



CICS TS for z/OS V3.2 Technical Overview

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CICS Transaction Server



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Notes

- CICS® Transaction Server for z/OS® V3.2 delivers significant innovation for integration, application transformation, systems management, and architectural enhancements.
- CICS is a modern transactional application server designed to execute demanding mixed-language application workloads and to enable those applications easily to be integrated with enterprise solutions. CICS TS V3.2 provides open standards-based connectivity, enabling CICS applications to be integrated within a Service Oriented Architecture (SOA), while preserving the long-established CICS qualities of security, reliability, data integrity and optimal application responsiveness.
- The major new functions in CICS TS V3.2 are described in this presentation. For more details, please refer to IBM Software Announcement 207-051 and the CICS TS V3.2 library, specifically the Release Guide available from <http://www.ibm.com/cics> then follow the links to CICS TS V3.2, then Library.
- CICS TS V3.2 is recommended for all CICS customers migrating from older releases.
- CICS TS V3.2 requires z/OS V1.7, or later.
- The primary consideration when migrating from CICS TS V1.3 or TS V2.2 is the language and compiler level used by the applications. CICS TS V3.2 does NOT support the execution of OS/VS COBOL programs. CICS TS V2.3 continues to support the execution of OS/VS COBOL.
- An open beta programme for CICS TS V3.2 is being run from 27 March to 31 July 2007.
- The general availability for CICS TS V3.2 is June 29, 2007.



Acknowledgements

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Agenda

- **CICS Transaction Server V3**
 - Strategy and themes

- **CICS TS V3.2**
 - Application connectivity
 - Application reuse
 - Service management
 - Architectural enhancements

- **Summary**

CICS Transaction Server V3 values

- **Application connectivity**

Enables extending existing applications beyond their original designs to support integrated business processes via standard APIs and protocols

- **Application reuse**

Enables the creation of components from existing applications which are more flexible & configurable for use in new applications.

- **Service management**

Enables effective management of large runtime configurations via modern user interfaces, so that demanding service level and IT governance objectives can be met

- **Architectural enhancements**

Relieves constraints on processing, configuration or data capacities to allow for continued application and system growth

Notes

CICS Transaction Server for z/OS is a modern transactional application server designed to execute demanding mixed-language application workloads, and to enable those applications easily to be integrated with enterprise solutions. CICS Transaction Server for z/OS® (CICS TS) V3.2 provides open standards-based connectivity, enabling CICS applications to be integrated within a service-oriented architecture (SOA), while preserving the long-established CICS qualities of security, reliability, data integrity, and optimal application responsiveness.

CICS TS Version 3 has introduced features and enhancements within the set of values outlined on the chart.

CICS TS V2 highlights

	Application connectivity	Application reuse	Service management
CICS TS V2.2 January 2002 End of service April 2008	SDK for z/OS 1.3.1 -Resetable mode Link 3270 Bridge ECI over TCP/IP	EJB support -Session Beans -EJB deployment tooling -JNDI (COS or LDAP) JDBC 2.0 XML for COBOL and PLI	CICS DB2 enhancements -OTE exploitation -Group Attach -RMI purge Sign-on retention CF rebuild and duplexing
CICS TS V2.3 December 2003	SDK for z/OS 1.4.1 -Continuous mode -Shared Class Cache -Storage Protection -zSeries Application Assist Processor IOP Authentication & Encryption SOAP for CICS	EJB Support -Performance enhancements -JNDI caching -Improved monitoring CCI Connector for CICS TS JCICS APIs -WEB -Document -Extract Debugging Enhancements	CPSM Enhancements -Definitional Web User Interface -Workload Management for LINK3270 bridge -Architectural improvements Additional Thread Safe commands -ASKTIME -FORMATTIME -DOCUMENT MRO timeout TN3270 address display Statistics enhancements

CICS TS V3 highlights

	Application connectivity	Application reuse	Service management
CICS TS V3.1 March 2005	Web services and the CICS Web services assistant HTTP/1.1 including outbound API and URIMAPs Transport Layer Security, 256-bit encryption, and improved SSL V3	Containers and channels Language support enhancements Architectural patterns Information Center	Open Transaction Environment for all thread safe applications XPLink for C & C++ programs Thread safe WEB commands CPSM Web User Interface including user favourites, group profiles, and 2 column views Batchrep callable via the Web User Interface
CICS TS V3.2 June 2007	Maturing Web Services and SOAP standards Wider support of other payload format (XOP & MTOM) Conforming with WSDL 2.0 Optimization of the HTTP Transport to give better performance, robustness and manageability Delivering a consistent approach between CICS systems for an IP environment.	Exploitation of 64-bit storage for channels and containers More extensive Web Services support for COBOL data types Java Enhancements Service Flow Feature	Enterprise wide workload management – ARM correlator CPSM Integrated install and definition & CPSM WUI enhancements JDK 1.4.2 JVM management and PD improvements Continued enhancements to OTE enabling some File Control configurations and the MQ Bridge Adapter Remove capacity restraints relating to Data

CICS Transaction Server V3.2

- **Application connectivity**
 - Web services standards, interoperability profiles, large messages, and data mapping
 - Intercommunications over TCP/IP
 - HTTP and TCP/IP management and performance
- **Application reuse**
 - 64-bit storage for CONTAINER data
 - CICS integrated translator support for C and C++
 - Java enhancements
- **Service management**
 - On-line management of program libraries
 - Enterprise Workload Manager
 - CICSplex SM Web User Interface help, usability, and MAP support
 - CICS-WMQ adapter installation and management
- **Architectural enhancements**
 - Capacity of VSAM ESDS files >4GB, shared data tables >2GB, CICS regions in a Sysplex
 - Trace, monitoring and statistics
 - Threadsafe core APIs for accessing VSAM files, journals, WebSphere MQ

Notes

The major new features in CICS TS V3.2 are summarised below;

CICS application connectivity

- New Web services capabilities include support for recent standards, interoperability profiles, and the ability to send large amounts of binary data efficiently. The ability to interconnect CICS regions over TCP/IP for Distributed Program Link (DPL) allows exploitation of System z™ IP networking, and provides an alternative to Systems Network Architecture (SNA). All CICS TCP/IP workloads benefit from simple and robust systems and workload management facilities.

CICS application reuse

- Enhancements to the efficiency of deploying Web services into CICS include handling a wider range of programming language and XML data types and attributes, and improvements to performance and diagnostics. Applications will now automatically utilize 64-bit storage for data held in containers, providing for improved scalability and performance. The CICS integrated translator is now supported by the z/OS XL C/C++ compiler, delivering more comprehensive development and debug capabilities.

CICS service management

- Online management of program libraries makes it easier to maintain continuous system availability while bringing new or changed applications into production. Support for Enterprise Workload Manager (EWLM) makes possible end-to-end workload monitoring in heterogeneous environments. Potential for performance enhancements is offered by making threadsafe the core APIs for accessing local and RLS VSAM files, journals, WebSphere® MQ, and system autoinstalled Global User Exits. There is improved management of Java™ workloads. The CICSplex® SM Web User Interface has new help and map capabilities and usability enhancements.

CICS architectural enhancements

- Larger amounts of data can now be stored in shared data tables (>2 GB) and VSAM entry sequenced data set (ESDS) files (>4 GB). Improvements to monitoring and statistics facilities include more precise timing data and compression of monitoring records. The default internal trace table size has been increased for better problem diagnosis. The limit on the number of CICS regions supported in a sysplex is increased by enabling a CICS region to join a named XCF group.

CICS TS V3.2 Support of External Standards

■ XML

- Extensible Markup Language Version 1.0
- XML Encryption Syntax and Processing
- XML-Signature Syntax and Processing
- XML-binary Optimized Packaging (XOP)

■ Profiles

- WS-I Simple SOAP Binding Profile Version 1.0
- WS-I Basic Profile Version 1.1

CICS TS V3.2 Support of External Standards...

- **SOAP**
 - SOAP 1.1 and 1.2
 - SOAP 1.1 Binding for MTOM 1.0
 - SOAP Message Transmission Optimization Mechanism (MTOM)
 - Web Services Security: SOAP Message Security
- **Web Services Atomic Transaction Version 1.0**
- **Web Services Coordination Version 1.0**
- **Web Services Trust**
- **Web Services Description Language Version 1.1**
- **Web Services Description Language Version 2.0**

CICS Web Services Assistant

- **New options**
 - MAPPING-LEVEL={1.0, 1.1, 1.2, 2.0}
 - Level of mapping that the CWSA should use when generating the Web service binding file and Web service description or language structure
 - MINIMUM-RUNTIME-LEVEL={MINIMUM, 1.0, 1.1, 1.2, 2.0, CURRENT}
 - Minimum CICS runtime environment that the Web service binding file can be deployed into
 - CCSID
 - Specifies the CCSID to be used at runtime
 - TRANSACTION
 - In a service provider, specifies the name of an alias TRANID
 - USERID
 - In a service provider, specifies a user ID which can be used by any client

CICS Web Services Assistant...

- **Mapping Level (retrofitted to CICS TS V3.1 via the service channel)**
 - 1.0
 - CICS TS V3.1 base level
 - 1.1
 - Variable length binary data mapped to container
 - XML schema list and union types mapped to character arrays
 - Other character and binary data mappings to containers depending on data length
 - 1.2
 - Character and binary data of more than 32,767 bytes mapped to a container
 - CHAR-VARYING
 - CHAR-VARYING-LIMIT
 - CHAR-MULTIPLIER
 - DEFAULT-CHAR-MAXLENGTH
 - Support for:
 - Multiple variable length mappings
 - COMP-1 (float)
 - COMP-2 (double)
 - LEVEL 88 toleration
 - Improved messages in the event of conversion errors
 - 2.0
 - Currently the same as level 1.2

Support for Binary Attachments

- **In standard SOAP messages:**
 - Binary objects are base64 encoded
 - Included in the message body
 - Can significantly increase message size, impacting transmission time and latency
- **MTOM/XOP provides a solution to this problem**
 - The MTOM specification
 - Defines a method for optimizing SOAP messages
 - Separates out binary data
 - Sends it in separate binary attachments using a MIME Multipart/Related message
 - The XOP specification
 - Defines an implementation for optimizing XML messages
 - Uses binary attachments in a packaging format
 - > Includes but is not limited to MIME messages

Notes

In standard SOAP messages, binary objects are base64 encoded and included in the message body. This significantly increases their size, and for very large binary objects, this can impact transmission time. Implementing MTOM/XOP provides a solution to this problem.

