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CICS Transaction Server for z/OS V4.1

CICS Transaction Server

Introducing Version 4

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Briefing for Scottish and Southern Energy

Title page – Notes

CICS Transaction Server for z/OS® (CICS TS) is a modern, dependable, and cost-effective application platform. CICS TS V4.1 will deliver new business event capabilities, Web 2.0 programming support, and new operational tooling that will enable enterprise agility when responding to business opportunity and risk in rapidly changing markets. Its traditional qualities of security, reliability, availability, scalability, data-integrity, and application responsiveness make CICS TS the perfect transaction-server partner for Web application servers.

CICS TS V4.1 brings new levels of ease-of-use and flexibility to meet the needs of the next generation of business users, and is aimed at helping users in:

- Competing for new opportunities by gaining insight into business processes and responding by modifying key business applications quickly and with confidence.
- Complying with corporate, industry and government policies to manage business risk of critical business applications.
- Controlling costs by simplifying IT infrastructure and improving development and operations productivity through easier-to-use interfaces and functions.

CICS TS V4.1 is the appropriate upgrade path for all CICS customers

- CICS TS V1.3 service was discontinued 30 April 2006
- CICS TS V2.2 service was discontinued 30 April 2008
- CICS TS V2.3 service will be discontinued 30 September 2009

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Agenda

- **CICS TS Version 4**
  - Strategy and Themes
  - Compete, Control & Comply
    - Event Processing
    - Atom Feeds
    - CICS Explorer
    - Improvements to XML parsing
- **Other Functionality**
- **References and Summary**

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Strategy and Customer Trends

- **SOA continues to be the major driving force**
  - Driving increased IT flexibility
  - Faster time to market for new solutions
  - Greater reuse of existing assets
- **Maturing of new programming architectures**
  - Web 2.0 (*RESTful, WOA, …)*
  - Event Based Processing
- **Skills and expertise challenges**
  - Effectiveness and efficiency
- **Increased Governance requirements and regulations**
- **Interoperability and synergy with other SOA products**

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Ongoing Strategies

- **Exploitation of Open Transaction Environment**
  - Providing more flexible and effective CICS infrastructure
- **Threadsafety of CICS applications**
  - Exploiting OTE and hardware n-way capacity
- **Java as a language for business logic**
  - EJB interop overtaken by SOA and Web services
- **Healthy tools eco-system**
  - SDK for CICS Explorer

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Strategies and Trends – Notes

These slides discuss trends in the industry and in customer needs which continue to drive the functionality in CICS TS, and ongoing strategic areas on which CICS continues to focus.

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CICS Transaction Server V4 Themes

CICS TS V4 helps users to…

Compete *for new opportunities by gaining insight into business processes and responding by modifying key business applications quickly and with confidence*

Comply *with corporate, industry and government policies to manage business risk of critical business applications*

Control costs *by simplifying IT infrastructure and improving development and operations productivity through easier-to-use interfaces and functions*

and provides ***Architectural Enhancements*** *to relieve constraints on processing, configuration or data capacities allowing for continued application and system growth*

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CICS TS V4 Themes – Notes

CICS Transaction Server for z/OS, Version 4 Release 1 delivers a set of capabilities which provide customer value by enabling business flexibility through IT simplification.

These capabilities are represented in three principal themes.

Compete for new opportunities by gaining insight into business processes and responding by modifying key business applications quickly and with confidence

Comply with corporate, industry and government policies to manage business risk of critical business applications

Control costs by simplifying IT infrastructure and improving development and operations productivity through easier-to-use interfaces and functions

There is a fourth theme that spans the CICS product:

Architectural Enhancements to relieve constraints on processing, configuration or data capacities allowing for continued application and system growth.

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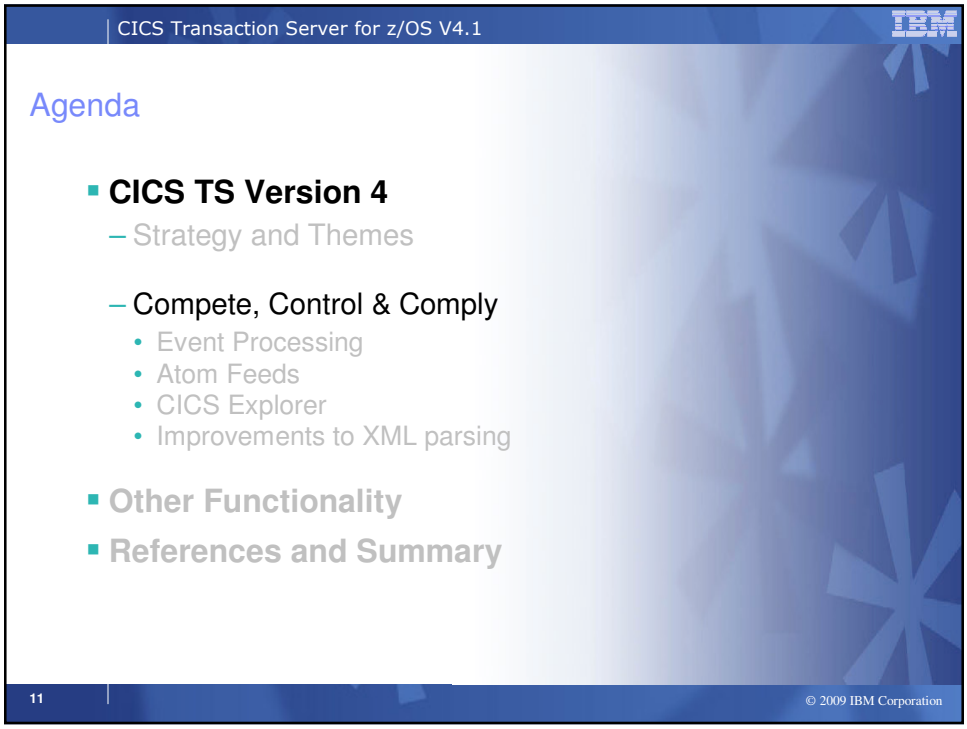
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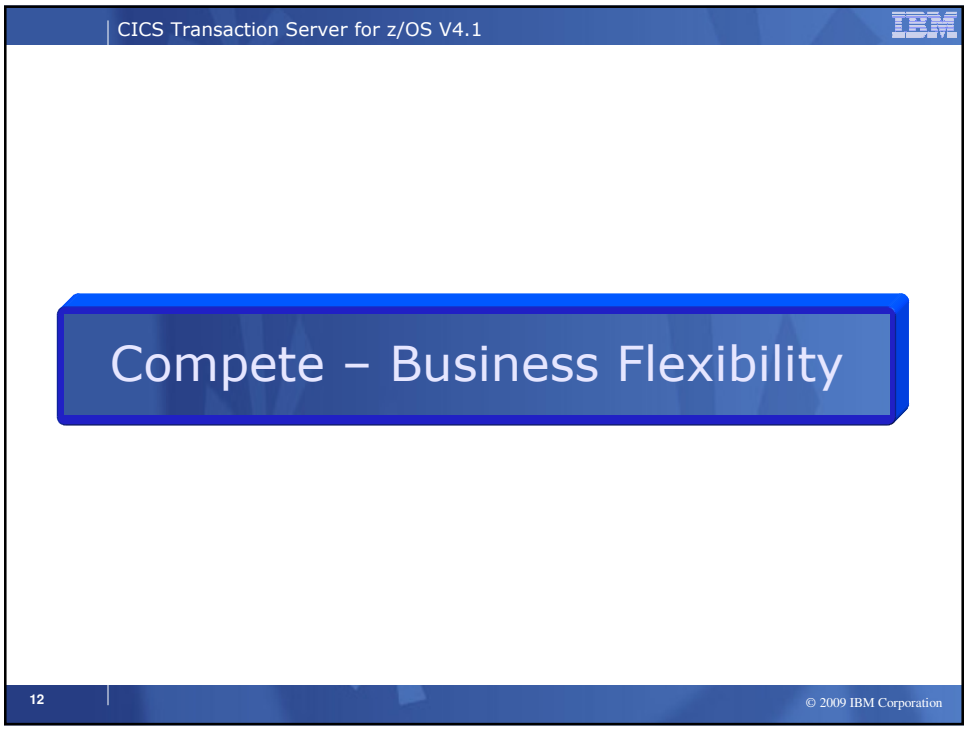
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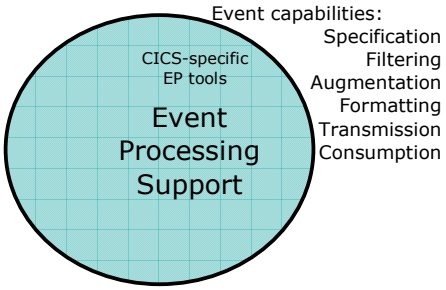
Compete - Business flexibility



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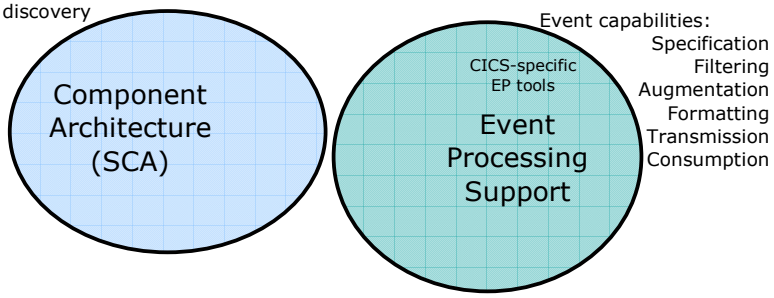
Compete - Business flexibility

Component metadata (SCDL support)
Component discovery
Refactoring



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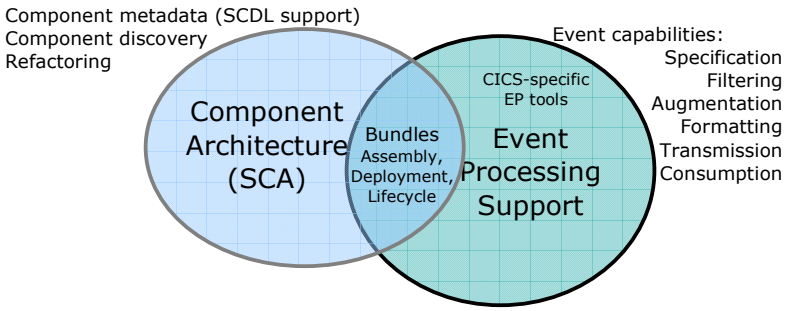
Compete - Business flexibility



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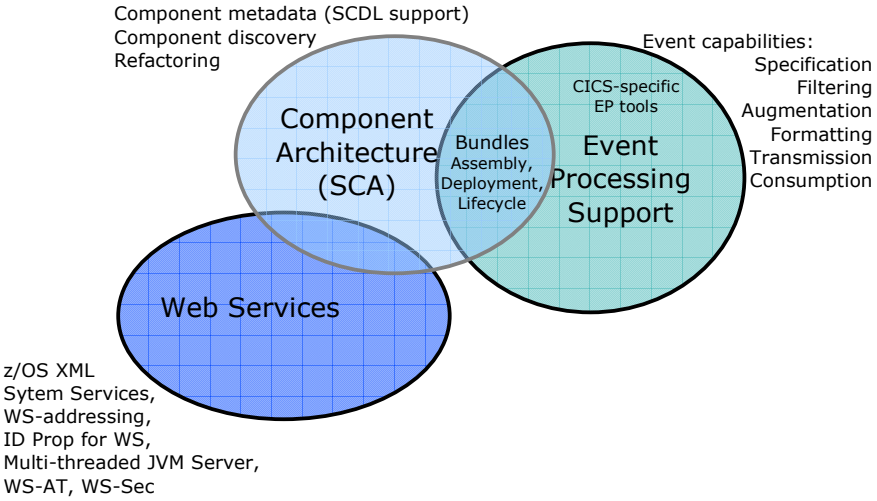
Compete - Business flexibility



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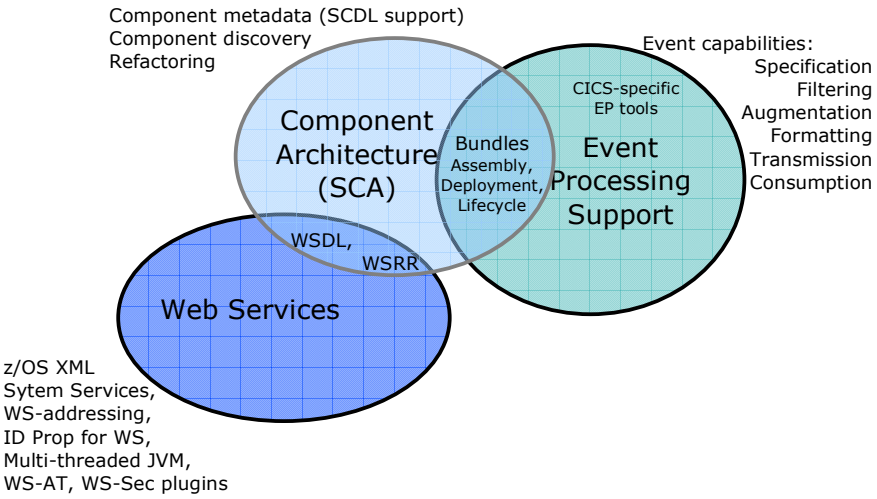
Compete - Business flexibility



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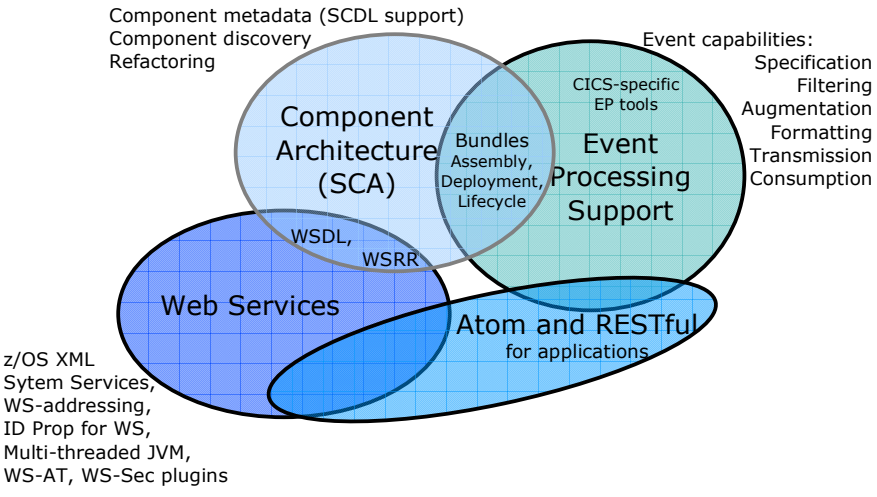
Compete - Business flexibility



