now provides data mapping to support COBOL OCCURS DEPENDING ON and OCCURS INDEXED BY clauses.

- The OCCURS DEPENDING ON clause is supported at a mapping level of 4.0 or higher. Complex OCCURS DEPENDING ON is not supported. This limitation means that OCCURS DEPENDING ON is only supported for the last field of a structure.
- The OCCURS INDEXED BY clause is supported at any mapping level.

V4.1 V4.2 V5.1

Enable the transformation of UTF-16 data

CICS now provides support for transforming application data that is encoded in UTF-16 at a mapping level of 4.0 or higher.

- You can enable this behavior by using language-specific data types for UTF-16 when you use the DFHLS2JS, DFHLS2SC, or DFHLS2WS assistants.
- You can enable this behavior by setting CCSID=1200 when you use the DFHJS2LS, DFHSC2LS, or DFHWS2LS assistants.

Upgrading SOAP web services

If you use SOAP web services, you have some changes to make when you upgrade your version of CICS.

Upgrade actions

Your current version	Action	Mandatory or optional?
V4.1	"Exploit connection pooling for performance benefits" on page 166	Optional
V4.1	"Exploit the additional URIMAP resource from a pipeline scan" on page 166	Optional
V4.1 V4.2	"Enable SOAP message validation in a JVM server" on page 166	Mandatory
V4.1 V4.2 V5.1	"Package WEBSERVICE resources in CICS bundles" on page 166	Optional

Your current version	Action	Mandatory or optional?
V4.1 V4.2 V5.1	"Exploit the data mapping of COBOL OCCURS clauses" on page 167	Optional
V4.1 V4.2 V5.1	"Enable the transformation of UTF-16 data" on page 167	Optional

V4.1

Exploit connection pooling for performance benefits

Connection pooling can provide performance benefits where a service requester application makes multiple requests and responses. When you implement connection pooling, CICS keeps the client HTTP connection open after the application finishes making its request and receiving its response. The application can reuse the connection to make further requests and responses, rather than opening a new connection each time. Connection pooling is specified on the URIMAP resource for a client HTTP connection, so the application must specify a URIMAP resource on the INVOKE SERVICE command.

V4.1

Exploit the additional URIMAP resource from a pipeline scan

A pipeline scan produces a second URIMAP resource for each WSDL document that is present in the pickup directory. This URIMAP resource defines a URI that points to the location of the WSDL document. You can use this URI to publish WSDL documents so that external requesters can create web service applications.

Enable SOAP message validation in a JVM server

SOAP message validation is now performed in a JVM server. To enable SOAP message validation, you must set up a JVM server in the CICS region. JVM servers can run different workloads, and SOAP validation can run in a JVM server that is configured to support an OSGi framework or Axis2. SOAP validation cannot run in a Liberty JVM server.

The DFHPIVAL program must refer to a JVMSERVER resource. By default, the program uses the sample JVM server, DFHJVMS. To change the JVM server, edit the DFHPIVAL definition in group DFHPIVAL.

V4.1 V4.2 V5.1

Package WEBSERVICE resources in CICS bundles

WEBSERVICE resources can now be defined and packaged in CICS bundles. The resource is dynamically installed in the CICS region when you install the BUNDLE resource. You can import a web service binding file and a WSDL document or WSDL archive file to be packaged with the resource definition, and for a service

provider you can include a PROGRAM definition in the bundle. You can also use an existing WEBSERVICE definition in a CICS bundle to generate related URIMAP resources and alias transactions.

V4.1 V4.2 V5.1

Exploit the data mapping of COBOL OCCURS clauses

CICS now provides data mapping to support COBOL OCCURS DEPENDING ON and OCCURS INDEXED BY clauses.

- The OCCURS DEPENDING ON clause is supported at a mapping level of 4.0 or higher. Complex OCCURS DEPENDING ON is not supported. This limitation means that OCCURS DEPENDING ON is only supported for the last field of a structure.
- The OCCURS INDEXED BY clause is supported at any mapping level.

V4.1 V4.2 V5.1

Enable the transformation of UTF-16 data

CICS now provides support for transforming application data that is encoded in UTF-16 at a mapping level of 4.0 or higher.

- You can enable this behavior by using language-specific data types for UTF-16 when you use the DFHLS2JS, DFHLS2SC, or DFHLS2WS assistants.
- You can enable this behavior by setting CCSID=1200 when you use the DFHJS2LS, DFHSC2LS, or DFHWS2LS assistants.

Upgrading from Version 3

CICS TS Version 3.1 and Version 3.2 were withdrawn from support in December 2015. This section summarizes the actions that you must take to upgrade from one of these releases.

Table 69. Upgrade considerations for Version 3

Upgrade requirement	Actions
Upgrading CICSPlex SM	Follow the instructions in “Upgrading CICSPlex SM” on page 117 and “Upgrading CICSPlex SM: considerations for upgrading from CICS TS Version 3” on page 168.
Upgrading CICS regions	Follow the instructions in “Upgrading CICS regions” on page 133 and “Upgrading regions: considerations for upgrading from CICS TS Version 3” on page 169.
Upgrading file control	Follow the instructions in “Upgrading file control” on page 148.
Upgrading CICS Explorer	Follow the instructions in “Upgrading CICS Explorer” on page 116.
Upgrading the Java environment	Follow the instructions in “Upgrading the Java environment” on page 149
Upgrading applications	Follow the instructions in “Upgrading applications” on page 155 and

Table 69. Upgrade considerations for Version 3 (continued)

Upgrade requirement	Actions
Upgrading connections	Follow the instructions in "Upgrading connections" on page 158 and "Upgrading MRO: considerations for upgrading from CICS TS Version 3" on page 171 and "Upgrading connections to IBM MQ: considerations for upgrading from CICS TS Version 3" on page 171.
Upgrading web services	Follow the instructions in "Upgrading web services" on page 164 and "Upgrading SOAP web services: considerations for upgrading from CICS TS Version 3" on page 175 and "Upgrading ATOM feeds from SupportPac CA8K" on page 177.
Upgrading security	Follow the instructions in "Upgrading security" on page 145 and "Upgrading security: considerations for upgrading from CICS TS Version 3" on page 179.

V3.1

Upgrading CICSPlex SM: considerations for upgrading from CICS TS Version 3

In addition to the actions described in "Upgrading CICSPlex SM" on page 117, you must do the following:

- Replace a CAS with a WUI:

  If you still use CAS (coordinating address space), replace it with a WUI server at V3.1. Then, when you upgrade the maintenance point CMAS, upgrade the back-level WUI to the new release.

- Delete previous CICSPlex SM release definitions from CSD files:

  If you are upgrading from CICS TS for z/OS, Version 3.1 or an earlier release, when you successfully upgrade all your systems to CICSPlex SM Version 5.4, delete the definitions for previous versions and releases from the CSD of each CMAS and MAS.

  From CICS TS for z/OS, Version 3.2 onwards, the CICS resource definitions for CICSPlex SM are created dynamically, so you no longer need to delete those definitions after the upgrade.

  1. Issue the DFHCSDUP UPGRADE command and specify module EYU9R*xxx*, where *xxx* is the release number for the previous release; for example, EYU9R310 for Version 3.1. This module is supplied in CICSTS54.CPSM.SEYULOAD. For example:

```
//CSDUP   EXEC PGM=DFHCSDUP
//STEPLIB  DD  DSN=cics.index.SDFHLOAD,DISP=SHR
//         DD  DSN=cpsm.index.SEYULOAD,DISP=SHR
//DFHCSD   DD  DSN=cics.dfhcsd,DISP=SHR
//SYSPRINT DD  SYSOUT=*
//SYSIN    DD  *
 UPGRADE USING(EYU9Rxxx
)
 /*
```

When this JCL is run, EYU9R*xxx* attempts to delete all the groups and group lists for that CICSPlex SM version from the CSD. However, because not all of the items that the job attempts to delete are defined in the CSD, DFHCSDUP gives a return code of 04.

2. Use the DFHCSDUP SYSPRINT output to check the results of the deletions. The output lists the items that were deleted and the items that were not found.

V3.1 V3.2

Upgrading regions: considerations for upgrading from CICS TS Version 3

In addition to the actions described in "Upgrading CICS regions" on page 133, you must do the following:

- APF-authorize the CICS activation modules:

  CICS TS V5 introduced activation modules for each edition: base, Developer Trial, and Value Unit Edition. At the start of upgrading your regions, you must:

  – AFP-authorize the SDFHLIC or SDFHVUE library.
  – Add the SDFHLIC or SDFHVUE library in the STEPLIB of the CICS TS JCL.
  – If you use coupling facility data table servers, temporary storage servers, region status servers, or named counter-servers, also add the SDFHLIC or SDFHVUE library to the STEPLIB of the JCL for each of the servers.

- Migrate the DFHLRQ data set:

  If outstanding BTS activities for BTS processes exist in CICS, you migrate the contents of your local request queue data set, DFHLRQ. You can use a utility such as IDCAMS COPY to update the new data set with the contents of the DFHLRQ data set from your current release. You must apply this to each CICS region, as necessary.

- After you upgrade a CSD, if you plan to share the CSD with Version 3.2, include the DFHCOMPD compatibility group in addition to the compatibility groups listed in Table 61 on page 141.

Table 70. Contents of compatibility group DFHCOMPD

Resource type	Name
TDQUEUE	CPLD CPLI
PROGRAM	DFHPIVAL DFHSJJML IXMI33DA IXMI33D1 IXMI33IN IXMI33UC IXM4C56
TRANSACTION	CJMJ

V3.1

Upgrading applications: considerations for upgrading from CICS TS Version 3

In addition to the actions described in "Upgrading applications" on page 155, you must do the following:

- Review startup JCL for unsupported language libraries:

CICS translator support for pre-Language Environment compilers is withdrawn. Runtime support is provided for existing application programs that were developed with these compilers, except for OS/VS COBOL and OO COBOL programs, which do not have runtime support. For details of the compilers that are supported by CICS, see High-level language and compiler support.

The following JCL procedures that were supplied in earlier releases for translating, compiling, and link-editing with unsupported compilers are also withdrawn:

COBOL
The DFHEITVL, DFHEXTVL, DFHEBTVL, DFHEITCL, and DFHEXTCL procedures.

PL/I The DFHEITPL, DFHEXTPL, and DFHEBTPL procedures.

C The DFHEITDL and DFHEXTDL procedures.

CICS now supplies the following procedures only, for use with compilers that conform to Language Environment:

Language	CICS-online	Integrated translator	EXCI	EXCI with integrated translator
C	DFHYITDL	DFHZITDL (without XPLINK) DFHZITFL (with XPLINK)	DFHYXTDL	DFHZXTDL (without XPLINK)
C++	DFHYITEL	DFHZITEL (without XPLINK) DFHZITGL (with XPLINK)	DFHYXTEL	DFHZXTEL (without XPLINK)
COBOL	DFHYITVL	DFHZITCL	DFHYXTVL	DFHZXTCL
PL/I	DFHYITPL	DFHZITPL	DFHYXTPL	DFHZXTPL

The following CICS translator options, which all relate to the unsupported compilers, are obsolete:
– ANSI85
– LANGLVL
– FE

The CICS translators ignore these translator options and issue a return code 4 warning message.

- Replace any OO COBOL applications:

  You cannot use COBOL class definitions and methods (object-oriented COBOL). This restriction includes both Java classes and COBOL classes.