The SOAP Message Transmission Optimization Mechanism (MTOM) and XML-binary Optimized Packaging (XOP) specifications, often referred to as MTOM/XOP, define a method for optimizing the transmission of large base64binary data objects within SOAP messages.

- The MTOM specification conceptually defines a method for optimizing SOAP messages by separating out binary data, that would otherwise be base64 encoded, and sending it in separate binary attachments using a MIME Multipart/Related message. This type of MIME message is called an *MTOM message*. Sending the data in binary format significantly reduces its size, thus optimizing the transmission of the SOAP message.

- The XOP specification defines an implementation for optimizing XML messages using binary attachments in a packaging format that includes but is not limited to MIME messages.

The size of the base64binary data is significantly reduced because the attachments are encoded in binary format. The XML in the SOAP message is then converted to XOP format by replacing the base64binary data with a special <xop:Include> element that references the relevant MIME attachment using a URI.

Support for Binary Attachments...

- **CICS implements MTOM/XOP support**
 - in both the requester and provider pipelines
 - New MTOM/XOP configuration options in the pipeline
- **New modes of operation in the pipeline**
 - Direct mode
 - Binary attachments associated with an MTOM message
 - Passed in containers through the pipeline and handled directly by the application handler
 - Inbound messages
 - > Application handler passes the binary attachments to the application program without needing to perform any data conversion
 - Outbound messages
 - > XOP enabled applications can pass binary attachments from the application program to the pipeline without any data conversion
 - Compatibility mode
 - XOP document contained in inbound MTOM messages
 - Converted into a SOAP message
 - Associated binary attachments are converted into base64binary data..
 - Outbound SOAP messages converted into MTOM message after all other processing taken place
 - Each binary object has to be converted from a base64 encoding in the pipeline
- **WS-Security and WSDL Validation run with compatibility mode for MTOM/XOP**

Notes

CICS implements support for these specifications in both requester and provider pipelines. As an alternative to including the base64binary data directly in the SOAP message, CICS applications that are deployed as Web service providers or requesters can use this support to send and receive MTOM messages with binary attachments.

You can configure this support by using additional options in the pipeline configuration file.

There are certain scenarios where CICS cannot support the XOP document format in MTOM messages directly. For example, the Web Services security functionality and Web services validation cannot parse the <xop:Include> elements in the XOP document. Therefore, two modes of support are provided in the pipeline to handle XOP documents and any associated binary attachments.

If the application handler program is capable of supporting XOP documents, such as the standard handlers that are provided when you deploy a Web service using the Web services assistant, then CICS performs XOP processing in direct mode. If you are using a different application handler in the pipeline that is not capable of handling XOP documents, all XOP processing is performed in compatibility mode.

If you are using the Web Services Security functionality or are testing with validation switched on, all XOP processing is performed in compatibility mode even if you have specified direct mode in the pipeline configuration file.

Support for WSDL 2.0

- **WSDL 2.0 is a “Candidate Recommendation” with the W3C**
- **Mandatory requirements**
 - Only the message exchange patterns in-only, in-out, robust in-only, and in-optional-out may be used in the WSDL
 - Only one Endpoint is allowed for each Service
 - There must be at least one Operation
 - Endpoints may only be specified with a URI
 - There must be a SOAP binding
 - The XML schema type must be used

Support for WSDL 2.0...

▪ CICS Web Service Assistants

- DFHLS2WS new options
 - WSDL_1.1(<HFS filename location>)
 - WSDL_2.0(<HFS filename location>)
 - SOAPVER(1.1|1.2|ALL)
 - URI parameter may now specify an relative or absolute URI
- DFHWS2LS new options
 - Automatically determines the WSDL version
 - OPERATION=value
 - Specifies the subset of valid operations that are required for a requestor
 - Used to limit the size of the WSBIND file
 - WSDL-SERVICE=value
 - Specifies the wsdl:Service element to be used when there is more than one Service element for a Binding element

Support for WSDL 2.0...

▪ Message exchange patterns supported

- In-Only
 - CICS as the provider
 - CICS will receive a message and send no response
 - CICS as the requester
 - CICS application will send a message and expect no response
- In-out
 - CICS as the provider
 - CICS will receive a message and respond with a normal response or fault
 - CICS as the requester
 - CICS application will send a message and expect a normal response or fault

Notes

In-only with CICS as provider: This pattern is where CICS receives a message and must not return anything to the requester even if something goes wrong. This pattern is supported already and will continue to be supported in the same way. CICS Web Service support puts the DFHNORESPONSE container into the SOAP handler channel to indicate that the pipeline must not send anything to the requester.

In-only with CICS as requester: This pattern is where CICS as a requester of service will send a message to a service provider and receive no response. This situation is supported already. The task sending the message knows that no response is to be expected, so it will not wait for one.

In-out with CICS as provider: In this pattern, CICS will receive a message from a requester and will respond with either a normal response or with a fault message. This is a normal flow of messages for a web service and very much in the standard CICS application pattern. It is already supported and will continue to be so.

In-Out with CICS as requester: In this pattern, CICS will send a message to a service provider and will receive a response, which may either be a normal response or a fault message. Again, this is a natural set of messages for a CICS application. The pattern is already supported and will continue to be so.

Support for WSDL 2.0...

▪ Message exchange patterns supported...

- Robust in-only
 - CICS as the provider
 - CICS will receive a message and respond only if an error occurs
 - CICS as the requester
 - CICS application will send a message and expect a response only if an error occurs
 - > New timeout specification on the PIPELINE definition
- In-optional-out
 - CICS as the provider
 - CICS will receive a message and may respond with
 - > A normal response
 - > An error response
 - > Nothing (no response)
 - CICS as the requester
 - CICS application will send a message and expect:
 - > A normal response
 - > An error response
 - > Nothing (no response)

Notes

Robust in-only with CICS as provider: CICS as the service provider will receive a message from the requester. CICS only needs to respond if an error occurs. If an error occurs in the pipeline, a SOAP fault will be sent back to the requester.

Robust in-only with CICS as requester: If CICS is the service requester in a MEP where a response of some sort may or may not be received, then a timeout needs to be specified to define how long CICS is to wait for any possible response. A new timeout parameter has been added to the PIPELINE resource. The value specified is stored in binary form in a new container called DFHWS-RESPWAIT. The value specifies the timeout value to use in seconds. This is so as to allow the value to be interrogated and perhaps changed by handlers in the PIPELINE if desired.

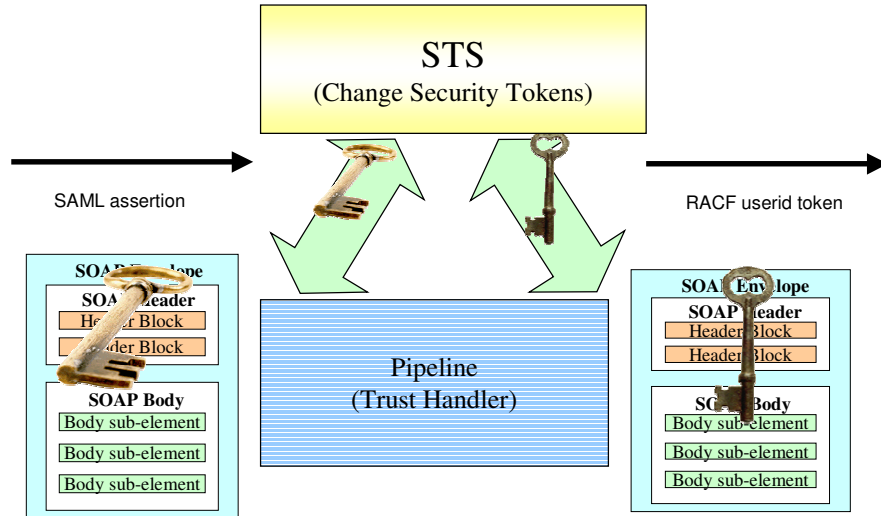
In-optional-out CICS as provider: CICS as a provider with this MEP will receive a message from the requester and then may send a normal response, may send an error response or may send nothing back to the requester. Which option will occur is not known until runtime. The application program will need to indicate to DFHPITL that it does not intend to send a response by deleting the DFHWS-DATA container from the channel.

In-optional-out CICS as requester: If CICS is the requester of service, it will send a message to the service provider. The provider may respond with a normal response, an error response or never respond at all. The situation is very similar to that for the robust in-only pattern with CICS as the requester. The question is, how long does CICS wait for the optional response from the provider? The solution will be to use the timeout value again for this situation.

CICS support of WS-Trust

- **Web Services Trust Language (or WS-Trust) specification**
- **CICS can now interoperate with a Security Token Service (STS) to validate and issue security tokens in Web services**
 - Eg. Tivoli® Federated Identity Manager
- **Supports sending and receiving Web services message that contain a wide variety of security tokens to interoperate securely with other Web services**
 - Eg. SAML assertions and Kerberos tokens
- **Configured via pipeline configuration elements within <wsse_handler>**
- **CICS can either validate or exchange the first security token or the first security token of a specific type in the message header**

CICS support of WS-Trust



TCP/IP in CICS - Background

- **SNA networking and VTAM have been at the heart of CICS for 30 years**
 - No plan to remove existing SNA support
 - No requirement to change the CICS applications to exploit IP
- **Customers are asking for TCP/IP alternatives for CICS to CICS connectivity**
 - Network convergence
 - SNA skills shortage
- **CICS Transaction Server IP Standardization**
 - Provide a new transaction IP communications protocol for connectivity between and into CICS
 - Long term plan to provide CICS with IP choice for most of the CICS programming model
 - CICS TS V3.2
 - Distributed Program Links (DPL)
 - JCA
- **CICS TCP/IP network management will be provided**
 - Systems and User correlation data tracking with CICSplex Systems Manager

Notes

CICS has been the leader in support new functions in SNA and VTAM for over 30 years. CICS was the first IBM program product to support LU6.2 and Advance Program to Program Communication (APPC).