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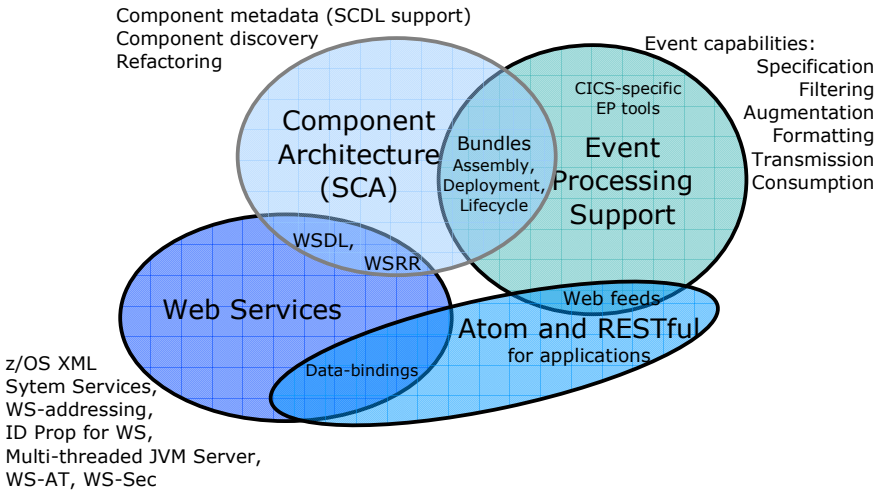
Compete - Business flexibility



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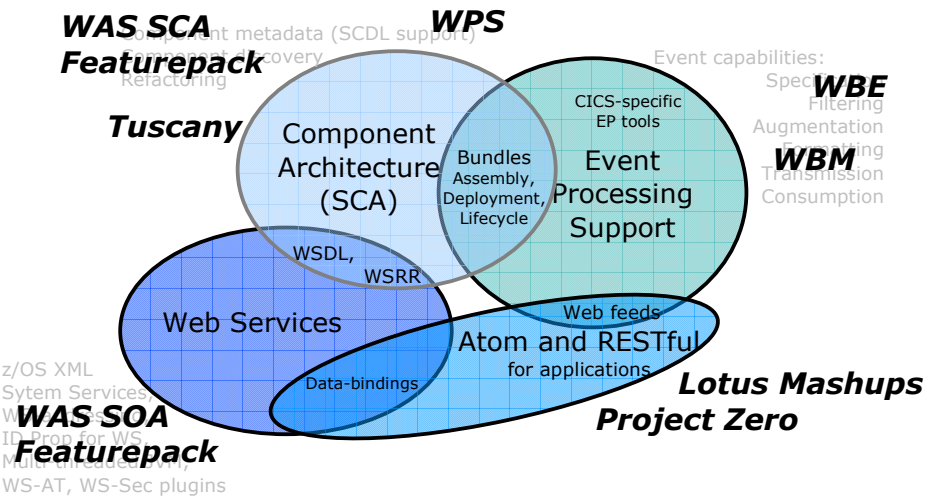
Compete - Business flexibility



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Control Costs – simple, efficient

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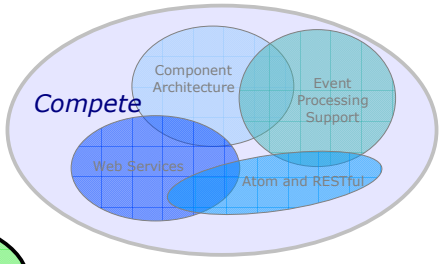
Control Costs - Communications



- IPIC for non-terminal STARTs and TR
- IP Transport Enhancements and IPv6
- MQ Group Attach

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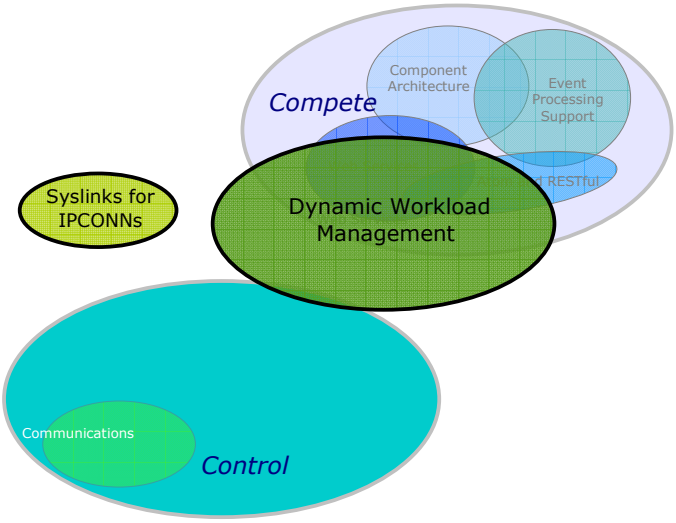
Control Costs – System Management core enhancements



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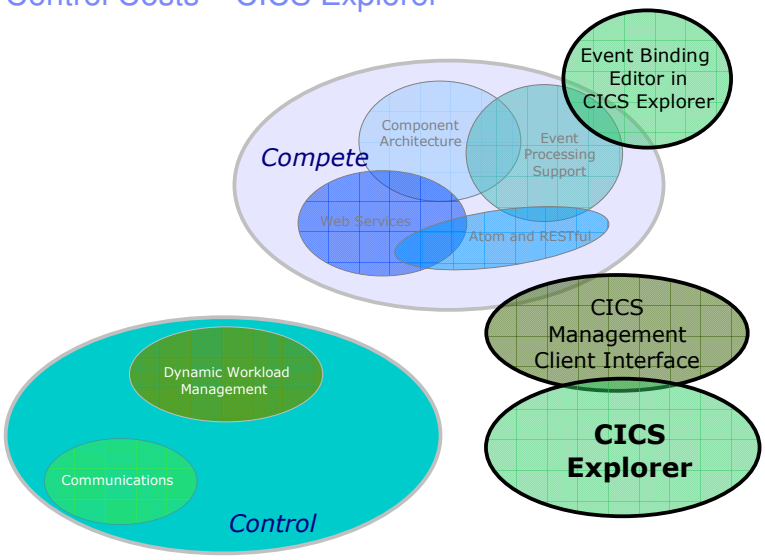
Control Costs – CICS Explorer



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Comply – Manage Risk

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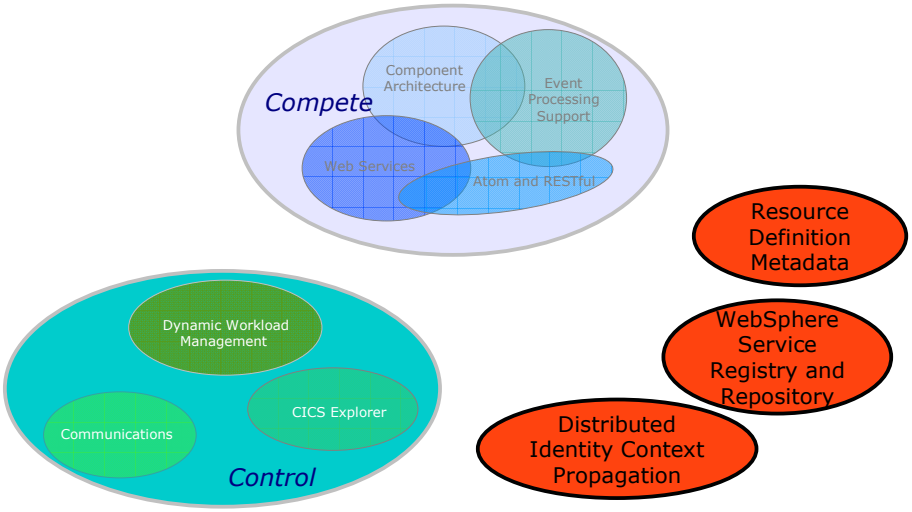
Comply



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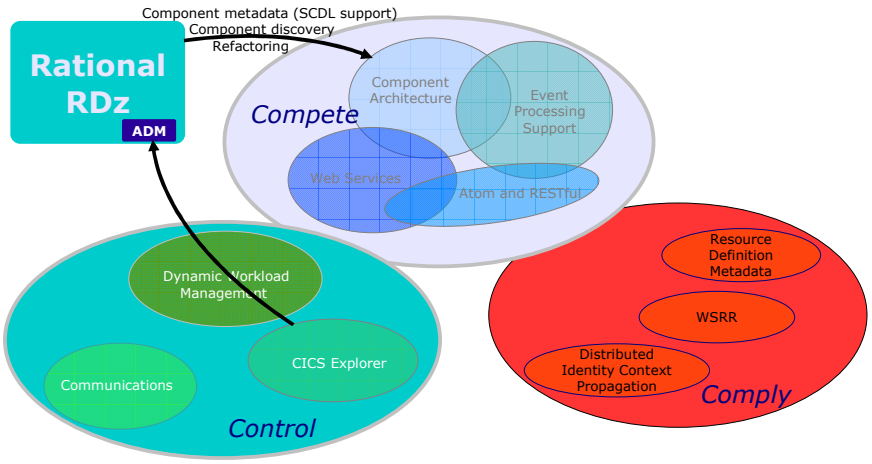
Rational Developer for System z Synergy



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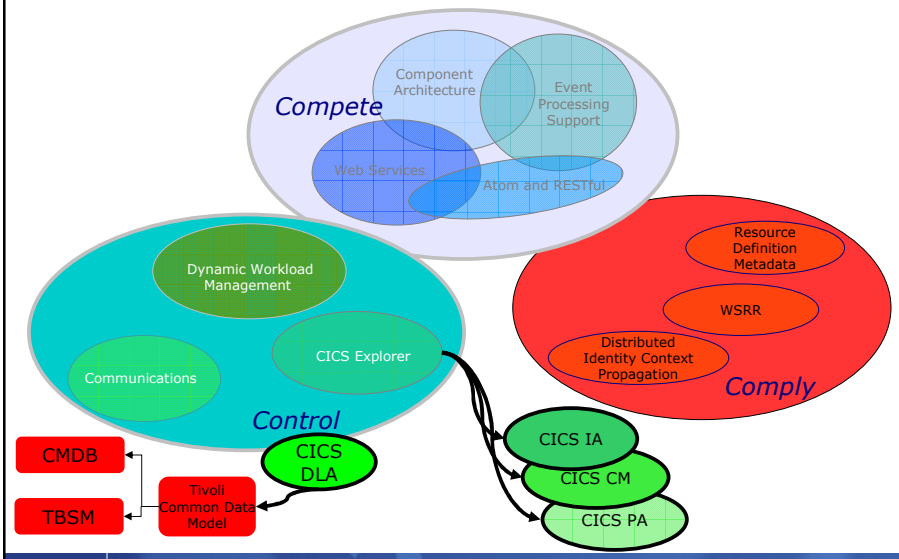
CICS Tools and Tivoli Synergy



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Agenda

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    - **Event Processing**
    - Atom Feeds
    - CICS Explorer
    - Improvements to XML parsing
- **Other Functionality**
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Agenda – Compete, Control and Comply – Notes

The next topics look in more detail at a few of the major functions in the release, which span across a number of the themes, starting with CICS support for Event Processing.

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Event Processing

- **An event is something that happens**
  - A **business event** is something that happens that is relevant to the business
  - "**simple**" event: meaningful in itself
    - Order placement, stock trade
  - "**complex** event processing": detect & respond to patterns of events over time
    - 3 orders from a customer in 2 days, suspicious pattern of ATM activity
  - "Business Event Processing" extends event processing capabilities to business users
- **CICS can be significant source of events**
  - Focus is on events relevant to the Line-of-Business
  - ***CICS will emit single events***
  - Events emitted by CICS could
    - Drive another CICS transaction
    - Be written to a WebSphere MQ queue
    - Be written to a temporary storage queue
    - Be input to a monitor or business manager's dashboard
      - e.g. WebSphere Business Monitor
    - Be sent to a "complex event processing" engine such as WebSphere Business Events
    - …

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Event Processing – Notes

You can specify, capture, and emit business events from a CICS® application. These business events can be consumed by another CICS application, or placed on a WebSphere MQ queue for consumption in a variety of ways including by a complex event processing engine such as IBM WebSphere Business Events.

A business event is anything that happens that is relevant to your business. An individual stock trade or the placement of an order are both examples of business events. CICS allows business events to be captured in an application and emitted for processing, with typically no change to the emitting CICS application.

After CICS has captured and processed a business event, it is passed to an EP (Event Processing) adapter for formatting and routing. CICS provides EP adapters to allow business events to be emitted to WebSphere MQ, either in XML format for consumption by WebSphere Business Events, in CBE (Common Business Event) XML format to the Common Event Infrastructure (CEI) for consumption by business monitors, or in a non-XML character format, as well as to a CICS transaction or to a CICS temporary storage queue.

