CICS Transaction Server Version 5

Technical Overview

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IBM CICS TS for z/OS, V5.3 builds on the capabilities that were delivered in earlier CICS TS V5 releases, and adds substantial new DevOps functionality. New and enhanced capabilities are delivered in three main focus areas and four core capabilities:

Service agility: Focuses on enhanced support for Java and the WebSphere Liberty profile and includes:
- Additional WebSphere Liberty profile features
- Enhanced interoperability
- Simplified management
- Enhanced Java SE support

Operational efficiency: Includes performance optimizations, enhanced metrics, and additional security:
- Web service optimizations
- Performance improvements
- Enhanced metrics
- Additional security options

Cloud with DevOps: Includes new cloud and DevOps support to automate CICS deployments:
- Automated builds
- Scripted deployments
- UrbanCode Deploy support
- Enhanced cloud enablement

CICS Transaction Server for z/OS V5.3 is planned to be generally available December 11, 2015.
Please Note:

- IBM’s statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM’s sole discretion.

- Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision.

- The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract.

- The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

- Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user’s job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.
Session Agenda

- CICS TS 5.1 & 5.2 Review
- Statements of Direction
- CICS TS 5.3 Overview
  - Service Agility
  - Operational Efficiency
  - Cloud with DevOps
  - Foundation
  - Explorer
- Summary
CICS TS V5 Vision

Service Agility
Enhanced support for Java and the WebSphere Liberty profile

Operational Efficiency
Performance optimizations, enhanced metrics and additional security

Cloud Enablement
New cloud and DevOps support to automate CICS deployments

300+ requirements satisfied in V5!
Notes

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CICS 5.1 and 5.2 Review – Service Agility

- **WebSphere Liberty Profile Support**
  - A production-ready web container
    - Local access to CICS applications and data
  - Deploy lightweight Java servlets and JSPs

- **Mobile Feature Pack integration**
  - JSON support for mobile applications

- **z/OS Connect support**
  - Runs in Liberty in the CICS region
  - Uses a local call to access back-end applications
Notes

This chart lists the major service agility functions delivered in CICS 5.1 and 5.2.
CICS 5.1 and 5.2 Review – Operational Efficiency

- **Greater capacity**
  - More threadsafe, more 64-bit exploitation, increased limits

- **Managed operations**
  - Resource threshold policies
    - CPU, storage usage, data access

- **Increased availability**
  - Reduced need to shutdown CICS to apply changes

- **Deeper insight**
  - Audit trail of system changes, additional metrics collected

- **Security**
  - Security Assertion Mark-up Language support
Notes

This chart lists the major operational efficiency functions delivered in CICS 5.1 and 52
Platform and Application Support

• Group new and existing regions as platforms
• Decoupling applications from the region topology
• De-provision resources when requested
• Manage disparate resources as a single entity
• Rapidly move through the application lifecycle
• Automate dependency management
• Measure entire application resource usage
• Dynamically manage applications and platforms with policies
• Application multi-versioning support
Notes

This chart lists the major cloud functions delivered in CICS 5.1 and 5.2
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<th>Cloud with DevOps</th>
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</thead>
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<tr>
<td>Enhanced support for Java and the WebSphere Liberty profile</td>
<td>Performance optimizations, enhanced metrics and additional security</td>
<td>New cloud and DevOps support to automate CICS deployments</td>
</tr>
</tbody>
</table>

- Additional Liberty features
- Enhanced interoperability
- Simplified management
- Enhanced Java SE support
- Web service optimizations
- Performance improvements
- Enhanced metrics
- Additional security options
- Automated builds
- Scripted deployments
- UrbanCode Deploy support
- Enhanced cloud enablement

General availability: December 11, 2015
Notes

This chart is a short summary of the features delivered in CICS Transaction Server 5.3.
Service Agility

- **Additional WebSphere Liberty profile features**
  - JEE6 Web profile support, including following new features:
    - Context and Dependency Injection
    - Managed Beans
    - Java Persistence API - JDBC Type 4 driver only
    - Enterprise Java Beans Lite 3.1 subset
  - Java EE Connector Architecture - including local ECI resource adapter
  - Java Message Service 1.1 - with WLP embedded messaging engine
  - Session Persistence – using JDBC Type 4 driver only
  - Lightweight Directory Access Protocol registry - including CICS security integration using distributed identities
  - MongoDB
  - Open Service Gateway Initiative Console
  - Java Management Extensions (JMX)
    - Allows monitoring of Liberty Java application and system objects
      - Support for both local JMX client and remotely with the Jconsole tool

- **Extended function**
  - Enterprise Archive (EAR) support for bundles
  - SQLJ support for DB2 type 2 driver data sources
  - Transaction support added to Blueprint feature
Notes

Contexts and Dependency Injection (CDI) is a Java EE feature which aids the loose coupling of enterprise tiers. It is a set of services which provide dependency injection and lifecycle management in enterprise applications.