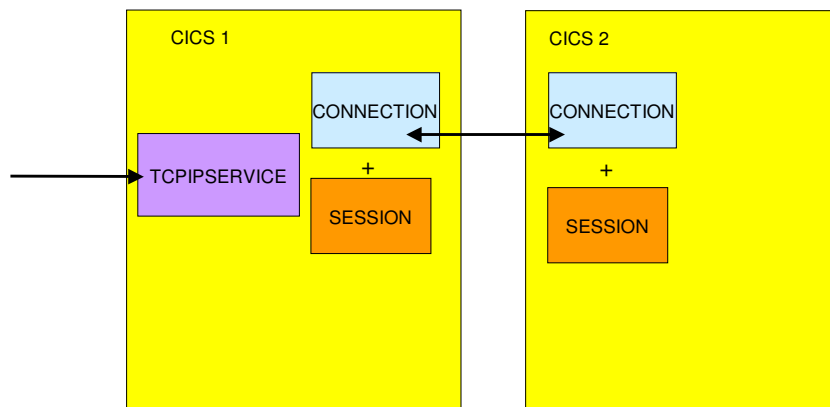
Customers are now asking for IP alternatives to VTAM to allow them to simplify their systems management tasks by converging their networks and to help them address the question of VTAM and SNA skills. New programmers are familiar with IP and not with SNA.

CICS has a multi-release plan to provide a new transactional IP protocol between CICS regions and into CICS systems. This strategy will allow CICS to realize value from advances in TCP/IP, exploit System z technology (e.g. hipersockets) and provide for a standard IP CICS infrastructure for access into CICS. In the CICS TS V3.2 release, Distributed Programs Links and JCA will be able to take advantage of the new IP connectivity options.

There is **NO** plan to remove the existing SNA and VTAM function from CICS or to require a customer to migrate to TCP/IP for CICS connectivity. There is no requirement for CICS applications to change to take advantage of the new TCP/IP function.

CICS TS V3.2 will prove the ability to track a CICS request that flows between regions using system correlation data and user associated data. User association data can be specified by using a new CICS Global User Exit. CICSplex Systems Manager provides the ability to track the request across CICS regions using the system correlation data and the user associated data, if present.

Current CICS Resource Definitions



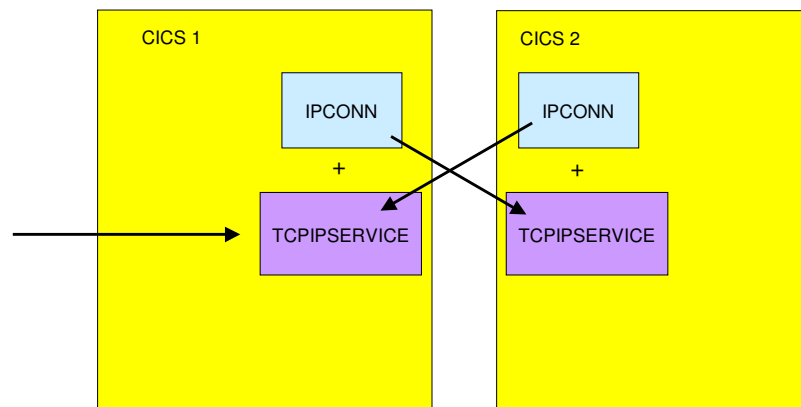
- Inbound to CICS socket support – ECI over TCP/IP (clients), IIOP, HTTP or user protocol

Notes

A CONNECTION defines a remote system with which your CICS system communicates, using intersystem communication (ISC) or multi-region operation (MRO). When you define a CONNECTION, you give enough information to identify the system and specify its basic attributes. You put details in the SESSIONS definition about the sessions you use to communicate with the system. CICS uses the CONNECTION name to identify the other system when the definition has been installed.

A TCPIPSERVICE resource defines which TCP/IP services are to use CICS internal sockets support. The internal CICS services that can be defined are ECI over TCP/IP (for CICS Clients), IIOPI, CICS Web support (HTTP) or a user-defined protocol.

CICS TS V3.2 Resource Definitions



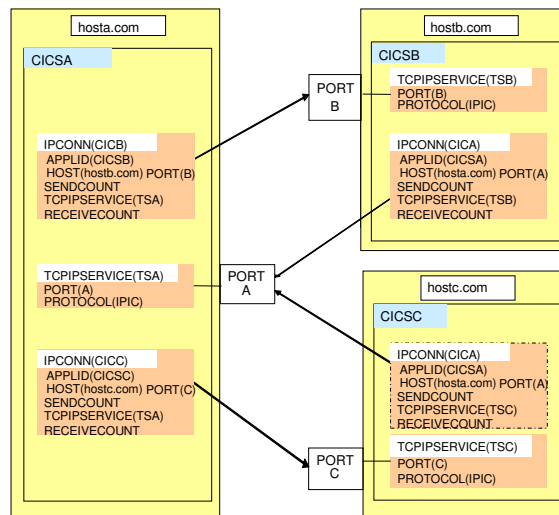
- Inbound to CICS socket support – ECI over TCP/IP (clients), IIOPI, HTTP, **IPIC** or user protocol

Notes

An IP connection is a Transport Control Protocol/Internet Protocol (TCP/IP) communication link to a remote system. An IPCONN definition specifies the **outbound** attributes of the TCP/IP connection. The **inbound** attributes of the connection are specified by the TCPIP SERVICE definition named on the TCPIP SERVICE option of the IPCONN definition.

A TCPIP SERVICE resource defines which TCP/IP services are to use CICS internal sockets support. The internal CICS services that can be defined are ECI over TCP/IP (for CICS Clients), IIOF, CICS Web support (HTTP), TCP/IP Interconnectivity (IPIC), or a user-defined protocol.

CICS TS V3.2 Resource Definitions...



Notes

This figure shows an example of the relationships between the IPCONN and the TCPIP SERVICE definitions.

A single TCPIP SERVICE can be used to receive messages from more than one connected CICS regions while an IPCONN resource can only direct messages to a single CICS region.

IP Interconnectivity Security

- **TCPIP SERVICE and IPCONN settings**
 - Bind time security
 - SSL client certificates on the TCPIP SERVICE definition
 - Link security
 - SECURITYNAME parameter on the IPCONN definition
 - User security
 - USERAUTH parameter on the IPCONN definition

Notes

The security mechanisms for IP connections are similar to those provided for APPC (LU6.2) connections (though they are implemented differently):

Bind-time security prevents an unauthorized remote system from connecting to CICS. On IP connections, bind security is enforced by the exchange of Secure Sockets Layer (SSL) client certificates.

Link security defines the complete set of CICS transactions and resources that the remote system is permitted to access across the IP connection.

User security checks that a user is authorized both to attach a CICS transaction and to access all the resources and SPI commands that the transaction is programmed to use. User security is a subset of link security: that is, a user cannot access a resource, even if it is included in the set defined as accessible by their userid, if it is not also included in the set of resources accessible by the link userid.

As noted above, IP connections support SSL controls and encryption.

SYSID Processing: IPCONN v CONNECTION

- **CICS TS V3.2 supports IP Interconnectivity for DPL**
- **If a single region supports both DPL and other forms of function shipping then:**
 - Both an IPCONN and a CONNECTION, with the same name, will have to be installed
 - DPL will search for IPCONN match before looking for CONNECTION
 - IPCONN and CONNECTION with same name must have same APPLID, and vice versa

Notes

You cannot install two or more IPCONN definitions that specify the same APPLID and the same NETWORKID. (The combination of APPLID and NETWORKID can be used to ensure unique naming of systems across the network).

You can install an IPCONN definition that specifies the same APPLID as the NETNAME of an installed MRO, APPC, or LUTYPE6.1 CONNECTION definition.

If an installed IPCONN definition has the same name (sysid) as an installed CONNECTION definition, the APPLID of the IPCONN definition must match the NETNAME of the CONNECTION definition.

The IPCONN definition takes precedence over the CONNECTION definition: that is, if an IPCONN and a CONNECTION have the same name, CICS uses the IPCONN connection. Also, the TCPIPSERVICE and CONNECTION definitions have the same name then DPL requests will fail if the IPCONN is released or out of service, even if the CONNECTION resource is fully functioning. The IPCONN must be discarded before the CONNECTION becomes available for DPL request.

The above rules are validated at install time.

IPCONN AUTOINSTALL

▪ Enabling AUTOINSTALL for IPCONN

- TCPIPSERVICE must be defined with PROTOCOL (IPIC) and URM (DFHISAIP | program_name)
- An IPCONN definition to be used as a template must be installed

▪ URM (DFHISAIP | program_name)

- Invoked at INSTALL
 - Specifies name of installed IPCONN to be used as a template
 - May override APPLID, HOST and PORT
- Invoked at DELETE
 - No action necessary
- Values returned by the user program in its communications area

Notes

The IP autoinstall user program performs a similar role, for IP connections, to that performed for APPC connections by the APPC autoinstall user program. Like the APPC autoinstall user program, the IP autoinstall user program chooses an installed connection to use as a template for the new connection, the main difference being that the template is an IPCONN rather than a CONNECTION definition. If IP autoinstall is active, CICS installs the new IPCONN connection using:

- The information in the connect flow
- The IPCONN template selected by the IP autoinstall user program
- Values returned by the user program in its communications area

For IP autoinstall to be active:

- The receiving region must have installed at least one TCPIP SERVICE that specifies PROTOCOL(IPIC).
- The name of the IP autoinstall user program must be specified on the URM option of the installed TCPIP SERVICE definition.

This differs from autoinstall of APPC connections, where the name of the autoinstall user program is specified on the AIXIT system initialization parameter. There is no equivalent system initialization parameter for IP autoinstall. Instead, the name of the autoinstall user program is specified on the TCPIP SERVICE definition.