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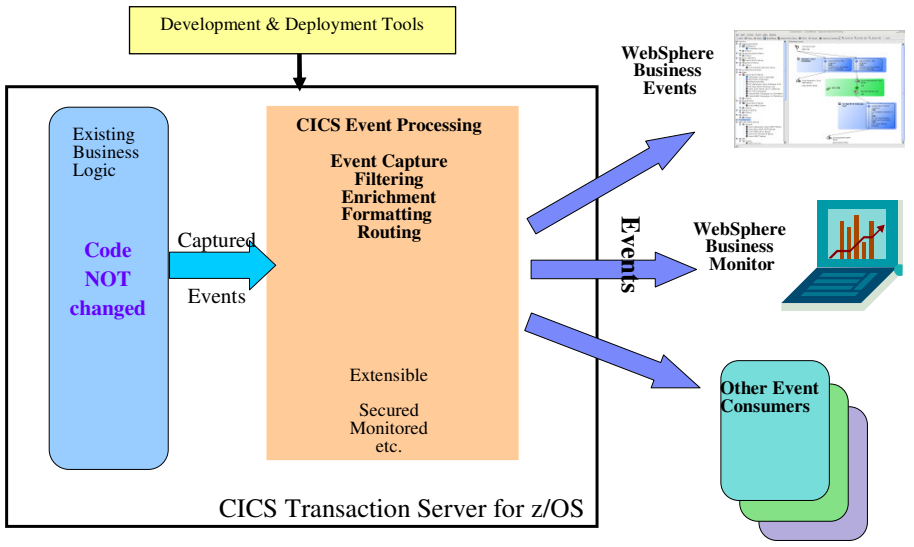
CICS Event Processing Support



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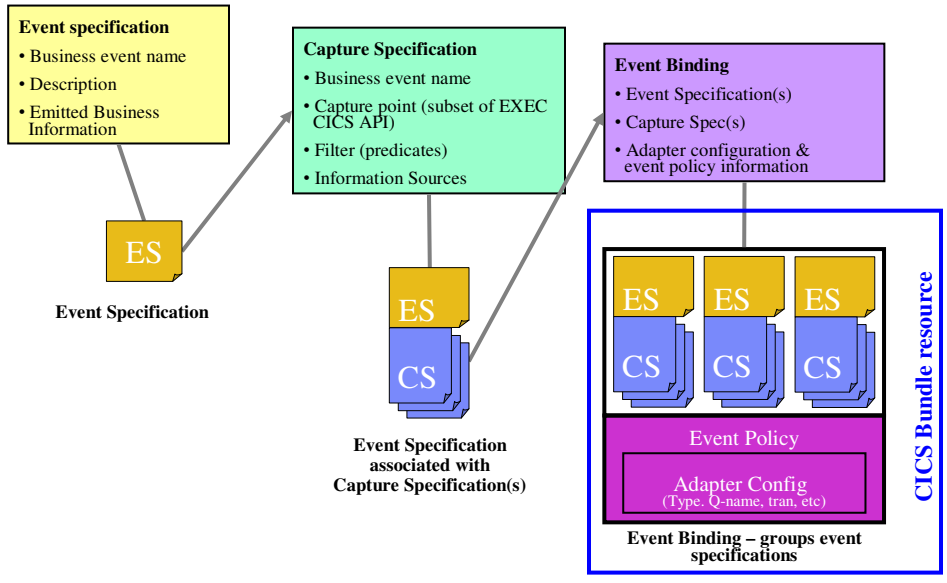
CICS Event Specifications



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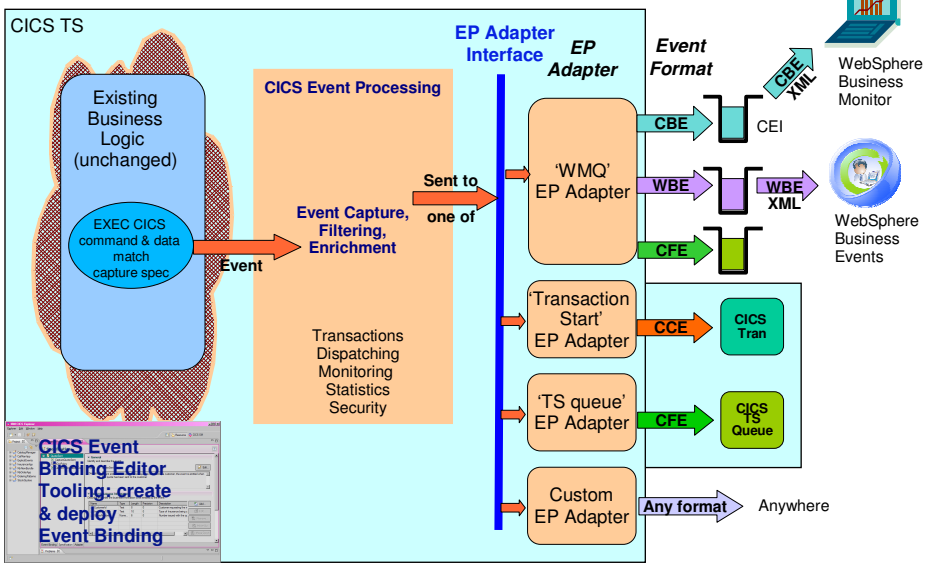
CICS Event Processing Adapters



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CICS Event Processing Adapters – Notes

When an event is captured, CICS directs it to an EP adapter, based on what has been specified in the event binding. All adapters are invoked using a standard EP Adapter interface.

The EP adapters format the event and route it to the potential consumers, which include WebSphere Business Monitor, WebSphere Business Events, and a CICS transaction.

The EP adapters provided by CICS support the following transports and formats:

- WMQ transport, CBE (Common Base Event) XML format – primarily for sending events to WebSphere Business Monitor
- WMQ transport, WBE XML format – primarily for sending events to WebSphere Business Events
- WMQ transport, CFE ("CICS Flattened Event") text-based format – to be read from the queue by consuming application
- CICS transaction start EP adapter, CCE ("CICS Channel-based Event") format – to drive new work in this or another CICS region
- Temporary storage queue EP adapter, CFE format – primarily to test events are emitted when expected and contain the correct data

The standard EP adapter interface also allows users and IBM Business Partners to write custom EP adapters, to support formats and/or transports not provided by CICS

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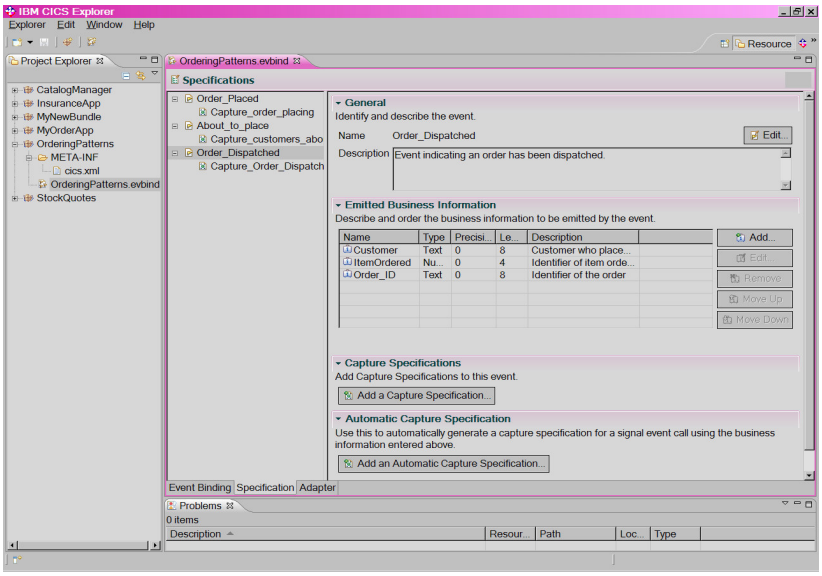
Event Binding Editor – Event Specification



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Event Binding Editor – Event Specification – Notes

This shows a screenshot from the Event Binding Editor, which is the tooling used to create event specifications, and is part of the CICS Explorer.

This slide shows an event Order_Dispatched within an event binding called OrderingPatterns. This view of the event specification shows the business-oriented aspects of the event: its name, which will indicate the interesting thing that happened, a description (which is used to describe the event when working with it in the Event Binding Editor), and the items of information to be included in the event.

In this example, the event indicates that an order has been dispatched, and the business information that is to be emitted as part of the event is the customer to whom the order is being dispatched, the item that was ordered, and an order identifier for the order. When specifying the emitted business information, you also specify whether it is text or numeric data, the length to be emitted, and a precision to be used (for numeric data).

Having defined the external view of the event, the user would 'Add a capture specification', which will indicate to CICS how to detect this event when it occurs at runtime.

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CICS Event Processing

- **Non-invasive instrumentation of events**
  - No requirement to change existing business logic
- **EXEC CICS SIGNAL EVENT for explicit instrumentation**
- **Tooling to create event specifications**
  - Event binding editor in CICS Explorer
  - Deployed to CICS via event bindings in BUNDLE resources
    - Specify event and its payload, and how it can be detected/captured by CICS
    - Specify event capture points as EXEC CICS command (from supported subset)
    - Filtering on command parameters and data
- **Events dispatched to specified EP adapter for formatting and emission to event consumer**
  - CICS-supplied EP adapters
  - Capability to write custom EP adapters

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CICS Event Processing – Notes

A CICS application can capture and emit business events with no change to the application itself, using non-invasive capture points, after (and sometimes before) selected EXEC CICS API calls, and at program start.

For situations in which the non-invasive capture points are not sufficient to capture a specific business event, a new EXEC CICS API call, SIGNAL EVENT, allows events to be captured anywhere in a CICS application.

The CICS Explorer includes the CICS event binding editor, a tool that helps you to define simple business events and create event bindings for your CICS applications. You deploy event bindings to a CICS system from the CICS Explorer.

After CICS has captured and processed a business event, it is passed to an EP (Event Processing) adapter for formatting and routing. CICS provides EP adapters to allow business events to be emitted to WebSphere MQ, either in XML format for consumption by WebSphere Business Events, in CBE (Common Business Event) XML format to the Common Event Infrastructure (CEI) for consumption by WebSphere Business Monitor and other CBE consumers, or in a non-XML character format, as well as to a CICS transaction or to a CICS TS queue.

You can also write your own custom EP adapter, where additional formats and transports are needed.

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Agenda – Atom Feeds – Notes

The next topic is the support in CICS TS V4.1 for Atom Feeds.

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Atom Feeds

- **What is an Atom Feed?**
  - Protocol and XML format for content publishing
    - Provide XML based feed of updated content
    - Process is known as syndicating a feed
      - Follow-on to Really Simple Syndication (RSS)
    - Simple publish/subscribe implementation
      - Polling model
      - Based on http support
  - Described by two Internet Requests for Comments
    - The Atom Syndication Format
      - Targeted at producing feeds
      - RFC4287: (Dec 2005) **http://tools.ietf.org/html/rfc4287**
    - The Atom Publishing Protocol
      - Targeted to creating and updating resources
      - RFC5023: (Oct 2007) **http://tools.ietf.org/html/rfc5023**

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Atom Feeds – Notes

Atom is both a protocol and an XML format for content providers to provide XML based web feeds of updated content. An Atom feed is a web feed provided using the Atom protocol and format. This provision of updated content is known as syndicating a web feed. Web users can subscribe to a feed allowing them to see new content as soon as it is made available.

Atom is described by two proposed standards defined by two Internet RFCs. Consult the following RFCs for complete, and authoritative, information about Atom.

The Atom Syndication Format

The Atom Publishing Protocol

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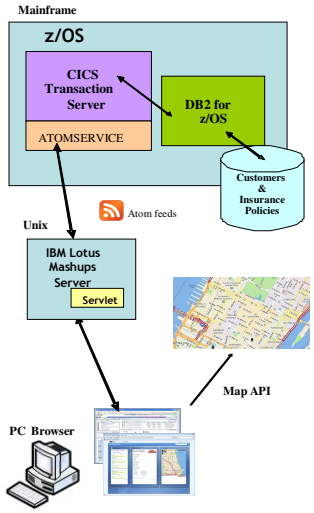
Atom feeds from CICS

- **Enables CICS applications to:**
  - Provide live information for Web 2.0 consumption
  - Integrate with related data
  - Give full picture in a single holistic view
- **Create new applications based on up-to-date content and information**
  - Decision-support tools for knowledge workers
  - Composite user interfaces for expert workers
  - Information feeds & widgets to consumers for use in their own mashups
- **Develop using WebSphere sMash or RDz with EGL**



High level architecture: CICS Atom feeds

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Atom feeds from CICS – Notes

Business users can take advantage of CICS Atom feeds to quickly create mashups, Web 2.0 applications that pull information from a variety of sources and aggregate it into a single, dynamic application. Businesses can exploit mashup technology in a variety of ways, including:

Create decision-support tools for knowledge workers who require access to a variety of commercial and public, structured and unstructured data and content.

Build composite, dynamic user interfaces for workers whose daily activities involve accessing data and functions in multiple, disparate applications and systems.

Make new location-aware applications combining enterprise data with presence information from mobile providers and mapping and geo-spatial information from third parties.

Deliver information feeds and widgets to consumers to use in their own mashups,

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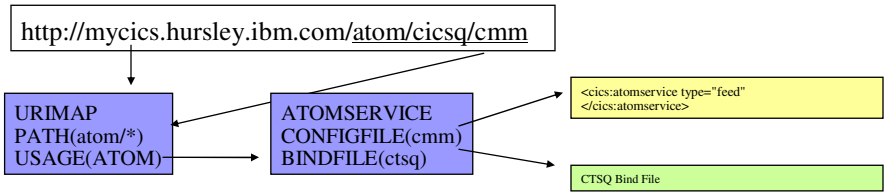
Definitions for Atom Feeds

- **URIMAP definition**
- **ATOMSERVICE definition**
  - Describes the type of Atom document returned
    - FEED, SERVICE, COLLECTION, CATEGORY
  - Specifies the type of CICS resource that provides the data for this Atom feed or collection
    - FILE, TSQUEUE
- **Atom Service Configuration file**
  - Specifies metadata/field names for the returned document
- **XML Binding file**
  - Describes the CICS resource format
  - Created by the CICS XML Assistant



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Definitions for Atom Feeds – Notes

The new ATOMSERVICE resource definition defines an Atom service, feed, collection, or category document, and identifies the Atom configuration file, CICS resource or application program, and Atom binding file that are used to supply the data for the feed. URIMAP resource definitions handle the incoming requests and point to the appropriate ATOMSERVICE resource definition.

The Atom configuration file contains XML that specifies metadata and field names for the Atom document that is returned for this resource definition.