CDI Managed Beans are Java classes which are not defined as EJBs and which have an appropriate constructor. Though not required, they can have a number of annotation specified to enhance their capabilities within the CDI framework, such as providing a default implementation or scoping a bean to a session state.

MongoDB is a non-SQL database running on UNIX platforms (not z/OS). The data is stored using BSON (binary equivalent of JSON).

The OSGi Console allows a user to connect to the Equinox OSGi framework using a Telnet session. This is useful for debugging purposes.

Database session persistence enables persistence of HTTP sessions to a datasource using JDBC.

EJB Lite enables support for Enterprise JavaBeans written to the EJB Lite subset of the EJB 3.1 specification.

Java EE Connector Architecture enables the configuration of resource adapters to access Enterprise Information Systems (EIS) from applications.

Java Management Extensions (JMX) can be used to monitor Java applications and JVM system objects. The following JMX-related WebSphere Liberty profile features are now supported:

- JMX Connector
- Monitoring
- REST connector (for JMX)

Users of the WebSphere Liberty profile JVM server can now manage and monitor applications and system objects locally by using the JMX client API, or remotely by using the JConsole monitoring tool included in Java SE.
Service Agility…

- Enhanced interoperability
  - Java applications can use the standard JEE Connector Architecture (JCA) to invoke CICS programs
Notes

**JCA local ECI support**

You can deploy JCA ECI applications into a Liberty JVM server that is configured to use the JCA local ECI resource adapter.

The JCA ECI programming interfaces provided by the CICS® TS JCA local ECI resource adapter are fully documented in Javadoc that is generated from the class definitions.

The libraries and OSGi bundle required for application development are provided by the CICS Explorer® SDK.

The CICSdev community has an article on porting JCA applications to the CICS Liberty server. The article can be found at:

Service Agility…

- **Liberty z/OS Connect feature support in CICS**
  - Base support in CICS 5.2 by PI25503
  - Server.xml configuration updated by PIPELINE scan
  - CICS or Java parser available
Notes

Capabilities of z/OS Connect for CICS

The integrated z/OS® Connect capability in CICS® has differences to z/OS Connect in other environments. z/OS Connect for CICS is optimized for local access to CICS, and uses standard CICS services.

z/OS Connect for CICS has the same features and functions as z/OS Connect in WebSphere® Liberty for z/OS, however, there are some differences. The following paragraphs describe these differences.

WSBind files can be generated by using the CICS supplied DFHLS2JS and DFHJS2LS tools.

WSBind files are deployed to the z/OS Connect for CICS infrastructure by using WEBSERVICE and URIMAP resources.

This makes the operational management of z/OS Connect for CICS similar to other CICS web services.

JSON services that are hosted in CICS can interact with CICS programs through an optimized local connection.

JSON services can be developed by using both bottom-up and top-down development strategies. The RESTful style of JSON services can be housed in CICS.

The integrated z/OS Connect for CICS cannot be used to directly interact with assets from other z/OS subsystems, such as IMS™ or Batch.

If the PIPELINE scan command is used to install services, per-service configuration changes are not required for CICS in the WebSphere Liberty Profile's server.xml file. However, per-service configuration in server.xml is supported.

Both z/OS Connect and z/OS Connect for CICS acquire the root context for URIs. You are encouraged to deploy z/OS Connect for CICS into its own Liberty JVM server environment.
IBM makes the following statements of general direction:

- IBM intends to deliver enhanced support for Java applications that exploit Java EE 7 Full Platform features when running in the WebSphere Liberty profile that is integrated with IBM CICS Transaction Server for z/OS (CICS TS).

- IBM intends to deliver additional Java EE 7 components and technologies for the CICS TS-hosted WebSphere Liberty profile through continuous delivery of new features in the coming months.

These additional components and technologies are intended to include CICS TS-hosted support for Java EE 7 Web Profile features, CICS TS-hosted support for JMS 2.0 with IBM MQ for z/OS, and the ability to link to a CICS TS-hosted WebSphere Liberty profile Java application from a CICS COBOL program.
IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision. The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remain at our sole discretion.
Service Agility…

- **Simplified Management**
  - Improved Java log management
    - New JVM profile option: `LOG_FILES_MAX = nn`
    - `LOG_PATH_COMPATIBILITY=TRUE | FALSE`
  - Timestamps in messages can use local time
  - Stderr/stdout/dfhjvmtrc can be redirected to MVS DD instead of zFS files
Notes

*Simplified management*

Administration of the JVM servers is enhanced by simplifying the process of managing log files that include controls for the maximum number of zFS logs, the ability to redirect log files to the MVS JES log, and the standardization of timestamps.
Service Agility…

