Smarter systems for a smarter planet

Revitalise your CICS environment with intelligent technologies, and new and enhanced run-time tooling.

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Welcome !

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- **Seminar materials**
  - Will be on a web site and link sent via email
- **About IBM Centre**

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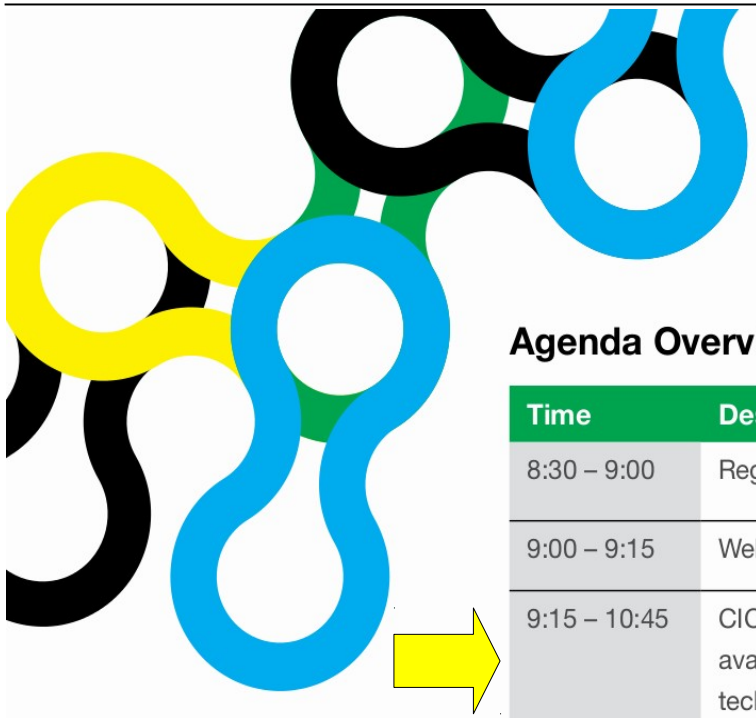
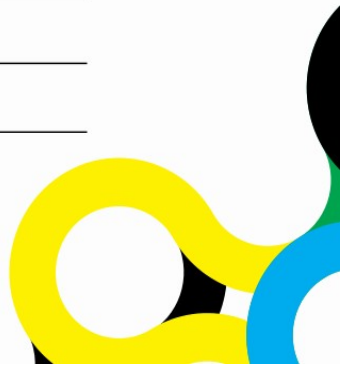


Agenda Overview

Time	Description
8:30 – 9:00	Registration & Coffee
9:00 – 9:15	Welcome and Introductions
9:15 – 10:45	CICS TS V4.2 technical introduction – CICS TS V4.2 became generally available on 26th June. This presentation will provide you with a technical overview of all new and enhanced technology.
10:45 – 11:00	Morning tea
11:00 – 12:00	Java as an application development option
12:00 – 12:50	CICS Explorer and Tools update
12:50 – 13:00	Wrap up



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What is Mainframe Enterprise Modernization?

- Delivering applications via the web or a Smart Phone
- Consolidate and modernize the applications user interface
  - Consolidate screens, more data / fields per screen
- Extend flexible reuse and connectivity of core application assets
  - SOA enable legacy applications to leverage agile development environment
  - Reduce cost of application development and delivery effort

Portal

Browser

Mobile

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To meet these challenges companies must extract maximum business value from existing assets

- Web Services
- Business Process Management
- Rules
- Enterprise Service Bus
- Events

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Capture CICS events for smarter business outcomes

Send events easily to a broad range of IBM Middleware for end-to-end process monitoring

Business Events Processing for real-time insight into critical business applications

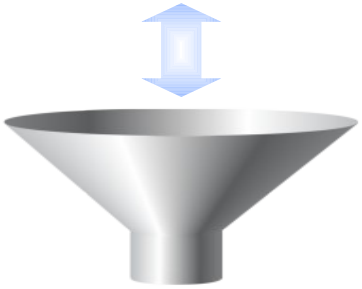
CICS 4.2

CICS Transactions

Events

Events

WebSphere Business Monitor



WebSphere Business Events

Actions

WebSphere Process Server or other application

SMS, email alerts or social media

NO APPLICATION CHANGE REQUIRED

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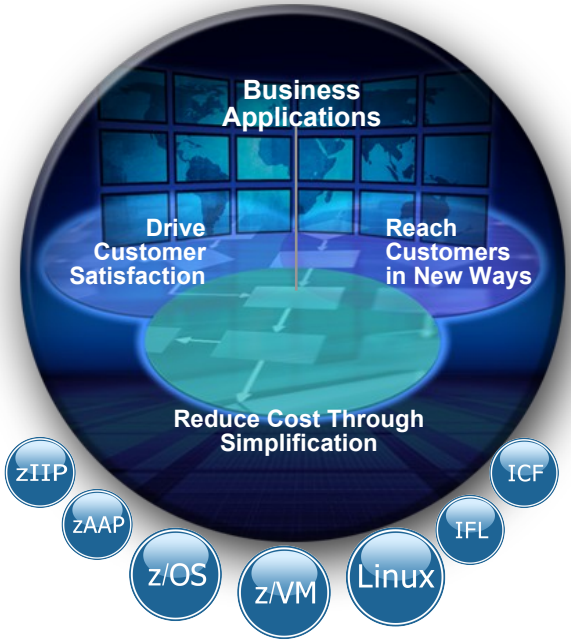
CICS Product Directions

- **Hardware Exploitation**
  - Using new faster z196 instruction sets
  - Enabling Large CICS Regions
    - 64 bit addressing
    - Multi-threading and n-way CP exploitation
  - Hybrid Exploitation
- **Modern application platform**
  - Further SOA enhancements
  - Exploitation of CICS multi-threaded JVM
  - Maturing of New Programming architectures
    - Event Based Processing
    - Web 2.0 (RESTful, WOA…)
    - Dynamic and Situational Applications
- **Robust, Performance, Scalability, Cost, Governance**
- **Skills and Expertise Challenges**
  - Application and System Programmer Productivity



"Visa relies on System z for global transactions processing--and confirmed the ability to handle the 2010 Christmas peak of almost 11,000 transactions a second.".

VISA

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IBM zEnterprise System – Best-in-class systems and software technologies

A "System of Systems" that unifies IT for predictable service delivery

IBM zEnterprise 196 (z196) IBM zEnterprise 114 (z114)

- Optimized to host large-scale database, transaction, and mission-critical applications
- The most efficient platform for large-scale Linux® consolidation
- Capable of massive scale-up
- New easy-to-use z/OS®

zEnterprise Unified Resource Manager

- Unifies management of resources, extending IBM System z® qualities of service end-to-end across workloads
- Provides platform, hardware and workload management

zEnterprise BladeCenter Extension (zBX)

- Selected IBM POWER7® blades and IBM System x® blades for deploying applications in a multi-tier architecture
- High-performance optimizers and appliances to accelerate time to insight and reduce cost
- Dedicated high-performance private network

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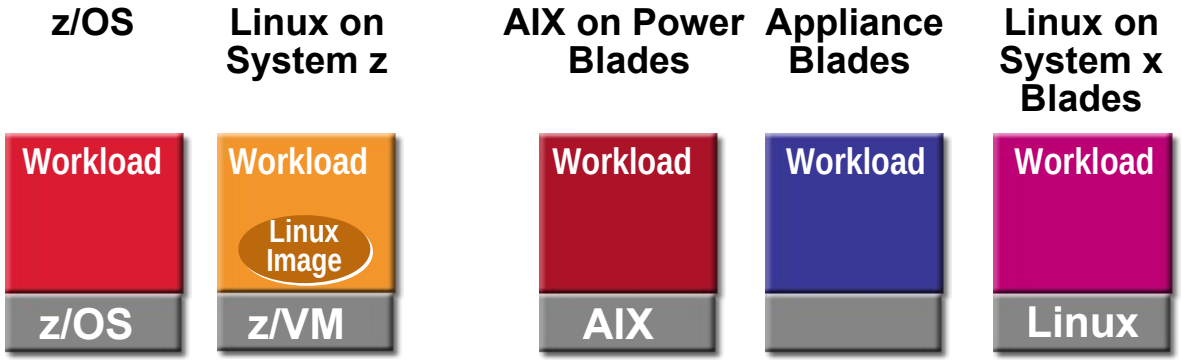
zEnterprise Broadest Architectural Support for Business Applications



zEnterprise

zEnterprise BladeCenter Extension (xBX)

Fit-for-Purpose Strategy

- Assign workloads to the environment that best satisfies requirements

Integrated Service Management

- Visibility
- Control
- Automation

Achieves overall lowest cost per workload

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Why 250 Migrations to System z?

1. **Up to 50% savings on applicable IT costs.** In some instances, large scale consolidation can reduce cost of energy, facilities & software licenses by up to 90 %.
2. **Up to 99.999 %** availability
3. **Industry-leading EAL5 security classification**
4. **Proven mixed workload capabilities** – allows centralized management to **reduce labor** overhead by up to **40%; simplifies** application environment complexity
5. **Up to 100% utilization** – reduces wasted, redundency of hardware, improves SLAs.

IT COST SAVINGS reflect overall reductions in software and/or hardware maintenance charges and reduced costs of system and workload management over a period of 3-5 years, when consolidating workloads from other systems to a virtualized Linux environment on System z. AVAILABILITY percentage is based on System z servers in a Parallel Sysplex environment, assuming application data sharing across multiple servers. Actual environmental costs and performance characteristics will vary depending on individual client configurations and conditions. Contact IBM to see what we can do for you. Current as of 7/7/2011.

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CICS TS availability and service dates

- **CICS TS V3.1 & V3.2**
  - In service **until at least** Sept 2013
- **CICS TS V4.1**
  - In service since 26 June 2009
- **CICS TS V4.2**
  - Announced and Open beta on 5 April 2011
  - In service since 24 June 2011
  - System requirements
    - z/OS 1.11, or later
    - IBM 64-bit SDK for z/OS, Java Technology Edition V6.01, or later
    - Hardware as per z/OS 1.11
      - Workloads can take advantage of CF, zAAP, cryptos
      - Java workloads can take advantage of new z196 instruction set
    - Further details - www.ibm.com/support/docview.wss?uid=swg27020857
  - Support by ISV products - www.ibm.com/software/htp/cics/partners.html

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What are people saying about CICS TS V4.2

It is important to us that IBM continues to improve Java support in CICS TS and exploitation the newest levels of Java. We are impressed with IBM's continuous investment in CICS and with the way CICS is exploiting new technology.

Ana Brajkovic, Chief Technical Officer, Vestigo d.o.o.

It is always in the best interest of the US Government to stay ahead of the curve when it comes to technology. Speaking for myself and not as an official Government representative, I believe that being part of the CICS TS beta programs has proven to be the best way to gain the technology required to lead our department to the successful conversion of over 250 CICS regions.

Jerry Harding, Modernization Support Team, US Government Department

Nothing else can handle the diverse workload or the volume that we put through CICS and deliver the same degree of reliability. Otherwise, we'd be running it.

Robert Garrett, CICS Systems Programmer, large U.S.-based financial services

Our clients and ourselves are very interested in using newer technologies to gain business advantage. Both Explorer and Event Processing are providing platforms to build such solutions.

***Rob Lloyd,** Data Center Services, Business Connexions*

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CICS portfolio strategy

- **Continue to be the best enterprise level transaction processing platform**
  - Focus on traditional CICS values of quality, scalability, performance and reliability
    - Realise full potential of System z and software stack
  - Continue to support enterprise modernization
    - Mixed programming languages , Modern programming architectures
- **Simplify management and reduce complexity**
- **Encourage a vibrant partner ecosystem and community**
- **Extend reach to emerging geographies and new customers**
- **Deliver frequent innovations to demonstrate market leadership**

IBMs 100 Icons of Progress

If asked to list the worlds bestselling software, it is unlikely that many people would be able to name IBM CICS, the Customer Information Control System. In fact, this revolutionary product ranks as one of the top 35 technologies that shaped the industry, according to Computerworld magazine. It may well be IBM s best kept secret.

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CICS TS V4.2 key enhancements

Events

System Events
Assured Events
Lifecycle Management

Connectivity

Axis2 web services
Web Services Offload
HTTP & IP Extensions

Java

64-bit Applications
Multithreaded Server
OSGi Management

Management

Transaction Tracking
Workload Management
Password Phrases

Scalability

More Threadsafe
Optimised Threadsafe
64-bit Exploitation

a smarter transaction processing experience

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CICS TS V4.1

Integration

- Event processing
- Atom feeds from CICS
- Web services standards, monitoring, stats
- Integrated support for WSRR
- Transaction routing & system links for IPIC
- IPv6, identity propagation, large file hosting

Performance and scale

- XML System Services parsing
- JVM server runtime environment
- Wild branch diagnosis improvements
- Adherence to z/Architecture MVS linkage

Application support

- Application bundles
- Application components
- Improvements to data mappings & new API
- Java 6

Enterprise management

- CICS Explorer
- RESTful API (CMCI)
- Improved (WUI) browser views
- Workload management optimisations
- WebSphere MQ queue-sharing groups
- Governance and SPI for resources
- Improvements in CICS monitoring
- Discovery Library Adapter for CICS

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Statements of direction from the Announcement Letter

- **IBM intends in the future for IBM WebSphere MQ for z/OS to provide Group Units of Recovery (Group UR) support for CICS TS V4.2**
- **IBM intends in the future to deliver a Dynamic Scripting Feature Pack for use with CICS TS V4.2**
- **IBM intends a future release of CICS TS to discontinue support for both:**
  - Session beans using Enterprise Java Beans (EJB)
  - The Java pool infrastructure
- **Removal of support**
  - Support for "CICS Events for WebSphere Business Events SupportPac CB11"
    - CICS TS V4 provides more comprehensive event support

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Notes

IBM declares the following statements of general direction:

IBM intends in the future for IBM WebSphere MQ for z/OS to provide Group Units of Recovery (Group UR) support for IBM CICS Transaction Server for z/OS (CICS TS).

IBM intends in the future to deliver a Dynamic Scripting Feature Pack for use with CICS TS V4.2.

IBM intends a future release of CICS TS to discontinue support for both: (i) session beans using Enterprise Java Beans (EJB); and (ii) the Java pool infrastructure. Customers are encouraged to migrate Java applications to the new JVM server infrastructure, and to migrate EJB applications to Java SE components and make them available through web services or the JEE Connector architecture (JCA). CICS will continue to support Java as a first class application programming language for CICS applications, including enhancements to the CICS interfaces, the deployment infrastructure, and Java runtime environment.

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Events

- System events
- Assured event emission
- EPADAPTER resource
- Search facility
- Additional data types
- TSQ EP adapter XML event format
- Capture specification improvements
- Relaxation to allow event capture from Atom support and WebSphere MQ DPL Bridge

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What is an event?

- **An event…**
  - is anything that happens
  - has a name and usually some data (its payload)
  - is produced and responded to asynchronously
- **Simple event processing…**
  - is the processing of a single event, meaningful in itself; not an abstraction or composition of other events
- **Complex event processing…**
  - is detecting and responding to patterns of events
- **Business Event Processing…**
  - is using simple and complex event processing to detect and respond to business-impacting situations across the enterprise

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What is Business Event Processing?

"Turn insight into action"

Event

Pos Purchase

Business Context

2nd purchase in a week and total purchases this year > $1000

Action: Offer loyalty program membership before customer leaves the store

Event

No meter signal

Business Context

Third consecutive period without signal

Action: Trigger automated troubleshooting process

Event

GPS Signal

Business Context

Calculated arrival > 30 min over SLA

Action: Phone customer to re-arrange delivery

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CICS and Business Events

- **Event processing addresses the need for agility**
  - Modern businesses must react quickly to circumstances
  - Decision makers need reliable, timely information
- **CICS systems run an enormous amount of existing business logic**
- **With an event-based approach**
  - Potential to gain insight into the processing in CICS
  - Introduce additional extensions to applications
- **CICS TS V4.1 allows you to emit business events from existing applications**
  - Supporting changing corporate policies
  - Without the need to change the applications
  - In a dynamic, decoupled fashion
  - And driving your choice of destination
    - WebSphere Business Monitor
    - WebSphere Business Events
    - CICS application
    - WebSphere MQ

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Notes

- Events are valuable to Enterprise Systems, providing the ability to respond in real-time, or near real-time.
- Given the considerable amount of business processing which is carried out in CICS systems across the world (over 30 billion transactions a day), CICS is a very significant source of business events. This can provide enhanced business flexibility and the ability to meet governance and compliance regulations.
- Event emission is asynchronous to the emitting application, and the consumption of the event is decoupled from its originator.
- CICS TS will emit simple, single events. These may be consumed by a "complex event processing" engine where they can be combined with events from other sources in addition to CICS. They can be sent to a Business Monitor to provide insight into processing within CICS.

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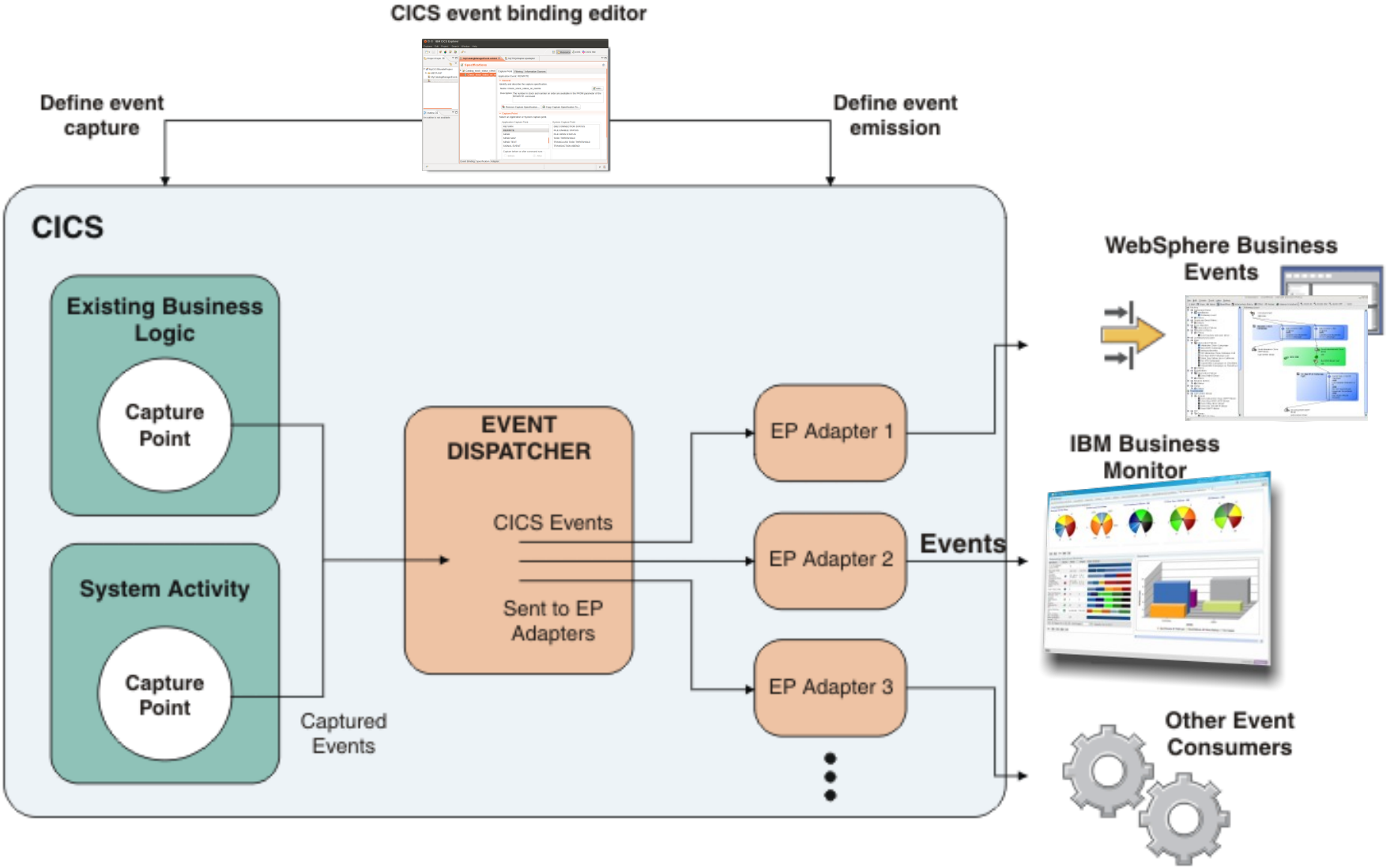
CICS TS V4 Event Processing