The XML binding file specifies the data structures used by the resource named in RESOURCENAME, which supplies the data for the Atom document that is returned for this resource definition. You can create an XML binding file using the CICS XML assistant program DFHLS2SC.

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Agenda – CICS Explorer – Notes

The CICS Explorer is “the New Face of CICS”.

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CICS Explorer

- **Intuitive and common tooling for CICS architects, analysts, developers, administrators**
  - Quick and easy to install via Web browser
  - Eclipse based, runs on Linux and Windows
  - Fast, highly customizable and extensible
- **CICS Explorer provides operations, workload, resource management and application deployment**
  - Rich set of views, tasks and editors
  - Supports a single CICS region to large CICSPlex
- **Supports CICS tools and the CICS Transaction Gateway**
  - Other IBM tools
  - Easy to link and perform tasks across products
  - Unified resource representation and terminology
- **Transfer skills, knowledge and best practice to new CICS technical staff**
- **Powerful, context-sensitive resource editors**
  - Show only applicable attributes and tabs
  - Clear explanation of options and context help
  - Parameter case sensitivity, length and relationship to other parameters handled by intelligent controls
  - Instant feedback for errors
- **Create your own dashboard to quickly perform common tasks**
  - Save windows, views and filters

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CICS Explorer – Notes

The CICS Explorer is a system management tool that is designed to provide a simple, easy to use way of managing one or more CICS systems. Based on an Eclipse platform, it provides a view of some of the CICSPlex SM functions in a CICS Transaction Server and is a platform for the integration of future CICS tools.

Eclipse is a platform for building and deploying client applications in which the majority of data manipulation is done by the client application rather than the server. This platform is known as a Rich Client Platform (RCP). The platform provides the ability to deploy native graphical user interface (GUI) applications to a variety of desktop operating systems. The CICS Explorer is an Eclipse RCP-based GUI application that runs on the Windows and Linux operating systems.

Today, you manage CICS regions with a variety of stand-alone graphical and non-graphical user interfaces, and with no common way of performing tasks. The CICS Explorer provides a base set of CICSPlex SM functions to manage CICS regions, and a platform on which future CICS tools that are integrated in the Eclipse RCP can perform tasks and present the information in a common way.

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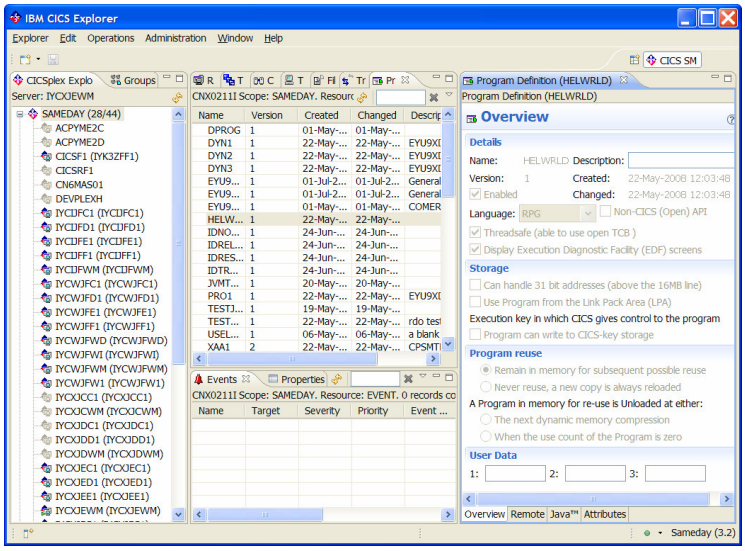
CICS Explorer Screenshot



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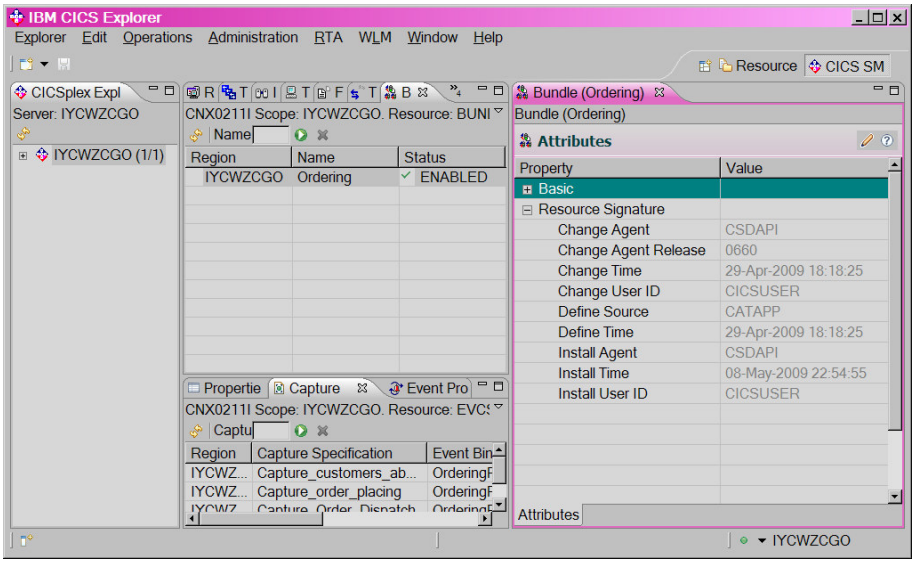
CICS Resource Signatures – *CICS Explorer View*



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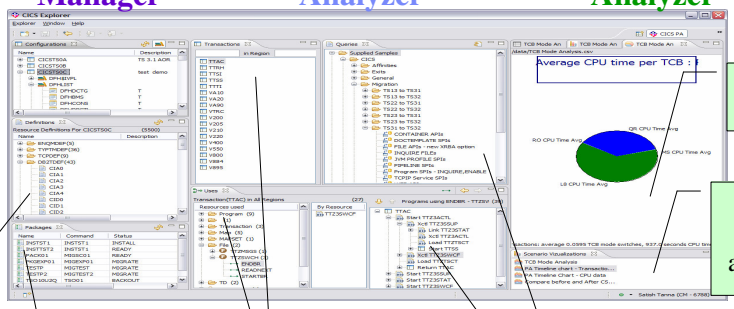
CICS Explorer Tools Plug-ins

Configuration Manager | **Interdependency Analyzer** | **Performance Analyzer**



Average CPU Time

Provides Scenarios for analysing data

Change Packages

Transactions Captured

Shipped Sampled Queries

Resource Definitions for the CSD

View Resources used by a transaction

View tree of resources used

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Agenda

- CICS TS Version 4
  - Strategy and Themes
  - Compete, Control & Comply
    - Event Processing
    - Atom Feeds
    - CICS Explorer
    - **Improvements to XML parsing**
- Other Functionality
- References and Summary

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XML & Web Services

1. **Use of z/OS XML System Services parser**
   - Improved SOAP XML parsing performance
   - Eligible for offload to zAAP engines
   - Parsing storage acquired from 64-bit storage
2. **Generic XML Mapping**
   - EXEC CICS TRANSFORM command
     - XML to Data
     - Data to XML
   - New XML Assistants
     - Language structure to schema
     - Schema to language structure
     - Generates artifacts necessary to define a BUNDLE
       - New XMLTRANSFORM resource definition

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XML & Web services – Notes

z/OS XML System Services (z/OS XML®) parser is a system level XML parser that is integrated with the base z/OS operating system. It is intended for use by system components, middleware, and applications that need a simple, efficient, XML parsing solution. The parser is used for SOAP parsing by CICS web services support. Storage necessary for the parsing process is acquired from 64-bit storage above the bar. If the z/OS LPAR is configured with zAAP engines then system XML parser activity can be offloaded to those engines.

The CICS XML assistant is a set of batch utilities that can be used to transform XML into high-level language structures and vice versa. The assistant supports rapid deployment of applications that perform XML processing with the minimum amount of programming effort.

Using the XML assistant for CICS reduces the amount of code required to parse or construct XML; CICS transforms data between XML fragments and the data structure of an application program.

The XML assistant can create an XML schema from a simple language structure, or a language structure from an existing XML schema, and supports COBOL, C/C++, and PL/I. It also generates metadata that CICS uses at run time to automatically convert XML data to binary application data or vice versa; the metadata is defined in an XML binding file and stored on z/OS UNIX.

CICS provides a new EXEC CICS TRANSFORM command to transform application data to XML or XML to application data. The XML bind file produced by the XML assistants is used in the transformation.

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Agenda

- CICS TS Version 4
  - Strategy and Themes
  - Compete, Control & Comply
    - Event Processing
    - Atom Feeds
    - CICS Explorer
    - Improvements to XML parsing
- **Other Functionality**
  - **The rest of CICS TS V4.1**
- References and Summary

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Other Functionality – Notes

The slides which follow provide more details on much of the other functionality and capability that is included in CICS TS V4.1.

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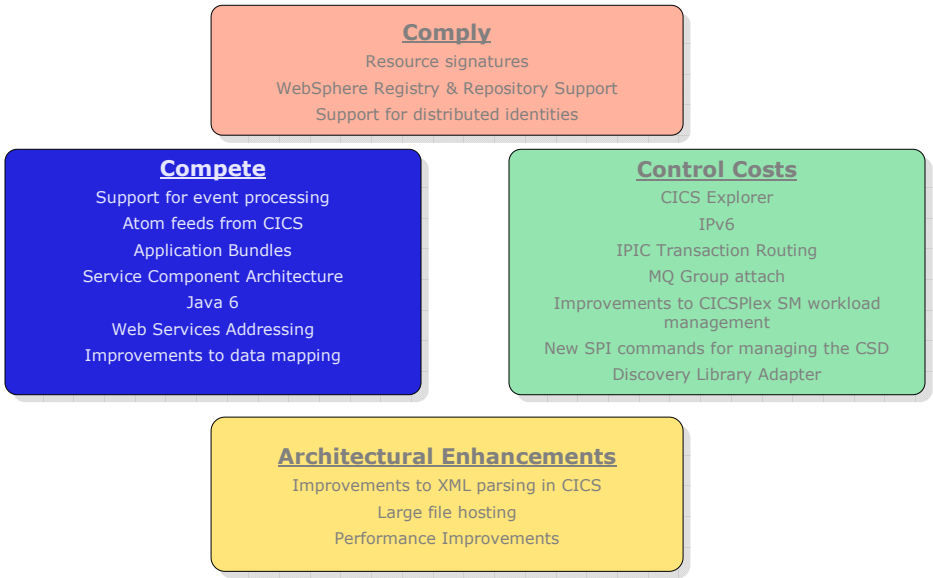
CICS Transaction Server V4.1 Key Enhancements



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Key Enhancements – Compete - Notes

This section focuses on other functionality in the area of 'Compete'.

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CICS Bundles

- **New resource type: BUNDLE**
- **Defines a unit of deployment for an application**
  - The collection grouping is maintained for the life of the bundle install
    - All resources are enabled or disabled as a group
    - Managed by a new Resource Lifecycle domain (RL)
- **A collection of:**
  - CICS resources
  - Artifacts
  - References
  - A manifest file
- **Enable Extensible Resource Definitions**
  - Registration Program
    - Name (register) the callback program for a resource
    - URI that describes the resource that the callback program can manage
  - Callback Interface
    - Creates and manages the life cycle of a user resource
      - Create, enable, disable, or discard the user resource

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CICS Bundles – Notes

A bundle is a collection of CICS resources, artifacts, references, and a manifest that represents the resources it contains. A number of the new resources in CICS TS V4.1 are not defined and installed as individual resources, but by being included in a Bundle resource. These include the resources for service components, and event bindings.

Bundles are typically created using a tool such as Rational Developer for System z or the CICS Explorer.

A bundle is defined in CICS using a BUNDLE resource.

The BUNDLE resource is different from an RDO group because it maintains a relationship with all of the resources after they are installed, so that you can manage all of the related resources as a single entity; for example, if you disable a BUNDLE resource because you want to stop an application from running, CICS disables all of the related application resources for you. To view the contents of a bundle and the state of its resources, use the IBM CICS Explorer.

Extensible for additional resource types:

Use the bundle registration interface to register a program as the owner of a resource type that is deployed in an application bundle. The program is responsible for managing the life cycle of any resources of a particular type that are installed in a CICS region as part of a bundle deployment.

To define your own user resources in a bundle, write a callback program to handle the management of the user resources when the bundle deploys into the CICS region. CICS provides a registration interface to register the callback program as the owner of a user resource type. The registration interface is channel-based and provides containers that your registration program must populate.

When a bundle contains a resource type that the callback program is responsible for handling, CICS calls the program to create the resource using a channel-based callback interface. CICS calls the program for other transitions during the resource lifecycle, such as enablement and disablement.

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Service Component Architecture

A new service-oriented programming model for IBM middleware to simplify the development of applications and integration of applications into solutions

- **Open programming model for assembling SOA solutions from flexible, reusable service components based on diverse business IT assets**
- **Specifications that describe a model for building applications & systems using SOA**
- **Extends, exploits and complements existing standards**
  - Web Services, JMS, JEE, JCA, etc
- **Provides business functions by assembling services together in a composite application**
  - Application assembly, NOT application flow
- **Services can be implemented in various programming languages**
- **Services are bound together by various communication technologies**
- **Simple deployment and packaging model**
- **Benefits include: Loose Coupling, Flexibility, Re-use**

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Service Component Architecture – Notes

"Service Component Architecture (SCA) provides a programming model for building applications and systems based on a Service Oriented Architecture. It is based on the idea that business function is provided as a series of services, which are assembled together to create solutions that serve a particular business need. These composite applications can contain both new services created specifically for the application and also business function from existing systems and applications, reused as part of the composition. SCA provides a model both for the composition of services and for the creation of service components, including the reuse of existing application function within SCA compositions.

SCA is a model that aims to encompass a wide range of technologies for service components and for the access methods which are used to connect them. For components, this includes not only different programming languages, but also frameworks and environments commonly used with those languages. For access methods, SCA compositions allow for the use of various communication and service access technologies that are in common use, including, for example, Web services, Messaging systems and Remote Procedure Call (RPC)."