- **Enhanced Java SE support**
  - Java 8 support
    - Will exploit new facilities of the z13 ((SIMD and CPACF)
    - Can run Java 8, 7.1 and 7 in different JVM servers in the same CICS
  - SET BUNDLE COPY(PHASEIN) support
    - Enables registration of a new OSGi bundle replacing any currently registered version
    - New requests will use the new version
    - Existing requests will use the old version until complete
  - Java SE programs that run in a CICS JVM server can now use:
    - JMS 1&2 support with MQ in an OSGi JVM server
      - Non-managed connection factories
    - JMS 2 in a Liberty server with WebSphere imbedded messaging
      - Managed connection factories
    - Currently no support for JMS in a Liberty server with MQ
      - IBM intends to provide this support
Notes

The CICS TS V5.3 JVM server environment is enhanced to support 64-bit SDK for z/OS, Java Technology Edition, Version 8.0 (Java 8), in addition to support for Version 7.0 and Version 7.1. The enhanced support for Java 8 in CICS TS enables the use of new facilities delivered by IBM z13, which are exploited by Java 8. These new facilities include 'Single Instruction Multiple Data' (SIMD) instructions for vector operations and the Faster CP Assist for Cryptographic Function (CPACF) processor.

The new PHASEIN option for the SET BUNDLE command enables the registration of a new version of an OSGi bundle with the OSGi framework, to replace any version currently registered. The new version of any OSGi services that are implemented by the new version of an OSGi bundle will then be used by any new service requests. Existing requests will continue to use the old version until the request completes.

Enhanced support is provided for Java SE developers who need access to MQ for z/OS. Java SE programs that run in a CICS OSGi JVM server can now use the MQ for z/OS classes for the Java Message Service (JMS), as an alternative to the proprietary MQ for z/OS classes for Java. There is currently no support in a WebSphere Liberty profile JVM server. However, IBM intends to provide this support.

Developers familiar with the JMS API can easily access MQ for z/OS resources. The CICS MQ attachment facility is enhanced to support the necessary new commands. Support from MQ for z/OS for use of the MQ for z/OS classes for JMS in an CICS OSGi JVM server is provided in releases V7.1 and V8:

- V7.1 requires MQ for z/OS APAR PI29770 (built on fix pack 7.1.0.6) or any later fix pack level.
- V8.0 requires base APAR PI28482 and fix pack 8.0.0.2 or any later fix pack level.
Operational Efficiency

- **Web Service optimizations**
  - Remove need for intermediate CWXN transaction in many cases
    - Reduced CPU and storage requirements for most SOAP and JSON HTTP services
    - Optimization can be used for inbound HTTPS requests
      - SSL support is provided by Application Transparent Transport Layer Security
        > Feature of Communication Server
        > Security configuration moved TCIPSERVICE definition to the IP stack
    - Multiple TCB switches eliminated for CICS SSL support using CWXN
Notes

The pipeline processing of HTTP requests are improved by removing the need for an intermediate web attach task (CWXN transaction) in the majority of use cases. This will reduce the CPU and memory overhead for most types of SOAP and JSON-based HTTP CICS web services.

This optimization can also be used for inbound HTTPS requests, where SSL support is provided by the Application Transparent Transport Layer Security (AT-TLS) feature of IBM Communications Server. CICS TCPIPSERVICE resources can be configured as AT-TLS aware to obtain security information from AT-TLS.

HTTPS implementations that use CICS-provided SSL support still use the CWXN transaction. However, multiple Task Control Block (TCB) switches are eliminated for these scenarios. Therefore, these implementations should also see performance improvements.
Operational Efficiency…

- **Web Service optimizations…**
  - Region Overload protection (SO Tuning)
    - When activated:
      - Pauses listening for new HTTP connection requests
      - Instead of these requests queuing in CICS
      - They are queued outside of CICS in the TCP/IP backlog queue allowing feedback to TCP/IP port sharing and Sysplex Distributor
      - Marks all new connections as non-persistent and closes existing persistent connections after their next request
    - Allows the region to recover from unconstrained resource demand
  - New CICS native JSON parser running in z/OS Connect
    - Provides greater throughput
    - Uses substantially less overall CPU
      - CPU reduction is on the Java code path

- **Performance Improvements**
  - Numerous internal improvements made across CICS
    - Exploitation of new hardware instructions
    - Cache alignment of key CICS control blocks
    - Improvements to MRO session management algorithms
Notes

New capability for performance tuning of HTTP connections is provided to protect CICS from unconstrained resource demand. When activated, if a region becomes overloaded, new HTTP connections requests are suspended. All new connections are marked as non-persistent and existing persistent connections are closed after their next request.

The performance of JSON-based web services running inside z/OS Connect, inside CICS TS, is now dramatically improved through the introduction of a new optimized JSON parser. This new processing infrastructure provides greater throughput, while using substantially less overall CPU. This CPU usage reduction is predominantly in the Java code path, meaning that less zIIP CPU should be needed to run the same processing.