As with APPC, putting the template IPCONNs out-of-service disables the autoinstall function.

The purpose of the autoinstall user program is to provide CICS with any extra information it needs to complete an autoinstall request. For IP connections, the user program selects the template to be used, and provides a name for the new connection. Optionally, it can modify the values of the APPLID, HOST, and PORT attributes of the new connection from those supplied by the IPCONN template. All other attributes of the new IP connection are taken from the selected IPCONN template and cannot be modified by the user program.

If the selected template is usable, CICS makes a copy of the definition within it and attempts to install the new IPCONN definition. If the installation is not successful, a message is issued.

The default autoinstall user program, DFHISAIP, is an assembler-language program that uses a CICS-supplied IPCONN definition named

WEB Performance improvements

- **CICS TS V3.1 processing**
 - An OPTIONS request is made when a WEB OPEN command is issued
 - Determine the HTTP version of the partner
- **CICS TS V3.2 processing**
 - Server version can be determined when the first response is received from the server
 - An OPTIONS request is made when WEB OPEN command is issued, if HTTPVNUM and HTTPRNUM are specified (provides Version/Release level of HTTP server)
- **Optimized support for codepage conversion**
 - Performance enhancements to data conversion services in CICS
 - Used by CICS Web Support and Web services

Notes

In CICS TS V3.1, to determine the HTTP version of the server, CICS made an HTTP request with the OPTIONS method whenever the EXEC CICS WEB OPEN command was issued. The result of the request could be returned on the WEB OPEN command.

In CICS TS V3.2, CICS makes an HTTP request with the OPTIONS method on the WEB OPEN command only if you specify the HTTPVNUM and HTTPRNUM options on the WEB OPEN command.

When CICS receives the first response from the server, the server's HTTP version can be identified from the response, and CICS applies this for the remainder of the session.

Containers for the HTTP Header Repository

- **HTTP headers now use Containers instead of Temporary Storage**
 - Both Client and Server sides will use Containers
 - Removal of Temporary Storage removes 32k outbound session limit
 - TSQPPREFIX now redundant on TCPIP SERVICE definition

Notes

Containers are used to store HTTP headers, removing the requirement for temporary storage queues for CICS Web support. CICS Web support no longer uses temporary storage queues to store request lines, status lines, and HTTP headers for inbound and outbound messages. This means that the TSQPREFIX attribute is no longer required on TCPIPSERVICE definitions, and you do not need to create TSMODEL definitions for this purpose.

The CICS-supplied default definition for use by CICS Web support was DFHWEB, which has now been removed. Containers defined by CICS are now used for request lines, status lines, and HTTP headers. The containers user are:

SERVER_HDR_IN - for headers received on request (includes request line)
SERVER_HDR_OUT - for headers to be sent on response
SERVER_RESP_LINE - for response line to be sent (ie.status line)
CLIENT_HDR_IN - for headers received on resp (includes response line)
CLIENT_HDR_OUT - for headers to be sent on request

Channel and container support for Web commands

- **New WEB SEND command options**
 - CHANNEL
 - Specifies the name of the channel that the container belongs to
 - CONTAINER
 - Is the container from which the HTTP request body will be sent

 - Chunked requests
 - May not use the channel and container option
 - Must send all chunks in the same codepage

Notes

CHANNEL (data-value) specifies the name of the channel that the container belongs to. The name of the channel can consist of up to 16 alphanumeric characters, including appropriate punctuation. Leading and embedded blanks are not permitted. If the name is less than 16 characters, it is padded with trailing blanks. If the CONTAINER option is specified, CHANNEL is optional. If the CHANNEL option is not specified, then CICS assumes the current channel.

CONTAINER (data-value) specifies the name of the container where the HTTP body is held, before it is sent to the server. The name of the container can consist of up to 16 alphanumeric characters, including appropriate punctuation. Leading and embedded blanks are not permitted. If the name is less than 16 characters, it is padded with trailing blanks.

Channel and container support for Web commands...

▪ New WEB RECEIVE command options

- BODYCHARSET character set of the HTTP request body
- TOCHANNEL name of the channel that owns the TOCONTAINER
- TOCONTAINER container into which the HTTP response body will be received

▪ New WEB CONVERSE command options

- BODYCHARSET returns the character set of the HTTP response body
- CHANNEL name of the channel that the container belongs to
- CONTAINER container from which the HTTP request body will be sent
- TOCHANNEL name of the channel that owns the TOCONTAINER
- TOCONTAINER container into which the HTTP response body will be received

Notes 1/4

BODYCHARSET (data-area) specifies the character set of the HTTP request body.

The name of the character set can consist of up to 40 alphanumeric characters, including appropriate punctuation. If the HTTP body is received into an application buffer, the character set returned is as follows:

If the INTO or SET option is specified, and the HTTP body is converted, CICS returns the character set of the HTTP body before conversion.

If the INTO or SET option is specified, and the HTTP body is not converted, CICS returns the charset specified in the Content-Type header. If charset information is not available, blanks are returned.

If the HTTP body is received into a named container, the character set returned is as follows:

If the container is a CHAR container, CICS returns the character set of the encoded data.

If the container is a BIT container, CICS returns blanks.

If the value returned is more than 40 bytes, the data is truncated. If the value returned is less than 40 bytes, the data is padded to the right with blanks.

MEDIATYPE (data-area) specifies the data content of any message body provided, for example text/xml. The media type is up to 56 alphanumeric characters, including appropriate punctuation.

TOCHANNEL (data-value) specifies the name of the channel that the container belongs to. The name of the channel can consist of up to 16 alphanumeric characters, including appropriate punctuation. The acceptable characters are A-Z a-z 0-9 \$ @ # / % & ? ! ; | " = , ; < > . - and _ . Leading and embedded blanks are not permitted. If the name is less than 16 characters, it is padded with trailing blanks. If the TOCHANNEL option is not specified, then CICS assumes the current channel.

TOCONTAINER (data-value) specifies the name of the container where the data is placed. The name of the container can consist of up to 16 alphanumeric characters, including appropriate punctuation. The acceptable characters are A-Z a-z 0-9 \$ @ # / % & ? ! ; | " = , ; < > . - and _ . Leading and embedded blanks are not permitted. If the name is less than 16 characters, it is padded with trailing blanks.

Notes 2/4

On the `WEB CONVERSE` command, there are new options, `BOYCHARSET`, `CHANNEL`, `CONTAINER`, `TOCHANNEL` and `TOCONTAINER`.

BODYCHARSET (data-area) specifies the character set of the HTTP response body. The name of the character set can consist of up to 40 alphanumeric characters, including appropriate punctuation. If the HTTP body is received into an application buffer, the character set returned is as follows:

- If the INTO or SET option is specified, and the HTTP body is converted, CICS returns the character set of the HTTP body before conversion.

- If the INTO or SET option is specified, and the HTTP body is not converted, CICS returns the charset specified in the Content-Type header. If charset information is not available, blanks are returned.

If the HTTP body is received into a named container, the character set returned is as follows:

- If the container is a CHAR container, CICS returns the character set of the encoded data.

- If the container is a BIT container, CICS returns blanks. If the value returned is more than 40 bytes, the data is truncated. If the value returned is less than 40 bytes, the data is padded to the right with blanks.

Notes 3/4

CHANNEL (data-value) specifies the name of the channel that the container belongs to. The name of the channel can consist of up to 16 alphanumeric characters, including appropriate punctuation. Leading and embedded blanks are not permitted. If the name is less than 16 characters, it is padded with trailing blanks. If the CONTAINER option is specified, CHANNEL is optional. If the CHANNEL option is not specified, then CICS assumes the current channel.

CONTAINER (data-value) specifies the name of the container where the HTTP body is held, before it is sent to the server. The name of the container can consist of up to 16 alphanumeric characters, including appropriate punctuation. Leading and embedded blanks are not permitted. If the name is less than 16 characters, it is padded with trailing blanks.

Notes 4/4

TOCHANNEL (data-value) specifies the name of the channel that the container belongs to. The name of the channel can consist of up to 16 alphanumeric characters, including appropriate punctuation. The acceptable characters are A-Z a-z 0-9 \$ @ # / % & ? ! : | " = , ; < > . - and _ . Leading and embedded blanks are not permitted. If the name is less than 16 characters, it is padded with trailing blanks. If the TOCHANNEL option is not specified, then CICS assumes the current channel.

TOCONTAINER (data-value) specifies the name of the container where the data is placed. The name of the container can consist of up to 16 alphanumeric characters, including appropriate punctuation. The acceptable characters are A-Z a-z 0-9 \$ @ # / % & ? ! : | " = , ; < > . - and _ . Leading and embedded blanks are not permitted. If the name is less than 16 characters, it is padded with trailing blanks.

Document Template Processing Changes

▪ Document templates now cached

- Document domain always caches templates from:
 - A PDS, a CICS file, the z/OS UNIX file system, a TS queue, a TD queue
- Document domain may cache templates from:
 - A CICS user exit
 - The exit may override by setting dhtx_cache_response to '1'
- Loader domain caches templates from:
 - A CICS application program

▪ Refresh Document template

- CEMT or EXEC CICS commands to SET DOCTEMPLATE NEWCOPY
 - Deletes cached copy and replaces it with the new copy

Notes

A new caching and refreshing facility improves performance for application access to CICS document templates. The document handler domain always caches a copy of the following types of document template:

- Templates in a partitioned data set
- Templates in a CICS file
- Templates in a z/OS UNIX System Services HFS file
- Templates in a temporary storage queue
- Templates in a transient data queue

The document handler domain may cache templates from the following source:

- Templates in an exit program: Document templates generated by exit programs might be different every time the exit program is called, so CICS only caches a copy of these templates if the exit program specifies caching in its exit parameter list.

The loader domain always caches the following types of document template:

- Templates in a CICS program: Document templates retrieved from CICS programs are never cached by the document handler domain, because programs are already cached elsewhere in CICS.