Specifications:

http://osoa.org/display/Main/Service+Component+Architecture+Specifications

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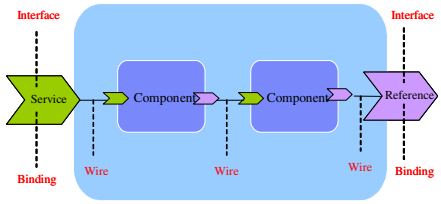
Service Component Architecture and CICS

- **Provide capability to easily develop flexible and reusable CICS application components**
  - Rapid assembly and deployment of new Services
  - Express existing applications as re-usable components
- **Separation of bindings from application code allows flexible infrastructure changes**
- **Reduce skills and effort required to view and manage business applications**



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Service Component Architecture and CICS – Notes

CICS provides support for applications that conform to the Service Component Architecture (SCA) specifications. SCA supports rapid deployment of new applications to meet changing business requirements by promoting the reuse of existing application assets in a component model.

In SCA, applications are composed of services, where each service is described using one or more components. These components are assembled together into a composite application that can participate in a service-oriented architecture (SOA) as part of a business service. A business service is a service that is aligned with business processes and models rather than a technical implementation.

The SCA component model is flexible, so you can reuse the same components in different composite applications without needing to change the underlying business logic.

To create a composite application, use the SCA tooling in Rational Developer for System z. The SCA tooling deploys composite applications to CICS as bundles and can be enabled and disabled using the BUNDLE resource.

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CICS SCA Infrastructure

- **Types of services**
  - **Channel based services**
    - Allow CICS LINKable assets to be defined as a component interface
      - Channel and container support
      - COMMAREA suppport
    - Available to other CICS programs that use the INVOKE SERVICE command
  - **XML based services**
    - Available to CICS applications that use the INVOKE SERVICE command
    - Available to business services on an external network
- **Use SCDL to describe and deploy a composite**
  - RDz SCA tooling
    - Wizards for CICS Component and Composite creation
    - Composite editor
    - Wizard for Bundle creation/deployment
- **New EXEC CICS INVOKE SERVICE command**
  - INVOKE WEBSERVICE command now a synonym of INVOKE SERVICE

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CICS SCA Infrastructure – Notes

You can create two types of service from your CICS applications:

Channel-based services are CICS applications that are described as components and assembled together using a tool such as Rational Developer for System z. Channel-based services can be called only by other CICS applications that use the INVOKE SERVICE API command and pass binary data in containers on a channel. (COMMAREA support is provided by passing the commarea in a container.)

In a service component architecture, the application program that you want to expose as a channel-based service is the implementation of the business logic. The application program is defined in the <Implementation> element of a component. The service definition of the component describes the interface to the application program in WSDL. There is one interface for a component, which can contain operations and bindings. For a channel-based service, the binding is described in the binding.cics section of the SCDL. There are no data mappings for a channel-based service, because the application interface expects a channel and binary data in containers.

XML-based services are Web service provider or requester applications that use XML to interface with other applications and use a binding to transform the data. XML-based services can be called by other CICS applications using the INVOKE SERVICE API command or by business services that are on an external network. For a Web service, the binding is described in the binding.ws section of the SCDL. The SCDL also includes the data mappings that transform the XML to the appropriate high-level language.

You can either create Web services using the Web services support in CICS or you can use Rational Developer for System z. If you use Rational Developer for System z, you can also create a service architecture component from your Web service. There are some advantages to creating a component from a Web service:

You can more reuse existing components to rapidly develop new composite applications using Rational Developer for System z.

You can use SCDL to describe the Web service, moving the configuration information out of the application and into metadata that is easier to change without having to change the application. For example, if you want to run a Web service under different transaction and user IDs, you can change the SCDL without having to regenerate the Web service binding file.

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Java 6

- **Support provided for the IBM 31-bit SDK for z/OS Java Technology Edition, V6**
  - Pre-requisite for CICS Web services and XML assistants, Java programs in CICS
  - Compliant with the Java SDK 6 compatibility tests
  - Can utilise System z Application Assist Processors (zAAPs)
  - Support for Java 1.4.2 and Java 5 has been removed
    - Java SDK 6 supports upward compatibility

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Java 6 – Notes

CICS TS V4.1 supports the JVM provided by the 31-bit version of the IBM SDK for z/OS, Java Technology Edition, Version 6. With Java 6, you continue to benefit from the new Java language features, improved garbage collection, and simpler class sharing first introduced in Java 5.

CICS TS V4.1 does not support the 64-bit version of the IBM SDK for z/OS, Version 6.

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Web Services Addressing

- **CICS Web Services Addressing**
  - Defines transport neutral mechanisms to address Web Services
    - Facilitates message transmission through networks
  - Consists of a SOAP Header describing
    - Endpoint Reference
      - Uniquely identify the service requested
    - Message addressing properties
      - Convey information about message relationships
      - Provide information on where messages are to be directed
  - WS-Addressing Specifications
    - Recommended
      - http://www.w3.org/TR/ws-addr-core/
      - http://www.w3.org/TR/ws-addr-soap/
      - http://www.w3.org/TR/ws-addr-metadata/
    - Submission
      - www.w3.org/Submission/ws-addressing

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CICS Web services addressing – Notes

CICS supports services that use the Worldwide Web Consortium (W3C) Web Services Addressing (WS-Addressing) specifications. This family of specifications provides transport-neutral mechanisms to address Web services and facilitate end-to-end addressing.

Web Services Addressing (WS-Addressing) is a Worldwide Web Consortium (W3C) specification that aids interoperability between Web services by defining a standard way to address Web services and provide addressing information in messages. The WS-Addressing specification introduces two primary concepts: endpoint references, and message addressing properties

Endpoint references provide a standard mechanism to encapsulate information about specific endpoints. Endpoint references can be propagated to other parties and then used to target the Web service endpoint that they represent.

Message addressing properties (MAPs) are a set of well defined WS-Addressing properties that can be represented as elements in SOAP headers and provide a standard way of conveying information, such as the endpoint to which message replies should be directed, or information about the relationship that the message has with other messages.

By default, CICS supports the W3C WS-Addressing 1.0 Core and W3C WS-Addressing 1.0 SOAP Binding specifications that are identified by the http://www.w3.org/2005/08/addressing namespace.

For interoperability, CICS supports only the W3C WS-Addressing Submission specification with the namespace http://schemas.xmlsoap.org/ws/2004/08/addressing.

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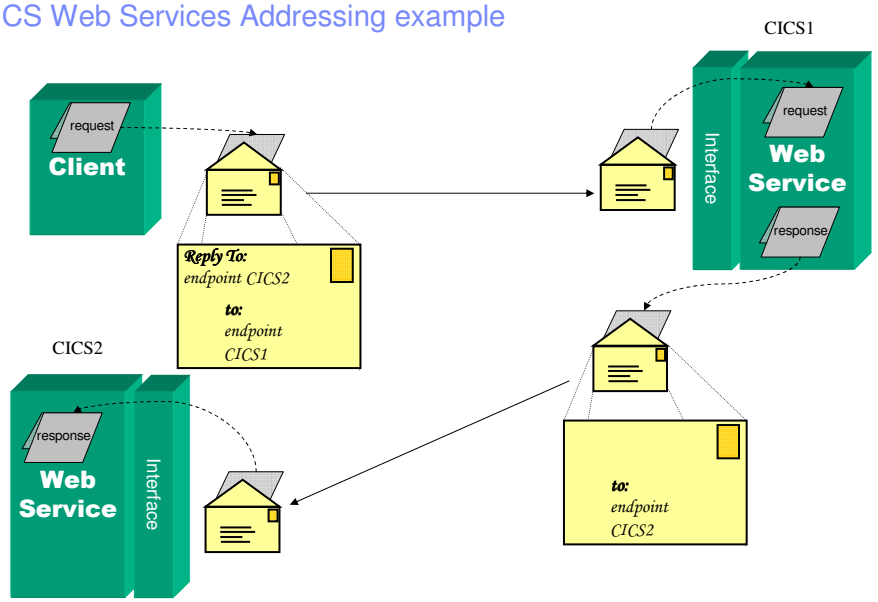
CICS Web Services Addressing example



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WS-Addressing example – Notes

An example of how WS Addressing may be used. In this example, the response is not returned to the requester, but to another system.

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WS-Addressing and CICS Applications

- **CICS Pipeline Configuration (Requester and Provider)**
  - New SOAP header handler to processing WSA constructs
- **New CICS commands**
  - EXEC CICS WSAEPR CREATE
    - Create an endpoint reference (EPR) to represent a Web service or Web service resource
  - EXEC CICS WSACONTEXT BUILD
    - Build an addressing context
  - EXEC CICS WSACONTEXT GET
    - Get the message addressing properties (MAPs) of the service requester
    - Get the MAPs of a service provider

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WS-Addressing and CICS applications – Notes

CICS service provider and requester programs need not be changed to use the WS Addressing functions. A CICS provided SOAP pipeline header handler can process the WSA elements and shield the application from the need to know about WS Addressing.

Web Services Addressing (WS-Addressing) support introduces new commands to manipulate addressing contexts and endpoint references (EPRs) for applications which do want to be WS-Addressing aware.

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CICS Transaction Server V4.1 Key Enhancements

Comply
- Resource signatures
- WebSphere Registry & Repository Support
- Support for distributed identities

Compete
- Support for event processing
- Atom feeds from CICS
- Application Bundles
- Service Component Architecture
- Java 6
- Web Services Addressing
- Improvements to data mapping

Control Costs
- CICS Explorer
- IPv6
- IPIC Transaction Routing
- MQ Group attach
- Improvements to CICSPlex SM workload management
- New SPI commands for managing the CSD
- Discovery Library Adapter

Architectural Enhancements
- Improvements to XML parsing in CICS
- Large file hosting
- Performance Improvements

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Key Enhancements – Control Costs - Notes

This section focuses on other functionality in the area of 'Control Costs' and IT Simplification.

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IPv6 Background

- **Evolution of the current version of IP (IPv4)**
  - Work started on this in the early 90's
- **IPv4 has 32 bit addresses**
  - IPv4 address – 10.67.122.66
  - Practical limit: less than 1 billion useable global addresses
- **IPv6 has 128 bit addresses**
  - IPv6 address – 2001:0db8:0000:0000:0000:0000:1428:57ab
  - No practical limit on global addresses
    - 2^{128} addresses
    - 5 x 10^{28} addresses for each of the 6.5 billion people alive today
- **IPv4 format**
  - Native 1.2.3.4 with each element 0-9, 00-99 or 00-255
- **IPv6 format to represent IPv4**
  - Compatibility ::1.2.3.4 with each element 0-9, 00-99 or 00-255
  - Mapped ::FFFF:1.2.3.4 with each element 0-9, 00-99 or 00-255
- **IPv6 format**
  - 1:2:3:4:5:6:7:8 with each element 0-F, 00-FF, 000-FFF or 0000-FFFF
  - If one or more 4 digit groups are 0000 the zeros may be replaced by two colons

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IPv6 Background – Notes

From Wikipedia:

"Internet Protocol version 6 (IPv6) is a network layer for packet-switched internetworks. It is designated as the successor of IPv4, the current version of the Internet Protocol, for general use on the Internet.
The main change brought by IPv6 is a much larger address space that allows greater flexibility in assigning addresses. The extended address length eliminates the need to use network address translation to avoid address exhaustion, and also simplifies aspects of address assignment and renumbering when changing providers. It was not the intention of IPv6 designers, however, to give permanent unique addresses to every individual and every computer.
It is common to see examples that attempt to show that the IPv6 address space is extremely large. For example, IPv6 supports 2^{128} (about 3.4×10^{38}) addresses, or approximately 5×10^{28} addresses for each of the roughly 6.5 billion (6.5×10^{9}) people alive today. In a different perspective, this is 252 addresses for every star in the known universe – more than ten billion billion billion times as many addresses per star as IPv4 supported."

You can specify an IPv4 address in one of the following formats:

As a native IPv4 dotted decimal address (for example, 1.2.3.4)

The following two formats are the IPv6 way of representing an IPv4 address

Using IPv6 syntax for an IPv4 migrated address (for example, ::FFFF:1.2.3.4)

As an IPv6 compatible address (for example, ::1.2.3.4)

You can specify an IPv6 address in the following format:

As a native IPv6 colon hexadecimal address (for example, ::a:b:c:d) without square brackets. IPv6 address syntax is described in RFC 4291, IP Version 6 Addressing Architecture, available from http://www.ietf.org/rfc/rfc4291.txt.

IPv6 addresses are normally written as eight groups of four hexadecimal digits, where each group is separated by a colon (:). For example, 2001:0db8:85a3:08d3:1319:8a2e:0370:7334 is a valid IPv6 address.

If one or more four-digit group(s) is 0000, the zeros may be omitted and replaced with two colons(::). For example, 2001:0db8:0000:0000:0000:0000:1428:57ab can be shortened to 2001:0db8::1428:57ab. Following this rule, any number of consecutive 0000 groups may be reduced to two colons, as long as there is only one double colon used in an address. Leading zeros in a group can also be omitted (as in ::1 for localhost)

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CICS Support for IPv6

- **Allow for IPv4, IPv6 or host names in:**
  - Resource definitions
  - Application Programming Interface
  - System Programming Interface
  - User Replaceable Modules
  - Global User Exits
  - Monitoring Records

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CICS Support for IPv6 – Notes

With CICS TS V4.1, you can now operate in an Internet Protocol version 6 (IPv6) network without the need for address translation. CICS still operates in an IPv4 network as before.

IPv6 is the protocol designed by the IETF to replace the current version Internet Protocol, IP Version 4 (IPv4). The IPv6 format has a much larger address space than IPv4, which provides greater flexibility in allocating addresses and for routing traffic.

A dual-mode environment operates in both IPv4 and IPv6 networks and always attempts to communicate using IPv6 before using the IPv4 network. A single-mode environment operates in an IPv4 network only.You can communicate using IPv4 and IPv6 if you have a CICS TS V4.1 region running in a dual-mode (IPv4 and IPv6) environment that is communicating with a CICS TS V4.1 region that is also running in a dual-mode environment.