  Modules that use OO features and compiled in earlier CICS releases with the OOCOBOL translator option cannot run in this CICS release. The OOCOBOL translator option was used for the older SOM-based (System Object Manager-based) OO COBOL, and runtime support for this form of OO COBOL was withdrawn in z/OS V1.2. The newer Java-based OO COBOL, which is used in Enterprise COBOL, is not supported by the CICS translator.
- Runtime support for programs developed with pre-Language Environment compilers:

  Applications that are compiled and linked with pre-Language Environment compilers usually run successfully with the runtime support that is provided by

Language Environment. These applications do not usually need to be recompiled or relink-edited. If required, adjust Language Environment runtime options to allow these applications to run correctly. For more information, see the z/OS Language Environment Run-Time Application Migration Guide and the migration information for the language in use. Because pre-Language Environment compilers are not Language Environment-conforming, programs that are compiled by these compilers cannot take advantage of all Language Environment facilities in a CICS region.

Although application program development support for obsolete compilers is withdrawn, CICS usually continues to provide runtime support for your existing application programs that were developed with these old compilers. However, to apply maintenance to these application programs, use one of the supported compilers that conforms to Language Environment.

Runtime libraries that are provided by Language Environment replace the runtime libraries that were provided with older compilers such as VS COBOL II, OS PL/I, and C/370™. The runtime libraries that are provided with pre-Language Environment compilers are not supported. Language libraries, other than the Language Environment libraries, must not be present in your CICS startup JCL.

V3.1

Upgrading MRO: considerations for upgrading from CICS TS Version 3

In addition to the actions described in "Upgrading MRO" on page 159, you must do the following:

- Upgrade to multiple XCF groups:

  If you are not constrained by the limit of 2047 members of an XCF group, you do not need to take any action. You can continue to use the default DFHIR000 XCF group and you do not have to specify DFHIR000 explicitly on the XCFGROUP parameter of the system initialization table and DFHXCOPT EXCI table. If you are constrained, you can split your CICS regions into related XCF groups. For recommendations about how to configure XCF/MRO, see Cross-system multiregion operation (XCF/MRO) in the IBM Knowledge Center .

  From Version 3.2 onwards, although a CICS region can still join only one XCF group, that group does not have to be DFHIR000. Although each group is still limited to 2047 members, an absolute limit no longer applies to the number of CICS regions that a sysplex can support. The effective limit of 2047 CICS regions that a single sysplex can support is lifted.

V3.1 V3.2

Upgrading connections to IBM MQ: considerations for upgrading from CICS TS Version 3

In addition to the actions described in "Upgrading connections with WebSphere MQ" on page 162, you must do the following:

- Review availability of TCBs for CICS-WebSphere MQ connection:

  Before CICS TS for z/OS, Version 3.2 , a CICS region used a pool of eight subtask TCBs to connect to WebSphere MQ queue managers. The subtask TCBs were not owned by the CICS tasks that made the requests to connect to WebSphere MQ. When a subtask TCB returned the results of a request to a CICS task, the subtask TCB became available for other CICS tasks that needed to connect to WebSphere MQ.

From CICS TS for z/OS, Version 3.2 , a CICS region uses open TCBs in L8 mode to connect to WebSphere MQ queue managers. When a CICS task makes a request to connect to WebSphere MQ, it obtains an L8 TCB from the pool in the CICS region, and keeps the L8 TCB from the time it is allocated to the end of the task. Even if the CICS task switches back to run on the QR TCB or makes no further requests to connect to WebSphere MQ, the L8 TCB is not released until the CICS task ends. Each concurrent CICS task that connects to WebSphere MQ therefore requires one L8 TCB for the duration of the task.

CICS sets the limit for the number of TCBs in the pool of L8 and L9 mode open TCBs automatically. The limit is based on the maximum number of tasks (MXT or MAXTASKS) specified for the CICS region, using the following formula:

```
(2 * MXT Value) + 32
```

The availability of L8 TCBs within this limit is determined by the number of other CICS tasks that are using L8 or L9 TCBs, such as CICS applications that connect to DB2 . A CICS task is allowed at most one L8 TCB, which the task can use for any purpose that requires an L8 TCB. For example, a task that connected to both WebSphere MQ and DB2 would use only one L8 TCB. Within the overall limit set for the TCB pool, there is no specific limit on the number of L8 TCBs that are allocated for CICS tasks that connect to WebSphere MQ queue managers; these tasks can potentially occupy all of the available L8 TCBs in the pool.

- Review use of common storage in the WebSphere MQ subsystem:

  CICS tasks that connect to WebSphere MQ require storage in the WebSphere MQ subsystem. When you upgrade from a release earlier than CICS TS for z/OS, Version 3.2 , or when the peak number of concurrent CICS tasks that connect to WebSphere MQ changes, review the use of common storage in the WebSphere MQ subsystem. For information about common storage and connections from CICS to WebSphere MQ, see Common storage in the WebSphere MQ product documentation .

- Increase the value of CTHREAD (WebSphere MQ V6 only):

  If CICS is connecting to WebSphere MQ Version 6, you might also need to increase your setting for the WebSphere MQ subsystem tuning parameter CTHREAD. Before CICS TS for z/OS, Version 3.2 , CICS always took up nine of the connections specified by CTHREAD, plus one for each task initiator (CKTI). From CICS TS for z/OS, Version 3.2, the number of connections depends on the number of CICS tasks that are using L8 TCBs to connect to WebSphere MQ. In WebSphere MQ Version 6, you can change the value of CTHREAD using the WebSphere MQ SET SYSTEM command. From WebSphere MQ Version 7, the CTHREAD parameter cannot be adjusted in WebSphere MQ.

- Adapt to the move of CICS-WebSphere MQ components from MQ to CICS:

  In CICS TS 3.2., the CICS-WebSphere MQ adapter, bridge, trigger monitor and API crossing exit moved from WebSphere MQ to CICS . You must take the following actions to use the CICS-WebSphere MQ connection components in their new location:

  – If you are using WebSphere MQ Version 6, apply the PTF for APAR PK42616 to WebSphere MQ to police the use of the correct adapter. This PTF is not required if you are using WebSphere MQ Version 7.
  – If you do not share your CSD with earlier releases of CICS , you can remove the existing groups CSQCAT1 and CSQCKB, which contain CSQCxxx definitions, from your CSD.
  – If you do share your CSD with earlier CICS releases, ensure that CSQCAT1 and CSQCKB are not installed for CICS TS Version 4 or CICS TS 3.2. You must also delete the CKQQ TDQUEUE from group CSQCAT1. For CICS TS

releases earlier than CICS TS 3.2, install the CSQCAT1 and CSQCKB groups as part of a group list, after installing DFHLIST. This overrides group DFHMQ and correctly installs the required definitions.

- Place the WebSphere MQ libraries after the CICS libraries in the CICS STEPLIB and DFHRPL concatenation of the CICS procedure, to ensure the correct adapter, trigger monitor and bridge code is used.
- Unlike WebSphere MQ, CICS does not support uppercase English. If you want to use uppercase English for your CICS-WebSphere MQ components, you must ensure that ASSIGN NATLANGINUSE returns E (US English), and the system initialization parameter is set to `MSGCASE=UPPER` . This allows the uppercase English mapset to be used.
- CICS supplies the program definition for CSQCAPX in group DFHMQ with the parameter CONCURRENCY(THREADSAFE). Specify CONCURRENCY(THREADSAFE) when you define your exit program and any programs that your exit program calls and use only threadsafe CICS commands within the exit. You should also examine any existing API crossing exits to ensure that their logic is threadsafe.
- CICS-WebSphere MQ messages are changed from the format CSQCxxx to DFHMQ0xxx. Ensure that your message retrieval applications cope with this change.
- All trace entries produced by the CICS-WebSphere MQ components now use the CICS trace domain. If you have user tracing enabled for WebSphere MQ tracing only, you can turn off user tracing, saving the overhead of application trace.
- If you want the CICS-WebSphere MQ connection to start automatically at CICS start up, add the system initialization parameter **MQCONN** to the system initialization table.

Some additional functional changes do not require any action:

- Modules are renamed to use CICS naming conventions, except for all WebSphere MQ stubs and exits. The names for these have been preserved so that existing JCL works, and you are not required to re-link-edit applications, unless you modify them to use the new API calls that were added in Version 7 of WebSphere MQ.
- CSQCCOPEN, CSQCCLOS, CSQCGET, CSQCPUT1, and CSQCINQ are shipped unchanged, and are all entry points into DFHMQSTB, which is loaded from SDFHLOAD.
- There are two new transient data queues, CMQM and CKQQ, both defined in group DFHDCTG. CMQM logs all CICS-WebSphere MQ messages issued by the CICS-WebSphere MQ adapter, trigger monitor and bridge. CKQQ logs all messages relating to CICS-WebSphere MQ connection and disconnection.
- WebSphere MQ statistics can now be reset during the life of a CICS execution. This means that when you use the **CKQC DISPLAY** commands, you see only active CICS-WebSphere MQ threads, so numbers can go down or reduce to zero.

- Replace DFHMQPRM with MQCONN resource definition:

  To support WebSphere MQ queue-sharing groups, CICS TS 4.1 introduced the MQCONN resource definition and new EXEC CICS and CEMT commands for the CICS-WebSphere MQ connection.

  Before CICS TS 4.1, you used the DFHMQPRM operand of the CICS system initialization parameter INITPARM to specify a default WebSphere MQ queue manager name and initiation queue name for the CICS-WebSphere MQ

connection. (The DFHMQPRM operand was called CSQCPARM before CICS TS 3.2.) An example of this statement is as follows:

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

You can no longer use the INITPARM system initialization parameter to specify these defaults. If the DFHMQPRM or CSQCPARM operand is present on INITPARM, you must remove it. CICS issues a warning message if the DFHMQPRM operand is present on INITPARM when you start the CICS-WebSphere MQ connection, and defaults specified there are not applied to the CICS-WebSphere MQ connection. The INITPARM system initialization parameter itself is still valid with other operands.

You must now set up an MQCONN resource definition for the CICS region to provide defaults for the connection between CICS and WebSphere MQ. You must install the MQCONN resource definition before you start the connection. The defaults that you specify in the MQCONN resource definition apply when you use the CKQC transaction from the CICS-WebSphere MQ adapter control panels or call it from the CICS command line or a CICS application. CICS uses the defaults when you use the MQCONN system initialization parameter to specify that CICS starts a connection to WebSphere MQ automatically during initialization. This example MQCONN resource definition can replace the example INITPARM statement shown previously:

```
MQconn         : MQDEF1
Group          : MQDEFNS
DEScription  ==>
Mqname       ==> CSQ1
Resyncmember ==> Yes                  Yes | No
Initqname    ==> CICS01.INITQ
```

You can specify either a WebSphere MQ queue-sharing group as a default in the MQCONN resource definition, or the name of a single queue manager. To use a WebSphere MQ queue-sharing group, the CICS SVC for CICS TS 4.1 or a higher level must be active for the CICS region. When you install a new level of the CICS SVC, an IPL is required to activate it. Message DFHMQ0325 is issued if a CICS region attempts to connect to a WebSphere MQ queue-sharing group when the CICS TS 4.1 or higher level CICS SVC is not active, and a system dump is taken with the dump code DFHAP0002 and the severe error code X'A0C6'.