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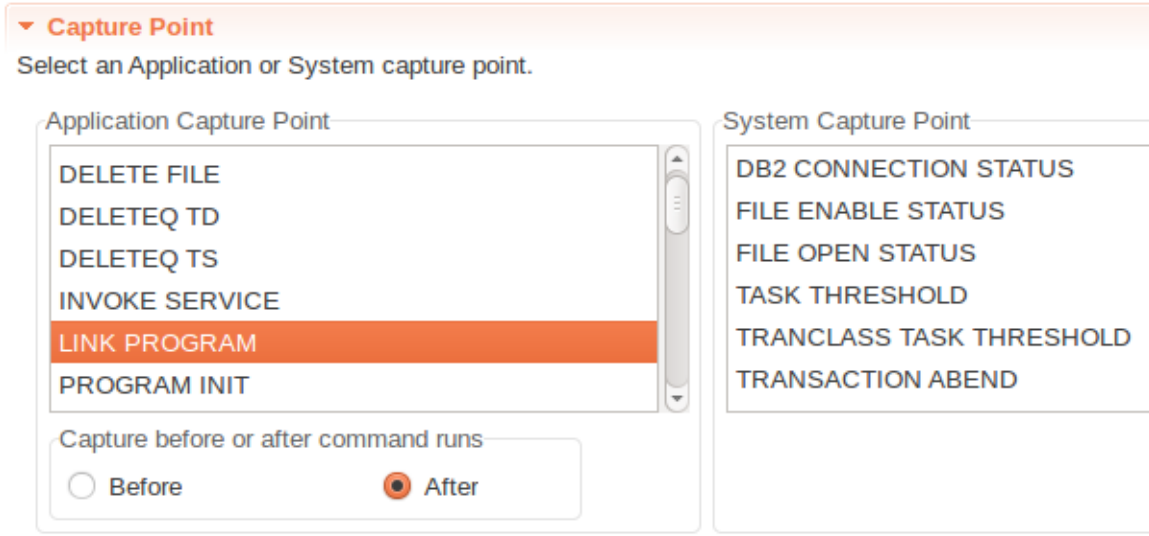
CICS TS V4 Event Processing - Capturing

- **CICS commands that are event enabled**
  - **Program control;** LINK PROGRAM, RETURN, INVOKE SERVICE, START, XCTL
  - **File;** DELETE FILE, WRITE FILE, READ, REWRITE, READNEXT, READPREV
  - **Terminal;** RETRIEVE, CONVERSE, RECEIVE, RECEIVE MAP, SEND, SEND TEXT
  - **TS and TD;** READQ, WRITEQ, DELETEQ
  - PUT CONTAINER
  - WEB READ/READNEXT
  - **SIGNAL EVENT**
    - Very flexible application event enablement
    - Small program change
- **Program initialization**
  - PROGRAM INIT
- **New system events**



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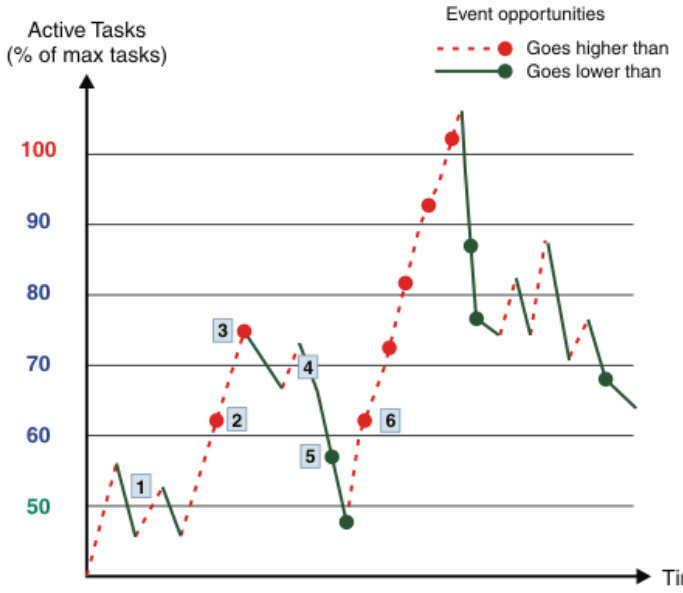
CICS TS V4.2 Event Processing - Capturing

System events

- **DB2 connection status changes**
- **FILE enable status changes**
- **FILE open status changes**
- **Unhandled transaction abends**
- **Current active tasks**
  - … in a region if they go above or below a specified percentage of the maximum tasks (MXT)
  - ... for a TRANCLASS if they go above or below a specified percentage of maximum active (MAXACTIVE)
  - Events can be captured only when the number of active tasks crosses a new threshold boundary
  - This prevents event flooding when workloads flip-flop across a threshold

"Can I capture events when something happens in my system, e.g. when a transaction abends or the system load goes over 80% of MAXTASKS?"

- Examples
  - Notify an application a file it uses is now disabled
  - Start an additional cloned CICS region if the number of tasks goes above 90% of maxtasks limit for that region



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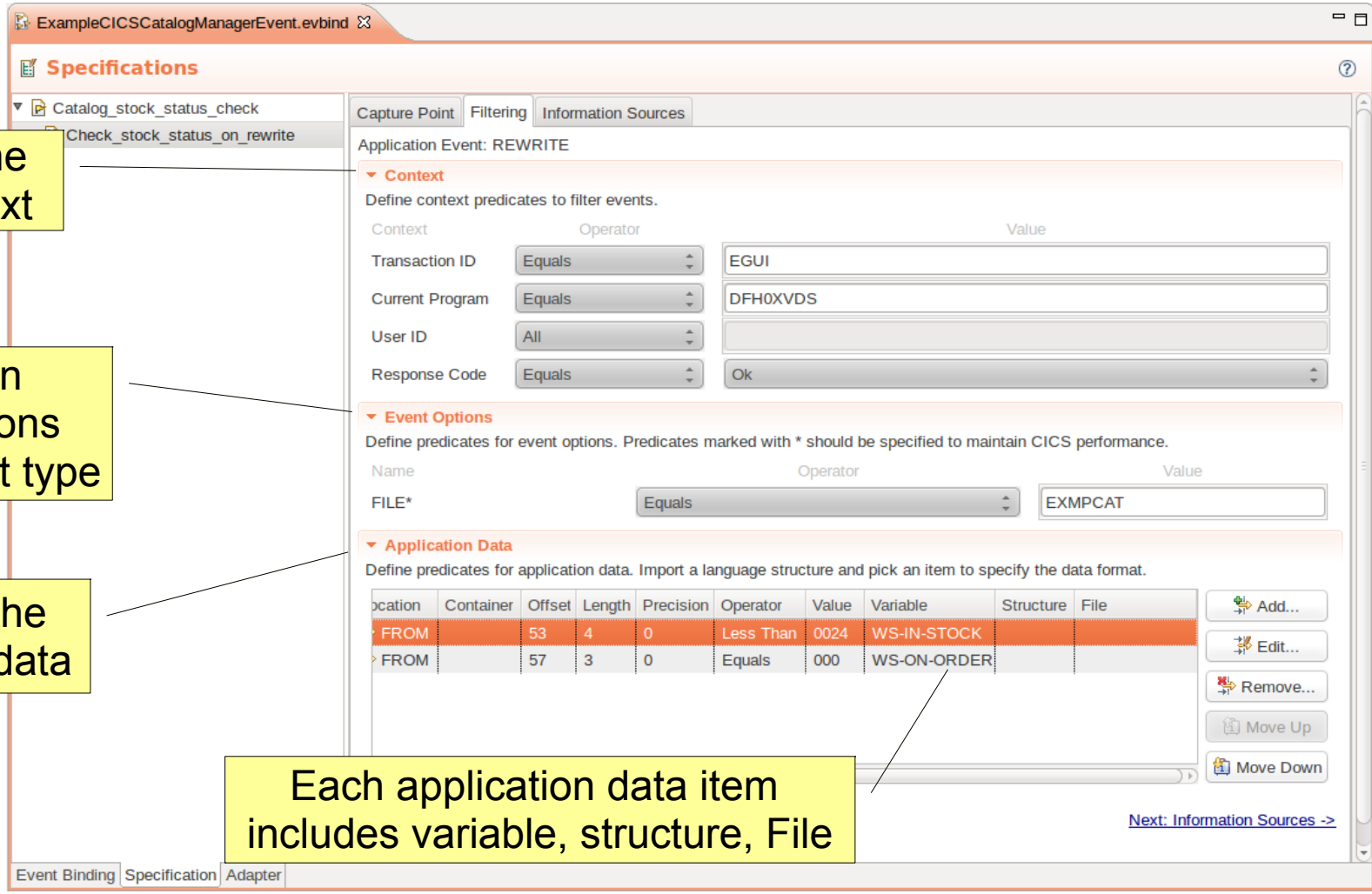
CICS TS V4.2 Event Processing - Filtering

3 types of filters you can use to determine an event occured

Filters on the Event context

Filters on event options for this event type

Filters on the application data



Each application data item includes variable, structure, File

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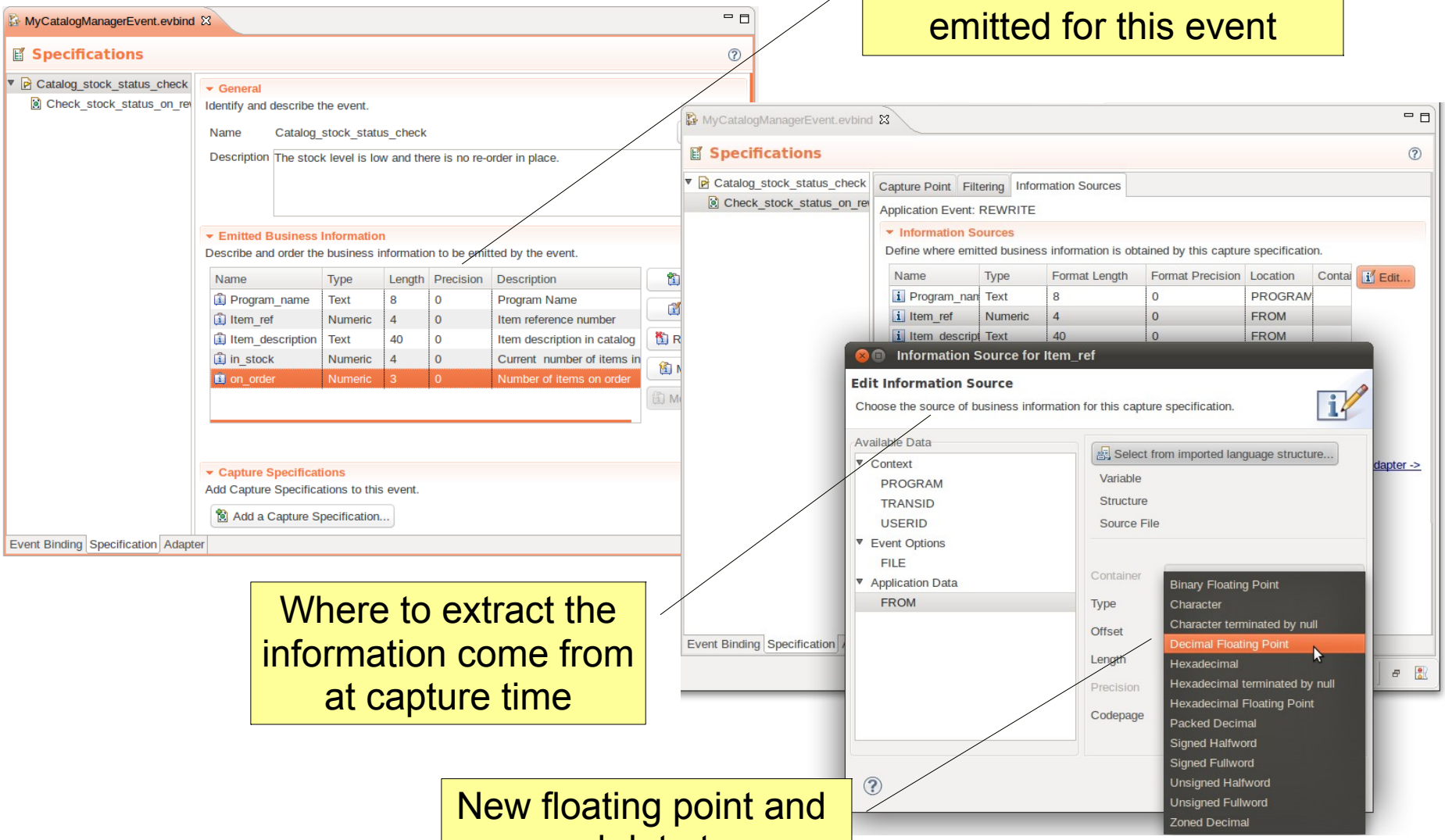
CICS TS V4.2 Event Processing - Enrichment

Custom information to be emitted for this event



Where to extract the information come from at capture time

New floating point and zoned data types

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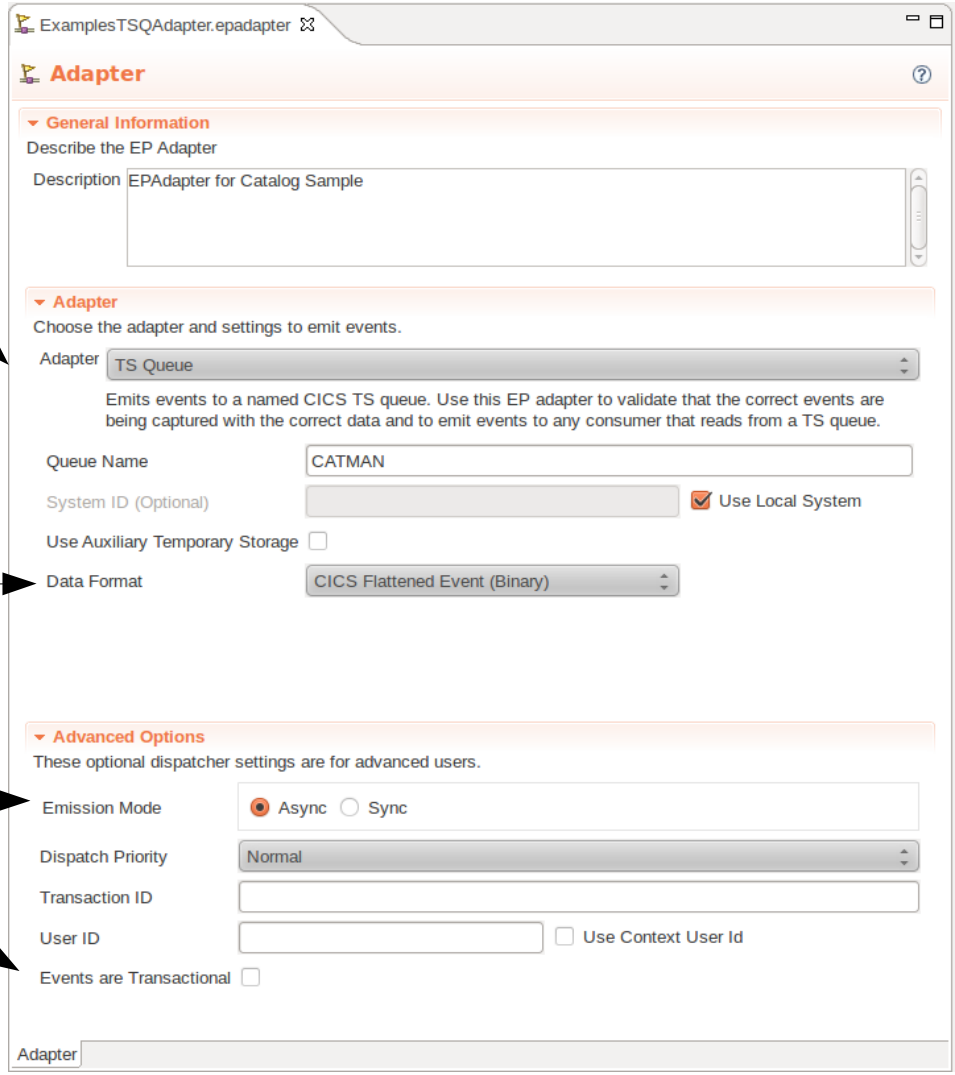
CICS TS V4.2 Event Processing - Formatting & Routing

- **Separate Event Processing Adapter**
- **Choice of EP Adapters to emit events**
  - WebSphere Message Queue
  - HTTP/S
  - Transaction Start
  - TS Queue
  - Custom
- **Choice of formatting options**
  - Binary and XML options
- **Assured event emission**
  - Emission mode of syc enables formatting and emission within UOW of capturing transaction
  - Transaction mode – If yes requires an EP adapter that uses recoverable resources, eg. WebSphere MQ



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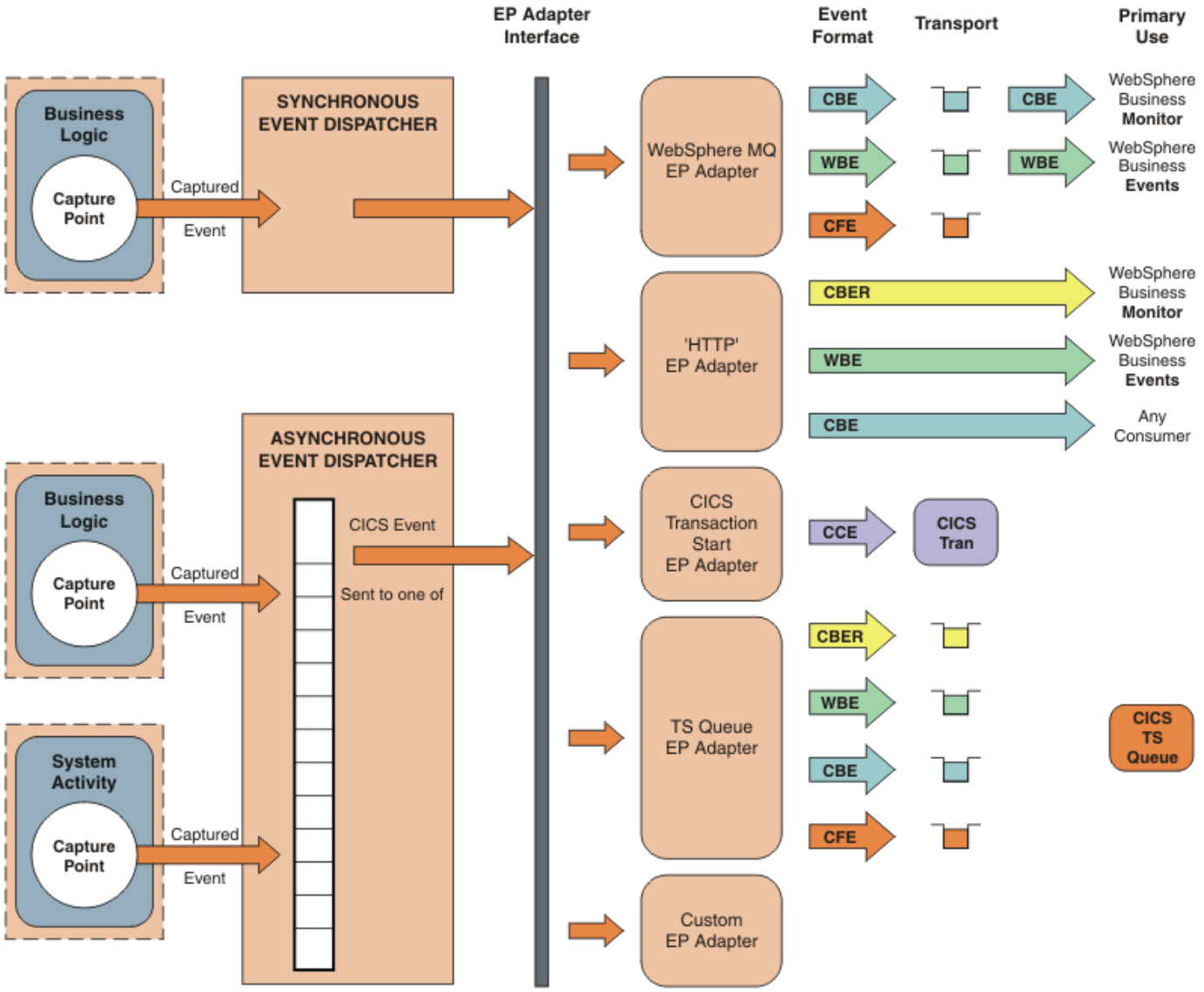
CICS TS V4.2 Event Processing - Formatting & Routing