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IP Interconnectivity

- **Continuation of CICS IP interconnectivity strategy**
  - 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
- **Enhancements to support 3270 transaction routing**
  - BMS, security and monitoring support
  - Shippable terminals supported
  - Restrictions
    - Routable(YES) on transaction definition not supported
    - No EDF
    - BMS routing support
    - No routing for APPC devices
- **Enhancements to Asynchronous Starts**
  - ATI over IPIC supported

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IP Interconnectivity – Notes

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.

IPIC supports these intercommunication functions and releases:

- Distributed program link (DPL) calls between CICS TS 3.2, or later, and other CICS TS 3.2, or later, regions.
- Transaction routing between CICS TS 4.1 and other CICS TS 4.1 regions.
- Asynchronous processing of START, START ATTACH, START CHANNEL and CANCEL commands between CICS TS 4.1 and other CICS TS 4.1 regions.
- The routing transaction, CRTE, supports transaction routing over IPIC connections.
- ECI requests from CICS Transaction Gateway Version 7.1 or later to CICS TS V3.2 or later.

Up to two send and two receive sockets are now available for each IPIC connection, replacing the single send and single receive socket. The increase in the number of sockets can improve your transaction throughput.

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MQ Group Attach

- **Connect to any active member of a WMQ Queue Sharing Group**
  - Allows common resource definitions for CICS regions
  - Connect to only one QMGR at a time
    - RESYNCMEMBER attribute for in-doubt resolution
  - QMGR must be on the same LPAR
- **Changes to CICS externals**
  - Resource definition
    - New MQCONN resource
  - SPI
    - EXEC CICS SET MQCONN
      - Quiecse or forceclose the connection
    - CICSPlex SM WUI views
    - CICS Explorer support

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MQ Group Attach – Notes

You can now specify a WebSphere MQ queue-sharing group for the CICS-WebSphere MQ connection, so CICS uses any eligible queue manager in the group when it reconnects to WebSphere MQ, rather than waiting for a single queue manager. Queue-sharing groups increase reliability when you reconnect to WebSphere MQ, and help you standardize this aspect of CICS setup across CICS regions and z/OS images.

Instead of defining default settings for the CICS-WebSphere MQ connection in the DFHMQPRM operand of an INITPARM system initialization parameter, you must now use the new MQCONN resource definition. You can use the MQCONN resource definition to specify a queue-sharing group, or you can use it to specify the name of a single queue manager.

If you have specified a queue-sharing group for the connection, you can select appropriate resynchronization actions for CICS using the RESYNCMEMBER attribute of the MQCONN resource definition. Resynchronization works in the same way as it does for the group attach function for DB2. Resynchronization takes place when the connection to WebSphere MQ is lost and CICS is holding outstanding units of work for the last queue manager. You can choose whether CICS waits to reconnect to the same queue manager, or whether CICS makes one attempt to reconnect to the same queue manager, but if that attempt fails, connects to a different eligible queue manager in the group. A queue manager is eligible for connection to a CICS region if it is currently active on the same LPAR as the CICS region.

An MQCONN resource defines the attributes of the connection between CICS® and WebSphere MQ. You can install or discard an MQCONN resource only when CICS is not connected to WebSphere MQ.

Only one MQCONN resource can be installed at a time in a CICS region. When you define an MQCONN resource, CICS checks to ensure that there is only one MQCONN resource defined in the group or list. If more than one is found, even one with a different name, a warning message is issued. If you do install a second MQCONN resource, CICS implicitly discards the existing MQCONN resource before proceeding with the installation, unless you are reinstalling an MQCONN resource with the same name.

When you have installed the MQCONN resource, you can use the CEMT or EXEC CICS SET MQCONN command, CICSPlex SM, or the CICS Explorer to start the connection between CICS and WebSphere MQ.

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Workload Management and CICSPlex SM

- **Sysplex-optimization to significantly reduce workload batching effects**
  - Exploitation of z/OS coupling facility
    - "Near real time" Sysplex-wide focus on target region status
    - No impact to "non-optimized" WLM
  - Optimized WLM routing enabled by configuring a Region Status Server
    - Uses CF Data Table to hold Region Status information
      - SOS, MaxTask, System or transaction dump in progress, Current Tasks?
    - Shared by all routing regions (in the Sysplex)
- **Percentile goals**
  - CICSPlex SM WLM support for percentile goals
- **Support in CICSPlex SM for all new resources, statistics, etc**

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WLM and CICSPlex SM – Notes

In CICS TS V4.1, workload throughput is improved through a more efficient workload management optimization function. This function is most effective for distributed workloads, for which the routing and target regions are managed by different CMASs. With new CICSPlex SM WUI views, you can monitor the distribution of dynamic workloads through your CICSplex.

Sysplex optimized workload routing is enabled at the z/OS coupling facility level by a region status server. If the coupling facility is not available, workload routing is managed by CICSPlex SM Workload Manager (WLM) using z/OS dataspaces owned by a CMAS to share cross-region load and status data.

CICS TS V4.1 provides support for z/OS workload manager percentile goals.

A percentile goal sets the percentage of transactions to be completed in the target response time. For example, consider a percentage goal set to 80% and response time set to 1 second. If a period contains 200 transactions, 160 of them must complete with a response time less than or equal to 1 second to meet the percentile goal.

Before CICS TS V4.1, any percentile goals were ignored by CICSPlex SM. So customers who use the CICSPlex SM goal algorithm and have z/OS WLM percentile goals will see different routing behavior when they migrate to CICS TS V4.1.

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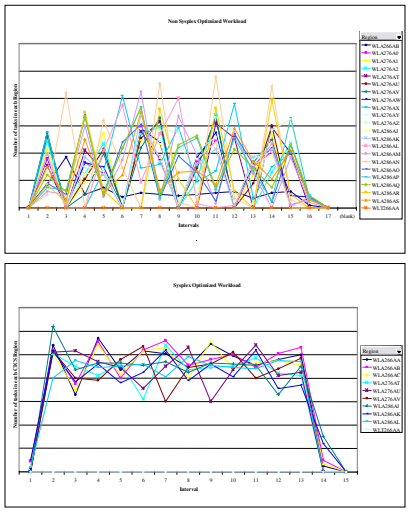
CICSPlex SM WLM: Optimized versus Non-optimized Routing



- **Non-optimized Routing**
  - 27 CICS regions on 3 LPARs
- **Optimized Routing**
  - 9 CICS regions on 3 LPARs
- **Comparison**
  - Workload is 10K started transactions
  - Number of tasks in each region measured every 10 second interval
- **Results**
  - Non-optimized environment shows “batching effects
  - Optimized results shows smoother distribution of work and higher throughput

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CICSPlex SM Optimized WLM – Notes

This chart illustrates the difference between CICSPlex SM Sysplex Optimized Routing and non-optimized routing. Ten thousand (10,000) transactions were started in both cases. In the non-optimized case there were 27 CICS regions on 3 LPARs. In the optimized case, only 9 CICS regions on 3 LPARs were required for the same workload.

What can clearly be seen in the non-optimized case (top chart) is the latency or batching that is occurring on the remote AORs. An AOR is routed to until it reaches MAXTASK and then the router discovers it is too busy and routes nothing to it. This occurs on the 15 second CICSPlex SM cycle as the heartbeat gathers the health information on the remote regions. An AOR is found to be not busy, CICSPlex SM routes to it and 15 seconds later finds it overloaded and stops routing to that AOR. This cycle is repeated over and over.

What we see in the optimized case (bottom chart) is what happens when the 15 second cycle is removed and the router has current information as to the health state of the AORs. Our results show a leveling of throughput on all the AORs and a higher throughput resulting in the 10K transaction be done in less elapsed time.

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Discovery Library Adapter

- **The IBM Discovery Library facilitates a common way to share information about discovered resources and relationships**
  - A set of specifications, components, and best practices for communicating the discovery of resources and the relationships between resources within the enterprise
  - A way to exchange resource and relationship data across multiple applications.
  - XML schema specification
- **CICS is providing a Tivoli Discovery Library Adapter (DLA) for CICS resources**

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Discovery Library Adapter – Notes

The Discovery Library Adapter (DLA) for CICS is a utility that collects runtime information about CICS and CICSPlex SM resources. It generates XML files that can be used by a discovery library reader to track these resources and their interdependencies across the enterprise.

The CICS DLA uses CICSPlex SM services to generate XML files (“books”) that conform to the Discovery Library IdML XML schema and Common Data Model (CDM). The books can be loaded by various products including Tivoli Change and Configuration Management Database (CCMDB) and Tivoli Business Service Management (TBSM).

The CICS DLA operates against all the CICSplexes that are associated with a specified maintenance point CMAS. The specified CMAS must be running at the current release level; however, the CICS regions discovered by the DLA can be at earlier release levels, as allowed by the cross-release support rules for CICSPlex SM.

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Discovery Library Adapter Utility

- **CICS DLA Utility (EYUJXDDP)**
  - Runs as Batch Job or Started Task
    - Range and depth of discovery controlled by parameters
    - Select the books to create:
      - CTSPLEX, CICSPLEX, CICSREGION
  - Uses CICSPlex SM services to generate XML files
    - Writes IdML books to a PDS
  - Runs against a specified CMAS
    - CMAS must be current level of CICSPlex SM
    - CICS regions discovered by the DLA can be an earlier release

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Discovery Library Adapter Utility – Notes

To use the CICS DLA you run EYUJXDD0 as a batch job on a z/OS system. Running the DLA creates IdML books in a PDS data set. The DLA also writes control files and debug information to this data set.

When you run the DLA, it can generate three types of IdML books:

One CTSPLEX book containing summary information about discovered CICSplexes

One or more CICSPLEX books containing information about the CICS system topology in a specific CICSplex and also the CICSPlex SM logical scopes and their associated resources.

One or more CICSREGION books containing information about CICS resources associated with a specific CICS region

The next step is to transfer the books to the discovery library file store (DLFS) located on your local system or accessible through a network connection. The DLA provides an automated mechanism for creating FTP statements and transferring files to the DLFS. From the DLFS you can load the books into CCMDB or TBSM.

You control the output of the DLA using the EYUDPARM DD parameters. These parameters control the range and depth of the discovery and specify which IdML books are created. The parameters also set general options about the operating environment, including the name of the maintenance point CMAS under which the discovery takes place. You supply these parameters in the EYUJXDD0 input file.

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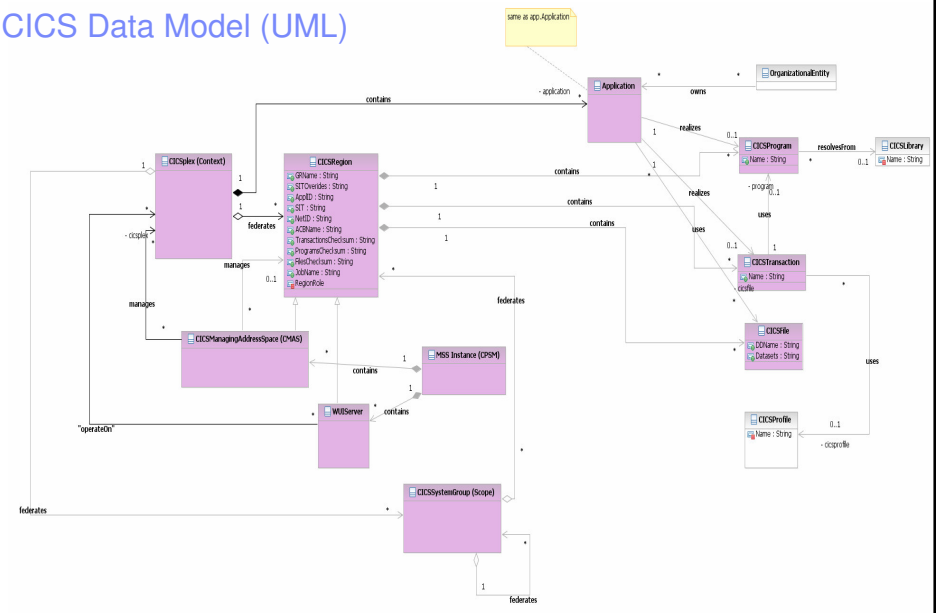
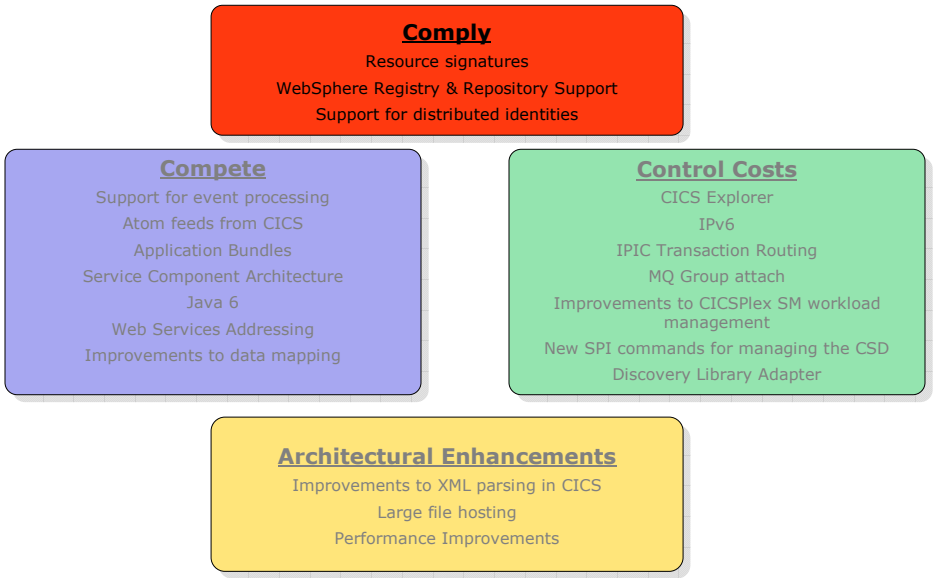
CICS Data Model (UML)



CICS Data Model (UML) – Notes

An example of the CICS Data Model.

CICS Transaction Server V4.1 Key Enhancements



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Key Enhancements – Comply - Notes

This section focuses on other functionality in the area of 'Comply'.