You can use new EXEC CICS and CEMT commands to work with the MQCONN resource definition. You can also use the SET MQCONN command to start and stop the CICS-WebSphere MQ connection, as an alternative to issuing CKQC START or STOP commands.

- Review how applications control the CICS-WebSphere MQ connection:

  You can upgrade your application to specify a queue-sharing group, or use the new SET MQCONN command to control the CICS-WebSphere MQ connection instead of linking to another program. The changes are optional but, if you choose not to use SET MQCONN, you might experience new results, depending on the parameters that are used by the application.:

  – Specifying a queue-sharing group: in the parameter list that your application passes to DFHMQQCN (or CSQCQCON), the CONNSSN parameter maps to the MQNAME attribute in the installed MQCONN definition. You can therefore now use this parameter to specify either the name of a WebSphere MQ queue-sharing group, or the name of a single WebSphere MQ queue manager.
  – Replacing EXEC CICS LINK to DFHMQQCN with SET MQCONN: you can start the CICS-WebSphere MQ connection from an application by issuing an EXEC CICS LINK command to link to program DFHMQQCN (or CSQCQCON, which is retained for compatibility) and passing a set of

parameters. However, if you continue to use this method of starting the CICS-WebSphere MQ connection, you might experience some new results depending on the parameters that you use in the application. If you upgrade your application to use the new SET MQCONN command to control the CICS-WebSphere MQ connection, you can avoid these results. The results are:

CONNSSN parameter
If your application uses the CONNSSN parameter to specify the name of a WebSphere MQ queue manager for the connection, CICS connects to this queue manager as before. In addition, your setting for the MQNAME attribute in the installed MQCONN definition is replaced with the name of the queue manager that you specified on the command. If you want to revert to the original queue manager or queue-sharing group, set MQNAME in the resource definition again.

CONNIQ parameter
If your application uses the CONNIQ parameter to specify the name of the default initiation queue for the connection, CICS uses that initiation queue name, and the INITQNAME attribute in the installed MQINI resource definition is replaced with the name of the initiation queue that you specified on the command. (MQINI is an implicit resource definition that CICS installs when you install the MQCONN resource definition.)

INITP parameter
If your application uses the INITP parameter, which specifies that the default settings are used, these default settings are now taken from the installed MQCONN resource definition, and not from the INITPARM system initialization parameter. The INITP parameter is therefore now known as MQDEF. When MQDEF is set to Y, the setting from the MQCONN resource definition applies as follows:

- If the MQCONN resource definition specifies the name of a WebSphere MQ queue manager in the MQNAME attribute, CICS connects to that queue manager.
- If the MQCONN resource definition specifies a WebSphere MQ queue-sharing group in the MQNAME attribute, CICS connects to any active member of that group. In the event of reconnection, CICS might either connect to the same queue manager or to a different queue manager, depending on the setting for the RESYNCMEMBER attribute in the MQCONN resource definition. You might need to modify your application to take this new behavior into account.

To stop the CICS-WebSphere MQ connection, you can use either EXEC CICS SET MQCONN NOTCONNECTED or continue to issue EXEC CICS LINK to program DFHMQDSC (or CSQCDSC, which is retained for compatibility). The results of this operation remain unchanged.

If you want to enable or disable the CICS-WebSphere MQ API-crossing exit while the connection is active, you must still link to the adapter reset program, DFHMQRS (or CSQCRST, which is retained for compatibility).

V3.1 V3.2

Upgrading SOAP web services: considerations for upgrading from CICS TS Version 3

In addition to the actions described in “Upgrading SOAP web services” on page 165, you must do the following:

- Check that your region size can accommodate the increased memory that is needed for DFHWS2LS and DFHL2WS:

  The web services assistant batch jobs DFHWS2LS and DFHLS2WS require memory to create web service binding files. Since this release, the amount of memory that is required increased to allow the web services assistants to process large and complex web service descriptions.

  The region size must now be at least 300 MB, although some documents might require 400 MB. Either increase the region size, or set the region size to `0M`.

  If you redeploy your existing web services in a CICS TS 5.4 region, the regenerated web service binding files are slightly larger.
- Enable MTOM/XOP support in a pipeline:

  MTOM/XOP support is provided as an optional set of elements in the pipeline configuration file. There are some considerations before you enable a pipeline to take advantage of the MTOM/XOP support:
  - If you use your own application handler instead of the default that is provided by CICS web services support, the pipeline processes MTOM messages in compatibility mode. If you want the pipeline to process MTOM messages in direct mode, specify DFHPITP as the application handler in your pipeline configuration file.
  - If you use the default CICS web services application handler, the pipeline processes MTOM messages in direct mode. Ensure that your message handlers can still run successfully when they process containers that hold XOP documents and binary attachments.
  - Configure the attribute `send_mtom="yes"` in a provider pipeline configuration file only when you are sure that all of your web service requesters can receive MTOM messages. The default value is `send_mtom="same"`, so that MTOM messages are only sent when an MTOM message is received.
  - Consider using zAAP:

    The performance of XML parsing in CICS improved with the introduction of the IBM z/OS XML System Services (XMLSS) parser, which can be accessed directly from CICS. The XMLSS parser uses above-the-bar storage, so there is more below-the-bar storage available for user programs. The XMLSS parser also allows XML parsing to be offloaded to an IBM zEnterprise® Application Assist Processor (zAAP). The zAAP-eligible proportion of the infrastructure for a web service is small, but if zAAP capacity is available, then using this capacity can reduce the cost of hosting web services in CICS.

    For more information on zAAP, see the IBM Redbooks® publication IBM Redbooks: zSeries Application Assist Processor (zAAP) Implementation.
  - Check that SOAP messages are well-formed:

    Improvements in the XML parsing of SOAP messages mean that CICS rejects some malformed SOAP messages that were tolerated in previous releases.

    For more information on XML parsing in z/OS, see the *z/OS XML System Services User's Guide and Reference* on the IBM z/OS XML System Services Library page.
  - Adapt to the changed namespace prefix of WS-Addressing elements:

    Web Services Atomic Transactions (WS-AT) use Web Services Addressing (WS-Addressing) elements in their SOAP headers. The default namespace prefix for these WS-Addressing elements that are changed from `wsa` to `cicswsa`.

V3.1 V3.2

Upgrading ATOM feeds from SupportPac CA8K

If you set up Atom feeds with the CA8K SupportPac in CICS TS for z/OS, Version 3.1 or CICS TS for z/OS, Version 3.2 , you can use them unchanged in this release, or you can upgrade them to use the support for Atom feeds that is included in CICS TS.

CICS TS for z/OS, Version 5.4 supports Atom feeds that were set up with the CA8K SupportPac. If you do not want to upgrade your Atom feed yet, you must retain all the resources unchanged, and continue to use the PIPELINE resource support instead of the new ATOMSERVICE resource.

When you upgrade Atom feeds from the CA8K SupportPac, you can continue to use your service routines after some modifications. However, you must replace most of the supporting resources, such as pipeline configuration files, with their CICS TS for z/OS, Version 5.4 replacements, such as Atom configuration files. You can use the CICS Explorer to set up the resources that you need for an Atom feed in this release.

Table 1 summarizes the resources that are used for an Atom feed with the CA8K SupportPac, and how they are reused or replaced in CICS TS support for Atom feeds.

Table 71. Reusing CA8K SupportPac resources

SupportPac CA8K resource	**CICS TS for z/OS, Version 5.4 usage**
URIMAP resource (samples DFH$W2U1 and DFH$W2V1)	Can be reused, with change from USAGE(PIPELINE) to USAGE(ATOM), or CICS creates a URIMAP resource automatically when you use the CICS Explorer to set up the resources for your Atom feed
PIPELINE resource (samples DFH$W2F1 and DFH$W2Q1)	Replace with ATOMSERVICE resource; CICS creates an ATOMSERVICE resource automatically when you use the CICS Explorer to set up the resources for your Atom feed
Pipeline configuration file	Replace with Atom configuration file
Terminal handler parameter list in pipeline configuration file	Most elements can be reused in Atom configuration file, except <cics:layout> element with DFDL, which is no longer required (the XML binding now describes the structure of the resource)
Message handler program (samples DFH$W2FD and DFH$W2SD)	No longer required; CICS performs this processing
Service routine (samples DFH$W2TS and DFH0W2FA)	Can be reused, with some modifications. The sample service routine DFH0W2F1 is an updated version of DFH0W2FA, and a new sample service routine DFH$W2S1 is provided
Resource Layout Mapping structure	Replace with XML binding
CICS resource that contains Atom feed data (such as temporary storage queue)	Can be reused unchanged

You must take the following upgrade actions:

- Modify your service routine:
  1. Rename the ATOMPARAMETERS container to DFHATOMPARMS.
  2. Rename the ATOMCONTENT container to DFHATOMCONTENT.
  3. If you used the optional containers ATOMTITLE and ATOMSUMMARY, rename these containers to DFHATOMTITLE and DFHATOMSUMMARY. If you used the optional container ATOMSUBTITLE, discard this container, as subtitles are not valid for an Atom entry, only for an Atom feed.
  4. Replace the references to the copybooks that mapped the parameters passed in the ATOMPARAMETERS container, with the copybooks that map the DFHATOMPARMS container, as follows:

Copybook	Replace with
DFH$W2PD for Assembler	DFHW2APD
DFH0W2PO for COBOL	DFHW2APO
DFH$W2PL for PL/I	DFHW2APL
DFH$W2PH for C	DFHW2APH

     The parameters in the container are listed in DFHATOMPARMS container in the IBM Knowledge Center. The following parameters from the list in SupportPac CA8K are no longer used:
     - **ATMP_RLM** , which pointed to the Resource Layout Mapping structure
     - **ATMP_KEY_FLD**
     - **ATMP_SUBTITLE_FLD**

     A number of new parameters are added in the DFHATOMPARMS container, and there are also some new bit values in **ATMP_OPTIONS**.
  5. Replace the references to the copybooks that contained the constant definitions that are referenced by the copybooks for the ATOMPARAMETERS container, with the copybooks that contain the new constant definitions, as follows:

Copybook	Replace with
DFH$W2CD for assembler	DFHW2CND
DFH0W2CO for COBOL	DFHW2CNO
DFH$W2CL for PL/I	DFHW2CNL
DFH$W2CH for C	DFHW2CNH

  6. Check the instructions in Writing a program to supply Atom entry data in the IBM Knowledge Center to see whether you want to make any additional modifications to your service routine to take advantage of new features. You might want to use some of the additional containers and parameters that are available for returning data.
  7. Recompile the modules for the service routine.
- Produce an XML binding:

  Use the CICS XML assistant program DFHLS2SC to produce an XML binding for the resource that contains the data for your Atom feed.

  The XML binding replaces the <cics:layout> element in the pipeline configuration file, and also the Resource Layout Mapping structure. To create an XML binding, you must have a high-level language structure, or copybook, in COBOL, C, C++, or PL/I, that describes the structure of the records in the

resource. For instructions to use DFHLS2SC, see Generating mappings from language structures in the IBM Knowledge Center.

- Deploy a bundle project:

  Follow the instructions in Setting up an Atom feed in the IBM Knowledge Center to use the CICS Explorer to set up and deploy a bundle project for an Atom feed.