If you make changes to a document template that has been cached, you can refresh the copy of the document template held by the document handler domain using the CEMT or EXEC CICS SET DOCTEMPLATE NEWCOPY command. (Note that with the SET DOCTEMPLATE command, which is not part of the EXEC CICS DOCUMENT API, you need to specify the name of the DOCTEMPLATE resource definition which defines the document template, rather than the 48-character name of the template.)

Deleting a Document

- **Currently a document exists until the end of the transaction**
 - Can cause storage leaks for long running transactions

- **New commands and options to allow deletion of a document during a transaction**
 - DOCUMENT DELETE command
 - DOCSTATUS(DOCDELETE) option
 - WEB SEND and WEB CONVERSE commands

Notes

Prior to CICS TS V3.2 a document exists until the end of the transaction. For long running transactions that make heavy use of documents this can consume a large amount of storage.

CICS TS V3.2 introduces a new DOCUMENT DELETE command and a new DOCSTATUS option on the EXEC CICS WEB CONVERSE and WEB SEND commands that allow the application to avoid consuming large amounts of storage.

DOCUMENT DELETE enables you to delete documents that are no longer required during a transaction. The command allows the application to request deletion of a document and all storage related to the document. On execution of this command, the storage allocated to the document is released immediately.

If the DOCUMENT DELETE command is not invoked, the document exists until the application ends unless the application has issued the WEB SEND or CONVERSE command with the DOCSTATUS(DOCDELETE).

A new DOCSTATUS parameter on the WEB CONVERSE and WEB SEND commands allows you to specify if you want to delete a document during a transaction. This parameter applies to all commands where a DOCTOKEN is specified, as this indicates that the command is processing a document.

If a WEB SEND command specifies the option DOCSTATUS(DOCDELETE), the WEB RETRIEVE command cannot retrieve the document, and a NOTFND response is returned. RETRIEVE is only for documents sent without the ACTION(IMMEDIATE) option, that is, a deferred send.

Changes to the Sample Programs

- **Samples have been changed to use CICS WEB commands**
 - DFH\$WB1A, DFH\$WB1C
- **New samples have been added to use pipelining**
 - DFH\$WBPA, DFH\$WBPC, DFH0WBPO
- **New samples have been added to use chunking**
 - Client chunking samples
 - DFH\$WBCA - Assembler Client Side Chunking
 - DFH\$WBCC - C Client Side Chunking
 - DFH0WBCO - COBOL Client Side Chunking
 - Server chunking samples
 - DFH\$WBHA - Assembler Server Side Chunking
 - DFH\$WBHC - C Server Side Chunking
 - DFH0WBHO - COBOL Server Side Chunking
- **Sample URIMAP definitions provided**

Security for documents

- **Resource level security added for DOCTEMPLATES**
 - Documents delivered as a static response to a Web request
 - TEMPLATE name specified on the URIMAP definition
 - Document templates used by an application program
 - CREATE, INQUIRE and DISCARD DOCTEMPLATE commands
 - EXEC CICS DOCUMENT CREATE and INSERT commands
- **Resource security is activated by:**
 - XRES parameter in the systems initialization table
 - Security check will be made on the userid associated with transaction

Notes

You can apply access controls to individual CICS document templates. Security checking for this resource is applied using the XRES system initialization parameter, which is set to YES by default. You can use this capability to secure individual Web pages delivered as static responses (using URIMAP definitions). You can also secure document templates that are used by application programs, either for Web delivery as part of an application-generated response, or for any other purpose.

The XRES system initialization parameter activates security checking for CICS document templates. The default setting for this system initialization parameter is YES, meaning that each time a document template is requested, CICS calls the external security manager to check that the user ID associated with the transaction is permitted to access the template. When YES is specified, the default resource class name RCICSRES and grouping class name WCICSRES are used. Alternatively, you can specify a different resource class name. If you set XRES to NO, no security checks are performed for document templates.

- Access to CICS document templates is controlled in the following cases:
- Document templates delivered as a static response to a Web client's request (specified on the TEMPLATENAME attribute of the URIMAP definition for the request).
- Document templates delivered as part of an application-generated response to a Web client's request (used by an application program that handles the request).
- All EXEC CICS CREATE, INQUIRE, and DISCARD DOCTEMPLATE commands.
- All EXEC CICS DOCUMENT INSERT and CREATE commands with the TEMPLATE option.

Security for HFS files

- **Access to HFS files can be controlled based on USERID**
 - Only for CICS Web clients
 - Only for pages delivered as static content
 - Specified in a URIMAP definition
- **HFS resource security is activated by:**
 - XHFS parameter in the systems initialization table
 - Security check will be made on the Web client USERID
 - USERID from basic authentication or a client certificate

Note - Must give access to CICS Region userid - read access min

Notes

Files stored in UNIX System Services can be used to supply Web pages through CICS Web support, as static responses provided by URIMAP definitions. When access control for HFS files is specified, you can control access to HFS files on the basis of the user IDs for individual Web clients. Access control for HFS files is enabled by default.

Access control for HFS files is activated by the XHFS system initialization parameter. The default for this parameter is YES, meaning that resource security for HFS files is active. If you do not want resource security for HFS files, set this system initialization parameter to NO. The RESSEC option on the transaction resource definition does not affect this security checking.

The CICS region user ID must always have a minimum of read access to all HFS files that it uses for CICS Web support, and the directories containing them. The user ID of the Web client is only used when accessing HFS files as a static response, but the CICS region user ID applies to all other attempts to access the HFS file. If the CICS region user ID does not have permission to access the file, even an authorized Web client will be unable to view it. This is the case even when the HFS file is defined as a CICS document template.

Basic authentication assistance for HTTP client apps

- **Parameters added to Client EXEC CICS WEB SEND and CONVERSE commands to allow application to :**
 - Specify credentials (username and password)
- **AUTHENTICATE (NONE|BASICAUTH) option**
 - NONE means there are no restrictions on accessing the data
 - If BASICAUTH is specified credentials may be specified
 - USERNAME, USERNAMELEN, PASSWORD, PASSWORDLEN
 - If BASICAUTH is specified and credentials are not supplied
 - User exit XWBAUTH will be invoked to do the credentials lookup
- **XWBAUTH user exit**
 - Inputs are the host and path components from the target URL
 - Output from the exit is a username and password
 - Sample exits provided

Notes

The WEB SEND and WEB CONVERSE commands have been expanded to allow you to provide basic authentication credentials (a username and password). CICS sends these details in an Authorization header to a server that is expecting it or in response to a HTTP 401 WWW-Authenticate message.

CICS converts the supplied username and password to the format that the HTTP basic authentication protocol is expecting. This allows you to supply your credentials in your usual EBCDIC character set through the WEB SEND or WEB CONVERSE command, or through the XWBAUTH user exit.

AUTHENTICATE (cvda)

This option allows you to specify user authentication details (credentials), to control access to restricted data. The CVDA values that apply for CICS as an HTTP client are:

NONE

specifies that there are no restrictions on accessing this data, therefore no credentials are required. This is the default value for AUTHENTICATE.

BASICAUTH

specifies that HTTP Basic Authentication credentials are required for this session. These details can be supplied within the command or by using the XWBAUTH global user exit.

Notes

XWBAUTH enables you to specify basic authentication credentials (username and password) for a target server. XWBAUTH passes these to CICS on request, to create an Authorization header. XWBAUTH is called during processing of an EXEC CICS WEB SEND or EXEC CICS WEB CONVERSE command. The host name and path information are passed to the user exit, with an optional qualifying realm.

When AUTHENTICATE(BASICAUTH) is specified within the EXEC CICS WEB SEND or WEB CONVERSE command, a username and password can be provided directly by the application. If these are not supplied, XWBAUTH is invoked, providing an alternative way of specifying these credentials.

The username and password are usually specific to the remote server environment, and might be longer than the standard eight characters used by RACF systems. The username and password fields can be up to 256 characters in length. The syntax of these fields is not validated.

The host is passed to the user exit program as the UEPHOST parameter, and the path is passed as the UEPPATH parameter. The realm is passed optionally as the UEPREALM parameter. In response, the user exit program returns the username and password as the UEPUSNM and UEPPSWD parameters.

A return code of UERCNORM indicates a successfully returned username and password.

Return code UERCBYP indicates that the username and password cannot be identified, so the Authorization header will not be added to the request.

If XWBAUTH sets return code UERCERR then the WEB SEND fails with NOTAUTH. (The send is not even attempted)

CICS Transaction Server V3.2

- **Application connectivity**
 - Web services standards, interoperability profiles, large messages, and data mapping
 - Intercommunications over TCP/IP
 - HTTP and TCP/IP management and performance
- **Application reuse**
 - 64-bit storage for CONTAINER data
 - CICS integrated translator support for C and C++
 - Java enhancements
- **Service management**
 - On-line management of program libraries
 - Enterprise Workload Manager
 - CICSplex SM Web User Interface help, usability, and MAP support
 - CICSplex SM and CICS-WMQ adapter installation and management
- **Architectural enhancements**
 - Threadsafe core APIs for accessing VSAM files, journals, WebSphere MQ
 - Capacity of VSAM ESDS files >4GB, shared data tables >2GB, CICS regions in a Sysplex
 - Trace, monitoring and statistics

New 64 bit Storage Manager

- Driven by Channels and Containers
- Based on existing Storage Manager domain:
 - New domain level CICS64 subpools
 - Storage objects managed in 2GB increments
 - Amount of storage based on MEMLIMIT
 - Specified in SMFPRMxx or JCL or overridden by IEFUSI
 - No GDSASIZE SIT parameter as storage is not preallocated
 - CICS TS 3.2 requires a MEMLIMIT which is at least as big as EDSALIM
 - Recommended at least 2GB
 - Provides services to copy data to and from storage above the bar
 - Monitoring and statistics gathering similar to that done currently
 - New messages in range DFHSM0601 upwards