Internal performance improvements are made in many areas of CICS TS V5.3 to help reduce CPU overhead. These include:

- The exploitation of a number of the new hardware instructions that were introduced with the IBM z9, cache alignment of some key CICS control blocks
- The use of prefetch, reduced lock contention within monitoring algorithms
- Improvements to the MRO session management algorithms
- Further tuning of internal procedures
- Over thirty existing SPI commands have been made threadsafe

Improvements in efficiency are seen in:

- The CICS trace facility
- The CICS monitoring facility
- Multi-region operation (MRO) connections with high session counts.
### Commands made threadsafe

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<td>INQUIRE RRMS</td>
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<td>INQUIRE TASK LIST</td>
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<td>INQUIRE TCLASS</td>
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<td>INQUIRE TDQUEUE</td>
<td>WRITE OPERATOR</td>
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<td>INQUIRE TCPIP</td>
<td>WRITE OPERATOR</td>
<td>SET WEB</td>
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</tbody>
</table>
Notes

Over thirty commands have been made threadsafe.
Operational Efficiency...

- **Enhanced Metrics**
  - Transaction tracking extended to the CICS-MQ for z/OS bridge
  - New metrics added to CICS global statistics
    - Transaction CPU time measurements are captured without the need for CICS monitoring to be active
Notes

CICS transaction tracking identifies relationships between tasks in an application as they flow across CICS systems, and can be visualized in CICS Explorer. Transaction tracking in CICS TS V5.3 is extended to transactions that are started by the CICS-MQ for z/OS bridge. This expands the scope of transactions that can use transaction tracking to help with problem determination, reporting, and auditing.

Additionally, a number of metrics are added into the global CICS statistics for transaction CPU time measurements and are captured without the need for CICS monitoring to be active. This allows greater insight into the CPU resource usage of CICS TS V5.3 regions, without the overhead of collecting and processing SMF 110 monitoring records.
Operational Efficiency…

- Additional security options
  - Support for the Enhanced Password Algorithm
    - Allows for stronger encryption of passwords (OA43999)
    - Support available for CICS 4.2, 5.1 and 5.2 (PI21865, PI21866)
  - Enhanced Kerberos support
    - Sign-on with a Kerberos token
      - EXEC CICS SIGNON TOKEN
  - MINTLSLEVEL SIT option
    - Specify minimum level of TLS supported by CICS
  - Offload authentication requests to an open TCB
    - Reduce contention for the RO TCB
Additional security options

CICS TS V5.3 also includes the following new and enhanced security options:

- New support for the Enhanced Password Algorithm, which was implemented in RACF APAR OA43999, to allow stronger encryption of passwords. This support has been applied to CICS TS V4.2 and CICS TS V5 in APARs PI21865 and PI21866 respectively.

- Enhanced support for Kerberos to provide an EXEC CICS SIGNON TOKEN command, avoiding the need to flow a password. This enables applications to validate a Kerberos security token (as determined by an external security manager) and associate a new user ID with the current terminal.

- A new CICS System Initialization Table (SIT) option, MINTLSLEVEL, allows installations to specify the minimum level of Transport Layer Security (TLS) supported by CICS.

Additionally, enhancements are made to further off-load authentication requests to open TCBs. This reduces contention on the resource owning (RO) TCB, which was previously used for processing all authentication requests.
Operational Efficiency…

- **Additional security options…**
  - New EXEC CICS REQUEST PASSTICKET
    - Can be used for basic authentication on outbound flows
    - Requests External Security Manager to build a Pass Ticket
Notes

Additional security options

A new EXEC CICS REQUEST PASSTICKET API that can be used for outbound requests from the current task, where basic authentication is required, thereby avoiding the need to flow passwords. The command requests an external security manager (ESM), such as RACF, to build a PassTicket.
Cloud and DevOps

- Automated builds
  - The process...
Notes

Automation for application deployment

The CICS Build Toolkit, the JCL utility called DFHDPLOY, and the ability to use UrbanCode Deploy with CICS components all make it easier to automate builds and to deploy them to the right environments.
Cloud and DevOps…

- **Automated builds with scripted deployment**
  - CICS Build Toolkit
    - Provides a command-line interface for automating the building of CICS projects
    - Allows for variable substitution in bundles
    - CICS cloud applications, bundles, and OSGi Java components can be built from source code
    - Supported on z/OS, Linux and Microsoft Windows

```
echo "Building com.ibm.cics.server.examples.bundle and referenced Java projects"
cicsbt build --source $SANDBOX/* 
  --bundle com.ibm.cics.server.examples.bundle 
  --output $OUTPUT 
  --target com.ibm.cics.explorer.sdk.runtime52.target

if [[ $? -gt 6 ]]; then
  exit $?
fi
```
Notes

The CICS Build Toolkit provides a command-line interface for automating the building of CICS projects created using CICS Explorer®. This includes CICS bundles, CICS applications, CICS application bindings, and projects that are referenced by CICS bundles, such as OSGi applications, OSGi bundles, enterprise applications and dynamic web projects.