  You create an Atom configuration file in the bundle project. You can edit the Atom configuration file to reuse most of the elements from your terminal handler parameter list. If you edit the Atom configuration file with an XML editor or a text editor, make sure that you follow the new nesting structure for those elements in the Atom configuration file. The elements that you can reuse from your terminal handler parameter list are as follows:

  – Reuse the <cics:resource> element, which specifies the name and type of the CICS resource that provides the data for the feed.
  – Reuse the <cics:fieldnames> element, which specifies the fields in your CICS resource that provide metadata for the Atom entries. Rename the "id" attribute as "atomid". Some new attributes are also available for this element in the Atom configuration file.
  – Reuse the <atom:feed> element and its child elements, which specify metadata for the Atom feed.
  – Reuse the <atom:entry> element and its child elements, which specify metadata and name the resource that provides the content for the Atom entries.

  The <cics:layout> element, which described the CICS resource in the Data File Descriptor Language (DFDL), is no longer required.

  When you deploy the bundle project to your CICS region and install the BUNDLE resource, CICS creates ATOMSERVICE and URIMAP resources that you can use for your Atom feed.

- Modify your URIMAP resource:

  If you want to use your existing URIMAP resource for your Atom feed instead of the one that CICS created, modify your existing resource to point to the ATOMSERVICE resource in place of a PIPELINE resource.

  1. Change USAGE(PIPELINE) to USAGE(ATOM).
  2. Delete the PIPELINE attribute.
  3. Add the ATOMSERVICE attribute, specifying the name of the ATOMSERVICE resource that CICS created when you installed the BUNDLE resource.
  4. Change the TRANSACTION attribute to specify CW2A, the default alias transaction for Atom feeds, or another alias transaction that runs DFHW2A, the W2 domain alias program. Creating an alias transaction for an Atom feed in the IBM Knowledge Center explains how to set up an alternative alias transaction.

V3.1 V3.2

Upgrading security: considerations for upgrading from CICS TS Version 3

In addition to the actions described in “Upgrading security” on page 145, you must do the following:

- Check DB2 signon exits and resources:

f you use RACF for some or all of the security checking in your DB2 address space, the circumstances in which CICS passes the RACF access control environment element (ACEE) to DB2 have changed.

In previous releases, the ACEE was passed to DB2 only when AUTHTYPE(USERID) or AUTHTYPE(GROUP) was specified for a DB2CONN or a DB2ENTRY resource. This behavior is unchanged, but, in addition, CICS now passes the address of the ACEE to DB2 when you specify AUTHTYPE(SIGN), and the SIGNID attribute specifies the CICS region user ID. This change makes it possible for DB2 to use RACF security when you use the CICS region user ID to control access to DB2. However, you must verify that your existing resource definitions do not introduce this changed behavior unexpectedly. You must also check any DB2 signon exits to ensure that they operate as expected when the CICS region ACEE is passed to DB2.

- Review the setting on USRDELAY:

  From CICS TS for z/OS, Version 4.1, CICS monitors for RACF type 71 Event Notifications (ENFs) that are sent when specific RACF commands affect the group authorization of a user. Notification of a change to the user ID overrides any setting that is specified in the USRDELAY system initialization parameter. Therefore, review your **USRDELAY** settings. For z/OS 1.13 with the PTF for APAR OA39486 applied, or later, these RACF commands are **ALTUSER** with the REVOKE option, **CONNECT**, **REMOVE**, **DELGROUP** and **DELUSER**.

  This change does not apply to a user ID that is signed on to a local region (for example, a TOR that uses the CESN transaction to sign on). In this situation, CICS is not notified of an ENF 71 event code.

  If you do not want CICS to monitor for RACF type 71 ENF events, you can use the RACFSYNC system initialization parameter to specify this behavior. Use this parameter only under direction from IBM Service, and only as an aid to migration.

Impact on CICS when you upgrade other systems

If you upgrade z/OS, DB2, or IMS, you want to know the impact of those upgrades on your release of CICS Transaction Server.

IBM Support provides information about CICS-related changes for upgrades of z/OS, DB2, or IMS here: CICS considerations when upgrading z/OS, DB2, and IMS.

Chapter 5. Explore upgrade scenarios

This section gives examples of upgrade scenarios.

Upgrading CICS to use multiple releases concurrently

This scenario illustrates how you can run some of your regions at one release of CICS TS and other regions at another release of CICS TS. Doing this gives you the flexibility to offer newer features to some parts of the business, while maintaining continuity in other parts.

Examples of where a multi-release environment could be used include:

- Allowing Java application developers to take advantage of new features in CICS Liberty as they become available, without disrupting the core infrastructure.
- Allowing a subset of regions to exploit functions in CICS, for example, in CICS TS V5.4:
  - Using WLM Health in regions where HTTP requests are received from a Virtual IP Address (VIPA).
  - Additional MQ capability and security provided by MQ monitors
  - EXEC CICS API for asynchronous processing.
- Maintaining a dependency on a specific version of CICS for certain applications or tools, without hindering the adoption of new function elsewhere in the environment.

In all these examples, the aim is to upgrade only a part of an existing environment, maintaining the continuity and availability of that existing environment.

About this scenario

The scenario in this section covers two of these examples of multi-release operation:

1. Providing Java application developers with access to the most up-to-date Liberty features, while leaving the rest of the environment at the existing release of CICS TS.

   In this example, part of an application runs in a Liberty JVM server in dedicated Liberty-owning regions (LORs). This part of the application is accessed directly through HTTP and connects to existing business logic through Distributed Program Link (DPL) over MRO. High availability and load balancing for the Liberty part of the application is achieved by using port sharing and Sysplex Distributor. CICSPlex SM Workload Management (WLM) is used to load balance calls to the COBOL part of the application that runs in the existing application-owning regions (AORs).
2. Providing application developers with access to the EXEC CICS API for asynchronous processing that is provided in CICS TS V5.4, while leaving the rest of the environment at the existing release of CICS TS.

   In this example, the new applications need to continue to interact with existing applications. To avoid impact on the existing environment, new application-owning regions will be added to the existing configuration. Work is directed dynamically to the appropriate region using CICSPlex SM Workload Management.

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In both cases, this section assumes that

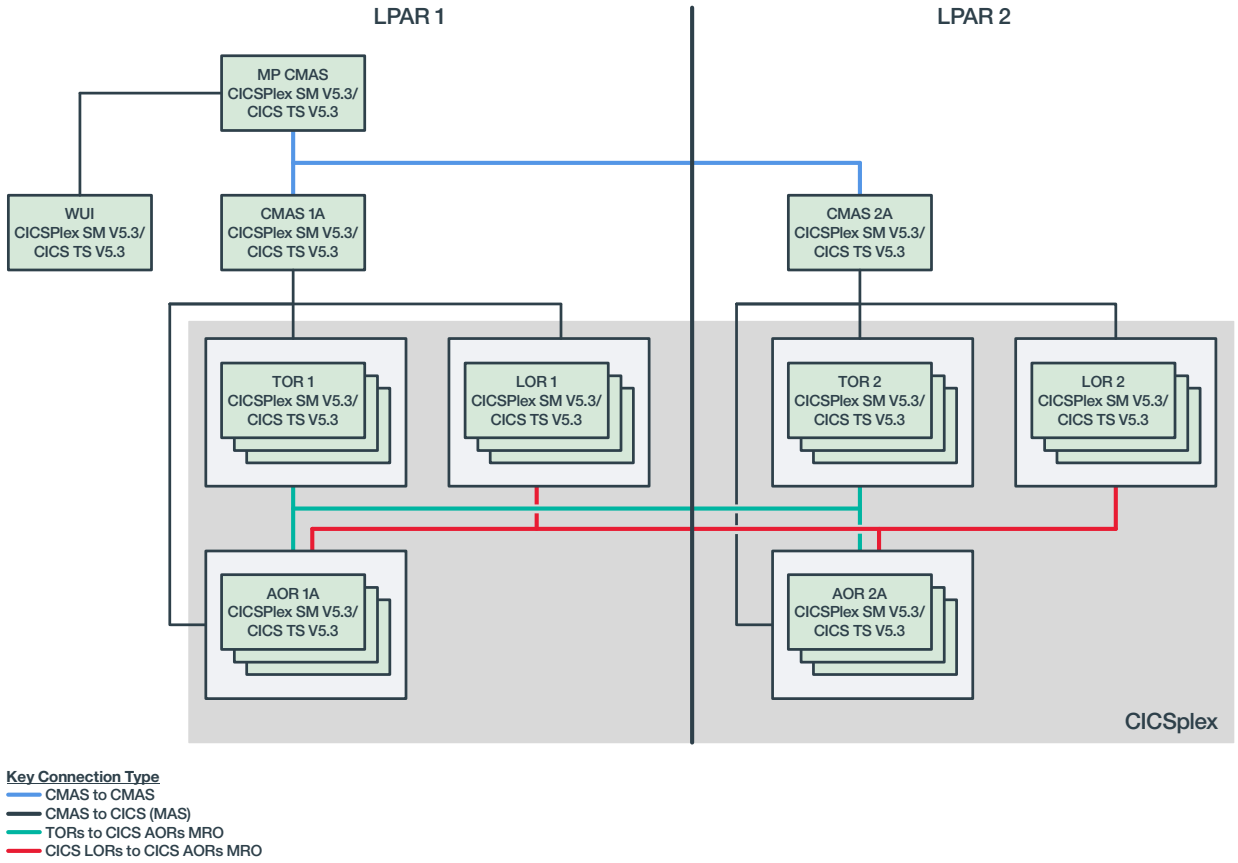
- Changes are made on an LPAR-by-LPAR basis, while maintaining availability of the existing workload.
- The CICS and CICSPlex SM agent code will be maintained at the same CICS TS release within a CICS region.
- All CICS regions use a single, shared CSD.
- You have checked the requirements for running existing applications and tools on the new release of CICS. (See Chapter 2, "Planning to upgrade," on page 3 for details of what to check.)

In outline, the scenario has these steps:

1. Upgrade CICS Explorer to the new release.
2. Upgrade LPAR 1 to the new release:
   a. Update the CICS SVC, LPA, and CSD
   b. Upgrade the CICSPlex SM topology
3. For the example of providing access to up-to-date Liberty only, upgrade the Liberty-owning regions on LPAR 1.
4. For the example of providing access to the asynchronous API only, introduce new application-owning regions on LPAR 1.
5. Upgrade LPAR 2 to the new release:
   a. Update the CICS SVC, LPA, and CSD
   b. Upgrade the CICSPlex SM topology
6. For the example of providing access to up-to-date Liberty only, upgrade the Liberty-owning regions on LPAR 2.
7. For the example of providing access to the asynchronous API only, introduce new application-owning regions on LPAR 2.

Initial configuration

The diagram shows the set up of the two LPARs at the start of these examples.



. The initial configuration

All regions are running CICS TS for z/OS V5.3, with a single, shared CICS system definition file (CSD). The environment consists of a single CICSplex to manage all the CICS regions.

There are two logical partitions (LPARs):

LPAR 1 is running CICS TS for z/OS and CICSPlex SM V5.3. It has:

- One Maintenance Point (MP) CMAS for the CICSplex. The MP CMAS is connected to the CMAS regions that are assigned to manage the CICSplex on LPAR 1 and LPAR 2. Only the Web User Interface (WUI) server region is connected to the MP CMAS.
- One non-Maintenance Point CICSPlex SM address space (shown as CMAS 1A in the diagram). This CMAS connects to the MP CMAS and the CMAS on LPAR 2. This CMAS is assigned to manage the CICSplex defined in the MP CMAS. All CICS regions on LPAR 1 are connected to this CMAS.
- One Web User Interface (WUI) server. The WUI server connects directly to the MP CMAS.
- A group of terminal-owning regions (TORs). These regions are linked to application-owning regions (AORs) on LPAR 1 and LPAR 2 using MRO connections.
- A group of Liberty-owning regions (LORs). These regions are linked to AORs on LPAR 1 and LPAR 2 using MRO connections.