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CICS Resource Signatures

- **Definition signature attributes added to CICS resources**
  - Signature data added when you add/alter a resource
    - DEFINESOURCE
    - DEFINETIME
    - CHANGETIME
    - CHANGEUSRID
    - CHANGEAGENT
    - CHANGEAGREL
- **Installation signature attributes added to CICS resources**
  - Signature data added when you Install a resource
    - INSTALLAGENT
    - INSTALLTIME
    - INSTALLUSRID
- **Resource signatures added to most resource types**

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CICS Resource Signatures – Notes

The resource signature, which combines the installation and definition signatures, provides specific information for resource definitions that were installed or changed in CICS® TS 4.1 or later. You can use these improved details to detect resource modifications for auditing, tracking, or for fixing problems.

The installation signature captures details as to when, how, and by whom the resource was installed. The definition signature captures details in the CICS system definition data set or the CICSPlex SM EYUDREP data repository, as to when, how, and by whom the resource was defined and the last change made to the resource definition.

The resource types that support the resource signature are: ATOMSERVICE, BUNDLE, CONNECTION, CORBASERVER, DB2CONN, DB2ENTRY, DB2TRAN, DJAR, DOCTEMPLATE, ENQMODEL, EVENTBINDING, FILE, IPCONN, JOURNALMODEL, JVMSERVER, LIBRARY, MQCONN, MQINI, PIPELINE, PROCESSTYPE, PROFILE, PROGRAM, REQUESTMODEL, TCPIPSERVICE, TDQUEUE, TRANCLASS, TRANSACTION, TSMODEL, URIMAP, WEBSERVICE, and XMLTRANSFORM.

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CICS Resource Signature Information

- **Signature information**
  - CEDA
    - New panel option (PF2)
  - CEMT
  - INQ SPI
  - CICS Explorer
  - CICSPlex SM Views
  - DFHCSDUP
    - New SIGSUMM Option produces a signature report
      - LIST GROUP(group) SIGSUMM (group can be generic)
      - LIST LIST(list) SIGSUMM
      - LIST ALL SIGSUMM

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CICS Resource Signatures Information – Notes

To support the definition signature, the PF2 key in the CEDA DISPLAY and EXPAND GROUP panels has a new function. To display the definition signature for an individual resource, or a group of resources, in the CEDA DISPLAY and EXPAND GROUP panels press PF2. To return to the previous CEDA command panel, press PF2 again. You can switch between the two panels while retaining scroll position.

The CEMT INQUIRE command supports the improvements in management of resource definitions for a number of resource types. The definition and installation signatures are displayed on the expanded view panel of the supported resource types. The new fields are displayed at the end of the list of attributes for the installed resource.

The INQUIRE command supports the resource signature for a number of resource types.

CICSPlex SM views support the resource signature. Detailed resource signature information can be viewed in the CICS operations views. New fields can also be displayed in the Web User Interface resource administration views.

DFHCSDUP now supports the improvements in management of resources. The definition signature fields are included in DFHCSDUP EXTRACT processing. A new option, SIGSUMM, is added to DFHCSDUP LIST to produce a summary of definition signatures for all of the specified resources.

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CICS Resource Signatures – *CEDA view*

```
 DI G(MYPROGS)
 ENTER COMMANDS
   NAME     TYPE          GROUP                    LAST CHANGE
 + TEXT     TRANSACTION   MYPROGS          07/02/20 14.25.25
   TMVS     TRANSACTION   MYPROGS          03/03/01 15.55.08
   TOUT     TRANSACTION   MYPROGS          01/02/07 11.24.46
   TR       TRANSACTION   MYPROGS          08/05/01 10.41.05
   TROL     TRANSACTION   MYPROGS          95/10/28 11.19.01
   TST1     TRANSACTION   MYPROGS          08/01/25 09.48.56
   TST2     TRANSACTION   MYPROGS          08/01/25 09.49.10
   T322     TRANSACTION   MYPROGS          08/01/22 14.20.59
   T327     TRANSACTION   MYPROGS          97/09/05 14.24.31
   VVID     TRANSACTION   MYPROGS          07/02/23 16.16.14
   WBTM     TRANSACTION   MYPROGS          98/11/07 11.43.39
   CMZL     TDQUEUE       MYPROGS          02/10/20 16.59.32
   HTTPNSSL TCPIPSERVICE  MYPROGS          98/07/17 11.22.42
   J2       URIMAP        MYPROGS          07/11/11 13.46.16
                                                SYSID=CIEU APPLID=IYKXXXXX
   RESULTS: 86 TO 99 OF 99                TIME:  14.15.14  DATE: 08.311
 PF 1 HELP 2 SIG 3 END 4 TOP 5 BOT 6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL
```

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CICS Resource Signatures – *CEDA view* – Notes

A text-only version of the screen shot, in case the slide is difficult to see or print

```
DI G(MYPROGS)
  ENTER COMMANDS
    NAME     TYPE          GROUP                    LAST CHANGE
  + TEXT     TRANSACTION   MYPROGS          07/02/20 14.25.25
    TMVS     TRANSACTION   MYPROGS          03/03/01 15.55.08
    TOUT     TRANSACTION   MYPROGS          01/02/07 11.24.46
    TR       TRANSACTION   MYPROGS          08/05/01 10.41.05
    TROL     TRANSACTION   MYPROGS          95/10/28 11.19.01
    TST1     TRANSACTION   MYPROGS          08/01/25 09.48.56
    TST2     TRANSACTION   MYPROGS          08/01/25 09.49.10
    T322     TRANSACTION   MYPROGS          08/01/22 14.20.59
    T327     TRANSACTION   MYPROGS          97/09/05 14.24.31
    VVID     TRANSACTION   MYPROGS          07/02/23 16.16.14
    WBTM     TRANSACTION   MYPROGS          98/11/07 11.43.39
    CMZL     TDQUEUE       MYPROGS          02/10/20 16.59.32
    HTTPNSSL TCPIPSERVICE  MYPROGS          98/07/17 11.22.42
    J2       URIMAP        MYPROGS          07/11/11 13.46.16
                                                 SYSID=CIEU APPLID=IYKXXXXX
    RESULTS: 86 TO 99 OF 99                TIME:  14.15.14  DATE: 08.311
  PF 1 HELP 2 SIG 3 END 4 TOP 5 BOT 6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL
```

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CICS Resource Signatures - *CEDA Signature panel*

```
 DI G(MYPROGS)
 RESOURCE SIGNATURES
   NAME      TYPE          GROUP      CHANGE TIME      USERID    AGENT       REL
+  TEXT      TRANSACTION   MYPROGS  07/02/21 14.25.25  ATULIP    CSDBATCH    0660
   TMVS      TRANSACTION   MYPROGS  03/03/30 15.55.08
   TOUT      TRANSACTION   MYPROGS  01/03/07 11.24.46
   TR        TRANSACTION   MYPROGS  08/04/30 10.41.05  MOXEYC    CSDAPI      0660
   TROL      TRANSACTION   MYPROGS  95/11/22 11.19.01
   TST1      TRANSACTION   MYPROGS  08/01/25 09.48.56  ATULIP    CSDBATCH    0660
   TST2      TRANSACTION   MYPROGS  08/01/25 09.49.10  ATULIP    CSDBATCH    0660
   T322      TRANSACTION   MYPROGS  08/01/22 14.20.59  ATULIP    CSDBATCH    0660
   T327      TRANSACTION   MYPROGS  97/09/05 14.24.31
   VVID      TRANSACTION   MYPROGS  07/02/21 16.16.14  ATULIP    CSDBATCH    0660
   WBTM      TRANSACTION   MYPROGS  98/10/02 11.43.39
   CMZL      TDQUEUE       MYPROGS  02/09/19 16.59.32
   HTTPNSSL  TCPIPSERVICE  MYPROGS  98/06/13 11.22.42
   J2        URIMAP        MYPROGS  07/12/01 13.46.16  ATULIP    CSDBATCH    0660



                                                  SYSID=CIEU APPLID=IYKXXXXX
   RESULTS: 86 TO 99 OF 99                    TIME:  14.15.14  DATE: 08.311
 PF 1 HELP 2 CMD 3 END 4 TOP 5 BOT 6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL
```

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CICS Resource Signatures – *CEDA Signature Panel* – Notes

A text-only version of the screen shot, in case the slide is difficult to see or print

```
DI G(MYPROGS)
  RESOURCE SIGNATURES
    NAME      TYPE          GROUP      CHANGE TIME      USERID    AGENT       REL
  +  TEXT      TRANSACTION   MYPROGS  07/02/21 14.25.25  ATULIP    CSDBATCH    0660
    TMVS      TRANSACTION   MYPROGS  03/03/30 15.55.08
    TOUT      TRANSACTION   MYPROGS  01/03/07 11.24.46
    TR        TRANSACTION   MYPROGS  08/04/30 10.41.05  MOXEYC    CSDAPI      0660
    TROL      TRANSACTION   MYPROGS  95/11/22 11.19.01
    TST1      TRANSACTION   MYPROGS  08/01/25 09.48.56  ATULIP    CSDBATCH    0660
    TST2      TRANSACTION   MYPROGS  08/01/25 09.49.10  ATULIP    CSDBATCH    0660
    T322      TRANSACTION   MYPROGS  08/01/22 14.20.59  ATULIP    CSDBATCH    0660
    T327      TRANSACTION   MYPROGS  97/09/05 14.24.31
    VVID      TRANSACTION   MYPROGS  07/02/21 16.16.14  ATULIP    CSDBATCH    0660
    WBTM      TRANSACTION   MYPROGS  98/10/02 11.43.39
    CMZL      TDQUEUE       MYPROGS  02/09/19 16.59.32
    HTTPNSSL  TCPIPSERVICE  MYPROGS  98/06/13 11.22.42
    J2        URIMAP        MYPROGS  07/12/01 13.46.16  ATULIP    CSDBATCH    0660



                                                    SYSID=CIEU APPLID=IYKXXXXX
    RESULTS: 86 TO 99 OF 99                      TIME:  14.15.14  DATE: 08.311
  PF 1 HELP 2 CMD 3 END 4 TOP 5 BOT 6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL
```

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CICS Resource Signatures - *CEDA expanded view*

```
 OBJECT CHARACTERISTICS                                  CICS RELEASE = 0660
  CEDA  View PROFile( MYCICSA  )
+  DVsuprt         : All               All | Nonvtam | Vtam
   Inbfmh          : All               No | All | Dip | Eods
   RAq             : No                No | Yes
   Logrec          : No                No | Yes
  RECOVERY
   Nepclass        : 000               0-255
   RTimout         : 0010              No | 1-7000 (MMSS)
  SIGNATURE
   CHANGEUsrid     : ASTEWART
   CHANGEAGEnt     : CSDBATCH
   CHANGEAGRel     : 0660
   CHANGETime      : 08/02/15 07:03:44
   DEFinetime      : 08/02/08 17:22:12




                                                SYSID=CIEU APPLID=IYKXXXXX

PF 1 HELP 2 COM 3 END            6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL
```

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CICS Resource Signatures - *CEDA expanded view* – Notes

A text-only version of the screen shot, in case the slide is difficult to see or print

```
 OBJECT CHARACTERISTICS                                  CICS RELEASE = 0660
  CEDA  View PROFile( MYCICSA  )
+  DVsuprt         : All               All | Nonvtam | Vtam
   Inbfmh          : All               No | All | Dip | Eods
   RAq             : No                No | Yes
   Logrec          : No                No | Yes
  RECOVERY
   Nepclass        : 000               0-255
   RTimout         : 0010              No | 1-7000 (MMSS)
  SIGNATURE
   CHANGEUsrid     : ASTEWART
   CHANGEAGEnt     : CSDBATCH
   CHANGEAGRel     : 0660
   CHANGETime      : 08/02/15 07:03:44
   DEFinetime      : 08/02/08 17:22:12




                                                SYSID=CIEU APPLID=IYKXXXXX

PF 1 HELP 2 COM 3 END            6 CRSR 7 SBH 8 SFH 9 MSG 10 SB 11 SF 12 CNCL
```

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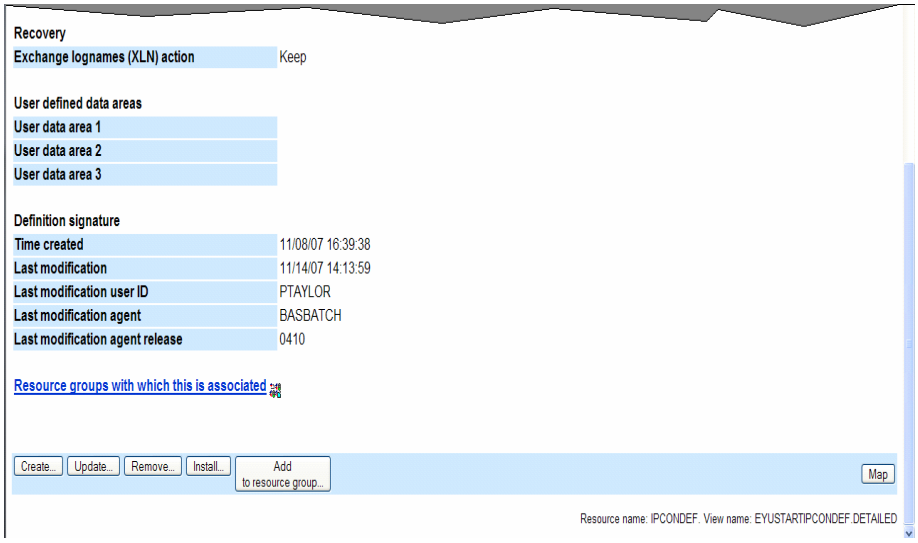
CICS Resource Signatures – *CICSPlex SM example*