You can automate the build of CICS applications by calling the CICS Build Toolkit from your build scripts. In a continuous integration environment, a build script can automatically run when developers make updates to their applications. This build script can check out the latest application version from source control along with its dependencies. The script then calls the CICS Build Toolkit to build the projects that form the application. Finally, the script copies the built projects to a suitable location, such as an artifact repository or a staging area on zFS.

You can automate the resolving of variables in CICS bundles by calling the CICS Build Toolkit from your deployment scripts. A script will typically use the built projects together with a properties file that defines values for variables in the target environment.

The CICS Build Toolkit is supported on z/OS, Linux, and Microsoft Windows operating systems.
Cloud and DevOps…

- **Automated builds with scripted deployment…**
  - **DFHDPLOY**
    - New batch utility to support automated provisioning of:
      - CICS bundles
      - OSGi bundles within CICS bundles
      - CICS applications
    - Commands can be used to deploy CICS bundles and CICS applications
      - Set the desired state
        > e.g. ‘enabled’ or ‘available’
      - Undeploy and remove bundles and applications
Notes

DFHDPOLOY is a batch utility to support the automated provisioning of CICS bundles, OSGi bundles within CICS bundles, and CICS applications. Commands in the DFHDPOLOY utility allow you to connect to a CICSpix and deploy CICS resources, to set their state after deployment, and to remove them when they are no longer required. These commands are:

- SET APPLICATION
- SET CICSPLEX
- DEPLOY APPLICATION
- UNDEPLOY APPLICATION
- DEPLOY BUNDLE
- UNDEPLOY BUNDLE

Example of using DFHDPOLOY:

- SET CICSPLEX command connects to the CICSpix.
- UNDEPLOY BUNDLE disables, discards and removes the existing BUNDLE from the CSD.
- DEPLOY BUNDLE defines the BUNDLE resource for version 2.0.0 in the CSD in group BANKING, then installs and enables it.
- Submit job. Could be scheduled by automation or build system.
Cloud and DevOps...

- Automated builds with scripted deployment...
  - Provided Sample JCL and commands for DFHDPLOY

**Undeploying a bundle to a DISCARDED state**

The following example script connects to MYPLEX and undeploys bundle MYBUND to a DISCARDED state:

```
//DFHDPLOY JOB CLASS=A,MSGCLASS=A,NOTIFY=SYSUID
/**
 //DFHDPLOY EXEC PGM=DFHDPLOY,REGION=100M
 /**
 //STEPLIB DD DISP=SHR,DSN=CICSTS53.CPSM530.SEYULOAD
 // DD DISP=SHR,DSN=CICSTS53.CPSM530.SEYUAUTH
 //SYSIN DD *

 * SET CICSPLEX(MYPLEX);
 *
 UNDEPLOY BUNDLE(MYBUND) SCOPE(MYSCOPE)
 TIMEOUT(40) STATE(DISCARDED);
 /**
```

The following is the DFHDPLOY output for this script when it runs successfully:

```
DFHRL2093I Bundle MYBUND found in scope MYSCOPE.
DFHRL2065I The state of bundle MYBUND is DISABLED and availability is UNAVAILABLE.
DFHRL2054I Setting bundle state to DISABLED.
DFHRL2042I Discarding MYBUND.
```
Notes

An example of using DFHDPLOY.
Cloud and DevOps…

- **Automated builds with scripted deployment…**
  - IBM UrbanCode Deploy orchestrates and automates deployment of applications, middleware configurations, and database changes.
  - CICS TS plug-in supports the deployment of CICS applications as part of these orchestrations.
  - CICS TS plug-in provides functions for:
    - Installing and removing resources
    - NEWCOPY and PHASEIN for programs
    - Performing a pipeline scan

![IBM UrbanCode Deploy Diagram](image)
IBM UrbanCode Deploy orchestrates and automates the deployment of applications, middleware configurations, and database changes. CICS provides a plug-in for IBM UrbanCode Deploy. This plug-in allows IBM UrbanCode to install and discard resources, change the state - for example: enable or open - of resources, and perform actions such as new copy and phase-in of programs, and pipeline scans.
Cloud and DevOps...

- **New resource threshold policies**
  - All CICS commands
  - IMS requests
  - MQ requests
  - Name Counter Server requests
  - Shared Temporary Storage requests

- **Support for TRANSACTION entry points**
  - Allows a policy to be associated with a transaction

- **Recovery of the Application Status after a restart**
  - The available or unavailable state is restored

- **New private resource, PACKAGESET, for DB2 collections**
  - Enables you to specify different DB2 collections across different environments by specifying in an application binding
  - CICS will issue the EXEC SQL SET CURRENT PACKAGESET command on behalf of the application
Notes

Policies allow you to control the behavior of running applications and platforms. You define threshold conditions and the actions to be taken when the conditions are met. This release extends the range of threshold policies.