- A group of application-owning regions (AORs). These regions are linked to terminal-owning regions (TORs) and Liberty-owning regions (LORs) on LPAR 1 and LPAR 2.

LPAR 2 is also running CICS TS for z/OS and CICSPlex SM V5.3. It has:

- One non-Maintenance Point CICPlex SM address spaces ((shown as CMAS 2A in the diagram). This CMAS is connected to the MP CMAS and to the CMAS on LPAR 1. This CMAS is assigned to manage the CICSplex defined in the MP CMAS. All CICS regions on LPAR 2 are connected to the CMAS.
- A group of terminal-owning regions (TORs). These regions are linked to application-owning regions (AORs) on LPAR 1 and LPAR 2 using MRO connections.
- A group of Liberty-owning regions (LORs). These regions are linked to AORs on LPAR 1 and LPAR 2 using MRO connections.
- A group of application-owning regions (AORs). These regions are linked to terminal-owning regions (TORs) and Liberty-owning regions (LORs) on LPAR 1 and LPAR 2.

Both sets of TORs are defined with the same z/OS Communications Server generic resource. This means that, when the regions are shut down on one LPAR, the work transfers to the regions on the second LPAR. CICSPlex SM can pass work that comes in to a TOR to any available AOR. This means that, each TOR connects to every AOR.

All Liberty-owning regions (LORs) receive work using Sysplex Distributor and port-sharing.

The CICSplex has a Workload Management Specification with a default "rule" which routes work from the terminal-owning regions and Liberty-owning regions to the application-owning regions. This means that, when the regions are shut down on one LPAR, the work transfers to the regions on the second LPAR.

Back up any data sets that you need to retain

Before you start any upgrade, you should back up any data sets that you need to retain. These data sets include CICS system definition data sets (CSDs), CICSPlex SM data repositories, and exported WUI repositories.

Although we recommend that you keep a back-up of your CMAS data repositories, if you later need to back out the upgrade, you should use the EYU9XDUT job to reset the repository. See “Upgrading CICSPlex SM” on page 117 for details.

Upgrade the CICS Explorer

Upgrade the CICS Explorer to a version that supports the target new release: in this example, CICS TS 5.4.

Upgrade the first LPAR

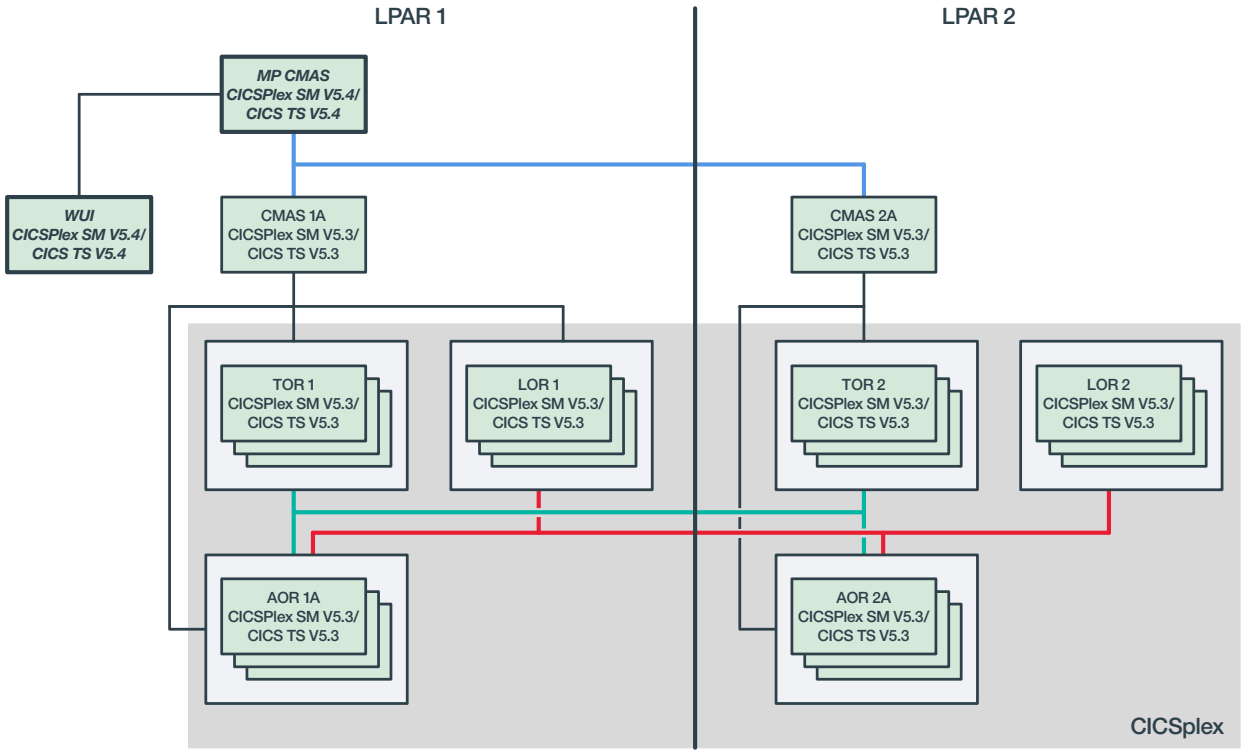
In this section, you upgrade one LPAR completely, then start the upgrade on the second LPAR. Start with the LPAR on which the MP CMAS is running. If you are not running a WUI server, ignore the steps that refer to it.

1. Dynamically update the CICS SVC while CICS is running. Use the same SVC number as the CICS TS 5.3 SVC, but replace it with the CICS TS 5.4 SVC. The highest-level CICS SVC is backwards-compatible. You need to do this because

all CICS regions that are communicating by using MRO on the same LPAR must use the same SVC, and because CICS does not start with a down-level SVC.

2. Ensure interregion communication (IRC) is closed on every system on the LPAR, including batch jobs and any potential users of EXCI.
3. Dynamically update the LPA modules while the interregion communication (IRC) is closed.
4. Re-open interregion communication (IRC) in the active CICS regions on LPAR 1 and confirm that the CICS connections have been acquired.
5. Upgrade the CSD. Ensure that all GRPLISTs that are used by the CICS regions on either LPAR include the required CSD compatibility groups (see CICS-supplied compatibility groups for details).
6. Shut down the MP CMAS, upgrade it and restart.
7. Shut down the WUI, upgrade it and restart.
8. Check that the CICSplex is working:
   - Check that the unmodified CICS TS V5.3 CMASs have reconnected to the upgraded CICS TS V5.4 MP CMAS.
   - Check that the CICS Explorer and WUI server are correctly showing the active CICS TS V5.3 CICS regions
9. Create a new CICS TS 5.4 CMAS and start it.
10. Use the CICS Explorer or WUI to create CMAS-to-CMAS definitions (CMTCMDEF) from the existing CMAS regions to the new CMAS.
11. Use the CICSPlex SM EYU9XDBT utility to create a batch job to define CMAS-to-CMAS definitions from the new CMAS to the existing CMASs. You can use the CICSPlex SM sample EYUJXBT2 as a template for the commands.
12. Assign the new CMAS to manage the CICSplex:
    - In the CICS Explorer SM Administration perspective, use the CICSplex definitions view to right-click on the CICSplex and select **Assign to CMAS**.
    - Use the CICS Explorer or WUI to confirm that the new CMAS is listed as an Active CMAS in the CICSplex view.

The diagram shows the configuration on LPAR 1 after step 8.



. LPAR 1 is partially upgraded. The MP CMAS and WUI have been upgraded and verified but the new CMAS that runs V5.4 is not yet in place.

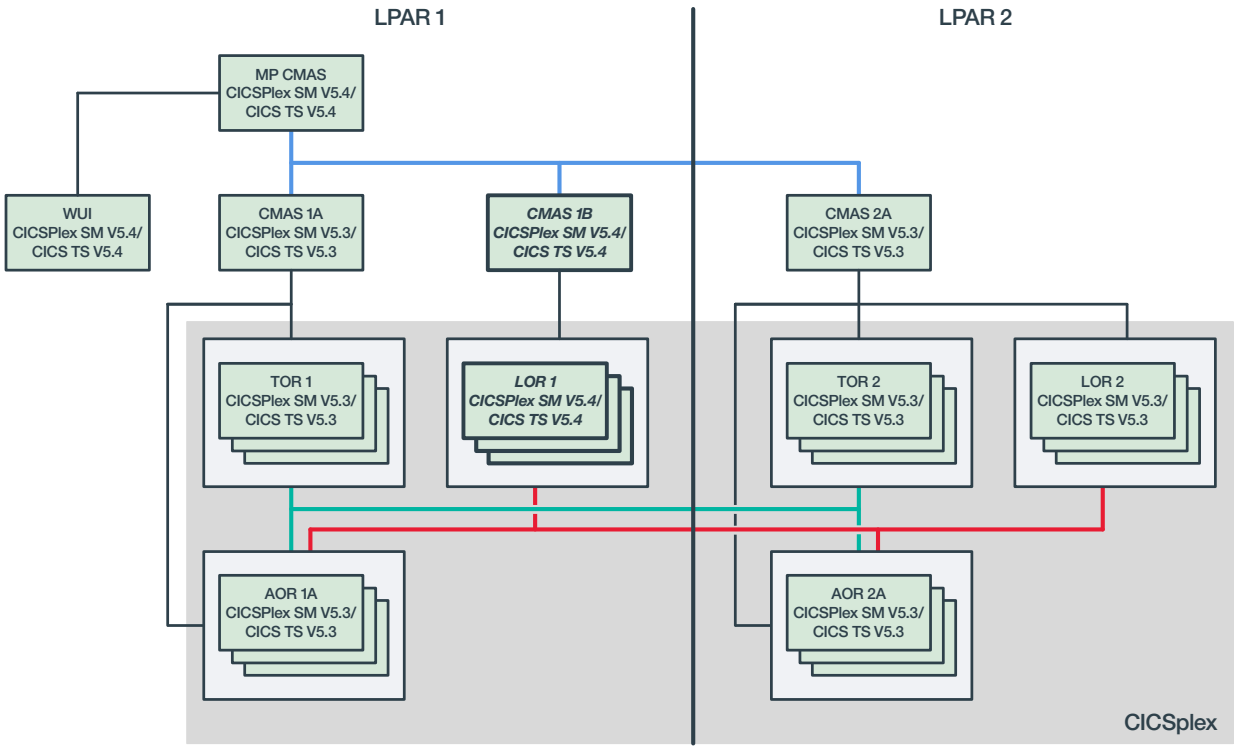
Upgrade Liberty regions on LPAR 1

The steps in this section are required only for the example of providing Java application developers with access to the most up-to-date Liberty features, while leaving the rest of the environment at the existing release of CICS TS.

In these steps, all Liberty-owning regions on the LPAR are stopped, upgraded, and restarted at the same time. An alternative sequence would be to do this on each region at a time.