Containers in 64-bit storage

- **Applications are unchanged. Containers are created and manipulated in 31-bit working storage areas.**
 - Applications still address containers using 31 bit ptrs
- **EXEC CICS PUT CONTAINER copies the container data into 64-bit storage.**
 - No 4K segmentation (Performance improvement over CICS TS 3.1)
 - Data conversion performed in 64-bit storage if necessary
(note - Performance improvement over 3.1 for Dataconversion)
- **EXEC CICS GET CONTAINER copies the container data from 64-bit to 31-bit storage for the application to access**
 - Hence size of each container still limited by ECDSA

CICS Java Enhancements

- **Resettable JVM removed**
 - Many removed, renamed and replaced options
 - Migration toward "Standard" JVMs
 - > Most old options are ignored or tolerated
 - Improved error messages
- **JVM Application Isolation Utility**
 - Standalone Utility
 - Code Analyzer tool
 - > Support Pac CH1B available now
 - Useful for migrating to Continuous Mode JVMs
 - Reports Modifications to static Objects
- **JVM Profile and Properties changes (Java 1.4.2)**
 - Any JVM option or system property may now be specified
 - "X" options now use standard Java format
 - System Properties may be specified in JVM properties or profile
- **Improved Trace – CICS formats JVM trace output**

CICS Java Enhancements – Startup & Shutdown

- **New JVM Profile option IDLE_TIMEOUT={30 | number}**
 - Specifies timeout threshold for JVMs
- **PERFORM JVMPOOL START**
 - JVMCOUNT – number of JVMs to start
 - JVMPROFILE – JVM profile name as it is stored in HFS
 - EXECKEY – Execution Key in which JVM is to run
- **PERFORM JVMPOOL TERMINATE**
 - PHASEOUT – running programs allowed to complete
 - PURGE – running programs terminated via the CICS PURGE facility
 - FORCEPURGE – running programs terminated via the CICS FORCEPURGE facility
 - JVMPROFILE(data-area) – optional. Only JVMs started with that profile are terminated
- **SET JVMPOOL TERMINATE**
 - Deprecated: use PERFORM JVMPOOL

JVM Garbage Collection

- **CICS TS V3.1 Garbage collection**
 - GC ran after nn Java programs executed in JVM
 - GC statistics counted against last user program in JVM
- **CICS TS V3.2 Garbage Collections**
 - Separate Transaction (CJGC)
 - Triggered by storage utilization in non-system heap
 - User-defined threshold storage utilization threshold
 - Runs in JVM immediately after user program terminates
 - Statistics not attributed to user programs
 - JVM not available for work until GC complete
 - Allocation Failures
 - GC runs as part of user task.
 - Statistics attributed to user task
 - User processing is suspended until GC is complete

CICS Transaction Server V3.2

- **Application connectivity**
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 - Trace, monitoring and statistics

On-line management of program libraries

- **Dynamic Program Library Management**
 - Specify the data sets and order that CICS will search for programs and program artifacts
 - Without restarting CICS
 - In addition to the existing static DFHRPL
 - Organise such data sets in dynamically definable LIBRARY resources
 - More flexible way of representing your applications
 - Defined via CEDA, DFHCSDUP, CREATE or CPSM BAS
 - SPI: INQUIRE, SET, DISCARD
 - Statistics: Library resource statistics
 - INQUIRE Program will report from where a program has been loaded
 - Use cases
 - Test, Pre-Production, Production will vary

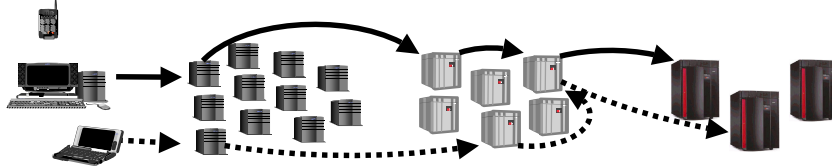
A high level overview of EWLM

Improves
utilization of IT
resources

Manages
business process
service levels

... e-business environment issues ...

- Are my business performance objectives being met?
- What components of the environment are contributing to the problem?
- What resources are being used by an application or business process?
- What workloads are impacted by the problem?
- How these performance problems can be resolved without any human intervention?



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A high level overview of EWLM...

- Ability to monitor *all* or *specific* transactions “groups” that an application processes.
- Monitor application transactions *separate* from operating system processes.
- Obtain end-to-end transaction data
 - Example transaction flow:
 - Hop 0 – WebSphere Application Server
 - Hop 1 – CICS TS V3.2
 - Hop 2 – DB2 Universal Database
- Autonomic resource management based on business goals and importance specified in the customer supplied policy.

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CICS Exploitation of EWLM

- **No application changes required**
- **Correlators accepted and passed**
 - CICS ↔ CICS
 - Flowing into CICS
 - Flowing out from CICS
- **Transports**
 - SOAP, HTTP, IP Interconnectivity for DPL, IIOF, MRO
- **EWLM Control Center used to set up policies, show CICS workloads, etc.**

EWLM Control Center

Hop details - Transaction class 'CICS Transactions starting with E'

View the data for the hops that are processing work in the class

Interval: 3/20/07 7:47:30 AM to 3/20/07 7:52:30 AM

Selected node

CICS Transactions starting with E

Hop 0

CICS

winmvs27.hursley.ibm.com

winmvs2c.hursley.ibm.com

SPUD20

IYK3ZC35

IYK3ZSC1

IYCWST1

IYK3ZC32

IYK3ZC21

IYCWCTGO

winmvs28.hursley.ibm.com

winmvs26.hursley.ibm.com

Hop 1

CICS

winmvs2c.hursley.ibm.com

IYK3ZC35

Hide Tree

1. The Hops of eWLM transaction recorded.

3. eWLM average timing.

2. The eWLM transaction counts.

Hop number	Name	Type	Platform	Average response time	Standard deviation	Average active time	Average queue time	Successful transactions	Failed transactions
0	CICS Transactions starting with E	Class		03.561359	00.000000	03.561838	00.002023	1	0
1	IYK3ZC32	Instance	z/OS	03.561359	00.000000	03.539838	00.000023	1	0
	IYK3ZC35	Instance	z/OS	03.399788	00.000000	00.013679	00.001750	1	0
Total:				3					

Base CICS and CICSplex SM Installation Merge

- **CICSplex SM TSO EUI removed**
 - WUI is the interface into CICSplex SM
- **FMIDs**
 - CICSplex SM becomes a dependent FMID
- **Ease of Installation and Configuration**
 - Single set of Jobs
 - EYUISTAR merged into DFHISTAR
 - New JCL samples for CMAS, WUI Server and MAS
 - EYUINST merged into DFHINST
- **EYUCMSDS & EYU9XDUT**
 - Enhanced CICSplex SM Data repository setup
- **New Installation Verification Programs**

CICSplex SM Resource Definitions

- **Default resource definitions created at startup for**
 - CMAS
 - WUI
 - MAS
- **Removed requirement to customize DFHCNV**
- **Enhanced EYUSAMP set**
 - EYU\$CDEF (CMAS)
 - EYU\$WDEF (WUI)
 - EYU\$MDEF (MAS)

CICS-WMQ adapter installation

- **Components transferred from the WebSphere MQ product into CICS TS V3.2:**
 - CICS-MQ Adapter
 - MQ trigger monitor for CICS
 - MQ bridge (includes the DPL bridge and link 3270 bridge)
 - Does not include the 3270 start bridge which is obsolete
- **CICS shipped components**
 - CICS-MQ Adapter and MQ trigger monitor for CICS - will work with all supported releases of Websphere MQ
 - MQ bridge - will work with MQ V6 and above, for MQ V5.3.1 control will be transferred to MQ shipped bridge
 - CICS Level 2 and Level 3 will service CICS shipped components
- **WebSphere MQ will continue to ship components for use with CICS TS V3.1 & below**
 - Until such time that all releases of CICS TS prior to CICS TS V3.2 are out of service
 - Limited enhancements over time, will functionally stabilize
 - MQ Level 2 and Level3 will continue to service MQ shipped components

CICS Transaction Server V3.2

- **Application Connectivity**
 - Web services standards, interoperability profiles, large messages, and data mapping
 - Intercommunications over TCP/IP
 - HTTP and TCP/IP management and performance
- **Application Reuse**
 - 64-bit storage for CONTAINER data
 - CICS integrated translator support for C and C++
 - Java management and Java 5
- **Service Management**
 - On-line management of program libraries
 - Enterprise Workload Manager
 - CICSplex SM Web User Interface help, usability, and MAP support
 - CICSplex SM and CICS-WMQ adapter installation and management
- **Architectural Enhancements**
 - Threadsafe core APIs for accessing VSAM files, journals, WebSphere MQ
 - Capacity of VSAM ESDS files >4GB, shared data tables >2GB, CICS regions in a Sysplex
 - Trace, monitoring and statistics

Threadsafe CICS commands

▪ File Control

- API Commands are threadsafe (local VSAM and RLS only)
 - DELETE RESETBR
 - ENDBR REWRITE
 - READ STARTBR
 - READNEXT UNLOCK
 - READPREV WRITE
 - INQUIRE FILE will be threadsafe
- API commands for remote files, shared data tables, CFDTs & BDAM files are NOT threadsafe
- SPI Commands not threadsafe
 - SET FILE
 - INQUIRE/SET DSNAME
 - CREATE/DISCARD FILE
- **FC GLUEs should be made threadsafe else excessive TCB switching will occur**

Threadsafe CICS commands...

- **CICS-MQ Adapter is enhanced to use OTE**
 - The CICS-MQ TRUE is enabled as OPENAPI
 - The CICS-MQ TRUE uses L8 TCBs not private TCBs
 - MQ API commands from CICS applications are threadsafe
- **The WebShere MQ shipped Adapter will not support OTE**

EXEC CICS Threadsafe Commands...