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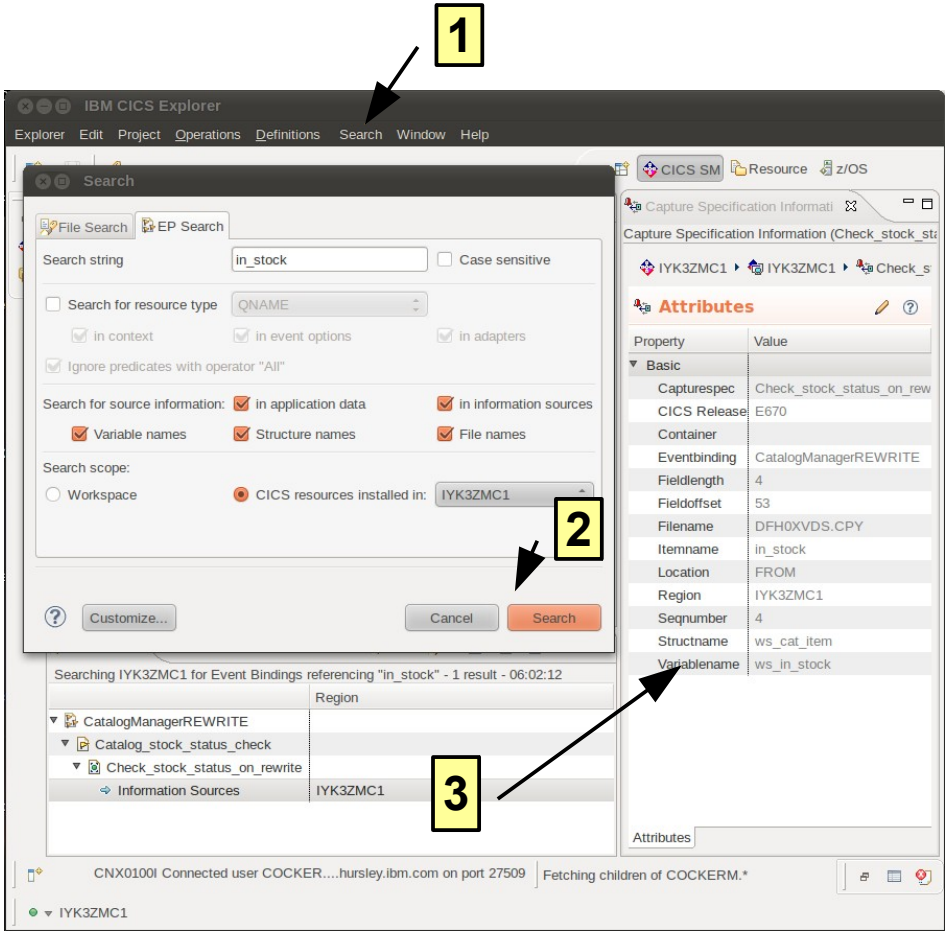
CICS TS V4.2 Event Processing - Searching

- **To understand impact of application changes on events**
- **CICS Explorer EP Search**
  - Enter the name of what you intend on changing and EP search will tell you which event bindings may be affected
  - When using Import from Structure in Event Binding Editor, details of the copybook/structure name and field name will be saved in the event binding
  - EP Search understands semantics of capture specifications
- **Searches event bindings in the CICS Explorer workspace or those installed in CICS regions that Explorer is connected to**



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Connectivity

Support for Java-based Axis2 web services pipeline

Support for web services discovery

HTTP connection management

IPIC support for function shipping

Recovery support for WebSphere MQ

Enhancements to CICS DB2 thread reuse

Enhancements to Atom feeds

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Support for Java-based Axis2 web services pipeline

- **Based on Axis2 technology**
  - Java SOAP pipeline/engine that is open source
    - Alternative to the existing CICS Web Services pipeline
  - Similar support to existing CICS Web services pipeline
    - Provider (inbound) and requester (outbound) applications
    - WS-Addressing and MTOM/XOP
  - Runs within CICS JVM server environment
    - Can access existing CICS programs files etc. using JCICS class library
- **Advantages of using Axis2**
  - XML parsing and conversion can off-loaded to zAAP
  - No need to use DFHWS2LS for top-down (wsdl to COBOL) mappings
  - Java components can use Java web services interfaces such as JAX-WS
  - Ability to develop pure Java Web Services applications
  - Widely used in the industry
  - Note: WS-Security not available for Axis2 WS provider applications

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Support for web services discovery

- **CICS allows Web service requester to discover WSDL using a URI**
  - Via HTTP GET against ServiceURI?wsdl
  - Pipeline scan now scans pickup directory for WSDL
    - If WSDL a single document, defined using existing WSDLFILE attribute on WEBSERVICE resource
    - If multiple documents, accessed as an archive file (.zip) defined using new ARCHIVEFILE attribute on WEBSERVICE resource
  - Dynamically creates a URIMAP which can be used by a URI query
- **Can be used by WSRR**

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HTTP connection management

- **Connection Throttling (inbound)**
  - CICS can limit number of persistent connections for a given HTTP listener
    - MAXPERSIST parameter on the TCPSERVICE definition (NO | 1-65535)
    - Once this limit is reached, no new connections accepted by the region
  - Can prevent overloading of a single CICS region when used in conjunction with Port Sharing or Sysplex Distributor
- **Connection Pooling (outbound)**
  - CICS can cache outbound HTTP connections for re-use
    - Enables pooling of outbound connections
    - Improves performance of web applications
  - Supports any HTTP client including Web Services or HTTP EP adapter
    - CICS web services applications
    - CICS web support applications
    - HTTP EP Adaptor
  - Controlled via new SOCKETCLOSE attribute on a URIMAP
  - Requires connection to be in a fit state to be placed into the pool, eg. 200 OK

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Notes

- If multiple Web clients set up long-lived persistent connections to CICS as an HTTP server and use the connections heavily, it is possible for a CICS region handling the connections to become overloaded and experience performance problems. If you experience this problem, you can set up connection throttling to make excess Web clients connect to other CICS regions that share the port and provide the same service.
- With connection throttling, you can set a limit on the number of persistent HTTP connections that a CICS region accepts for a particular port. If the limit is reached and further Web clients send requests, CICS sends Connection: close headers with each response to require the new clients to close their connection. The Web clients that already have persistent connections to the CICS region can maintain their persistent connections.
- By default, CICS closes a client HTTP connection after a CICS application has finished using the connection, or a service requester application has made a Web service request and received a response, or the HTTP EP adapter has emitted a business event. When you set up connection pooling, instead of closing the connection CICS can place the connection in a pool in a dormant state. The dormant connection can be reused by the same application or by another application that connects to the same host and port. Connection pooling can provide performance benefits where multiple invocations of CICS Web support applications, Web services applications, or the HTTP EP adapter make connection requests to a particular host and port, or where a Web services application makes multiple requests and responses.

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IPIC – a reminder

- **IPIC – IP InterCommunications Protocol**
  - Provide CICS communications support over TCP/IP as an alternative to that provided over ISC and MRO
- **TCP/IP alternative to SNA for CICS communications, to**
  - Enable network convergence and simplification
  - Address SNA skills shortage
  - Reduce cost of infrastructure
  - Take advantage of TCP/IP features on z/OS
  - Exploit high bandwidth OSA connectivity (QDIO)
- **Multi-version delivery**
  - No plans to remove existing SNA support
  - Migration of infrastructure without modification of CICS applications
  - Provide CICS with IP choice for most of the CICS comms-related programming model
- **White paper 'CICS delivers IP interconnectivity' available at:**
  - www.ibm.com/software/htp/cics/tserver/v32/library/index6.html

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IPIC support for function shipping

- **IPIC – IP InterCommunications Protocol**
  - Provide CICS communications support over TCP/IP as an alternative to that provided over ISC and MRO

Function	CICS TS 3.2	CICS TS 4.1	CICS TS 4.2
ECI requests	Yes	Yes	Yes
3270 Transaction routing	No	Yes	Yes
STARTs	No	Yes	Yes
DPL	Yes	Yes	Yes
Function Shipping	No	No	Yes
CPSM SYSLINKs	No	Yes	Yes

- **CICS TS V4.2 provides ability to run a CICSplex without SNA network**
  - Majority of ISC and MRO functions now supported over IPIC

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IPIC support for function shipping

- **IPIC Function Shipping**
  - Transient data
  - Temporary storage
    - MAIN option supported on WRITEQ TS command
  - File control
- **Improved performance**
  - Threadsafe IPIC mirror to relieve QR contention
    - DPL
    - Function shipping TS and FC (not TD)
  - MIRRORLIFE attribute on IPCONN resource
    - Enables long running mirrors when function shipping

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Recovery support for WebSphere MQ

- **Support for WebSphere MQ Group units of work recovery**
  - CICS TS V4.1 introduced support for WMQ group attach
    - However, in V4.1 if CICS has any outstanding UOWs with the WMQ server, need to reconnect to that specific WMQ server to resolve them
  - Will now be able to attach to any local WMQ server in the queue sharing group and have it resolve outstanding UOWs
  - This option can be used only when running a release of WebSphere MQ that supports group unit of recovery for CICS and when the GROUPUR attribute has been enabled in the WebSphere MQ queue managers.

- **Updated CICS-WebSphere MQ Adapter to support WebSphere MQ V7**
  - Supports 12 new MQ V7 API commands for message properties, publish subscribe, and asynchronous consume
  - Also available via APARs PK89844 and PK66866 for CICS TS V3.2

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Enhancements to CICS DB2 thread reuse

- **Long running protected or unprotected DB2 threads**
  - Can cause buildup in the DB2 EDM pool
  - This can lead to storage constraint problems in DB2
  - May force DB2 into a “short on storage” condition
- **New REUSELIMIT option on the DB2CONN resource**
  - Will limit the number of times a thread can be reused
    - Range of 0-10000, default 1000
  - Applies to both protected or unprotected threads
- **New PURGECYCLE lower value (5 seconds), default still 30 seconds**
- **New DB2 statistics**
  - Thread reuse limit
  - Number of times reuse limit reached (pool and entry threads)

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Notes

- **CICS provides new facilities for you to check and limit the number of times a thread can be reused. When a thread reaches its reuse limit CICS terminates it to free up DB2 resources. Long-running CICS DB2 threads can cause resource issues in DB2 particularly in storage. You can now set a reuse limit on the DB2CONN definition to specify this reuse limit.**
- **The new REUSELIMIT parameter of the DB2CONN resource definition specifies the maximum number of times a thread can be reused before it is terminated. This limit applies to all DB2 threads whether they are protected or unprotected.**
- **A value of 0 for REUSELIMIT means that no limit is placed on the number of times a thread can be reused; this is the same behavior as in previous releases. However, in CICS TS release 4.2 the default has been set to a value of 1000. This change has been implemented to reduce the likelihood of DB2 storage constraint issues, while having a negligible effect on the performance of CICS applications.**
- **You can now use the existing PURGECYCLE parameter on the DB2CONN resource definition to specify a new lower value of 5 seconds. The default remains the same: 30 seconds. The parameter controls how long protected threads are allowed to stay dormant awaiting reuse before being terminated**
- **The CICS DB2 global statistics now include the following information:**
  - The maximum number of times a thread can be reused before being terminated.
  - The number of times the reuse limit has been reached by a pool thread.
- **The CICS DB2 resource statistics now include the following information:**
  - The number of times the reuse limit has been reached by a thread for the DB2ENTRY.

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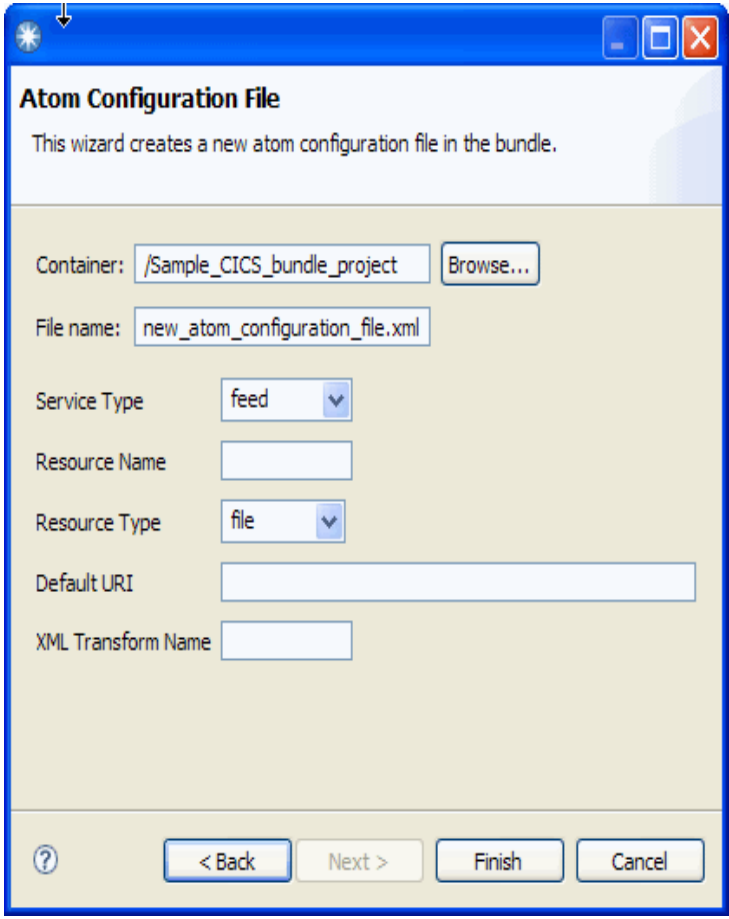
Enhancements to Atom feeds

- **Simplified deployment and administration of ATOM services**
  - Support for creating the configuration file
- **ATOMSERVICE and XMLTRANSFORM resources can be deployed via CICS BUNDLEs**
  - Appropriate URIMAP will be dynamically generated
- **CICS Explorer enhancements to generate and deploy the BUNDLE**
- **Sample BUNDLEs provided with general-purpose XMLTRANSFORM resources for use in creating ATOM Feeds**



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Management

Transaction tracking support

Improvements to dynamic workload mgnt

Password phrases

Dynamic transaction-level control for workload routing

New WLM routing algorithms to exclude link weighting

Enhancements to main and auxilliary temporary storage queues

WLM routing for IPIC connections

System availability monitoring

CMCI support for task history recording

...and sorting records

MVS job ID and SIT Parms

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Transaction Tracking

- **Track a transaction through the system**
  - Modern transactions (Web, WMQ, CICS TG etc) often do not have termids/sessions as principal facilities
    - Harder to track as they weave their way through complex web of associated regions and resources
- **User transactions have association data consisting of:**
  - Origin data
  - Task context data
  - User context data

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Transaction Tracking

- **CICS TS V4.2 extends content and uses of association data**
  - Transmission supported over MRO
  - Origin data section enhanced to include new adapter data
    - "Non-CICS" adapters (e.g. WebSphere MQ, WOLA, CICS sockets) can set origin data fields when initiating work via non-terminal STARTs
  - New previous hop data section
    - Describes the remote sender of the request so that a remote request can be tracked back to its previous system

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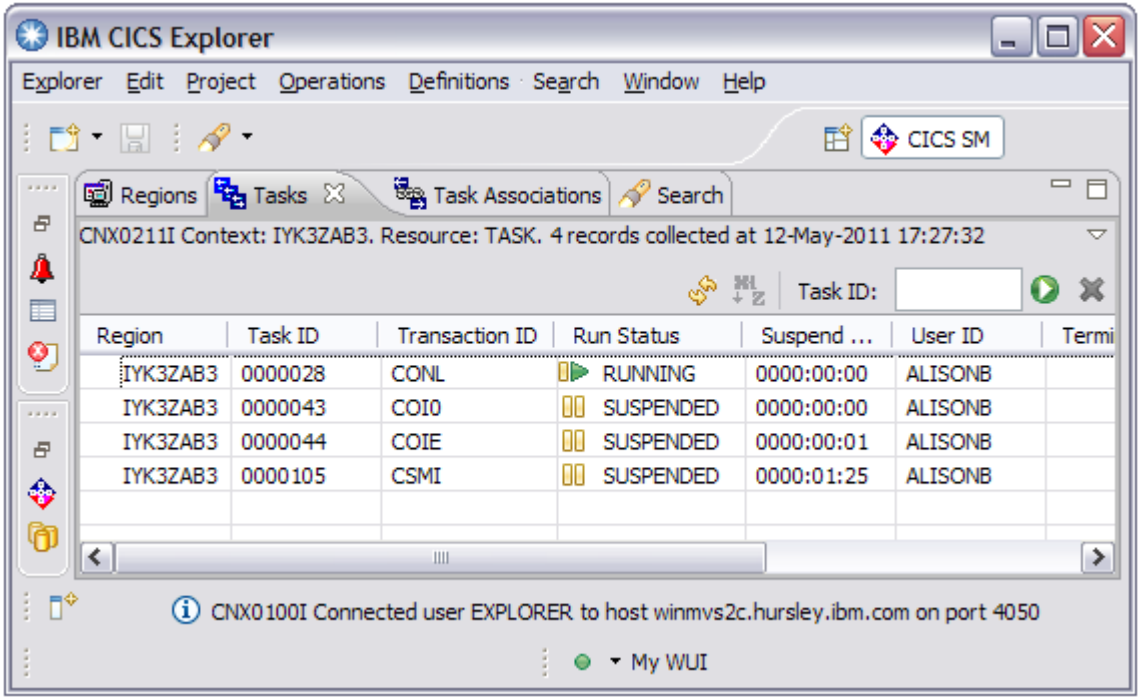
Transaction Tracking Example