1. Quiesce the Liberty-owning CICS regions on LPAR 1 and perform a shutdown, ensuring that it is stopped cleanly (see message DFHRM0204).
2. Upgrade the CICS region:
   a. Remove any compatibility groups from the GRPLIST for the Liberty-owning regions.
   b. Update the JCL to make sure that you use the CICS TS V5.4 data sets, licence, and UNIX System Services (USS).
   c. Change the EYUPARMs to reference the CMASSYSID of the new CMAS (shown as CMAS 1B in the diagram).
3. Restart the region with **START=INITIAL**. When you restart the region on LPAR 1, it runs on a newer JVM server and connects to the latest CICS TS V5.4 CMAS.
4. The workload initiates and runs.
5. Wait for 24 hours to confirm that the mixed mode is functioning.

The diagram shows the resulting configuration on LPAR 1.



. The Liberty-owning regions in LPAR 1 are upgraded and restarted.

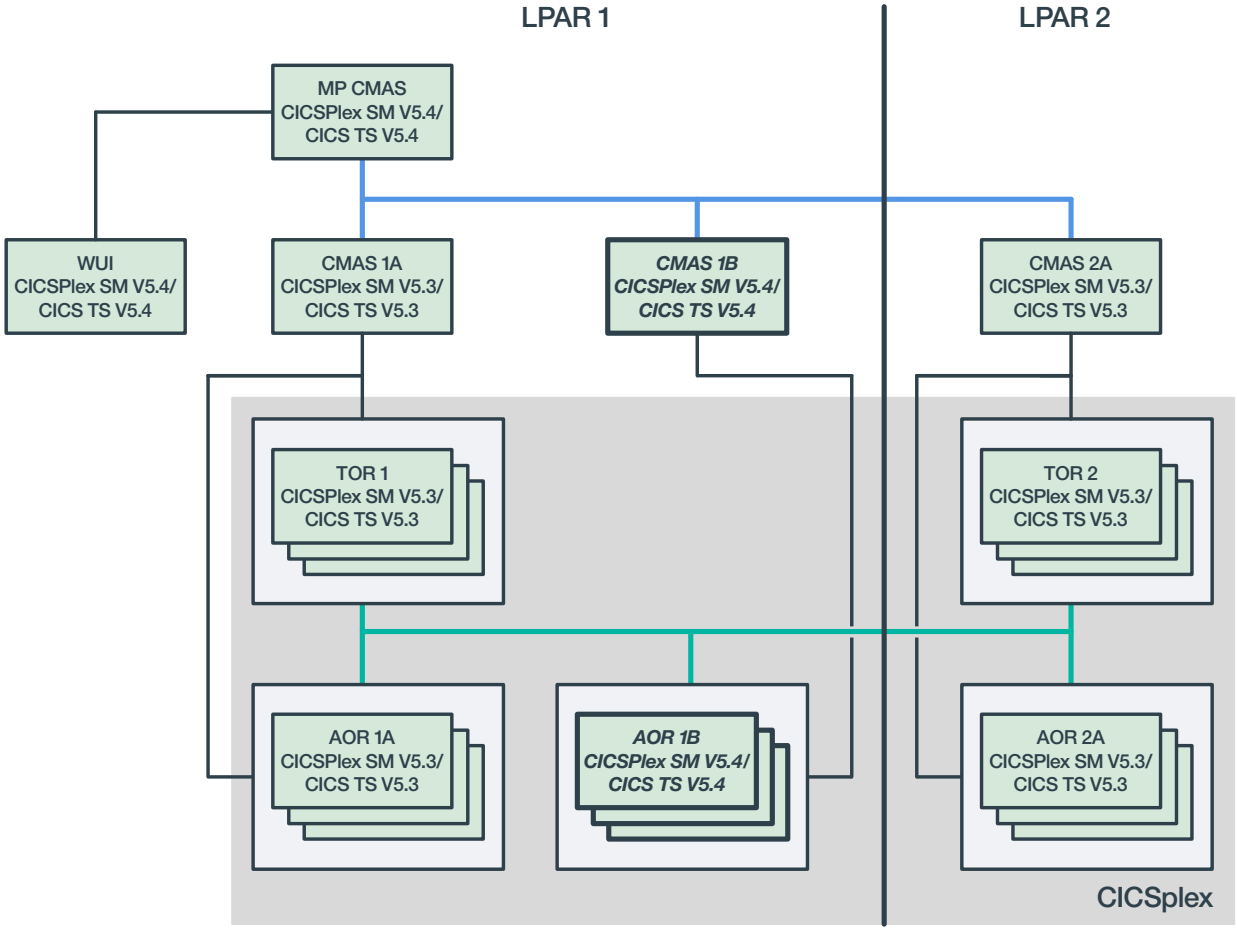
Introduce new application-owning regions on LPAR 1

The steps in this section are required only for the example of providing application developers with access to the EXEC CICS API for asynchronous processing that is provided in CICS TS V5.4, while leaving the rest of the environment at the existing release of CICS TS.

1. Define new application-owning regions on LPAR. These should be clones of the existing AOR regions.
   a. Remove any compatibility groups from the GRPLIST for the regions.
   b. Add the CSD resource definitions for the new asynchronous application resource definitions to the GRPLIST for the new regions.
   c. Update the JCL to make sure that you use the CICS TS V5.4 data sets, license, and UNIX System Services (USS).
   d. Change the EYUPARMs to reference the CMASSYSID of the new CMAS.
2. Update the CICSplex Workload:
   a. Define a new CICS System definition (CSYSDEF) for each new AOR required on both LPAR 1 and LPAR 2.
   b. Define a new CICS Group (AOR2) in the CICSplex and add the new AORs to it.
   c. Add the new CICS group as a sub-group to the existing AOR CICS group.
   d. Create a new “routing rule” to route the new asynchronous application transactions to the new application-owning regions.
   e. Install the new "routing rule" into the CICSplex.
3. Start the new AORs on LPAR 1.
4. Check that the new AORs on LPAR 1 are shown as active target regions under the new routing rule, when they become active.

5. Check that the existing workload is distributed across the previous and new AORs but that the new asynchronous application is routed only to the new CICS TS V5.4 AORs.

The diagram shows the resulting configuration on LPAR 1.



. AORs at the latest release level are active in LPAR 1 and integrated with the CICSplex Workload.

Upgrade LPAR 2

1. Dynamically update the CICS SVC while CICS is running. Use the same SVC number as the CICS TS 5.3 SVC, but replace it with the CICS TS 5.4 SVC. The highest-level CICS SVC is backwards-compatible. You need to do this because all CICS regions that are communicating by using MRO on the same LPAR must use the same SVC, and because CICS does not start with a down-level SVC.
2. Ensure interregion communication (IRC) is closed on every system on the LPAR, including batch jobs and any potential users of EXCI.
3. Dynamically update the LPA modules while the interregion communication (IRC) is closed.
4. Re-open interregion communication (IRC) in the active CICS regions on LPAR 2 and confirm that the CICS connections have been acquired.
5. Create a new CICS TS 5.4 CMAS (shown as CMAS 2B in the diagram) and start it.

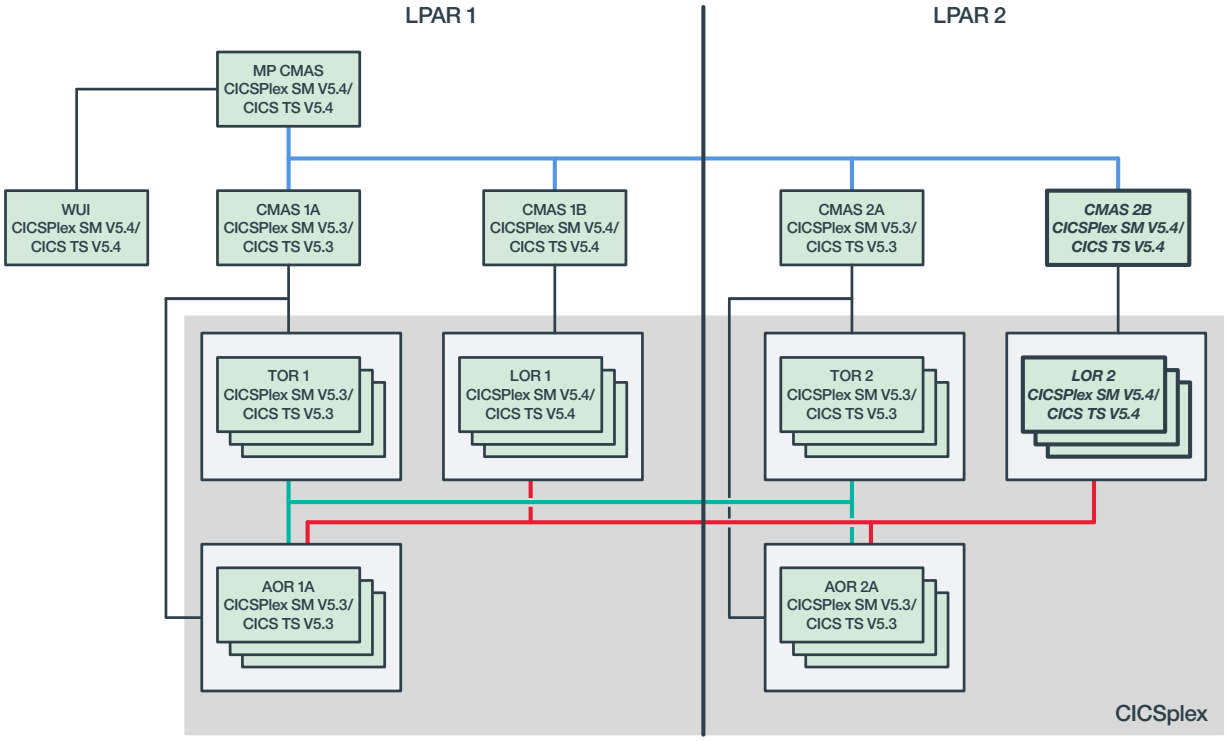
6. Use the CICS Explorer or WUI to create CMAS-to-CMAS definitions (CMTCMDEF) from the existing CMAS regions to the new CMAS.
7. Use the CICSPlex SM EYU9XDBT utility to create a batch job to define CMAS-to-CMAS definitions from the new CMAS to the existing CMASs. You can use the CICSPlex SM sample EYUJXBT2 as a template for the commands.
8. Use the CICS Explorer or WUI to confirm that the link between the existing MP CMAS and the new CMAS is active.
9. Assign the new CMAS to manage the CICSplex:
   - In the CICS Explorer SM Administration perspective, use the CICSplex definitions view to right-click on the CICSplex and select **Assign to CMAS**.
   - Use the CICS Explorer or WUI to confirm that the new CMAS is listed as an Active CMAS in the CICSplex view.

Upgrade the Liberty-owning regions on LPAR 2

The steps in this section are required only for the example of providing Java application developers with access to the most up-to-date Liberty features, while leaving the rest of the environment at the existing release of CICS TS.

1. Quiesce the Liberty-owning CICS regions on LPAR 1 and perform a Shutdown, ensuring that it is stopped cleanly (see message DFHRM0204).
2. Upgrade the CICS region:
   a. Remove any compatibility groups from the GRPLIST for the Liberty-owning regions
   b. Update the JCL to make sure that you use the CICS TS V5.4 data sets, licence, and UNIX System Services (USS).
   c. Change the EYUPARMs to reference the CMASSYSID of the new CMAS.
3. Restart the region with **START=INITIAL**. When you restart the region on LPAR 1, it runs on a newer JVM server and connects to the latest CICS TS V5.4.0 CMAS.
4. The workload initiates and runs.