**EXEC CICS Requests**

You can define threshold policies for the number of EXEC CICS (API and SPI) requests performed by a user task.

**IBM MQ and IMS DLI requests**

You can define a threshold policy for the number of IBM MQ requests or IMS DLI requests issued by a CICS task. The database request rule type is extended with a DLI command rule item to define a threshold for the number of EXEC DLI or CALLDLI requests. A new rule type, WebSphere MQ request, defines a threshold for the number of MQI requests that are processed by the CICS-WebSphere MQ adapter for a CICS task.

**Shared temporary storage (TS) queues**

You can define threshold policies for the amount of user data written to a shared TS queue, or the number of requests that are issued to a shared TS queue by a CICS task. In previous releases, policy thresholds could be set only on auxiliary and main TS queues.

**Named counter requests**

You can define threshold policies for the number of EXEC CICS, EXEC CICS GET COUNTER and GET DCOUNTER requests performed by a user task.

An application entry point identifies a resource that is an access point to an application. Application entry points are used to control users' access to different versions of an application that is deployed on a platform. They are also used to create an application context to monitor the resource usage for applications and to identify an application being run. TRANSACTION resources can now be used as application entry points, in addition to the PROGRAM and URIMAP resources from previous releases. By defining a TRANSACTION as an application entry point you can now scope policies to a particular transaction ID, whether deployed with CICS cloud applications or in standalone CICS bundles.

The availability status of an CICS cloud application is restored if you start or restart a CICS region in the platform after the time when you make the application available. In previous releases, an enabled status was restored, but you had to take additional action to make the application available for use.

The new private resource PACKAGESET makes the handling of DB2® data in a cloud environment easier and more flexible by enabling you to specify different DB2 collections across different environments. Using PACKAGESET, CICS can now issue the EXEC SQL SET CURRENT PACKAGESET command on behalf of the application. The PACKAGESET resource is optional, and existing mechanisms to manage different collections across different environments remain available, for example, multiple plans, dynamic plan exits, or setting the packageset yourself in the application.
Foundation

- **Channels and containers**
  - DELETE CHANNEL command added
  - Query the number of CONTAINERs in a CHANNEL

- **Java**
  - Allow use of an existing document in a Java program

- **ASSIGN command**
  - Return terminal input length
  - Return Abend offset on ASRA, ASRB and ASRD abends

- **Initialization**
  - Police hardware levels (z9 or higher) and software levels (z/OS 1.13 or higher)
  - Detect CICS module or table level mismatch
  - STGPROT SIT option default now set to YES
  - DFHRPL & Dynamic libraries can now reside in an EAS Space of an EAV volume
  - Identify CICS System Definition file maintenance level
Notes

This chart lists a number of Foundation enhancements.
Foundation…

- **Storm drain avoidance**
  - VSAM RLS
  - IMS DBCTL
  - WebSphere MQ

- **Performance data**
  - Number of GET COUNTER or GET D.COUNTER for a Name Counter Server
  - Number of GET and PUT queues to a Shared TS Server

- **Statistics**
  - Peak queue depth for Transient Data queues
  - New transaction entry point statistics

- **Dump**
  - Provide a summary of all tasks or a single task in a dump

- **Trace**
  - Provide a summary of tasks in the trace table
Notes

This chart lists a number of Foundation enhancements. Note the check for z/OS 1.13 also includes a check for OA38409 to insure CICS can measure specialty engine time.
z/OS Explorer V3 Aqua

- Eclipse based integration platform for z/OS users
- Secure and simple access to:
  - z/OS datasets
  - zFS files
  - JES jobs and output
- New Remote Systems Explorer
  - View remote files
  - Transfer files between systems
  - Remote Search
  - Run commands
- Default connections
  - Automatic connect at start-up
The IBM® Explorer for z/OS® (z/OS Explorer) provides a framework to manage your system connections, your
z/OS artifacts, and projects and resources.

z/OS Explorer is an Eclipse-based integration platform for z/OS users. It enables the integration of a wide variety
of solutions using IBM, vendors, or customer plug-ins. z/OS Explorer is extendable by using the IBM repository
of compatible products to fulfill each user's roles and responsibilities. For example, z/OS Explorer, powered by
IBM product plug-ins from the repository can provide a single workbench with the ability to develop, and test
CICS, DB2, WebSphere MQ, IMS, and batch applications and manage related subsystems.
CICS Explorer

- Support for the OS X Yosemite (10.10) operating system

- Support for new definitions
  - Transaction entry point
  - DB2 package set
  - New resource threshold policies

- Bundle changes
  - OSGI wizard name change to OSGI Bundle Reference
  - OSGI wizard may now specify a version range for the bundle
  - Support for OSGI Bundle Phase-in
CICS Explorer V5.3 is updated to support the new and enhanced capabilities delivered by CICS TS V5.3 including transaction entrypoint and PACKAGESET support for cloud applications, bundle phase in for OSGI Java programs and support for new threshold policies. Base Explorer enhancements include support for Apple OS X Yosemite, enhanced connection support providing default connections, automatic connection at startup and export functionality. CICS Explorer V5.3 also makes it easier to see your CICS data the way you want, with enhanced customization options for table views, which you can save for use in the future.