- **Slow mirror on FOR IYK3ZAB3**



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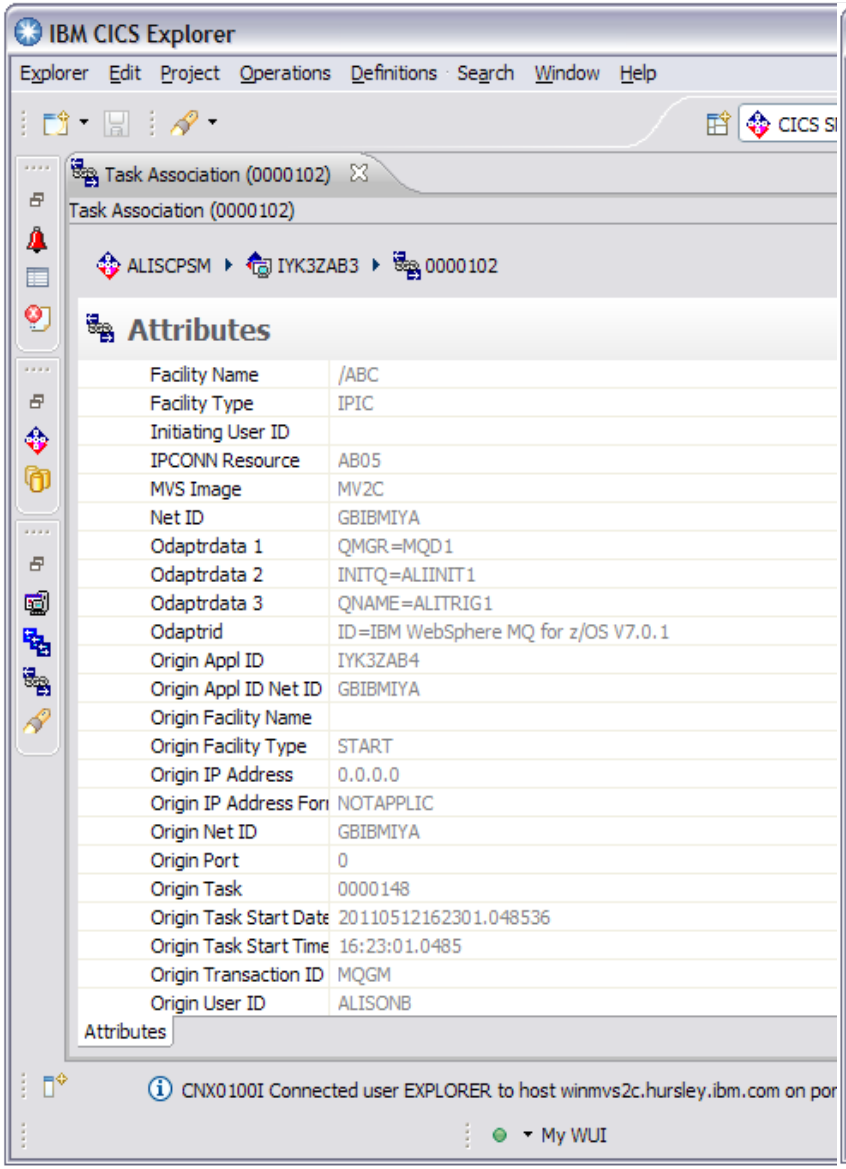
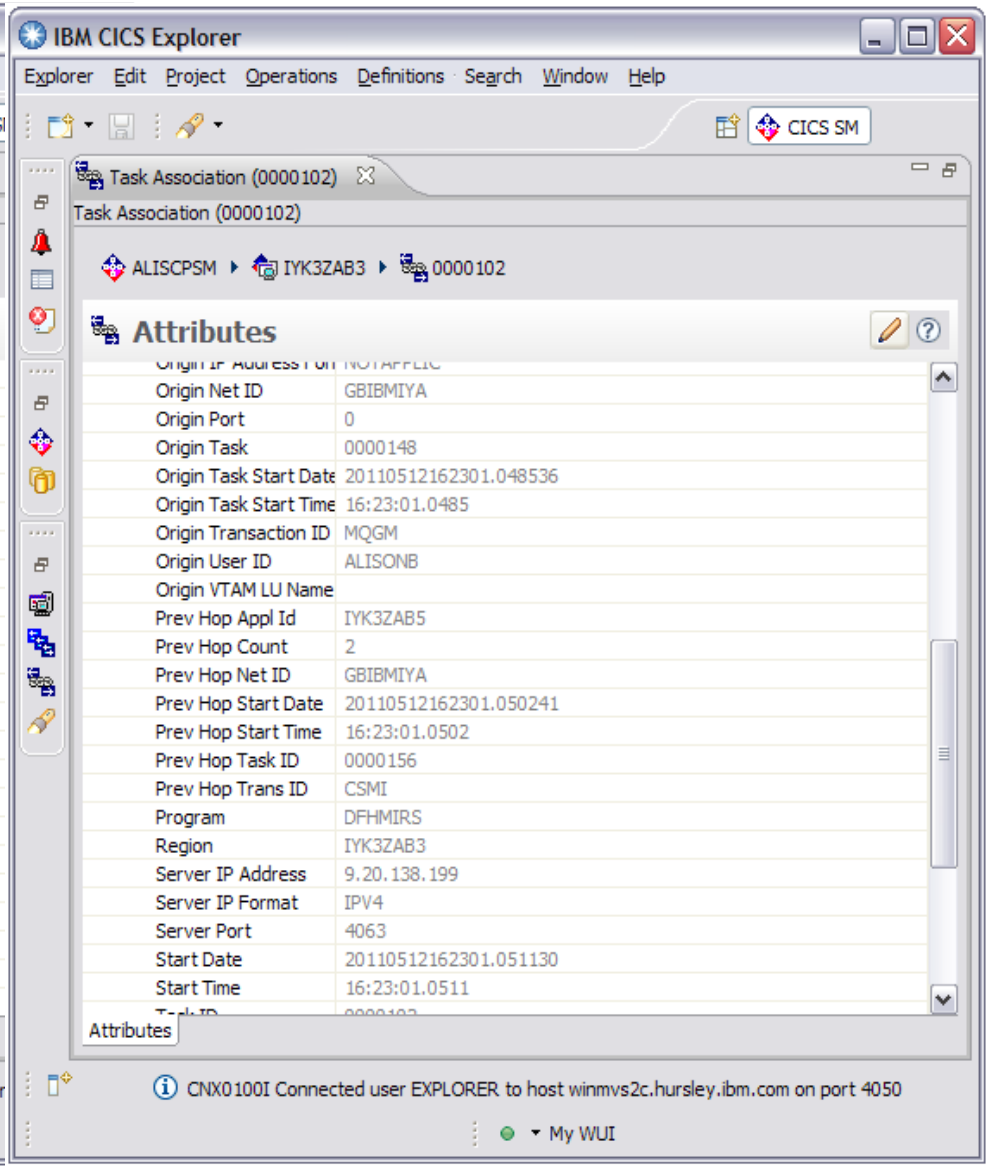
Association Data





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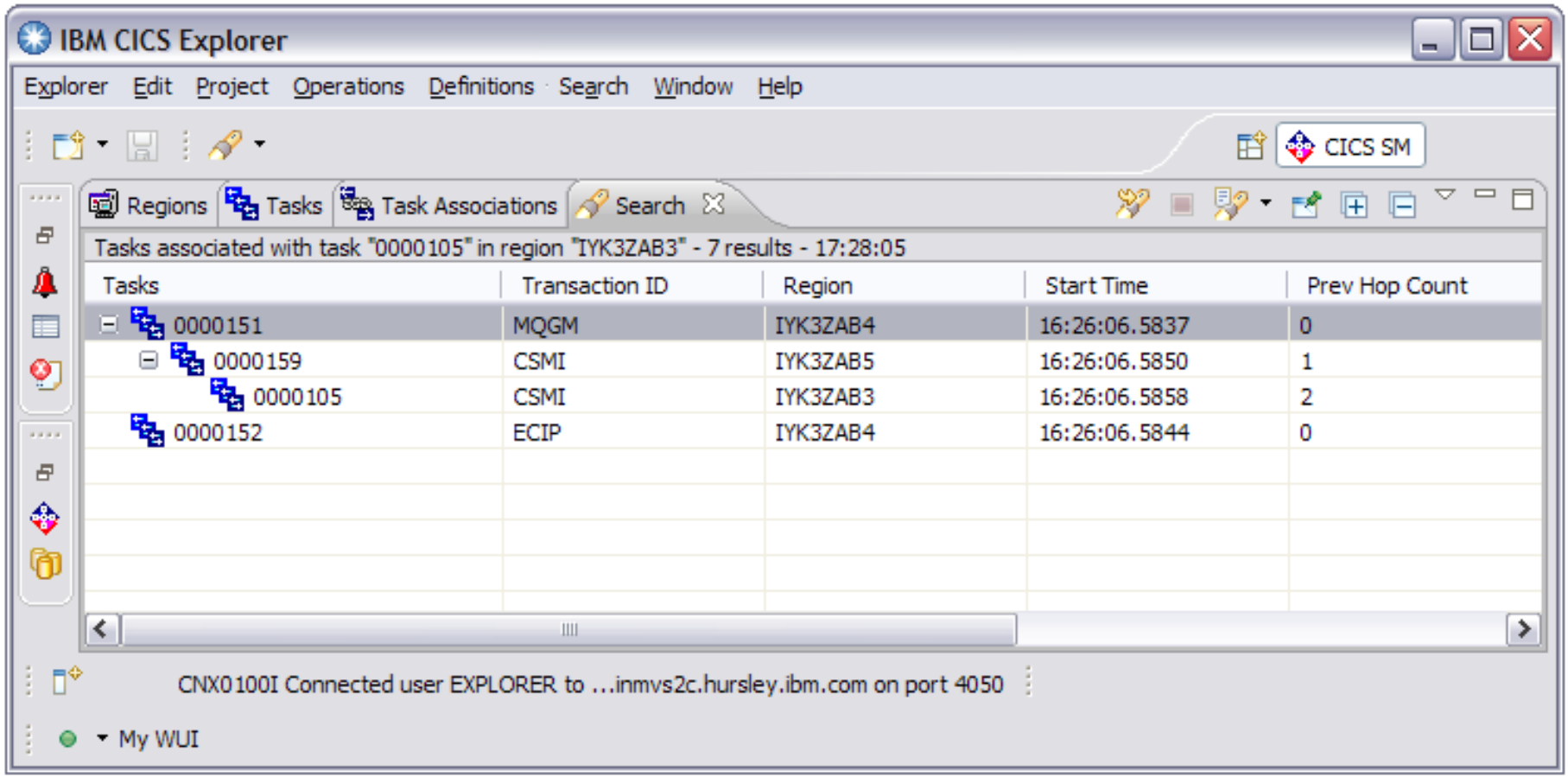
Previous Hop Data



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CICSPlex SM Workload Management

- **CICS TS V4.2 provides additional routing algorithms to control workload across regions in different ways**
  - QUEUE, GOAL – existing algorithms, use link weights to favour local systems in routing decisions
    - Link weighting altered to prefer IPIC over ISC
  - LNQUEUE, LNGOAL – *NEW* link neutral algorithms – ensure all types of links are treated equally, share workload more evenly across local and remote systems
    - LNQUEUE: route to region with most favourable load, health, abend probability, RTA event impact
    - LNGOAL: route to region that will best meet response time goal
- **Transaction-level control for routing**
  - Can specify routing algorithm on TRANGRP and override the WLMSPEC setting
- **UOW affinities**
  - Prevent possible deadlocking caused by multiple DPL requests within a single UOW
  - Ensure routing of subsequent requests to the same region as appropriate

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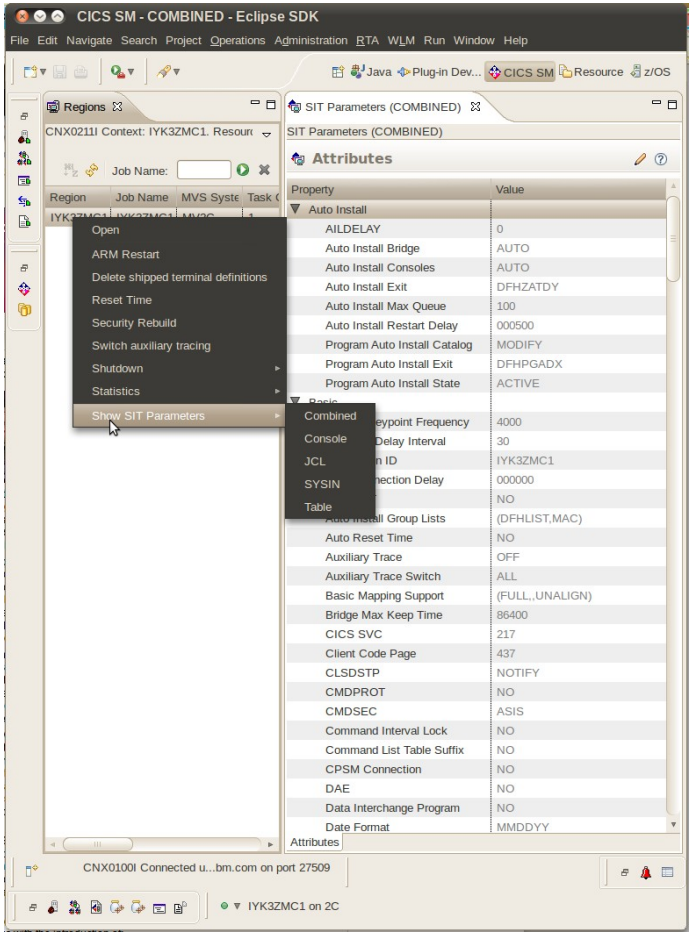
New CICSPlex SM SYSPARM Resource

- **New SYSPARM base table has been added to CICSPlex SM**
- **Allows retrieval of systems initialization table values**
  - Read-only access to SIT parameters
  - Ability to access SIT parameters from
    - DFHSITxx load module
    - EXEC PGM=DFHSIP,'PARM=...'
    - SYSIN dataset overrides
    - Console overrides
    - All of the above combined together in order
  - Cannot retrieve the changes made after startup using system programming interface commands



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Password Phrase Support

- **Password phrases are an alternative to traditional passwords**
  - Provide improved system security - harder to attack, easier to remember
  - Character string comprising mixed-case letters, numbers, and certain special characters, up to 100 characters in length
    - ESM specifies exact rules
    - Minimum length defined by RACF (14 characters unless ICHPWX11 exit present and allows 9 characters)
- **CICS introduced support for password phrases by most major CICS interfaces including:**
  - New sign-on transaction (CESL)
  - CICS API
  - Web
  - Web services
  - CMCI
  - WUI

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Notes

- **Interfaces that now support CICS password phrases include:**
  - Application Programming Interface
    - EXEC CICS SIGNON
      - New parameters to specify password phrase and length
      - New parameters to specify new password phrase and length
    - EXEC CICS CHANGE PHRASE
      - Change the password or password phrase for a userid
    - EXEC CICS VERIFY PHRASE
      - Verify that a password or password phrase matches the password or password phrase recorded by an ESM
    - EXEC CICS WEB SEND or CONVERSE
      - If the password length is greater than 8 them the password will be treated as a password phrase
      - Password length currently can be greater than 8 characters
  - CESL transaction
    - New transaction to sign on to CICS using a password or a password phrase
    - Supports both 3270, Sequential and Console devices
      - Does not support 40x12 size screens
  - CESN will remain unchanged
  - CEDF transaction
    - Changed to hide passwords or password phrases
  - Additional functions that support password phrases
    - CMCI, CICS Explorer, CPSM Web User Interface
    - Web support
    - Web services
    - LDAP (supports a long password)

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Notes

- **The following interfaces do not support password phrases:**
  - APPC
  - ONC RPC
  - IIOP
  - Define FILE
  - IMS DBCTL
  - FEPI
  - ECI/IP
    - CCI
    - Link3270 bridge using ECI
  - The C, COBOL, PLI, and REXX interface to CICSPlex SM

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Scalability

- Threadsafe extensions
- Concurrency in program resource definitions
- Threadsafe IMS Database Control
- Increased number of LSR pools
- CICS use of 64-bit storage
- Changes to storage use for CICS trace
- Changes to the overall limits for the CICS extended dynamic storage areas

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Threadsafe extensions – Threadsafe SYNCPOINT

- **Commands now made threadsafe***
  - EXEC CICS SYNCPOINT
  - EXEC CICS SYNCPOINT ROLLBACK
  - EXEC CICS RESYNC

  * some switching may still occur, but heavily reduced
- **EXEC API no longer switches to QR for syncpoint requests**
  - Recovery Manager (RM) domain now makes the decision if a switch is required
  - All RM domain clients register at startup and tell RM if they are threadsafe
  - RM domain keeps it on the open TCB wherever possible
- **End of task syncpoint can run on an open TCB before CICS switches to QR to terminate the task**

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Threadsafe extensions – Other APIs made threadsafe

- QUERY SECURITY
- SIGNON, SIGNOFF
- VERIFY PASSWORD, VERIFY PHRASE
- CHANGE PASSWORD, CHANGE PHRASE

- EXTRACT TCPIP, EXTRACT CERTIFICATE

- All Call and EXEC Level Named Counter Server commands
- Built in functions for DIGEST and DEEDIT

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Threadsafe extensions – Threadsafe SPI commands

- **New SPI commands that are threadsafe:**
  - INQUIRE CAPDATAPRED, INQUIRE CAPINFOSRCE, INQUIRE CAPOPTPRED
  - INQUIRE EPADAPTER, SET EPADAPTER
  - INQUIRE OSGIBUNDLE, INQUIRE OSGISERVICE
  - INQUIRE TEMPSTORAGE, SET TEMPSTORAGE

- **Existing SPI commands made threadsafe:**
  - INQUIRE CLASSCACHE
  - INQUIRE JVM
  - INQUIRE JVMPOOL
  - INQUIRE JVMPROFILE
  - PERFORM CLASSCACHE
  - PERFORM JVM POOL
  - SET CLASSCACHE
  - SET JVMPOOL

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Threadsafe extensions – OTE settings

- **In CICS TS 4.2 we have separated out whether an application must run on an open TCB from what type of APIs it uses**
- **CONCURRENCY(REQUIRED)**
  - Application must be coded to threadsafe standards
  - States that the application MUST run on an open TCB
  - Application starts on an open TCB
  - If a switch to QR is made for a CICS command, a switch back to the open TCB is made when returning to the application
- **Existing API keyword defines what APIS are used**
  - This defines what type of TCB is used

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Threadsafe extensions – OTE settings

- **CONCURRENCY(REQUIRED) & API(CICSAPI)**
  - The application will run on an open TCB from the start.
  - It only uses CICS supported apis (including DB2, IMS & MQ)
    - CICS will always use an L8 TCB in this instance irrespective of the execution key, as CICS apis do not rely on the key of the TCB.
  - This is great for applications that are going to resource managers like DB2 & MQ as the same L8 is used

- **CONCURRENCY(REQUIRED) & API(OPENAPI)**
  - The application will run on an open TCB from the start.
  - As it will use non CICS apis it will run on an L8 or an L9 TCB depending on the execution key. This is the same as with CICS TS 4.1 today
  - Only use OPENAPI when non CICS supported APIs are to be used

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Threadsafe extensions - Threadsafe Mirror

- **DFHMIRS is now threadsafe**
  - Supplied definition now specifies CONCURRENCY(THREADSAFE)
- **IPIC transformers are now threadsafe. Non IPIC code remains non threadsafe**
- **Only requests function shipped over IPIC will run on an Open TCB**
  - File Control
  - Temporary Storage
  - Distributed Program Link (DPL)
    - If the target program is defined as threadsafe and the mirror already on an open TCB
- **Review your DFHSIT specification for FCQRONLY**
  - Specify FCQRONLY=NO as there is no longer any need to turn off threadsafety in the FOR

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Threadsafe IMS Database Control (DBCTL)

- **CICS-DBCTL interface will use OTE when connected to IMS 12***
  - At connect time CICS & IMS determine if each other can support OTE
  - TCB switching is controlled by the IMS Database Resource Adapter (DRA)
  - With IMS 10 & 11
    - CICS-DBCTL TRUE enabled as QUASIRENT
    - DRA will continue to be called on QR TCB and will switch to a DRA thread TCB
    - Toleration APAR PM31730 (IMS 10), PM31729 (IMS 11)
  - With IMS 12*
    - DRA will not switch TCBs and run the IMS request on the calling L8 TCB
    - CICS-DBCTL TRUE enabled as OPENAPI
    - CALLDLI and EXEC DLI api now threadsafe when run with IMS 12
- **IMS 12 is available through a Quality Partnership Program (QPP)**
  - Exploitation APAR PM31730 is required
  - For more information, visit www.ibm.com/software/data/ims

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CICS and 64-Bit support

- **Enabled the CICS domain architecture to run in, and exploit 64-bit addressing mode**
- **Allowed CICS domains to use stack storage, domain anchor storage, and all associated domain control blocks in virtual storage above the bar**
- **Provided below the bar VSCR …**
  - Single System Scaling …
    - More concurrent tasks, larger applications, …
  - Increasing pressure on storage usage above the 16MB line!
    - Both in z/OS storage and in EDSA storage!

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CICS and 64-Bit support

- **CICS Transaction Server for z/OS V4.2 contains significant changes to the CICS domain architecture that exploit the underlying z/Architecture for 64-bit addressing and provides the infrastructure for CICS domains to utilize and AMODE 64.**

- **These changes affect a number of CICS internal interfaces and related control blocks, including (but not limited to)**
  - CICS Kernel Anchor and Domain Table separated, …
  - Kernel Stack, Stack Segments, Larger Save Areas, …
  - Kernel Task Entry (TAS), …
  - Common System Area (CSA) – signifcantly changed, …
  - Task Control Area (TCA) – 15% smaller, …
  - Control block changes for the following domains
    - Trace, Message, Loader, Temporary storage, monitoring...