The diagram shows the resulting configuration on LPAR 2.



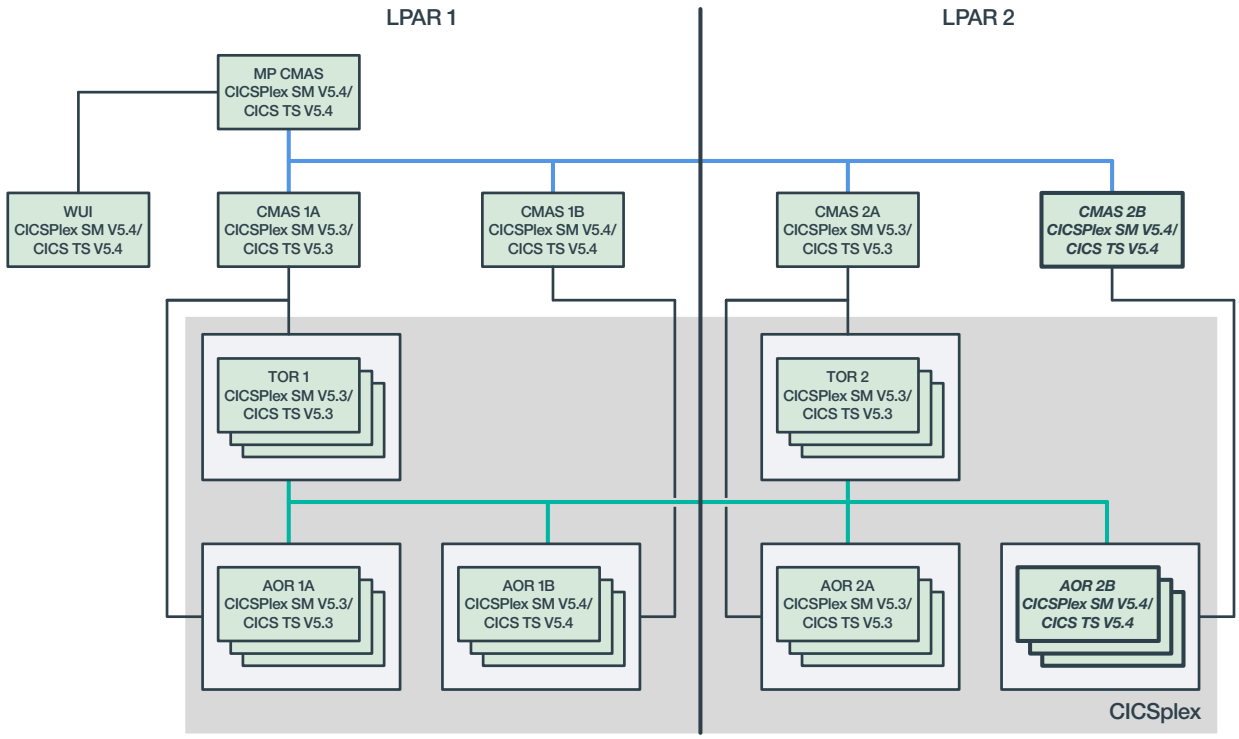
. The LORs in LPAR 2 are running CICS TS 5.4.

Introduce new application-owning regions on LPAR 2

The steps in this section are required only for the example of providing application developers with access to the EXEC CICS API for asynchronous processing that is provided in CICS TS V5.4, while leaving the rest of the environment at the existing release of CICS TS.

1. Define new application-owning regions on LPAR 2. These should be clones of the existing AOR regions.
   a. Remove any compatibility groups from the GRPLIST for the regions.
   b. Add the CSD resource definitions for the new asynchronous application resource definitions to the GRPLIST for the new regions.
   c. Update the JCL to make sure that you use the CICS TS V5.4 data sets, license, and UNIX System Services (USS).
   d. Change the EYUPARMs to reference the CMASSYSID of the new CMAS on LPAR 2.
2. Start the new AORs on LPAR 2.
3. Check that the new AORs on LPAR 2 are shown as Active CICS regions.
4. Check that the new AORs on LPAR 2 are shown as active target regions under the new routing rule, when they become active.
5. Check that the existing workload is distributed across the previous and new AORs but that the new asynchronous application is routed only to the new CICS TS V5.4 AORs.

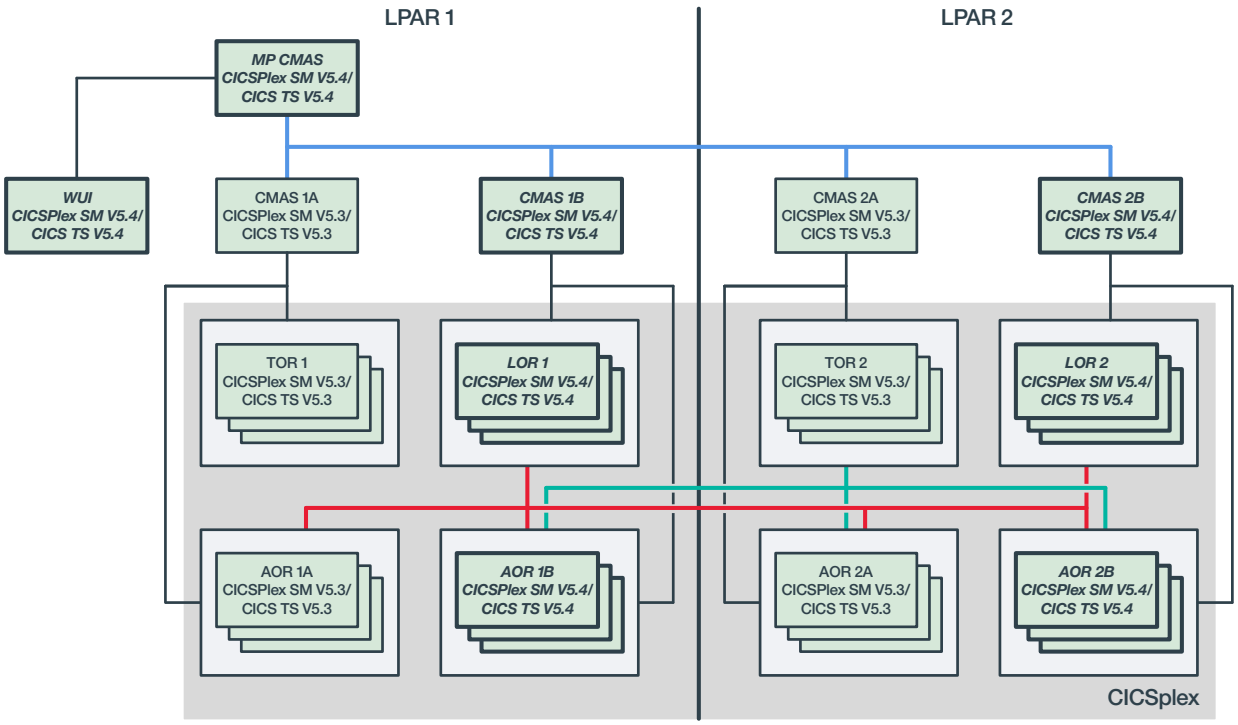
The diagram shows the resulting configuration on LPAR 2.



. AORs at the latest release level are active in LPAR 2.

Final configuration

The diagram shows the final set up of the two LPARs that are used in this example.



. The final configuration after upgrading to use multiple releases concurrently.

Some regions are running CICS TS for z/OS V5.3. Other regions are running CICS TS for z/OS V5.4. The environment consists of a single CICSplex to manage all the CICS regions.

Upgrading CICS with a running workload

The scenario uses the abilities of CICSPlex SM to route work to any available target region, and to continue to route work, even when the maintenance point CMAS is offline. It is possible to upgrade only the CICSPlex SM component and defer the upgrade of CICS. This scenario upgrades both at the same time.

One LPAR is upgraded first, then the other. In outline, the solution has these steps:

1. Shut down, upgrade and restart the maintenance point CMAS and WUI.
2. Quiesce each AOR as a workload target. When there are no longer running tasks, shut down and upgrade each AOR. Do not yet restart.
3. Deregister each TOR from generic VTAM. When no terminals are connected for that TOR and no work remains for that TOR, shut down and upgrade the TOR. Do not yet restart.
4. Upgrade any remaining CMAS in the LPAR.
5. Restart all CMAS.
6. Restart all AORs.
7. Restart all TORs.
8. Repeat for the second LPAR.

Initial configuration

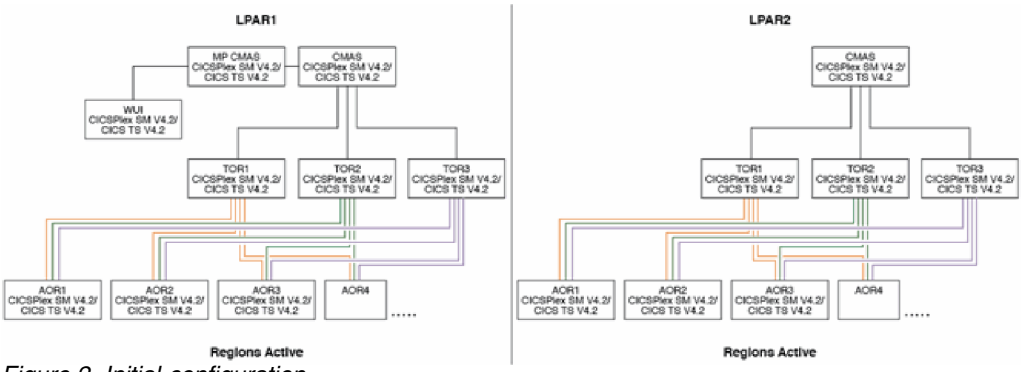


Figure 2. Initial configuration

To streamline the diagrams, connections between LPARs are not shown.

There are two logical partitions (LPARs), with a shared CICS system definition file (CSD):

LPAR 1 is running CICS TS for z/OS and CICSPlex SM V4.2. It has:

- Two CICPlex SM address spaces (CMAS), one of which is the maintenance CMAS. The CMAS on this LPAR connects to both the maintenance point CMAS and the CMAS on LPAR 2.
- Three terminal-owning regions (TORs). These regions are linked to application-owning regions (AORs) in LPAR 2.
- A WUI server.
- Ten application-owning regions (AORs). These regions are linked to terminal-owning regions (TORs) in LPAR 2.

LPAR 2 is also running CICS TS for z/OS and CICSPlex SM V4.2. It has:

- One CICSPlex SM address space (CMAS). This CMAS connects to the two CMAS on LPAR 1.
- Three terminal-owning regions (TORs). These regions are linked to application-owning regions (AORs) in LPAR 1.
- Ten application-owning regions (AORs). These regions are linked to terminal-owning regions (TORs) in LPAR 1.

Both sets of TORs are defined with the same z/OS Communications Server generic resource. This means that, when the regions are shut down on one LPAR, the work should transfer to the regions on the second LPAR. CICSPlex SM can pass work that comes in to a TOR to any available AOR. This means that, each TOR connects to every AOR.

Back up any data sets that you need to retain

Before you start any upgrade, you should back up any data sets that you need to retain. These data sets can include CICS system definition data sets (CSDs) and exported WUI repositories.