The name of the OSGi Bundle Project Reference wizard (named the Include OSGi bundle in Project wizard in earlier releases) is changed to the OSGi Bundle Reference wizard. The menu option to select this wizard is changed to OSGi Bundle Reference.

When you use the OSGi Bundle Reference wizard to select an OSGi project to include in a CICS bundle project, you can now specify a version range for the OSGi bundle. When you use the Export Bundle Project to z/OS UNIX File System option to deploy a CICS Bundle project that contains one or more OSGi bundles, the highest available version of the OSGi bundle in the specified version range is deployed.
CICS Explorer…

- Support for customizing views
  - Add, delete fields
  - Filter results by expression on fields
    - ==, >, <, >=, <=, !
  - Change sort order
  - Share customize views
A new Customize columns icon is provided in the toolbar of the resource type views. You can use this icon to select which attributes to display as columns in the view. This icon provides the same function as the Customize columns option in the View menu in the toolbar of the resource type views. When you use the Customize Columns dialog to select which attributes to display as columns in a resource view, you can now filter the attribute names to find the required attributes.
## Application insight

### What’s new in CICS IA V5.3?
- Support for CICS® Transaction Server V5.3
- Identify Application “entry points” and “dependencies” for cloud enablement of existing applications
- Easier administration of collector function by implementing scenario based collections
- Easier configuration and customisation of the CICS IA product
- Usability improvements in the CICS Explorer plug-in perspective

### CICS IA enables you to…
- Visualize application flow and structure
- Identify mobile and web service candidates
- Identify threadsafe / non-threadsafe programs
- Isolate and remove affinities
- Speed CICSPlex® SM workload management
- Advanced CICS command flow analysis
CICS IA V5.3 adds the ability to identify a set of resources that encapsulate an application. This information can be used to build a CICS bundle that can be included in a CICS application bundle for deployment into a CICS platform.

CICS IA 5.3 also includes scenario-based collections from the plug-in, usability improvements in the plug-in perspective, and a default configuration function.
The power of discovery

**What's new in CICS DA V5.3?**

- Support for IBM CICS Transaction Server V5.3
- RESTful API to enable discovery and cloning of CICS regions
- New API sample programs demonstrate how the RESTful API can be invoked from REXX or JavaScript
- New capability to de-provision CICS regions discovered/created by CICS DA
- New configuration tool for easier configuration of CICS DA server

**CICS DA enables you to...**

- Visualize and manage your CICS topology
- Discover existing regions and sus-systems
- Automation creates new CICSplex
- Plexify and clone CICS regions
- Start and stop a CICS region
- Share model with other applications
When cloning a CICS region, clients can specify that the new CICS region uses a different CSD to the source region. CICS regions can now be cloned through the RESTful API. CICS DA now provides the ability to remove CICS regions that are discovered or created by CICS DA. This feature also provides the option to remove all of the data sets, data set members and the CICSPlex SM region definition associated with the region being removed.

Users can specify JCL PROCs to be executed at the start and end of the clone process to augment the clone process and integrate the clone into existing processes. These JCL PROCs are passed the attributes that are used by DA as part of the clone. This includes user-entered values and values that are created by CICS DA. Users can define name transforms to be used when creating new data sets as part of the clone process. New API sample programs demonstrate how the RESTful API can be invoked from REXX or JavaScript. These new samples are customizable and include the ability to invoke discovery, clone a CICS region, and export the CICS DA data model to be used by other programs.

A new configuration tool enables easier configuration of the CICS DA server. Discovery can now be run under the user ID of the client requesting it. This reduces the authority required by the CICS DA server's user ID. Discovery has been enhanced to identify the command that is required to start CICS regions which are run as Started Tasks. The generated command will be used for operations that require one, removing the need for the user to specify the command used to start these regions. Discovery can now be initiated through the RESTful API.
# CICS Performance Analyzer for z/OS V5.3

## Performance Insight

### What's new in CICS PA V5.3?

- IBM CICS Transaction Server V5.3 support
- Forms-based summary reporting for CICS TS and CICS TG statistics
- New forms for mobile workload reporting and for use with mobile workload pricing tool
- DB2 table upgrade function
- New categorization and search for forms
- New pre-defined report sets based on scenarios
- List Extended report sort field limit has been removed to allow greater degree of sort granularity