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CICS and 64-Bit support

- **The following domains run AMODE(64)**
  - Trace Domain
  - Message Domain
  - Temporary Storage Domain
  - Kernel Domain
  - Monitoring Domain
  - Storage Manager Domain
  - Lock Manager Domain

- **MEMLIMIT**
  - New minimum requirement of 4G
    - CICS will not start with less - message DFHSM0602

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CICS and 64-Bit support - Exploiters

- **CICS Java**
  - Move to 64-bit JVM (Java 6) for pooled JVM and JVM server
  - 31-bit Java not supported
- **CICS Trace**
  - Internal Trace Table above the bar
    - Internal trace table in 64-bit storage only if Transaction Isolation inactive (TRANISO=NO) or APAR OA34311 applied on z/OS 1.12
  - Transaction Dump Trace Table in 64-bit storage
  - Many trace control blocks above the bar
  - 64-bit GTF tracing (OA32611 required for z/OS 1.11 & 1.12)
- **Message tables are above the bar (subject to TRANISO restriction)**

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CICS and 64-Bit support - Exploiters

- **CICS DUMP**
  - 64-bit storage SDUMP support
    - Requires z/OS APAR OA32271 (z/OS 1.11 and 1.12)
  - Use is now made of DUMPRIORITY for key control blocks in 64-bit storage that should have priority when taking an SDUMP
    - Improves chances of storage being in the SDUMP in case the dump data sets are not big enough!
      - (i.e. if not using SMS managed dump data sets)
- **EXITS**
  - XPI is based on domain architected interfaces
    - Linkage conventions have changed
  - All Global user exits using the XPI MUST be reassembled

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CICS and 64-Bit support - Temporary Storage

- **Many TS control blocks above the bar**
- **TS Main above the bar (subject to TRANISO restriction)**
- **Limiting Main Temporary Storage use**
  - A new SIT parameter TSMAINLIMIT={64M|amount}
  - Maximum is 32G, but must not be greater than 25% of MEMLIMIT else CICS will not start - message DFHTS1608
  - Available on INQUIRE and SET TEMPSTORAGE commands
    - SET TEMPSTORAGE TSMAINLIMIT cannot decrease by toomuch or increase to >25% of MEMLIMIT
      - INVREQ and message DFHTS1606 or DFHTS1607
  - TSMAININUSE option on INQUIRE TEMPSTORAGE provides current amount of storage occupied

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Temporary storage - automatic TS cleanup

- **EXPIRYINT can be specified on a TSMODEL definition**
  - Applies to
    - TS main and non-recoverable auxiliary
  - Does NOT apply to
    - Remote queues – use model in QOR instead
    - Recoverable AUX
    - Shared TS queues
    - CICS internal queue
    - Queues that don't match a TS model
  - Default is zero (no expiry), interval can be specified in hours (0 ¦ 1-15000)
  - Available via CEDA, CSDUP, CPSM BAS and Explorer
  - SPI to inquire and set and via CPSM and Explorer

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Increased number of VSAM LSR pools

- **CICS historically has allowed use of 8 local shared resource (LSR) pools**
- **DFSMS have allowed up to 256 lsrpools per address space from z/OS 1.4**
- **CICS allows you to specify up to 255 LSRPOOLS (1-255)**
  - We will not use pool 0
  - Today LSRPOOL number is held in one byte in the FCTE, with 0 meaning no LSR (ie NSR)
- **Potential performance optimization where greater subdivision of files across LSRPOOLs is required**
  - e.g. Place highly-used files in their own LSRPOOL

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Agenda Overview

Time	Description
8:30 – 9:00	Registration & Coffee
9:00 – 9:15	Welcome and Introductions
9:15 – 10:45	CICS TS V4.2 technical introduction – CICS TS V4.2 became generally available on 26th June. This presentation will provide you with a technical overview of all new and enhanced technology.
10:45 – 11:00	Morning tea
11:00 – 12:00	Java as an application development option
12:00 – 12:50	CICS Explorer and Tools update
12:50 – 13:00	Wrap up

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Java

IBM 64-bit SDK for z/OS, Java Technology Edition, V6.0.1

Support for Java applications in a JVM server

Java runtime support for JZOS and J2C copybook importers

Developing Java applications in the CICS Explorer SDK

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IBM 64-bit SDK for z/OS, Java Technology Edition, V6.0.1

- **64-bit provides significant more storage**
  - Removes significant constraint and complexity in managing large Java workloads
  - Applies to JVM servers and existing pooled JVMs
    - Java stack and heap are now allocated in above the bar storage
    - Allows more Pooled JVMs per region
    - Allows more storage to increase caches and reduce frequency of GC
  - No Java application changes
    - Requires code using the JNI to be 64-bit – typically only used by vendors
    - OSGi bundled 64-bit drivers available with DB2 and WebSphere MQ
- **V6.0.1 is IBM zEnterprise optimized for significant performance gains**
  - Exploits new z196 / z114 instruction set
  - Improved GC, JIT
  - Fully compatible with Java 6 SE
  - Eligible for offload to zAAP
- **Removed support previous and 31-bit JVM versions**

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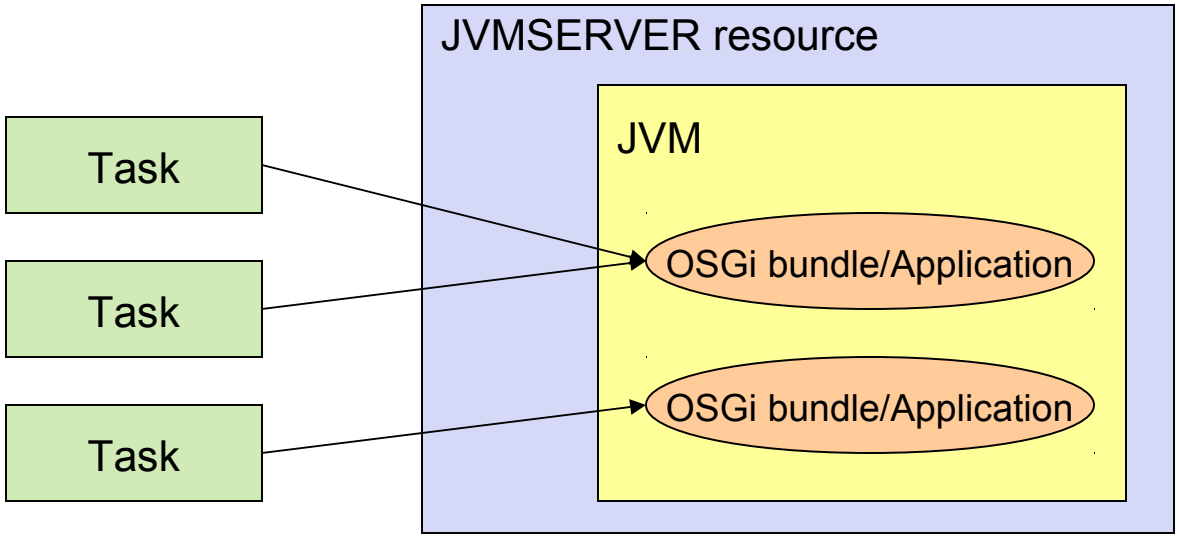
Support for Java applications in a JVM server



- **JVMSERVER is a new CICS resource defining a long-running JVM instance**
- **Serves multiple transactions concurrently**
- **Applications/tasks run exclusively as OSGi bundles**
- **New statistics available in CICS Explorer and monitoring records**
- **The strategic direction of Java in CICS**
  - Pooled Java will be discontinued in the future

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Notes

- The JVM server is a long-running JVM whose lifecycle and configuration is controlled by the ‘JVMSERVER’ CICS resource.
- A JVM server is able to run Java applications for up to 256 tasks concurrently. Each task runs as a thread that is attached to the JVM.
- You can run multiple JVM servers within one CICS region, with a maximum of 1024 concurrent threads shared across JVM servers.
- Each thread has full access to the JCICS API to interact with CICS resources.
- Applications are deployed as OSGi bundles, and are installed into CICS via the existing CICS bundle capabilites.

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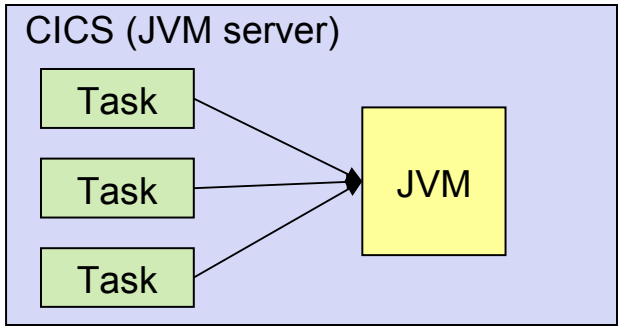
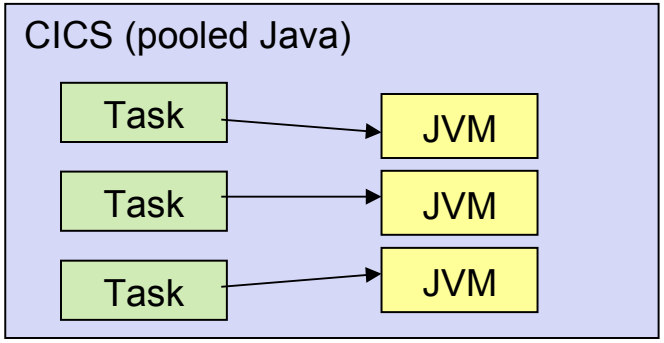
JVM server runtime vs. existing Java support





Single JVM - serves many tasks (reduced storage)	Pool of JVMs - each serves only a single task.
(concurrent, multi-threaded, up to 256 threads per JVM server)	Java Program Isolation
T8 (CICS key)	J8 (CICS key), J9 (User key)
MAXTHRDTCBS (automatically calculated), up to max of 1024 per region	MAXJVMTCBS, SIT parm
More standard Server model (+ data-sharing)	Difficult, convoluted to share data and state.
Dynamic update and replace of modules	JVMs must be restarted to effect changes

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Notes

- There are two types of JVM which can be run in the CICS environment:
- 1) The “traditional” Pooled JVMs, which provide support for a single thread of program execution in each JVM. This provides for isolation of Java programs from each other. The maximum number of JVMs a CICS region can support is governed by the MAXJVMTCBS system initialization parameter (assuming that enough resources are available to support that many). A PROGRAM definition in the CSD maps the CICS 8-character uppercase program name to the longer mixed-case Java class name, and specifies the execution key (CICS or USER) and the name of the JVM Profile which is associated with the program. JVM profile options specify the JVM characteristics.
- 2) “New” JVM servers, which operate in a more industry-standard fashion. The PROGRAM definition in the CSD specifes the name of the JVMSERVER instead of a JVMProfile (The JVMProfile is now associated with the JVMSERVER resource). Each JVMSERVER is also defined in the CSD. A JVMSERVER can run up to 256 simultaneous threads of execution, running on CICS T8 TCBs, with a system-wide limit of 1024 threads over all JVMSERVERs in the CICS region. Running many programs in the same JVM allows for data sharing between tasks.

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Support for Java applications in a JVM server

- **OSGi Service Platform**
  - Standards-based framework for deployment and management of Java applications
  - JVM server includes, Equinox an implementation of the OSGi Service Platform
- **Java applications are required to use OSGi development and packaging**
  - Existing CICS Java applications using main() method linkage can run unchanged if "wrapped" in an OSGi bundle
  - Java applications must be thread-safe and cannot use CICS EJB or CORBA
- **CICS BUNDLE resource provides deployment lifecycle for OSGi bundles**
  - New copy of Java code using discard, then install of a BUNDLE resource
  - OSGi provides built in version and pre-req management
- **Dedicated class loader for each OSGi bundle**
  - Application isolation
  - Improved class validation – no more NoClassDefFoundError

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Developing Java applications in the CICS Explorer SDK

- **CICS Explorer SDK**
  - Eclipse development toolkit for OSGi packaging and deployment to CICS
  - Requires Eclipse 3.6.2, or above
    - Freely available to download from www.elcipse.org
  - OR a product already based on Eclipse 3.6.2 such as IBM Rational Application Developer
  - Supports deployment to all CICS releases
    - JVM server at CICS TS V4.2 only
    - JVM Pool at CICS TS V3.2, and above
- **Java projects are developed as Plug-in Projects and then packaged in a CICS bundle and exported to zFS**

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Notes

OSGi technology is the dynamic module system for Java™

“OSGi technology provides a service-oriented, component-based environment for developers and offers standardized ways to manage the software lifecycle. These capabilities greatly increase the value of a wide range of computers and devices that use the Java platform.”

The OSGi specifications can be found at…

http://www.osgi.org/Specifications/HomePage

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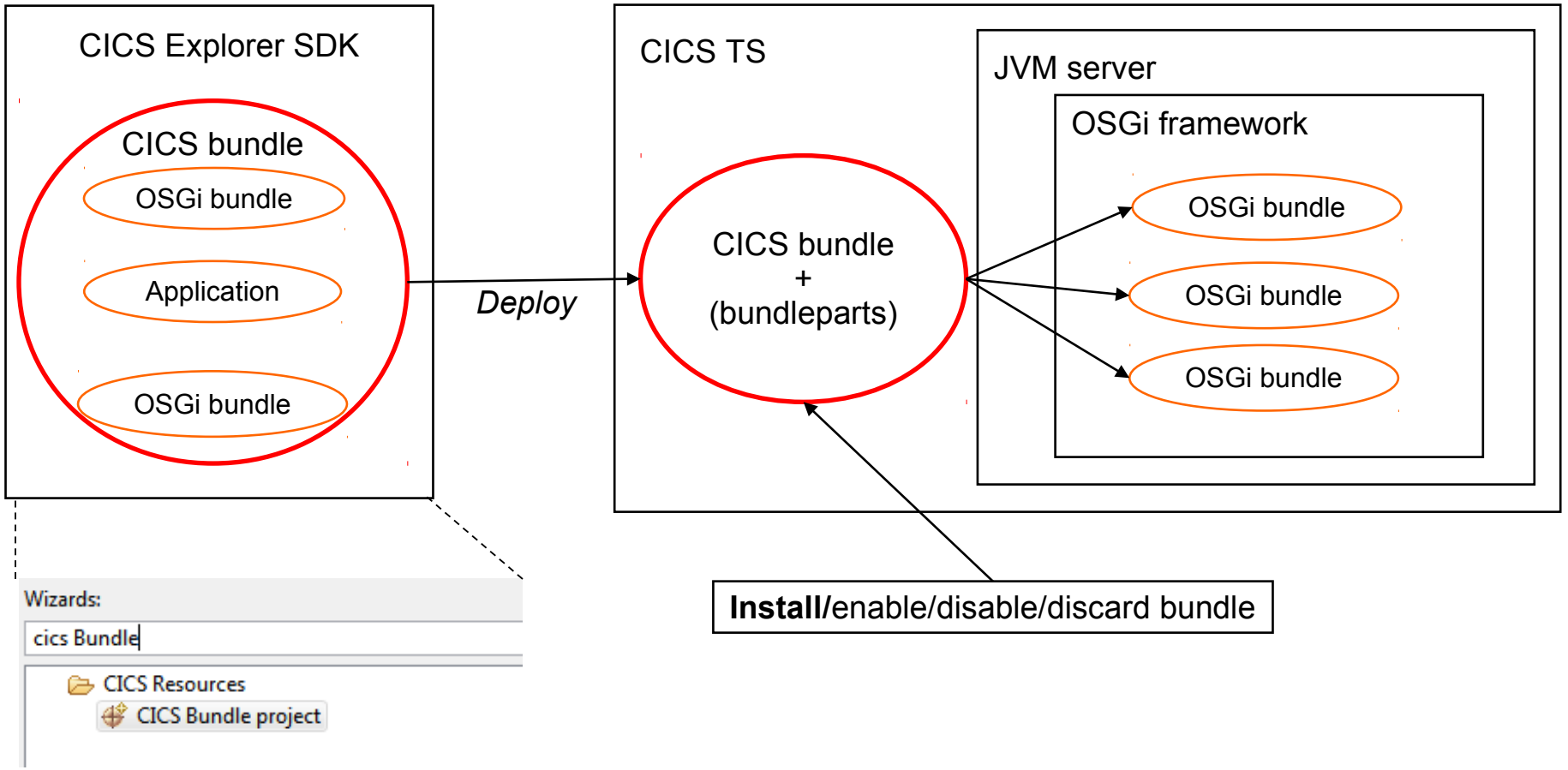
Developing Java applications in the CICS Explorer SDK



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Notes

JVM server has added the Equinox OSGi Framework into it's runtime, allowing applications to be deployed as OSGi bundles. CICS Explorer SDK (based in Eclipse) can be used to create new, or turn existing applications into OSGi bundles. Right click your Java project and select "convert to OSGi Bundle project"!

You can then create a 'CICS bundle project' through the Explorer SDK and place your OSGi bundles into a CICS bundle. Explorer can deploy your CICS bundles into CICS where the OSGi bundleparts are themselves deployed into the OSGi Framework of the JVM server.

With OSGi you don't end up with a large sprawling classpath - each bundle is self-contained with it's own classloader, and has explicit resolvable dependancies. JAR Hell is not an issue, you can't accidentally pick up anyone else's classes.

OSGi also allows you to install, start, stop, and discard OSGi bundles on the fly while the JVM server is still running (via lifecycle operations on the parent CICS bundle). You can also have parallel versions of the same OSGi bundle – very handy for migrating to newer code.

One other key benefit is that all dependencies between OSGi bundles are explicitly declared. This allows the framework to resolve your bundle and all it's dependencies before any code is actually run. No more CLASSDEFNOTFOUND!

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Java runtime support for JZOS & J2C copybook importers

- **Tooling and APIs to aid converting data types between COBOL and C/C++ language structures and Java objects**
  - Program interfaces – LINK, START, XCTL
  - Data – VSAM files, TS, TD
- **Data binding beans from the J2C tools and tooling wizards included with**
  - IBM Rational Application Developer (RAD)
  - IBM Rational Developer for System z (RDz)
- **IBM JZOS Batch Toolkit for z/OS SDK**
  - A version of the JZOS Batch Toolkit is included as part of the IBM Java SDK for z/OS
  - www.alphaworks.ibm.com/tech/zosjavabatchtk
- **Runtimes for the above products have been tested in the CICS JVM server**

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Dave the Developer

- **Goals**
  - Dave wants to write code
- **Tools and Products**
  - Development tools (e.g. Eclipse, Rational Application Developer)
  - Web browser
- **Tasks**
  - Tasked with implementing individual application components according to predefined contract
- **Skills / Education**
  - Background in software development
  - Familiar with one or more languages/ technologies e.g. Java.