Upgrade the first LPAR

In this section, you upgrade one LPAR completely, then start the upgrade on the second LPAR. If you are not running a WUI server, ignore the steps that refer to it.

1. Shut down the maintenance point CMAS. For more details, see Shutting down a CMAS in the IBM Knowledge Center. The CICS workload continues to run, even without the maintenance CMAS.
2. Upgrade both CICS TS for z/OS and CICSPlex SM to the latest level.
3. If you have a WUI, shut down the WUI server and upgrade it to the latest level.
4. Start the maintenance point CMAS.
5. If you have a WUI, restart the WUI. In the WUI or CICS Explorer, you can see the CMAS and WUI at the latest level of CICS and CICSPlex SM.

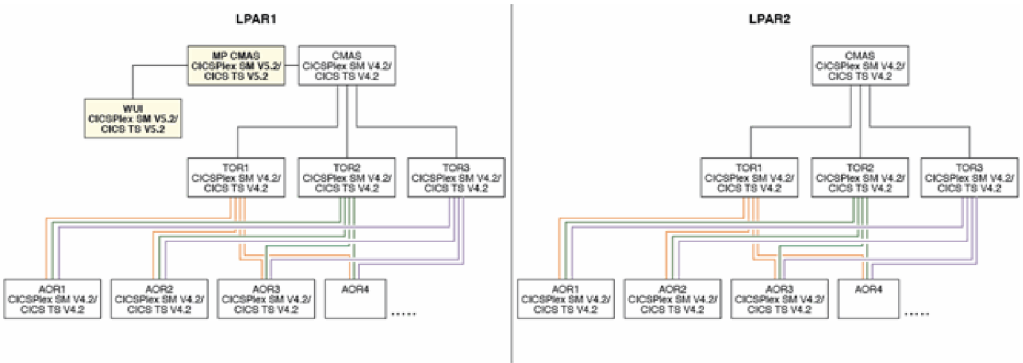


Figure 3. The outcome of the procedure so far: the CMAS and WUI are upgraded.

6. For each AOR:
   a. Quiesce the AOR from the workload. Check that all work that was running in that region is complete. For details, see Quiescing a target region in an active workload in the IBM Knowledge Center.
   b. Shut down the AOR.
   c. Upgrade the AOR to the latest levels of CICS and CICSPlex SM. Do not restart the AOR.

   The target regions are upgraded as shown in the diagram.

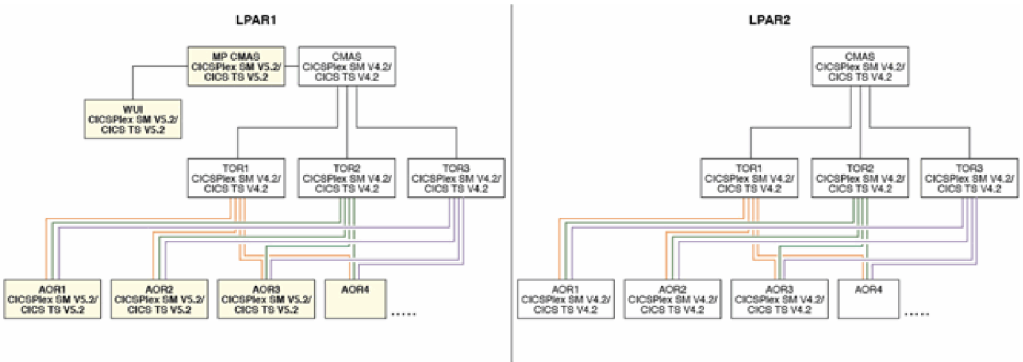


Figure 4. The outcome of the previous step: the AORs are upgraded.

7. For each TOR:
   a. Deregister the router as a VTAM generic resource (SET VTAM DEREGISTERED). Set close communications with VTAM (SET VTAM CLOSED), making the TOR unavailable to incoming work. For details, see Removing a TOR from a generic resource in the IBM Knowledge Center.
   b. When all work that is running in the region is complete, close the TOR.
   c. Upgrade the TOR to the latest levels of CICS and CICSPlex SM. Do not restart the TOR.

The routing regions are upgraded as shown in the diagram.

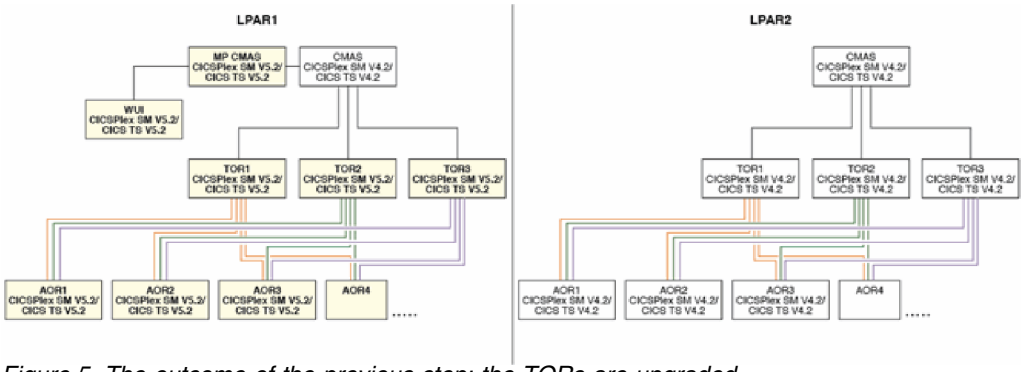


Figure 5. The outcome of the previous step: the TORs are upgraded.

8. Shut down any remaining CMAS.
9. Upgrade the remaining CMAS. You can see that only the maintenance point CMAS, and WUI if present, are running in this LPAR. The TORs and AORs are upgraded but are not yet started. The second LPAR is still fully active.

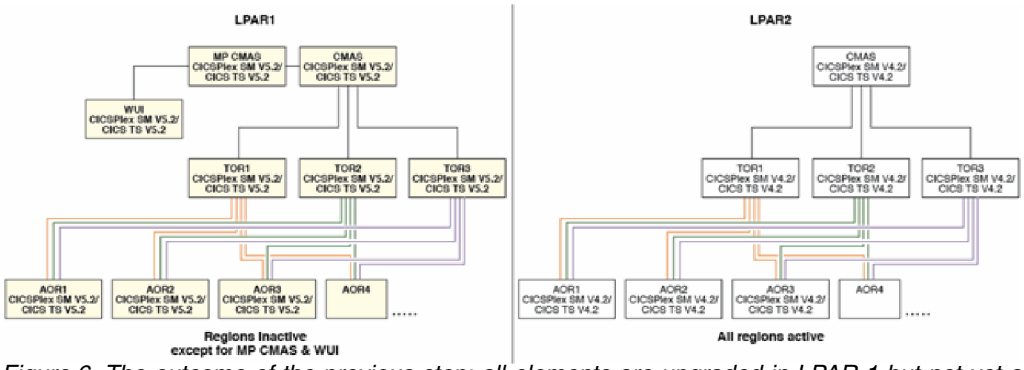


Figure 6. The outcome of the previous step: all elements are upgraded in LPAR 1 but not yet all started.

10. Restart the remaining CMAS. For details, see Restarting a CMAS in the IBM Knowledge Center.
11. When the CMAS are active, restart each TOR.
12. Restart each AOR.

Work is coming into the routing regions on both LPARs. It is routed to target regions in both LPARs. You can now upgrade the second LPAR while the workload continues to run in the first one.

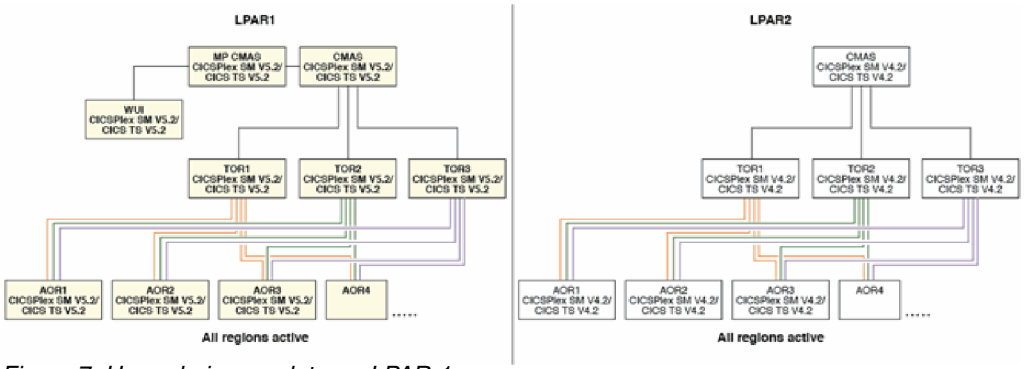


Figure 7. Upgrade is complete on LPAR 1

Upgrade the second LPAR

When work is flowing again in the first LPAR, you can upgrade the second one.

1. For each AOR:
   a. Quiesce the AOR from the workload. Check that all work that was running in that region completed. For details, see Quiescing a target region in an active workload in the IBM Knowledge Center.
   b. Shut down the AOR.
   c. Upgrade the AOR to the latest levels of CICS and CICSPlex SM. Do not restart the AOR.
2. For each TOR:
   a. Deregister the router as a VTAM generic resource (SET VTAM DEREGISTERED). Set close communications with VTAM (SET VTAM CLOSED), making the TOR unavailable to incoming work. For details, see Quiescing a target region in an active workload in the IBM Knowledge Center.
   b. When all work that is running in the region is complete, close the TOR.
   c. Upgrade the TOR to the latest levels of CICS and CICSPlex SM. Do not restart the TOR.
3. Upgrade the remaining CMAS.
4. Restart the remaining CMAS. For details, see Restarting a CMAS.
5. When the CMAS is active, restart each TOR.
6. Restart each AOR.

Work is coming into the routing regions on both LPARs. It is routed to target regions in both LPARs.

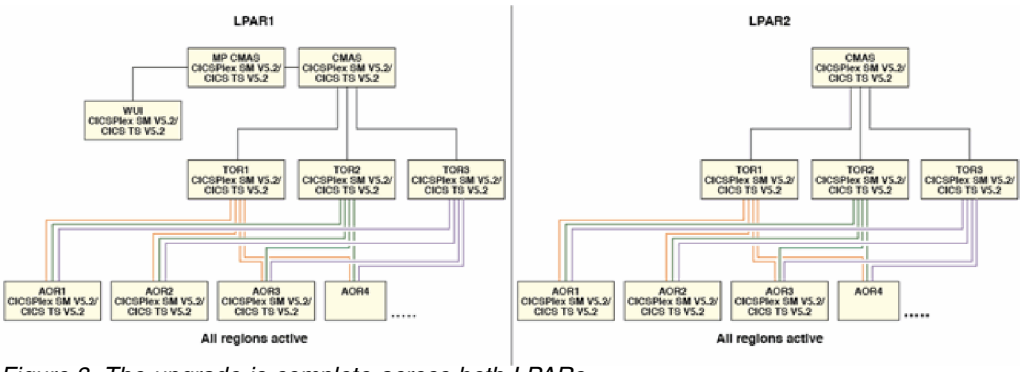


Figure 8. The upgrade is complete across both LPARs.

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- Developing applications
- Developing system programs
- Securing
- Developing for external interfaces
- Reference: application developmenth
- Reference: system programming
- Reference: connectivity

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