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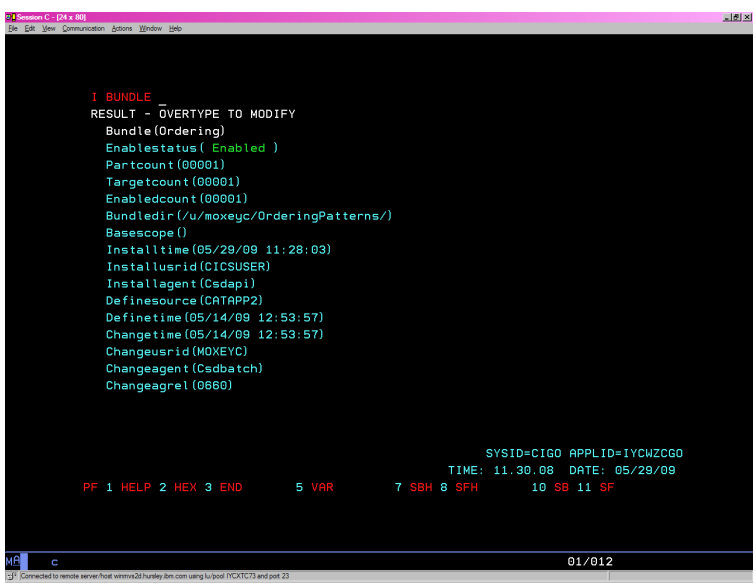
CICS Resource Signatures – *CEMT example*



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Resource Signatures – *CEMT example* – Notes

A text-only version of the screen shot, in case the slide is difficult to see or print

```
I BUNDLE
RESULT - OVERTYPE TO MODIFY
  Bundle(Ordering)
  Enablestatus( Enabled )
  Partcount(00001)
  Targetcount(00001)
  Enabledcount(00001)
  Bundledir(/u/moxeyc/OrderingPatterns/)
  Basescope()
  Installtime(05/29/09 11:28:03)
  Installusrid(CICSUSER)
  Installagent(Csdapi)
  Definesource(CATAPP2)                  ← CSD Group
  Definetime(05/14/09 12:53:57)
  Changetime(05/14/09 12:53:57)
  Changeusrid(MOXEYC)
  Changeagent(Csdbatch)
  Changeagrel(0660)


                                                  SYSID=CIGO APPLID=IYCWZCGO
                                              TIME: 11.30.08  DATE: 05/29/09
PF 1 HELP 2 HEX 3 END       5 VAR        7 SBH 8 SFH       10 SB 11 SF
```

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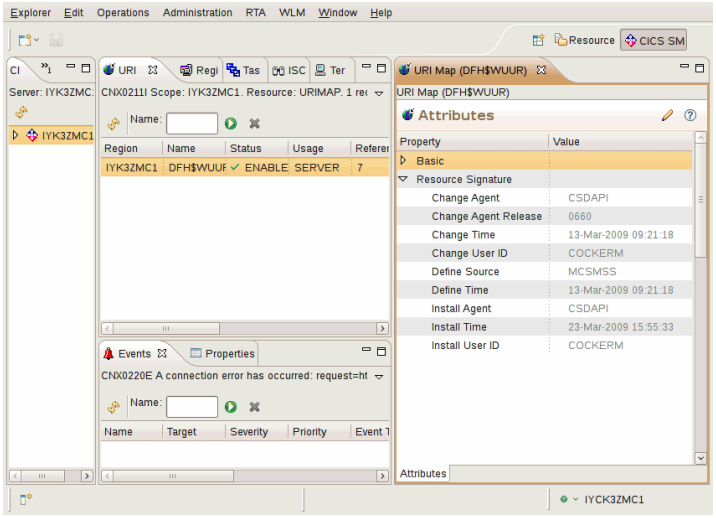
CICS Resource Signatures – *CICS Explorer View*



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WebSphere Service Registry and Repository

- **Enables governance**
  - Configurable service life-cycle, classifications and access controls
- **Manages service meta-data**
  - Providing better search granularity than most UDDI-based products
- **User-friendly UI**
  - Facilitates design time discovery
- **Provides location transparency through runtime access**
- **Stores all service artifacts**
  - Not just WSDL
- **Provides fully configurable functionality to classify services**
- **Supports state model functionality**
  - Manages service life-cycles in a shared environment
- **Service notification**
  - Facilitates communication between service consumers and providers
- **Enforces consumer access to services**
- **Simple version management functionality**

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WSRR – Notes

- WebSphere Service Registry and Repository provides a central repository for storing service interfaces and associated meta-data.
- It enables the management of services throughout their life-cycle, from concept through to retirement. The life-cycle is fully configurable using WebSphere Integration Developer. Thus, the SOA governance model for the service life-cycle can be represented by defining the life-cycle of the services in your organization and defining the authorization process for an application to move from one phase of the life-cycle to another. Once the life-cycle is defined, it can be installed into WSRR and used as the basis for managing the life-cycle of your services.
- Another area in which WSRR enables governance is through the use of classifications. The classification systems defined as part of your organizations governance model can be imported into WSRR and used to classify the services described in it.
- WSRR also enables documents to be tagged with properties and relationships to be defined between documents. The WSRR user interface is web based and provides search capabilities to enable services to be easily located.

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CICS Support for WSRR

- **DFHLS2WS**
  - Can now publish the generated WSDL to WSRR
  - Allows specification of the WSDL meta-data
  - SSL support
- **DFHWS2LS**
  - Can now retrieve WSDL from WSRR

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CICS Support for WSRR – Notes

- The Web services assistant batch jobs DFHWS2LS and DFHLS2WS have new parameters to support interoperability with the IBM WebSphere Service Registry and Repository (WSRR) server. You can optionally secure the network connection to WSRR using secure socket layer (SSL) encryption.
- This support requires mapping level 1.2 or higher.

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Identity Context Propagation

- **z/OS Identity Propagation initiative to provide asserted identity for end-to-end distributed security**
  - Logically tie together distributed end-user identities with z/OS userids
  - Enhance the ability for z/OS applications to participate centrally in SOA solutions
  - Function will require z/OS 1.11
- **ID Context Propagation allows an end user's identity to be propagated through to CICS**
  - Currently, the end users' identity is lost before the request gets to CICS
- ***Possible* Scenarios for ID context propagation**
  - "WAS-Local" (WAS on same LPAR as CICS)
    - Request made via JCA resource adapter and CICS TG over IPIC
  - "WAS-remote" (WAS on a different LPAR or non-z/OS system)
    - Request made via JCA RA and CICS TG over IPIC
  - Web Services request direct into CICS
    - Inbound to CICS from WAS
    - Inbound to CICS from DataPower
    - …

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Identity Context Propagation – Notes

The concept of sending a user's security identity information (the distributed identity) from a client system across a network, preserving the distributed identity for use during authorization and for auditing purposes.

The distributed identity is carried with a request from the distributed client application to the server, and is incorporated in the access control of the server as part of the authorization process.

z/OS, Version 1 Release 11 will make it possible to send a user's security identity information (the distributed identity) from a client system across a network, preserving the distributed identity for use during authorization and for auditing purposes.

Identity context propagation (ID Prop) is dependent on the z/OS Identity Propagation function that is provided in z/OS, Version 1 Release 11. ID Prop provides improved accountability and a new means of authorizing requests by associating the security information in the distributed environment with the security information used on the server.

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CICS Support for Identity Context Propagation

- **Support for Inbound Web services, propagating on as Web Service provider**
  - Provides support for Web Services callers
- **Support for Inbound over IP Interconnectivity (IPIC)**
  - To be used by CICS TG when operating as a WebSphere connector
    - Will require use of JCA resource adapter
- **Sysplex Support**
  - CICS will propagate on over MRO and IPIC Connections only
- **Additional items**
  - SPI and API to obtain IDID (distributed identity data)
  - Remove need for USRDELAY timeout for ACEE refresh

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CICS Support for Identity Context Propagation – Notes

CICS provides support for distributed identities in the following situations:

- Inbound requests to CICS from WebSphere Application Server using the CICS ECI resource adapters over a trusted IPIC connection
- Using an Extended Identity Context References (ICRX) WS-Security Header element in a Web Service request
- Using IPIC and MRO connections between CICS systems in the same sysplex

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CICS Transaction Server V4.1 Key Enhancements

Comply
- Resource signatures
- WebSphere Registry & Repository Support
- Support for distributed identities

Compete
- Support for event processing
- Atom feeds from CICS
- Application Bundles
- Service Component Architecture
- Java 6
- Web Services Addressing
- Improvements to data mapping

Control Costs
- CICS Explorer
- IPv6
- IPIC Transaction Routing
- MQ Group attach
- Improvements to CICSPlex SM workload management
- New SPI commands for managing the CSD
- Discovery Library Adapter

Architectural Enhancements
- Improvements to XML parsing in CICS
- Large file hosting
- Performance Improvements
- and **Additional enhancements**

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Additional Enhancements and Architectural Enhancements - Notes

This section focuses on other enhancements including architectural enhancements.

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Additional Enhancements in CICS TS V4.1

- **New SPI for managing CSD definitions**
  - EXEC CICS CSD commands
- **CICS monitoring improvements**
  - Transaction resource class data for DPL requests
  - Additional data
    - Web Services (Operation name, URIMAP, SOAP request/response length)
    - Parsing data (number bytes parsed, CPU time for parsing)
  - SMF Record compression is now the default
- **Configurable VTAM Persistent Sessions**
- **Wild branch diagnostic improvements**
  - Supports Breaking Event Address Register (BEAR) in the TACB & DFHPEP COMMAREA
- **Future Positioning**
  - JVM Server runtime environment
    - Provides a mechanism for CICS to use the same JVM for multiple tasks concurrently
    - New T8 TCB pool
    - Architectural enhancement that is provided for CICS to perform system processing
    - The JVM server is not available for use by Java applications

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Additional Enhancements – Notes

You can now manage CICS resource definitions in the CSD using a set of new CICS system programming interface (SPI) commands. These commands give you a command-level alternative to the CEDA transaction and the DFHCSDUP batch utility for updating the CSD.

New performance data metrics improve the performance reporting and analysis of Web and Web service applications. Use the new transaction resource class monitoring data for distributed program link requests to improve the work load management of DPL applications. Also, to help reduce the volume of monitoring output produced, the default now is to compress monitor records. New monitoring data provides information on how the XML System Services parser is performing when parsing XML documents.

You can increase the number of CICS regions in an LPAR by removing VTAM persistent sessions support where it is not required, such as in a CICS region that is used only for development or testing. You can now disable VTAM persistent sessions support for a CICS region using the new value NOPS for the PSTYPE system initialization parameter.

CICS TS 4.1 supports the Breaking Event Address Register (BEAR). This register captures the address of the instruction that generated the last successful branch before the error occurred in the program. This information helps when investigating wild branch problems in programs. The Breaking Event Address Register is held in the system diagnostic work area.

CICS includes a new runtime environment to perform Java processing. The runtime environment is called a JVM server and provides a mechanism for CICS to use the same JVM for multiple tasks concurrently. The JVM server requires a Language Environment enclave and a pool of T8 TCBs. Each task uses a T8 TCB to run as a pthread in the JVM. The JVM server is represented in CICS by a JVMSERVER resource . The JVMSERVER resource defines the runtime options for the JVM, including the location of the JVM profile and the maximum number of threads that the JVM supports.

The JVM server is not available for use by Java applications. The JVM server is an architectural enhancement that is provided for CICS to perform system processing only, if required by future developments.

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CICS TS V4.1 Useful References

- **CICS TS V4.1 page**
  - http://www-01.ibm.com/software/htp/cics/tserver/v41/
- **CICS TS V4.1 Announcement Letter**
  - http://www.ibm.com/common/ssi/ShowDoc.jsp?docURL=/common/ssi/rep_ca/5/897/ENUS209-135/index.html
- **CICS TS V4.1 Information Center**
  - http://publib.boulder.ibm.com/infocenter/cicsts/v4r1/index.jsp
- **CICS TS V4.1 Business Value video**
  - http://www.youtube.com/watch?v=W_w6t81VbYc
- **Other CICS information on YouTube under 'CICSfluff', including**
  - CICS TS V4.1 High Level Technical Overview
  - CICS Events 5 minute demo
  - CICS and PHP SupportPac

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CICS Transaction Server V4.1 Key Enhancements

Comply
- Resource signatures
- WebSphere Registry & Repository Support
- Support for distributed identities

Compete
- Support for event processing
- Atom feeds from CICS
- Application Bundles
- Service Component Architecture
- Java 6
- Web Services Addressing
- Improvements to data mapping

Control Costs
- CICS Explorer
- IPv6
- IPIC Transaction Routing
- MQ Group attach
- Improvements to CICSPlex SM workload management
- New SPI commands for managing the CSD
- Discovery Library Adapter

Architectural Enhancements
- Improvements to XML parsing in CICS
- Large file hosting
- Performance Improvements

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Summary

- **CICS Transaction Server V4.1 helps you to:**

Compete *for new opportunities by gaining insight into business processes and responding by modifying key business applications quickly and with confidence*

> **Business Flexibility and Innovation**

Comply *with corporate, industry and government policies to manage business risk of critical business applications*

> **Governance and compliance**

Control costs *by simplifying IT infrastructure and improving development and operations productivity through easier-to-use interfaces and functions*

> **IT Simplification**

Support increased workloads and remove constraints

> **Architectural Enhancements**

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Summary – Notes

CICS Transaction Server for z/OS V4.1 is a modern, dependable, and cost effective application platform.

This version brings new levels of ease-of-use and flexibility to meet the needs of the next generation of business users. It will assist its users in their activities directed at:

Competing for new opportunities by gaining insight into business processes and responding by modifying key business applications quickly and with confidence. Business flexibility: Making it easier to create, extend, and reuse applications quickly, to meet changing business needs

Complying with corporate, industry and government policies to manage business risk of critical business applications. Governance and compliance: Helping to ensure and demonstrate effective management control over business applications and IT facilities

Controlling costs by simplifying IT infrastructure and improving development and operations productivity through easier-to-use interfaces and functions. IT Simplification: Helping IT staff to perform their tasks more effectively, while assuming a mix of skill levels

New technologies can enable businesses to respond quickly and effectively, allowing them to capture emerging opportunities as markets recover. CICS TS V4.1 will deliver important new function to help businesses meet the demands of increased regulatory scrutiny, address changing demographics, and position themselves to take advantage of new growth opportunities

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Thank You !

Any questions?

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Thank you and Questions – Notes

Thank you for your time.

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