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Steve the Systems Programmer

- **Goals**
  - Work with a test and production environment which empowers the business user and is up 24/7.
- **Tools and Products**
  - CICS Explorer
  - TSO/ISPF
  - OMEGAMON® for z/OS
- **Tasks**
  - Manage the incoming requests for new roles and new applications
- **Skills / Education**
  - z/OS knowledge
  - Trouble shooting
  - Programming (e.g., JCL, COBOL)
  -

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CICS Explorer SDK

- **CICS Explorer SDK V1.0**
  - Introduced with CICS TS V4.1
  - Plug-in development for CICS Explorer
- **CICS Explorer SDK V1.1**
  - Introduced with CICS TS V4.2
  - CICS Java developement
- **CICS Explorer meets Eclipse IDE**
  - Integrated documentation, examples & wizards for simplified development & deployment
  - Support for migrating applications using conversion, wrapping or injection
  - Supports the development of Java applications for both a JVM server and pooled JVM

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Demonstration: CICS Explorer & CICS Explorer SDK

- **Goals**
  - Run a Java application in CICS
  - Demonstrate different development & management roles
  - End-to-end experience with CICS Explorer SDK
- **Dave the Developer**
  - Will create, deploy & test the application
  - Can troubleshoot application problems
- **Steve the System Programmer**
  - Will create the Java environment and install & manage the application
  - Can troubleshoot application dependency problems
- **Setup**
  - Orlando: Mac OS X 10.6 + Java SE 6 (Update 26) + Eclipse 3.6.2 (Cocoa 64-bit) + CICS Explorer SDK V1.1
  - Hursley: CICS TS V4.2 (CICSplex)
  - Java and CICS SM perspectives in separate workbench windows

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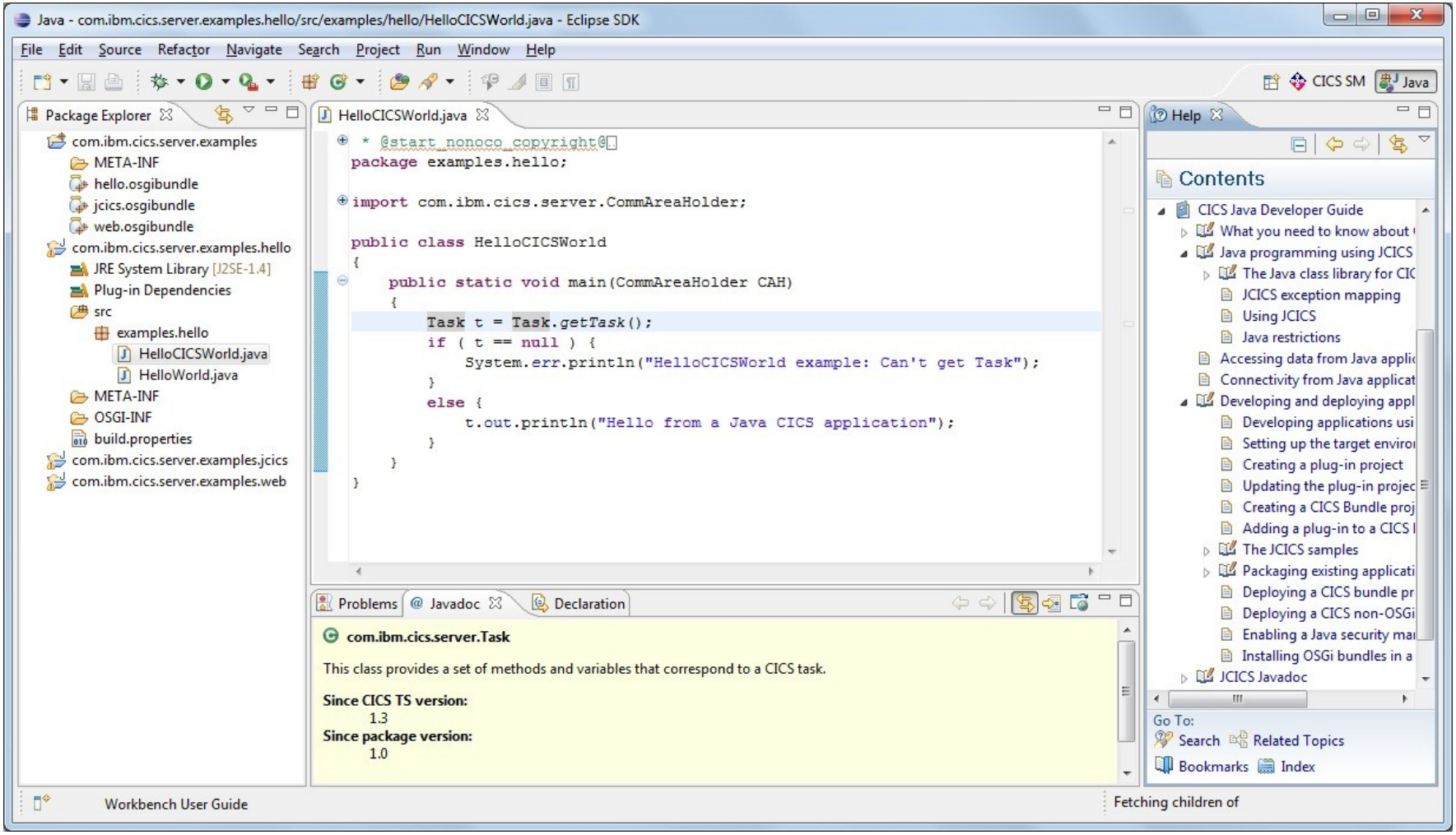
CICS Explorer & CICS Explorer SDK Demonstration



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Steve the Systems Programmer

1. Configure and install JVM server
2. Create and install (sample) CICS resources
3. Create CICS bundle

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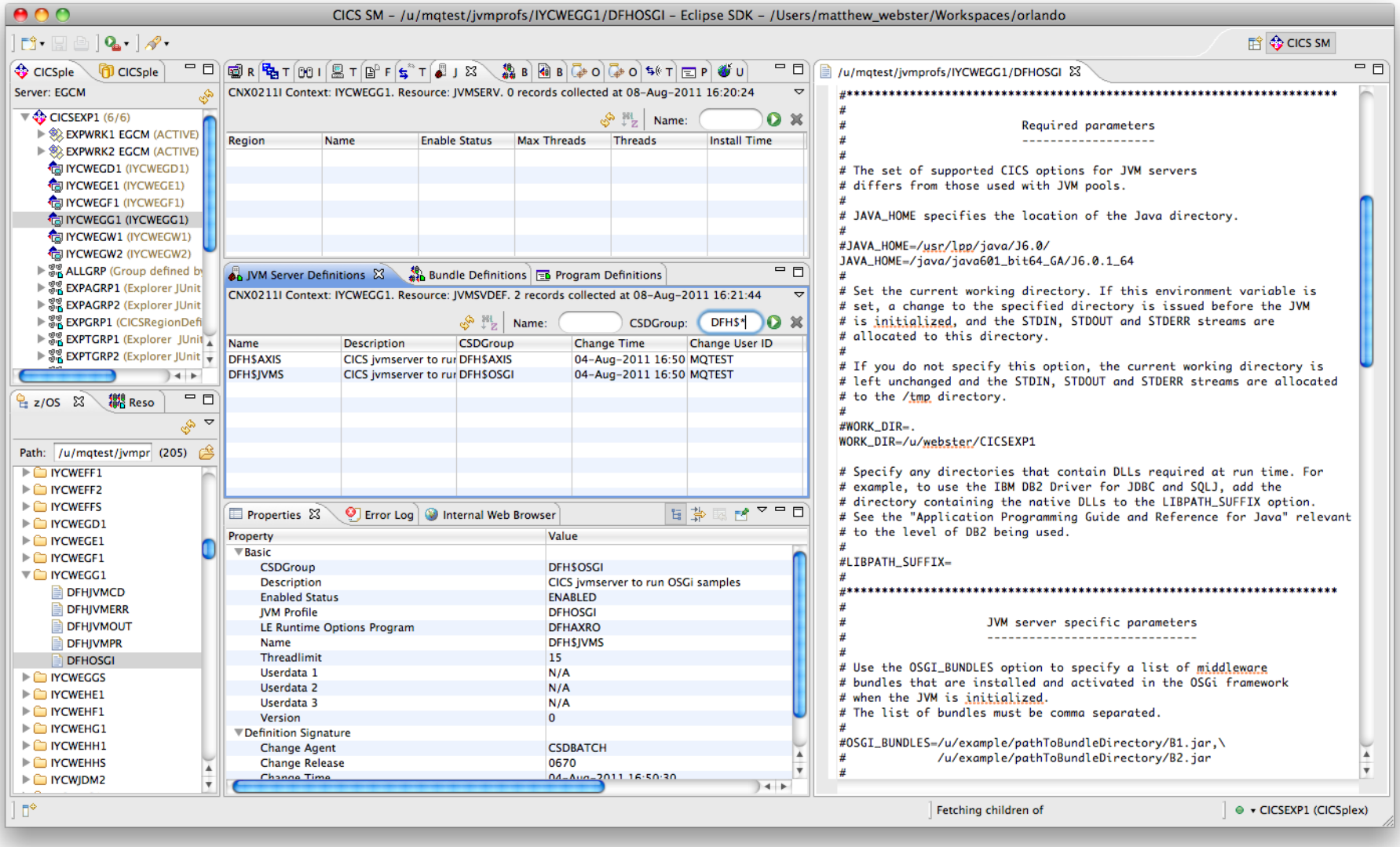
Edit supplied DFHOSGI profile and “File > Save As…”



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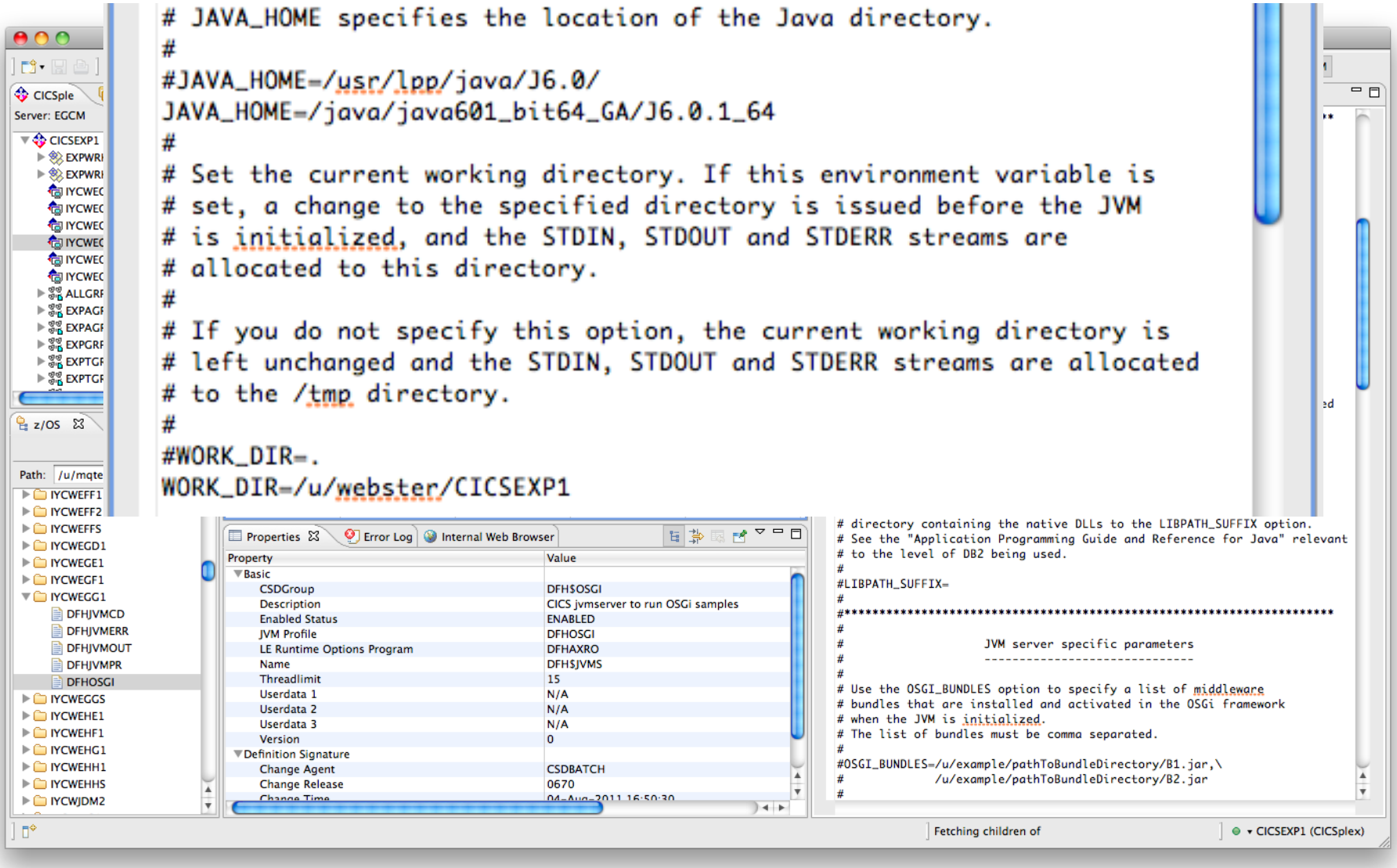
Edit supplied DFHOSGI profile and “File > Save As…”



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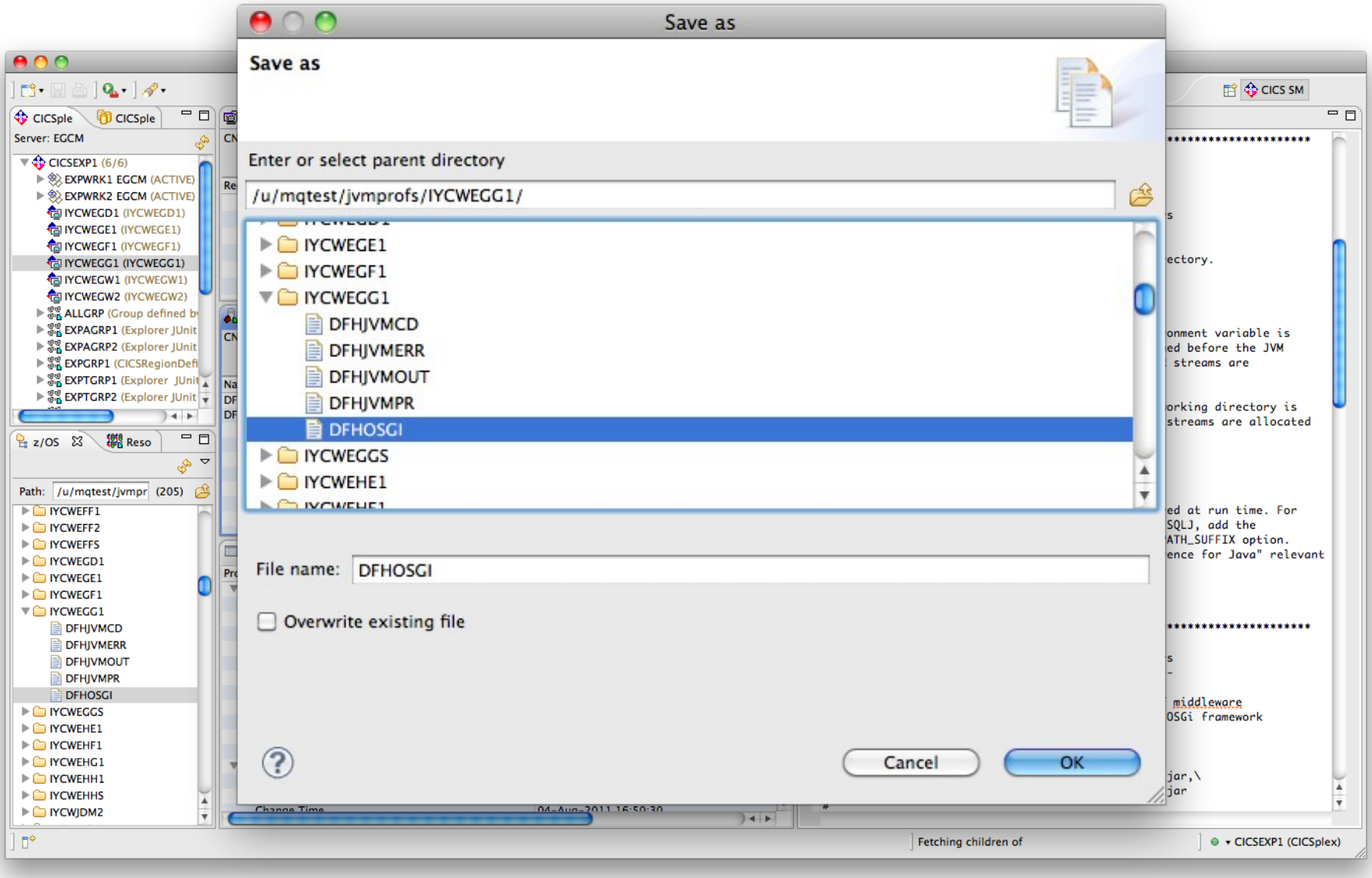
Edit supplied DFHOSGI profile and “File > Save As…”



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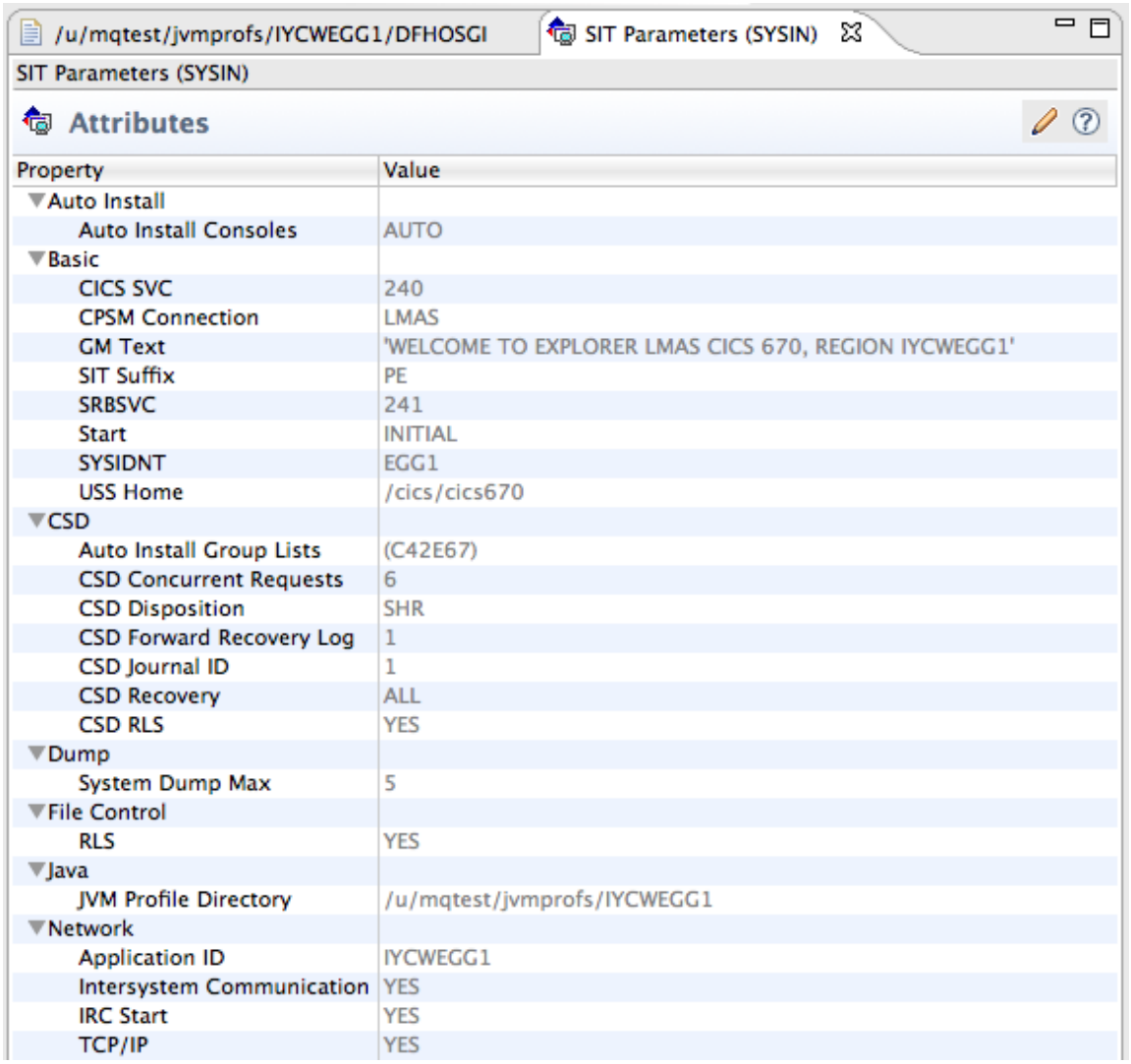
Use “Show SIT Parameters” to find JVM Profile Directory



Property	Value
Auto Install	
Auto Install Consoles	AUTO
Basic	
CICS SVC	240
CPSM Connection	LMAS
GM Text	'WELCOME TO EXPLORER LMAS CICS 670, REGION IYCWEGG1'
SIT Suffix	PE
SRBSVC	241
Start	INITIAL
SYSIDNT	EGG1
USS Home	/cics/cics670
CSD	
Auto Install Group Lists	(C42E67)
CSD Concurrent Requests	6
CSD Disposition	SHR
CSD Forward Recovery Log	1
CSD Journal ID	1
CSD Recovery	ALL
CSD RLS	YES
Dump	
System Dump Max	5
File Control	
RLS	YES
Java	
JVM Profile Directory	/u/mqtest/jvmprofs/IYCWEGG1
Network	
Application ID	IYCWEGG1
Intersystem Communication	YES
IRC Start	YES
TCP/IP	YES