### CICS PA enables you to…

- Comprehensive Performance Reporting and Analysis for CICS including DB2, WebSphere MQ, and MVS System Logger
- Understand trends and develop capacity plans
- View statistics and create statistical alerts
CICS Performance Analyzer for z/OS (CICS PA) enables historical performance reporting and analysis of CICS systems and applications, identification of performance problems from large volumes of SMF data, trend analysis, and capacity planning. In CICS PA V5.3, these capabilities are enhanced using pre-defined report sets based on performance problem or project scenarios, such as threadsafe or consolidation. CICS PA V5.3 introduces batch reporting for complex statistics data, which can then be integrated with automated reporting. New report forms enable reporting for the purpose of specifying CICS platform policies for IBM MQ for z/OS, IBM DL/1, named counter, and shared temporary storage requests. Report Forms can now be categorized and searched, based on performance and project scenarios. This makes it easier to find the most appropriate report to run for specific reporting and analysis scenarios. In addition, CICS PA V5.3 enables reporting of performance for mobile workloads and can also be used to generate comma separated value (CSV) files for use with mobile workload pricing.
# CICS Configuration Manager for z/OS V5.3

## The value of control

### What’s new in CICS CM V5.3?

- New detailed comparison of CSDs
- New tracking of CICS CM change package creator ID
- Implementation of hierarchical transformation rules using new Transformation Rule Groups
- XSLT batch sample suite allows output XML to be processed by a Style Sheet for customized automation
- New exit point at package define time
- Disable and discard options for installation of CICSPlex SM BAS definitions
- Check analysis will now highlight undefined group
- Beta version of a plug-in for IBM UrbanCode Deploy (UCD)
- ISPF and batch non-APF methods for SAF PassTickets

### CICS CM enables you to…

- Manage changes throughout the life-cycle
- Create reports to identify redundant definitions, show resource relationships, and change management history
- Manage audit, back-out and change authorizations
CICS CM V5.3 provides Extensible Stylesheet Language Transformations (XSLT) sample batch suite, which allows the output XML to be processed by a style sheet and used as input for customized automation processing.

CSD Compare is a DevOps feature that allows operations to confirm that CSD changes provided by the developers conform and are complete before and after upgrade. A new CICS CM plug-in to UrbanCode deploy enables upgrading CSD and CICSPlex SM Business Application Services (BAS) definitions across development, test, Quality Assurance (QA), and production environments. These CICS CM steps can be part of the process that includes deployment of CICS applications by using the CICS TS UrbanCode plug-in. The overall UrbanCode process flow can be automated and can also include UrbanCode plug-ins for source code management products, such as IBM Rational Team Concert™. If the application artifacts include zFS files, then the appropriate UrbanCode plug-in for this can be used and the steps included in the process flow.

Multiple deployment steps can be coordinated in a single action with UrbanCode Deploy. Similar applications and environments, such as development systems or more tightly controlled test and production environments, can reuse these deployment processes.
CICS Documentation

- **Major changes to the upgrading documentation**
  - New sections
    - Planning to upgrade
    - Changes between the releases
    - Upgrading to the new release
      - Upgrading CICSPlex SM
      - Upgrading regions
      - Upgrading CICS Explorer
      - Upgrading Applications
      - And more...
    - Upgrading CICS with a running workload
  - Upgrading information presented in a new format

  **Upgrade actions**

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<td>APP: authorize the CICS activation modules</td>
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<tr>
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<td>Redefine and initialize the local and global catalogs</td>
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<tr>
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<td>Upgrade user-modified, CICS-supplied resource definitions</td>
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- **Parallel Sysplex Application Migration Guide moved to CICS documentation**
Notes

Changes to documentation

Self-service PDFs

From IBM Knowledge Center, you can build your own collections of information. You can create a PDF of the collection, and download it for use offline. When IBM updates the information, any changes are reflected automatically in your collections.

This release provides collections of topics that match the manuals. These collections contain the same information as you find online in IBM Knowledge Center, but they have a structure that originated in previous versions of CICS. You can create PDFs from CICS manuals.

Program Directories in IBM Knowledge Center

CICS Program Directories are now provided online in IBM Knowledge Center. This is intended to make it easier for you to search them and use them alongside the other CICS information.

New look for Upgrading

Information about upgrading from earlier releases is now in one document. The document shows changes between versions, and the actions that you need to perform to get what you have today working on the new release.

Parallel Sysplex® Application Migration information moved into CICS documentation from z/OS

The z/OS Parallel Sysplex Application Migration manual (SA22-7662) contained information that was relevant to CICS. This information, from Part 1: Introduction and Part 2: Migrating CICS Applications, is included in the CICS documentation.
CICS Documentation...

- **New Red Books**
  - CICS and DevOps: What you need to know (SG24-8339)
  - CICS and Liberty: What you need to know (SG24-8335)
  - CICS Interdependency Analyzer (SG24-6458)

- **New Red Papers**
  - CICS Performance Series
    - Web Services Performance in CICS TS 5.3 (Redp-5322)
    - CICS TS 5.3 Benchmark on a z13 (Redp-5320)
    - CICS TS for z/OS V5 Performance Report (SG24-8298)
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made with

CICS

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Service Agility

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Do it continuously
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