- **EXEC CICS JOURNAL**
 - Is now threadsafe
 - WRITE JOURNALNAME (and WRITE JOURNALNUM)
 - WAIT JOURNALNAME (and WAIT JOURNALNUM)
 - XPI WRITE_JOURNAL_DATA

- **System “autoinstalled” global user exits**
 - 1st phase PLT programs
 - Can be defined as threadsafe via new keyword
 - on EXEC CICS ENABLE

Shared Data Tables greater than 2GB

- **New Data Space allocations**
 - Multiple data spaces are now available

- **Data Spaces:**
 - DFHDT001
 - Table Entry Descriptors
 - Previously stored in CICS Address Space
 - DFHDT002
 - Index Nodes
 - Previously stored in CICS Address Space
 - DFHDT003 – DFHDTnnn
 - Up to 2 GB of Record Data each
 - Up to 100 Dataspaces per CICS region
 - Previously only one Dataspace for Record Data

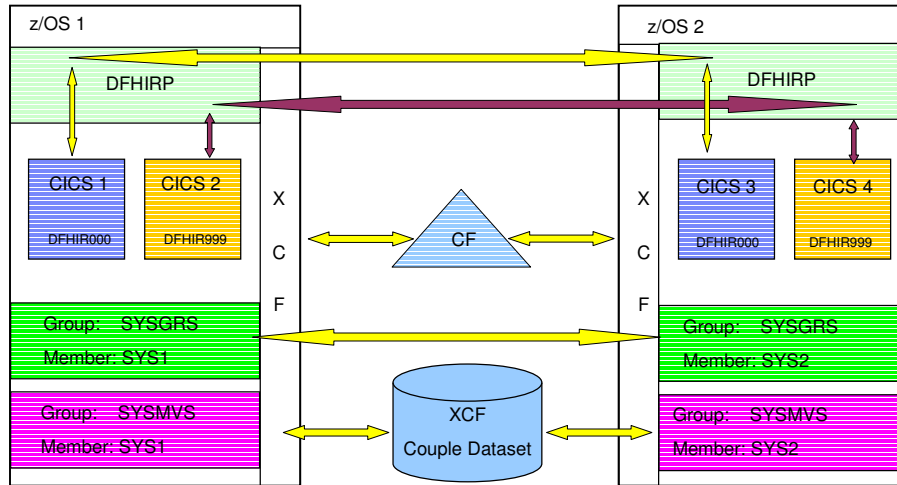
Support for ESDS greater than 4GB

- **New XRBA keyword on File Control Commands**
 - May be specified anywhere RBA is used
 - XRBA mutually exclusive with RBA
 - Requires 8-byte RBA field
 - XRBA API may be used on non-Extended ESDS
 - Remote files are supported
 - No Alternate Indexes over Extended ESDS - VSAM does not support this
- **Impact on Applications – not transparent to all**
 - RBA Sensitive
 - Program specifies RBA to Read/Update records
 - Must use XRBA to access Extended ESDS
 - RBA-Insensitive
 - Program does not use RBA to access records
 - May use RBA to access Extended ESDS with STARTBR, READNEXT, READPREV when using 'special' RBA to indicate start or end of data set
- **Impact on forward recovery utilities**
 - New CICS VR 4.2 supports new log record format

XCF Group Limit Changes

- **Allow specification of which XCF group to join**
 - New systems initialization parameter for CICS
 - XCFGROUP= name | DFHIR000
 - New EXCI options table parameter batch programs
 - XCFGROUP= name | DFHIR000
- **Display which XCF group a region has joined**
 - EXEC CICS INQUIRE IRC
 - CEMT INQUIRE IRC
 - CICSplex SM panel changes

XCF Group Limit Changes...



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Monitoring Clock Precision

- **Old Clock Format**
 - 8 byte area
 - 32 bits for Timer component
 - 16 microsecond units
 - About 19 hour capacity
- **New Clock Format**
 - 12 byte area
 - 64 bits for Timer Component
 - 1 microsecond units
 - Several years capacity
 - Reserved 8 bits and Period Count (24 bits) are unchanged
 - Performance Class Clocks Only

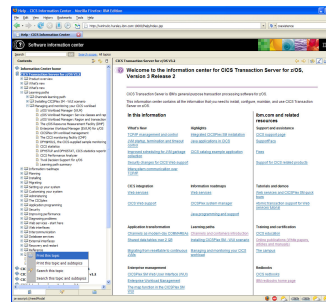
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Monitoring Record Data Compression

- **Monitoring Domain now issues CSRCESRV SERVICE=QUERY at Domain Initialization**
 - COMPRESS=YES|NO in DFHMCT TYPE=INITIAL macro
 - Default is COMPRESS=NO
 - Compression Length Field added to SMF 110 records
 - SMFMNCRL
 - Non-zero value indicates record is compressed
- **Monitoring Domain Subroutine now issues CSRCESRV FUNCTION=COMPRESS**
 - Algorithm chosen exploits occurrence of repeated characters in a data stream
- **Monitor Domain Dump Formatter now formats compression management information**
- **DFH\$MOLS contains logic and calls to decompress monitoring records**

CICS Information Center

- **Content**
 - Builds upon navigational improvements introduced in V3.1
 - Now includes previously licensed publications
 - New and updated learning paths and product overview Incl. Managing, measuring, and analyzing your CICS workload
 - New headers and footers on every page
 - feedback link
 - timestamp of last update
 - a link to the PDF
 - URL for the displayed topic
 - Anchors enable the Info Center to be extended with your own documentation
- **Upgraded to IBM Eclipse Help System V3.1**
 - Update Manager – install or update documentation from an IBM server via FTP or HTTP
 - An enhanced search and results
 - "Quick menu" to search or print a topic or section of the navigation
 - Icon to turn search highlighting on and off
- **Use via IBM Web site, workstation, or server**



Notes

- The Information Center is powered by Eclipse technology: it consists of an Eclipse Help System, with the information for CICS TS V3.2 as a set of plug-ins. The Information Center can be run from the CD-ROM provided with the product, or it can be installed onto a workstation or server. The CICS TS V3.2 Information Center builds on the improvements introduced in the previous release including sections on What's New, Learning paths, Information roadmaps, and integrated Troubleshooting and support.
- The previously licensed CICS publications are now included the CICS Information Center. These include the Data Areas, Supplementary Data Areas, Diagnosis Reference, Debugging Tools Interfaces Reference
- In the CICS TS V3.2 Information Center, the CICS documentation has been enhanced to include the following:
 - New headers and footers on every page, providing a feedback link, timestamp for when the topic was last updated, a link to the PDF, and a URL for the displayed topic
 - Additional learning path and new product overview section
 - Anchors. The CICS navigation now includes a number of anchor points, allowing users to write their own document plug-ins to use these anchor points and extend the information center navigation. The list of anchor points is published in the Information Center.
- The CICS TS V3.2 Information Center has been upgraded to run on the IBM Eclipse Help System V3.1 level. As a result, the Information Center has a number of enhancements. These include:
 - Update Manager. IBM refreshes the documentation in the Information Center on a regular basis. A user can obtain these updates directly from an installed Information Center using the Update Manager functionality, rather than reinstalling the whole Information Center from a CD-ROM or download. A command line interface is provided for server installations, and an icon in the user interface is provided for local installations. Update Manager allows a user to select and download new and updated information on a special download site called an update server site.
 - An enhanced search engine and search result listing. The enhanced search engine returns results that are more relevant to the search criteria, and the search results can optionally be viewed with an additional summary for each topic.
 - Improvements to the user interface. These include the introduction of the "Quick menu", which allows user either to search or print a topic or section of the navigation, and a new icon to turn search highlighting on and off.
- For a full list of the browsers, workstation platforms, and server platforms supported, please refer to the announcement letter.

CICS TS V3.2 packaging



- **CICS TS V3.2 product elements**
 - CICS Transaction Server
 - CICSplex System Manager
 - Information Center
 - REXX Development and runtime for CICS
 - CICS Application Migration Aid
- **CICS Service Flow Feature**
- **WebSphere Developer for System z V7 promotion**
 - Integrated development environment for CICS and WebSphere
 - COBOL, PL/I, Java and J2EE development
 - z/OS file system integration
 - One license included, but there is no service entitlement included

Notes

- CICS Transaction Server for z/OS V3.1 (5655-M15) product elements includes
 - CICS V6.5
 - CICSplex System Manager V650
 - CICS Information Center
 - REXX Development System for CICS/ESA
 - REXX Runtime Facility for CICS/ESA
 - CICS Application Migration Aid V1.1
- The CICS Service Flow Feature of CICS TS V3.2 is an optional, no-charge feature. In a single offering, the CICS Service Flow Feature provides the tooling and run-time capabilities to enable the creation of CICS business services by composing existing CICS applications and resources into service flows that implement the required business service behavior.
- CICS business services can be published as Web services, or integrated with enterprise solutions such as business processes hosted on WebSphere Process Server or WebSphere MQ-based Enterprise Application Integration (EAI) solutions. The CICS Service Flow Feature of CICS TS V3.2 will deliver enhanced tooling and run-time capabilities that extend the existing function of the CICS Service Flow Feature of CICS TS V3.1 with:
 - Exploitation of CICS channels and containers by Service Flow DPL nodes
 - Support for Link3270 non-mapped conversations
 - Improved installation, management, and error handling capabilities
- Also shipped with this product as a marketing promotion is a media pack with one free license of WebSphere Developer for System z (WDz) V7. WDz is not part of CICS TS, and is not required in order to use CICS TS. WDz is an Integrated Development Environment (IDE) that helps developers create dynamic Web applications including support for Java 2 Enterprise Edition (J2EE), XML and Web services technologies that can integrate WebSphere software and traditional transactional environments, including CICS, IMS, and Batch systems. It promotes the reuse and transformation of existing applications, and supports Java, COBOL, PL/I, and Enterprise Generation Language (EGL) development.

Planning and migration...