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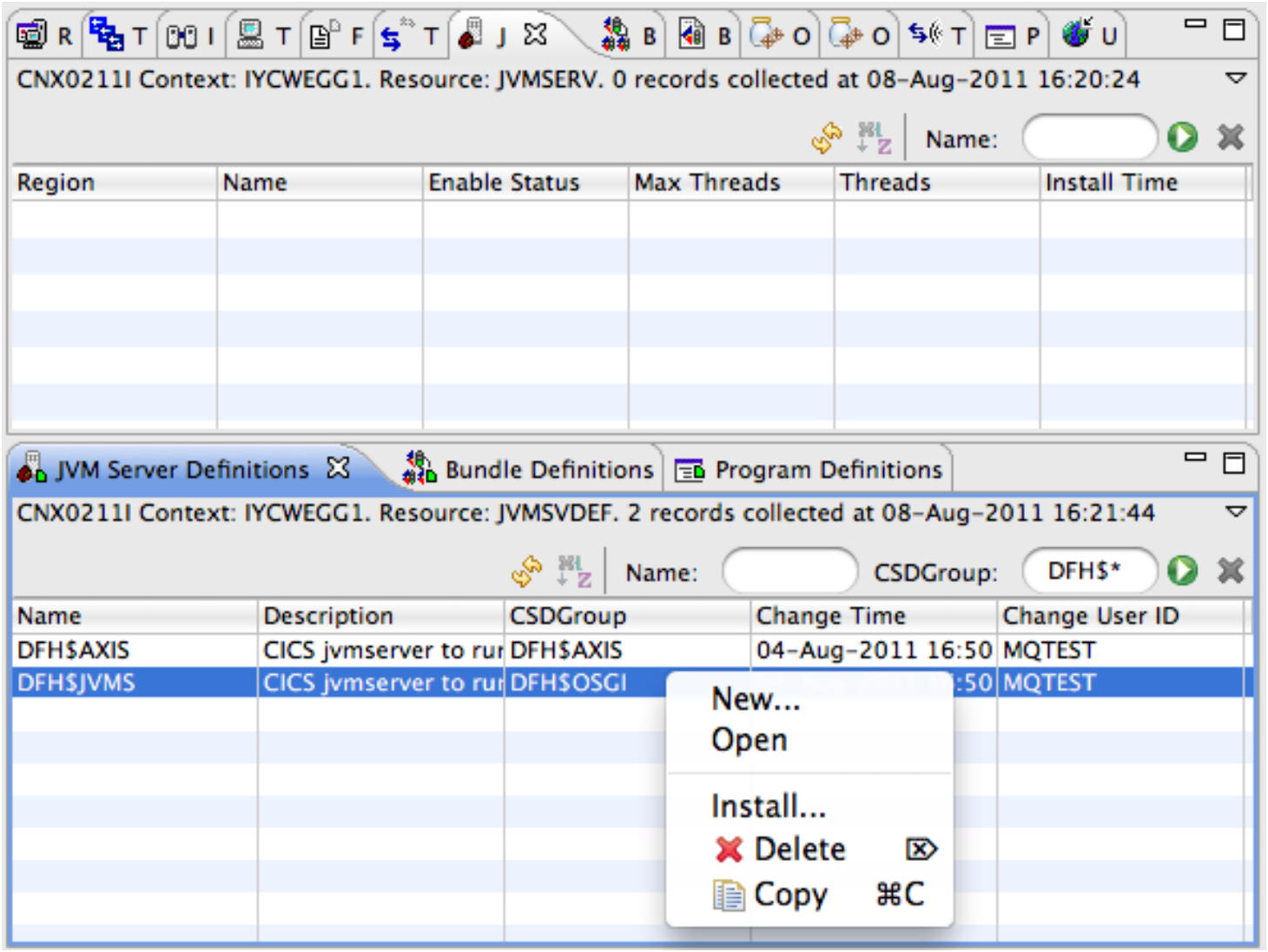
INSTALL sample DFH$JVM JVM server



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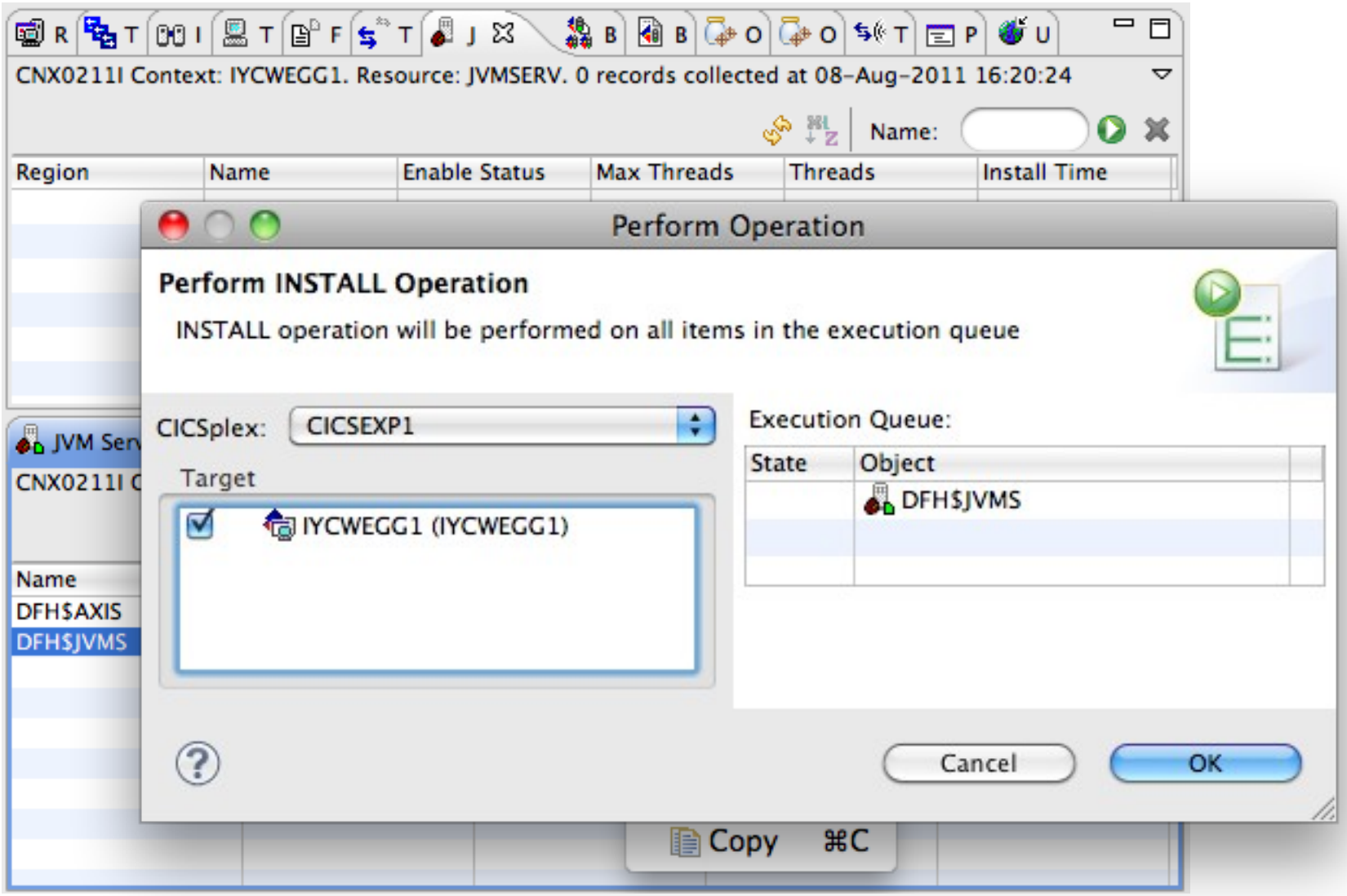
INSTALL sample DFH$JVM JVM server



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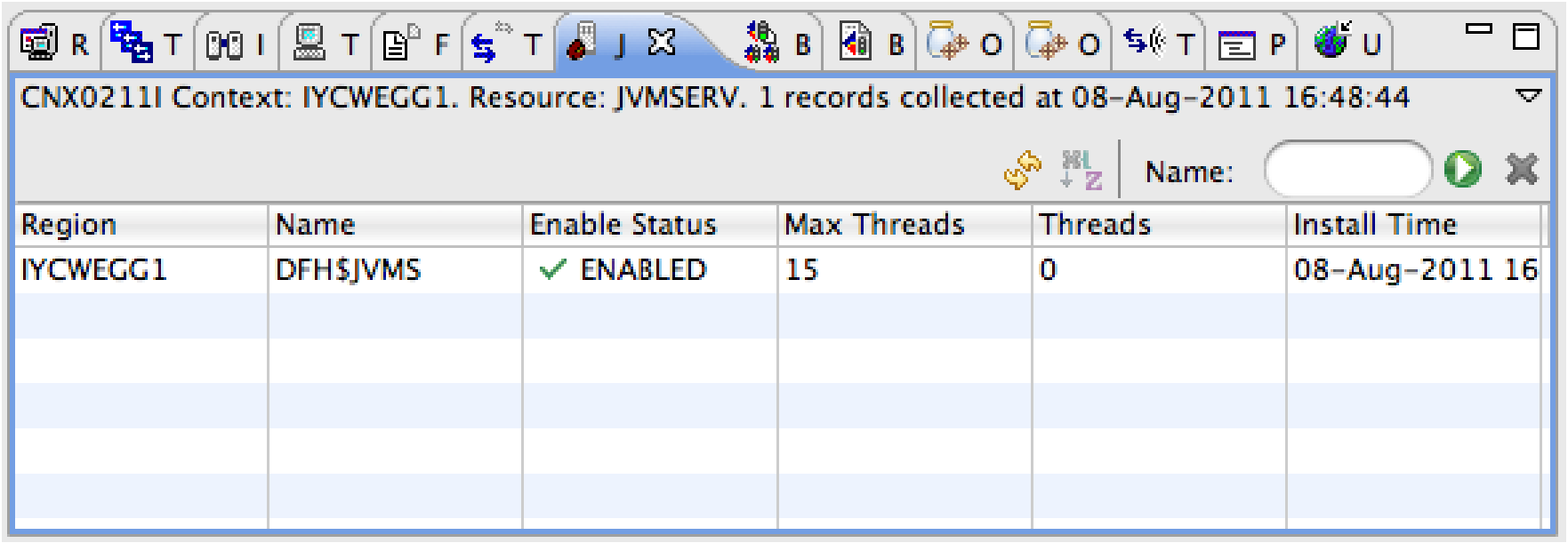
JVM server DFH$JVMS ENABLED



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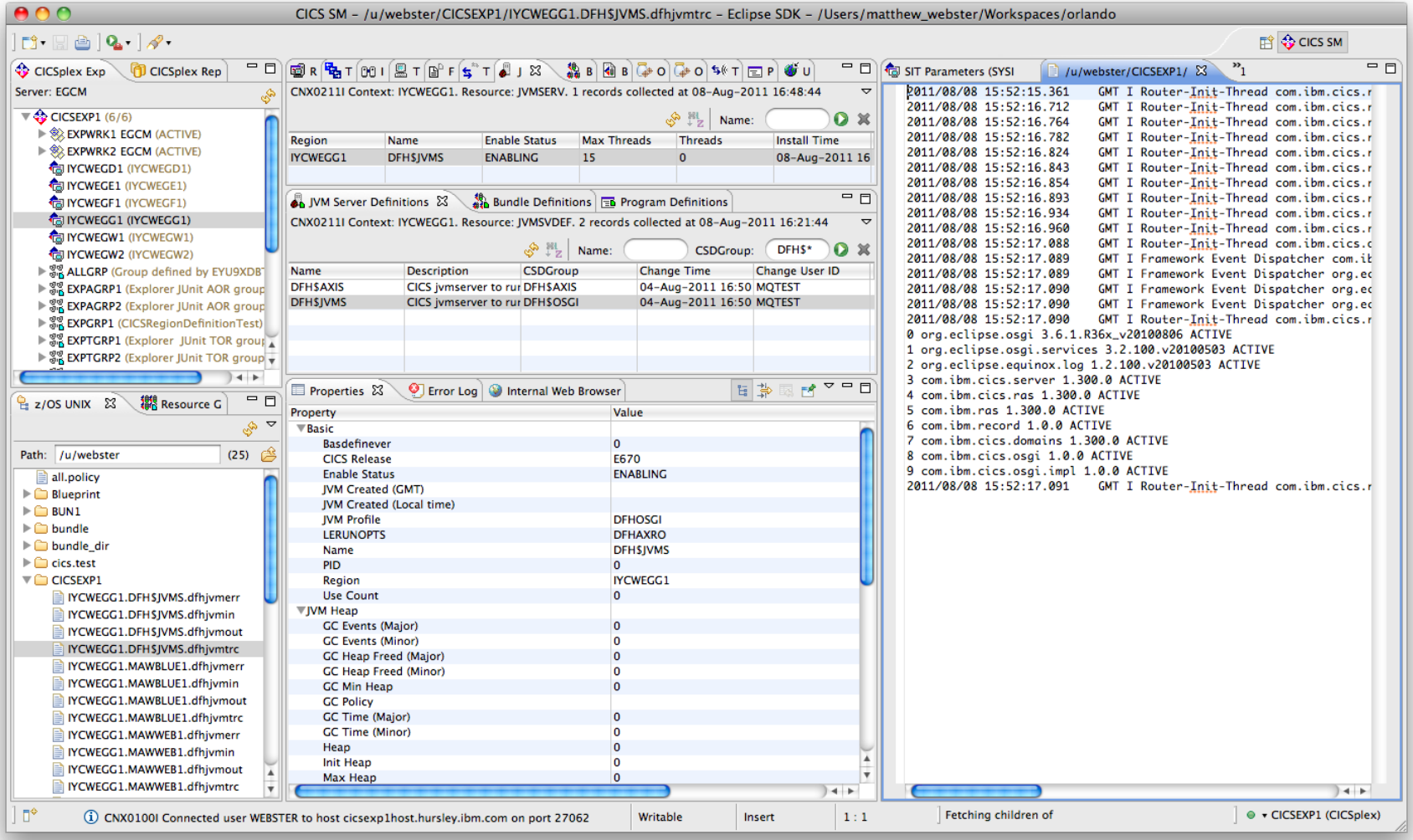
Check IYCWEGG1.DFH$JVMS.dfhjvmtrc for any problems



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List of system and “middleware” OSGi bundles installed

/u/mqtest/jvmprofs/IYCWEGG1/DFHOSGI | SIT Parameters (SYSIN) | /u/webster/CICSEXP1/IYCWEGG1.DFHSJVMS.dfhjvmtrc

```
2011/08/08 15:52:15.361    GMT I Router-Init-Thread com.ibm.cics.router.Router: Starting the OSGi Framework.
2011/08/08 15:52:16.712    GMT I Router-Init-Thread com.ibm.cics.router.Router: Installing OSGi System bundle: /ci
2011/08/08 15:52:16.764    GMT I Router-Init-Thread com.ibm.cics.router.Router: Installing OSGi System bundle: /ci
2011/08/08 15:52:16.782    GMT I Router-Init-Thread com.ibm.cics.router.Router: Installing CICS System bundle: /ci
2011/08/08 15:52:16.824    GMT I Router-Init-Thread com.ibm.cics.router.Router: Installing CICS System bundle: /ci
2011/08/08 15:52:16.843    GMT I Router-Init-Thread com.ibm.cics.router.Router: Installing CICS System bundle: /ci
2011/08/08 15:52:16.854    GMT I Router-Init-Thread com.ibm.cics.router.Router: Installing CICS System bundle: /ci
2011/08/08 15:52:16.893    GMT I Router-Init-Thread com.ibm.cics.router.Router: Installing CICS System bundle: /ci
2011/08/08 15:52:16.934    GMT I Router-Init-Thread com.ibm.cics.router.Router: Installing CICS System bundle: /ci
2011/08/08 15:52:16.960    GMT I Router-Init-Thread com.ibm.cics.router.Router: Installing CICS System bundle: /ci
2011/08/08 15:52:17.088    GMT I Router-Init-Thread com.ibm.cics.osgi.impl [com.ibm.cics.osgi.CICSController, com.i
2011/08/08 15:52:17.089    GMT I Framework Event Dispatcher com.ibm.cics.osgi.impl: BundleEvent STARTED
2011/08/08 15:52:17.089    GMT I Framework Event Dispatcher org.eclipse.osgi: BundleEvent STARTED
2011/08/08 15:52:17.090    GMT I Framework Event Dispatcher org.eclipse.osgi: FrameworkEvent STARTED
2011/08/08 15:52:17.090    GMT I Framework Event Dispatcher org.eclipse.osgi: FrameworkEvent STARTLEVEL CHANGED
2011/08/08 15:52:17.090    GMT I Router-Init-Thread com.ibm.cics.router.Router: Bundles:
0 org.eclipse.osgi 3.6.1.R36x_v20100806 ACTIVE
1 org.eclipse.osgi.services 3.2.100.v20100503 ACTIVE
2 org.eclipse.equinox.log 1.2.100.v20100503 ACTIVE
3 com.ibm.cics.server 1.300.0 ACTIVE
4 com.ibm.cics.ras 1.300.0 ACTIVE
5 com.ibm.ras 1.300.0 ACTIVE
6 com.ibm.record 1.0.0 ACTIVE
7 com.ibm.cics.domains 1.300.0 ACTIVE
8 com.ibm.cics.osgi 1.0.0 ACTIVE
9 com.ibm.cics.osgi.impl 1.0.0 ACTIVE
2011/08/08 15:52:17.091    GMT I Router-Init-Thread com.ibm.cics.router.Router: OSGi Framework started.
```

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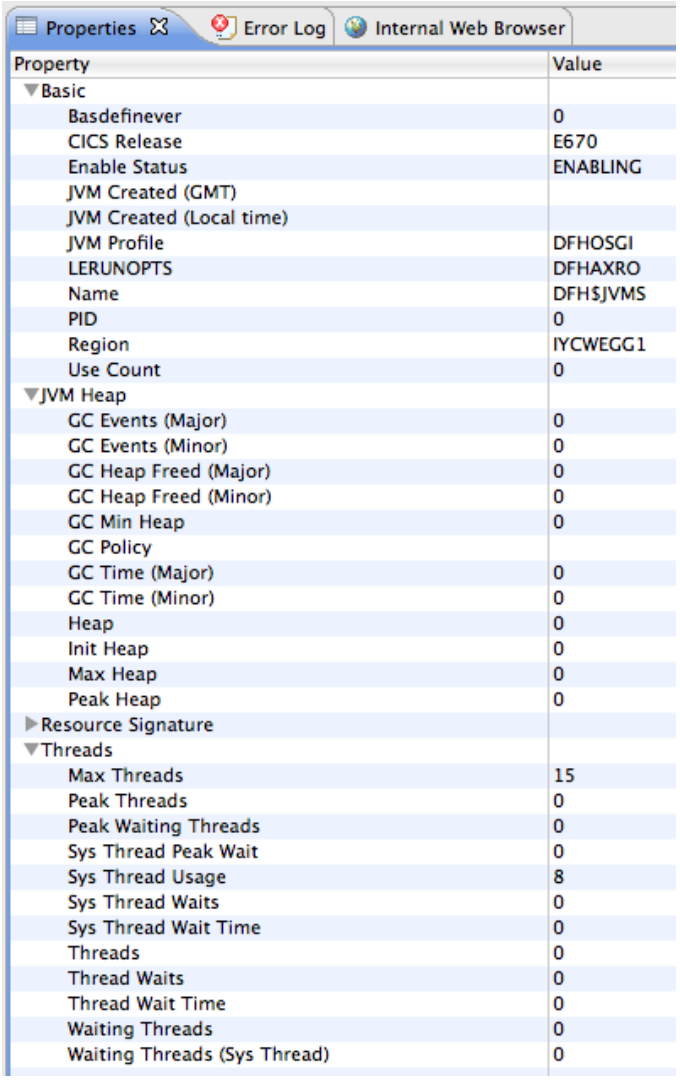
Lots of useful information about JVM server



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Dave the Application Developer

1. Consult CICS Java Developer Guide
2. Set Target Platform
3. Create (example) application
4. Deploy application as CICS bundle