- **Operating System required**
 - z/OS (5694-A01) V1.7, or later
- **Java runtime supported**
 - IBM SDK for z/OS Java 2 Technology Edition, V1.4.2, or later
 - Required for
 - CICS Web services assistant
 - CICS applications written in Java, including Enterprise JavaBeans
- **Latest language compilers supported**
 - IBM Enterprise COBOL for z/OS and OS/390 V3 (5655-G53)
 - IBM Enterprise PL/I for z/OS and OS/390 V3 (5655-H31)
 - z/OS C/C++ (component of 5694-A01)
- **See the Announcement Letter for the full list of older compilers supported and other software and hardware requirements**

Notes

- CICS TS for z/OS V3.2 requires z/OS V1.7 (5694-A01), or later, and will not initialize in an environment with a lower level of operating system installed.
- For Java application programs, enterprise beans, or the Web Services Assistant, the IBM SDK for z/OS, Java 2 Technology Edition, Version 1.4 (5655-156). This must be at the V1.4.2 level.
- The Language Environment library SCEERUN must be available to CICS during CICS initialization, by inclusion in either the STEPLIB concatenation or the LNKLIST. Language Environment services are used by a number of CICS functions.
- The Information Center can be used locally or as a server on the following platforms:
 - Windows 2000 (32-bit)
 - Windows XP (32-bit)
 - RedHat Enterprise Linux 3.0 (Intel) (32-bit)
 - SuSE Linux Enterprise 8 and 9 (Intel) (32-bit)
 - AIX V5.2 and V5.3 (32-bit)
- The Information Center can be used as a server only on the following platforms:
 - z/OS V1.7, or later
 - RedHat Enterprise Linux 3.0 for zSeries
 - SuSE Linux Enterprise 8 and 9 for zSeries
- For best results, view the Information Center using one of the following browsers:
 - Internet Explorer 6.0, and later
 - Mozilla-based browsers 1.7, and later
 - Firefox 1.0, and later
- PDF files shipped with the Information Center can be read using Adobe Acrobat Reader 5.0, or later, but Reader 6.0 is necessary to benefit from the accessibility features introduced in Adobe Acrobat Distiller 6.0.
- Note that, for accessibility purposes, screen readers may impose restrictions on browser choice.

Planning and migration


- **CICS TS V3.2 is applicable to all CICS customers**
 - CICS TS V1.3 service was discontinued in April 2006
 - CICS TS V2.2, V2.3, V3.1 continue to be serviced
 - CICS TS V2.3 continues to be orderable for customers requiring OS/VS COBOL runtime
- **SOAP for CICS Feature coexistence supported for migration to base CICS TS V3.2 function**
 - Modify your message adapters to use the new interfaces
 - Review your use of containers. The SOAP for CICS feature uses BTS containers; the Web services support in CICS TS V3.2 does not use BTS. In addition, the containers used in the new Web services support, and those used in the feature have different names
 - Replace function in user-written handlers with function provided in this release
- **Statement of direction**
 - IBM intends to deliver, in the second half of 2007, a release of the CICS Transaction Gateway that enables Java applications to exchange large amounts of data (greater than 32KB) with CICS applications that use the containers and channels APIs, and enables transactional (two-phase commit) support when using the JCA. This will also support EWLM over JCA. These capabilities will exploit the new IP interconnectivity for DPL provided in CICS TS V3.2.
 - IBM also intends to deliver, via the service channel on CICS TS V3.2, support for the new WS specifications in WS-Security.

Notes

- CICS TS V3.2 is recommended for all CICS customers migrating from older releases. The base software prerequisites for CICS TS V3.1 are similar to CICS TS V2.3 (e.g. z/OS V1.4 as a base). The primary consideration on migrating from CICS TS V1.3 or TS V2.2 is the language and compiler level used by the applications. CICS TS V3.1 removed support for the execution of OS/VS COBOL programs. CICS TS V2.3 continues to support the execution of OS/VS COBOL.
- The capabilities in the SOAP for CICS feature, which was orderable with CICS TS V2.2 and V2.3, became part of the base CICS TS product at CICS TS V3.1. However, to assist migration for customers who already have this feature, the feature may be used and is supported with CICS TS V3.2, and applications will continue to run. Customers are recommended to migrate to the Web services support capabilities of CICS TS V3.2.
 - The SOAP for CICS feature relies to a considerable extent upon user-written code, and therefore it is not possible to set out a step-by-step migration task. However, here are some of the things you will need to think about.
 - Consider using the Web services assistant to construct and parse SOAP messages.
 - If you use SOAP messages, but decide not to use the Web services assistant, you may be able to reuse your existing code for constructing and parsing the messages. However, you should consider whether to use the CICS-provided SOAP message handlers, because they are designed to work with SOAP 1.1 and SOAP 1.2 messages.
 - Review your use of containers. The SOAP for CICS feature uses BTS containers, whereas CICS Transaction Server uses channel containers.
 - Consider how to migrate the function that was provided by your pipeline programs. The pipeline in the SOAP for CICS feature has a fixed number of user-written programs, each with a designated purpose. The function provided by some of these programs is provided in CICS Transaction Server by the CICS-provided SOAP message handlers, so you may be able to dispense with these programs altogether. The way that pipeline programs communicate with CICS, and with one another, has changed, so you will need to review these programs to see if they can be reused in the new environment.
 - In the SOAP for CICS feature, you could have just one pipeline for all your service provider applications, and one for all your service requesters. In CICS Transaction Server, you can configure many different pipelines.
- CICS has announced plans to remove some older and obsolete functions. The TSO End User interface for CICSplex Systems Manager will be removed in the next release of CICS. In a future release of CICS, we plan to remove; the ONC RPC feature, the CICS Web Interface COMMAREA interfaces and the CICS Web Server plug-in.

Summary


- **CICS TS provides the base for the majority of mainframe applications today**
 - An efficient and optimized runtime for the reuse and transformation of existing CICS applications
 - Provides easy to use services that exploit new technologies by building on CICS skills
 - First class support and management of mixed application types and workloads
- **CICS TS and WebSphere Application Server are IBM's strategic middleware products that together support practically any mission critical solution**
 - Interoperate well using Web services and connectors to support end-to-end on demand systems
 - Complement z/OS qualities of service such as high availability, scalability, low cost per transaction, and excellent security
- **CICS TS V3.2 will be generally available 29 June, 2007**
 - The Release Guide (GC34-6811) is available now from <http://www.ibm.com/software/ts/cics>
 - An open beta version of CICS TS V3.2 is available now, and can be used until July 27, 2007

CICS Transaction Server 

IBM System z tools for CICS

- CICS Subsystem Management Tools
 - CICS Performance Analyzer for z/OS
 - CICS Configuration Manager for z/OS
 - IBM Session Manager for z/OS
 - CICS Online Transmission Time Optimizer for z/OS
 - CICS VSAM Recovery for z/OS
 - CICS Batch Application Control for z/OS
- CICS Application Transformation Tools
 - CICS Interdependency Analyzer for z/OS
 - CICS VSAM Transparency for z/OS
- Application Development tools
 - IBM Application Monitor for z/OS
 - IBM Fault Analyzer for z/OS
 - IBM File Manager for z/OS
 - IBM Debug Tool for z/OS
 - IBM WebSphere Developer for System z
- Connector technologies
 - CICS Transaction Gateway

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CICS Transaction Server 

WebSphere Developer for System z

Enabling a robust, flexible SOA runtime environment while maximizing existing assets

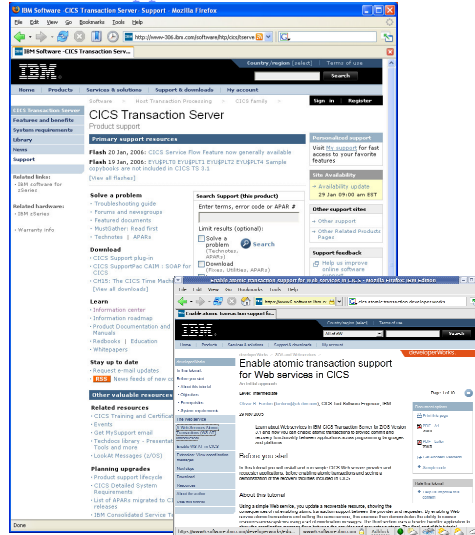
Modern Architectures	<ul style="list-style-type: none"> • RAD V7 • J2ee, JCA, CTG • Rich client support • Web Page Designer 	CICS Transaction Server Exploit provider/requestor Web service support for CICS assets, based on full Web service standards Extend the value of CICS transactions in a mixed language environment Build Web services from CICS transactions with no change to existing applications.
Web Services	<ul style="list-style-type: none"> • WSDL/Web Service updates • More extensive Web Services support for COBOL and PL/I data • Channels and containers, outbound web services, DB2 in SFM 	IMS Transaction and Database Exploit Web service support for IMS assets, based on full Web service standards Extend the value of IMS transactions in a mixed language environment Build Web services from IMS transactions with no change to existing applications.
MDD and Rapid Development	<ul style="list-style-type: none"> • UML to COBOL • Customizable transformations (patterns) 	WebSphere Application Server Extend existing Java assets with support for Web Services standards and standards-based messaging Help ensure 24x7 availability of business-critical applications with clustering and high availability Build and deploy Web Services quickly and easily with rapid development and deployment features
Innovation: ISPF, languages and lifecycle	<ul style="list-style-type: none"> • COBOL, PL/I local and remote • C, C++ remote • TXSeries supporting local unit test • MFS / BMS • File Manager integration preview • Implementation integration and performance 	

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CICS Transaction Server – support and news

ibm.com/software/http/cics/tserver/support/

- Search technotes (4,000+), APARs
 - Download SupportPacs
 - Read white papers, articles and brochures
 - Full Information Center and manuals
 - Updates via RSS feeds + e-mails
 - Submit and track problems
-
- Transaction Servers and Tools eNews
ibm.com/software/http/cics/enews/
 - developerWorks articles
-
- CICS User Groups
 - CICS-L forum



Upcoming Events

ibm.com/software/http/cics/events/

- **Share User group event**
 - Feb 11th -16th, 2007 - Tampa, USA
 - Aug 12th -17th, 2007 - San Diego, USA
 - share.org/events/Seattle/index.cfm
- **GSE Nordics User Group**
 - May 21st - 23rd, 2007 - Helsinki, Finland
 - gse.org/
- **IBM Technical Leadership Exchange**
 - Apr 15th - 18th, 2007 - Anaheim, USA
- **IBM Impact 2007**
 - May 20th -25th, 2007 - Orlando, USA
- **IBM Technical Leadership Exchange**
 - May 21th - 24th, 2007 - Paris, France