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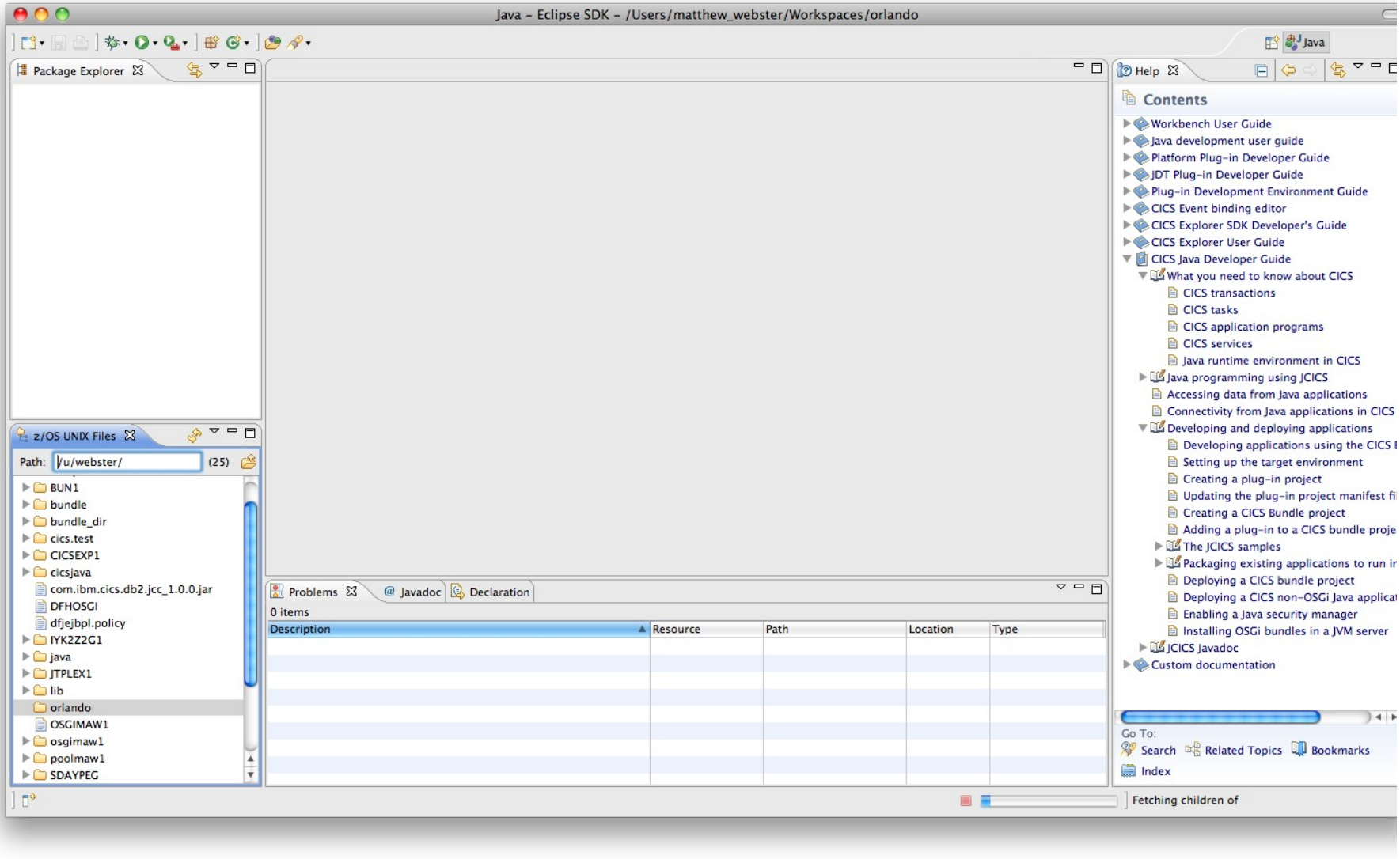
Empty workspace, empty CICS bundle



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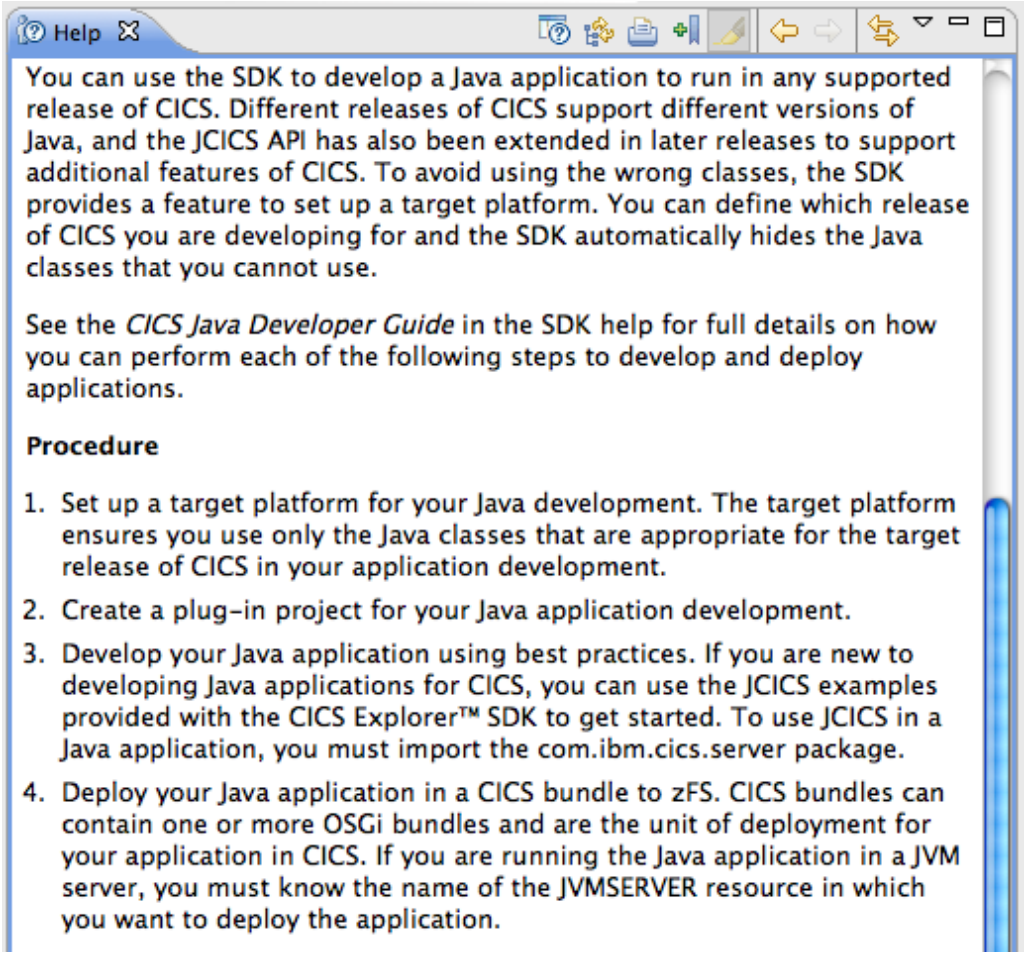
Developing applications using the CICS Explorer SDK



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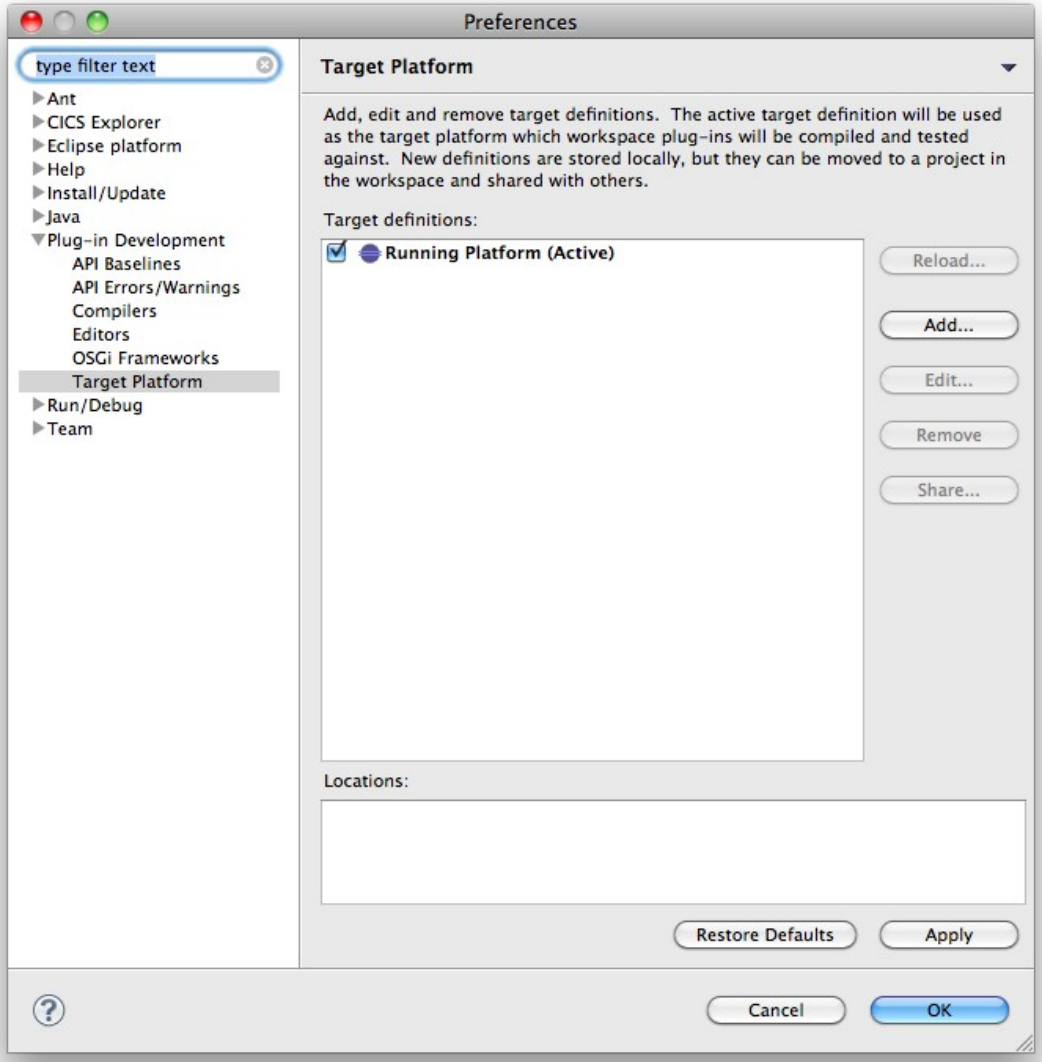
Set Target Platform



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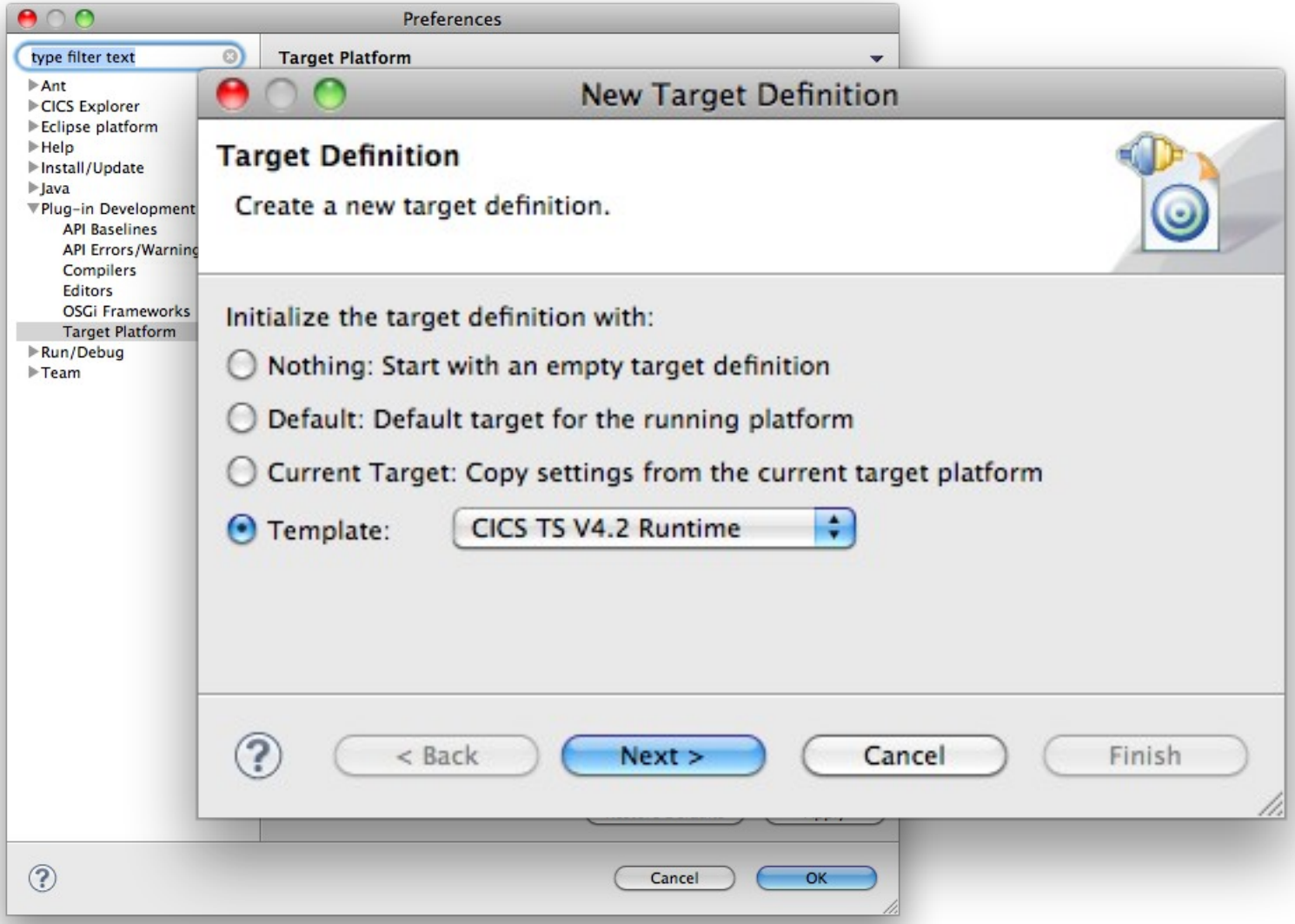
Set Target Platform



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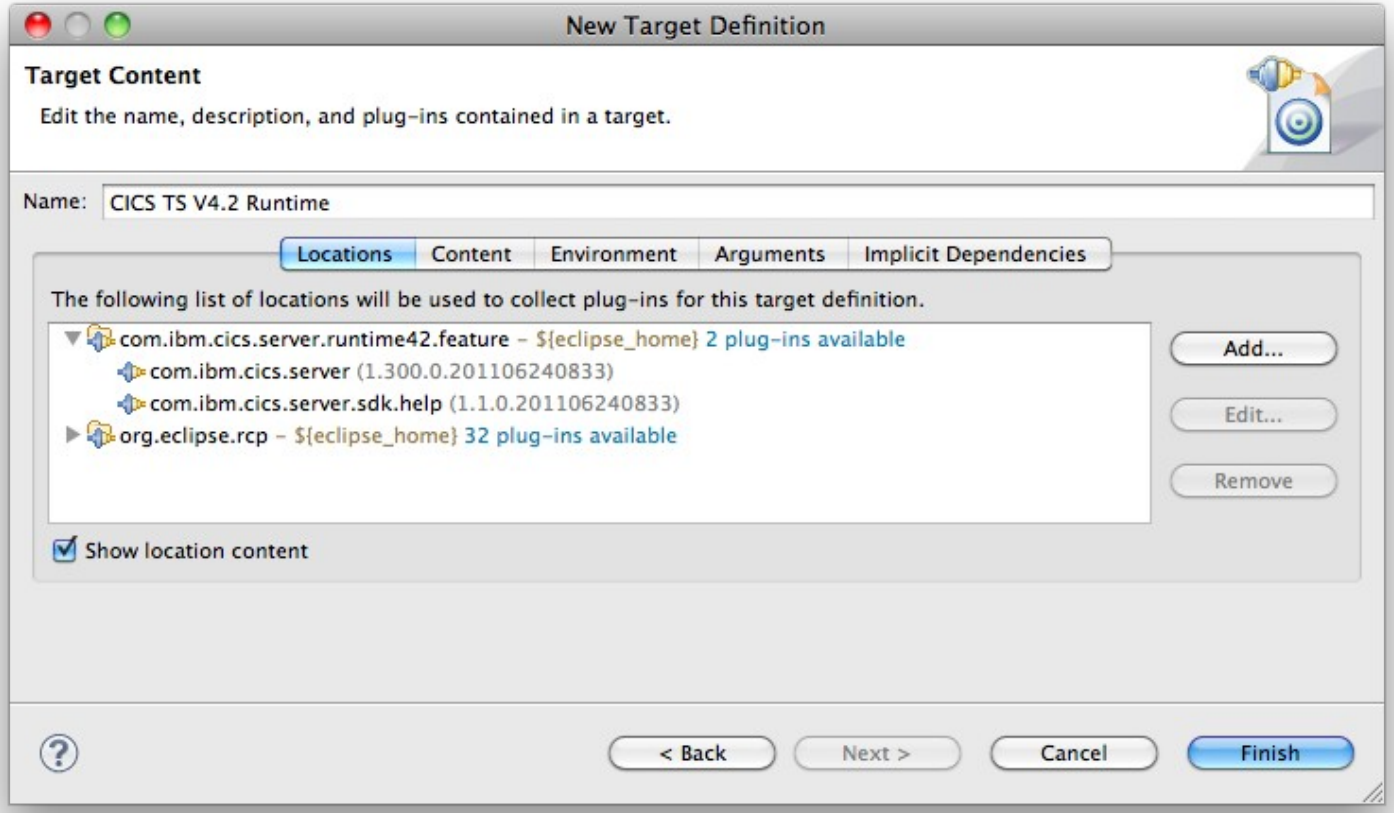
JCICS version 1.300 (V4.2)



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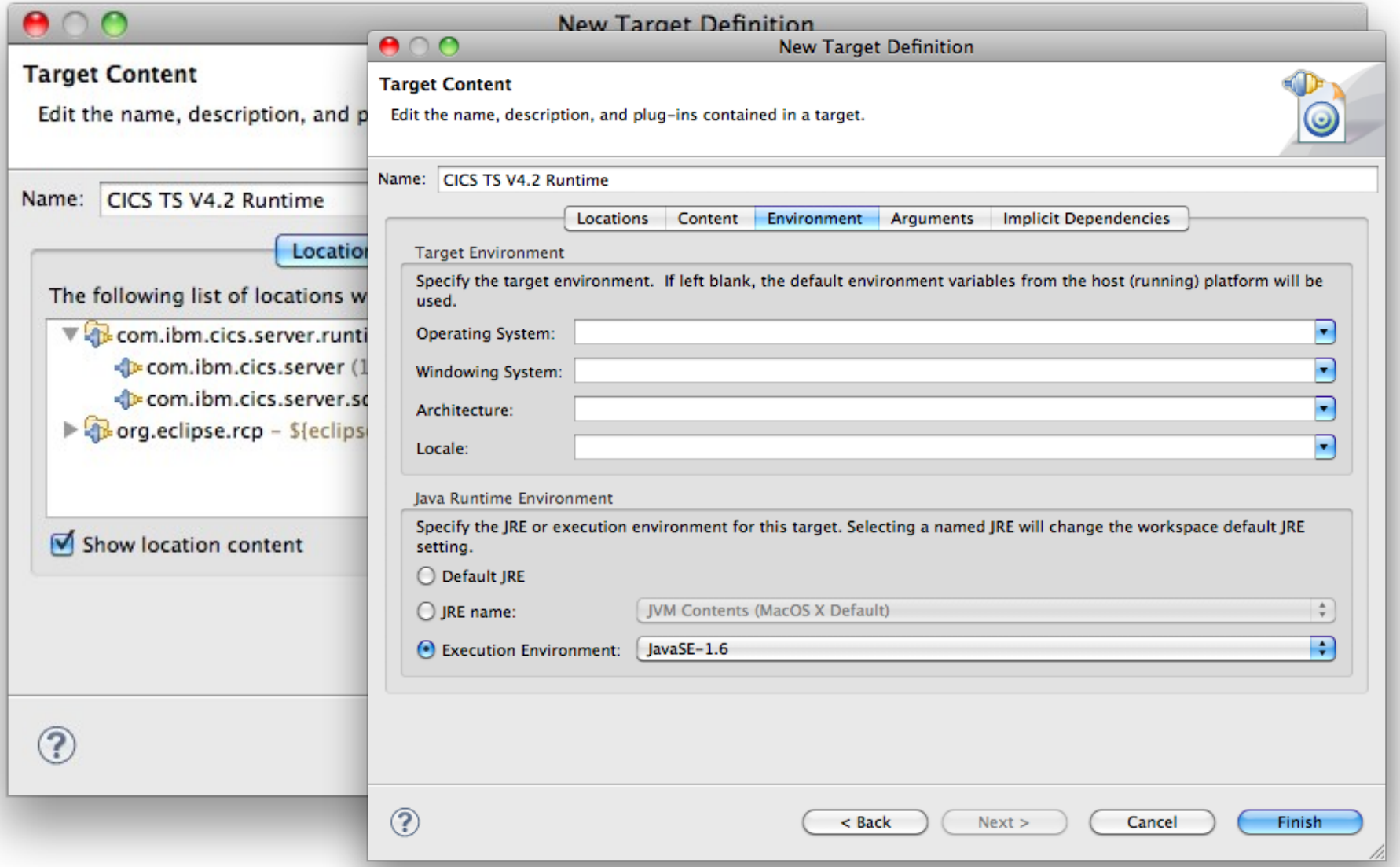
Java 1.6



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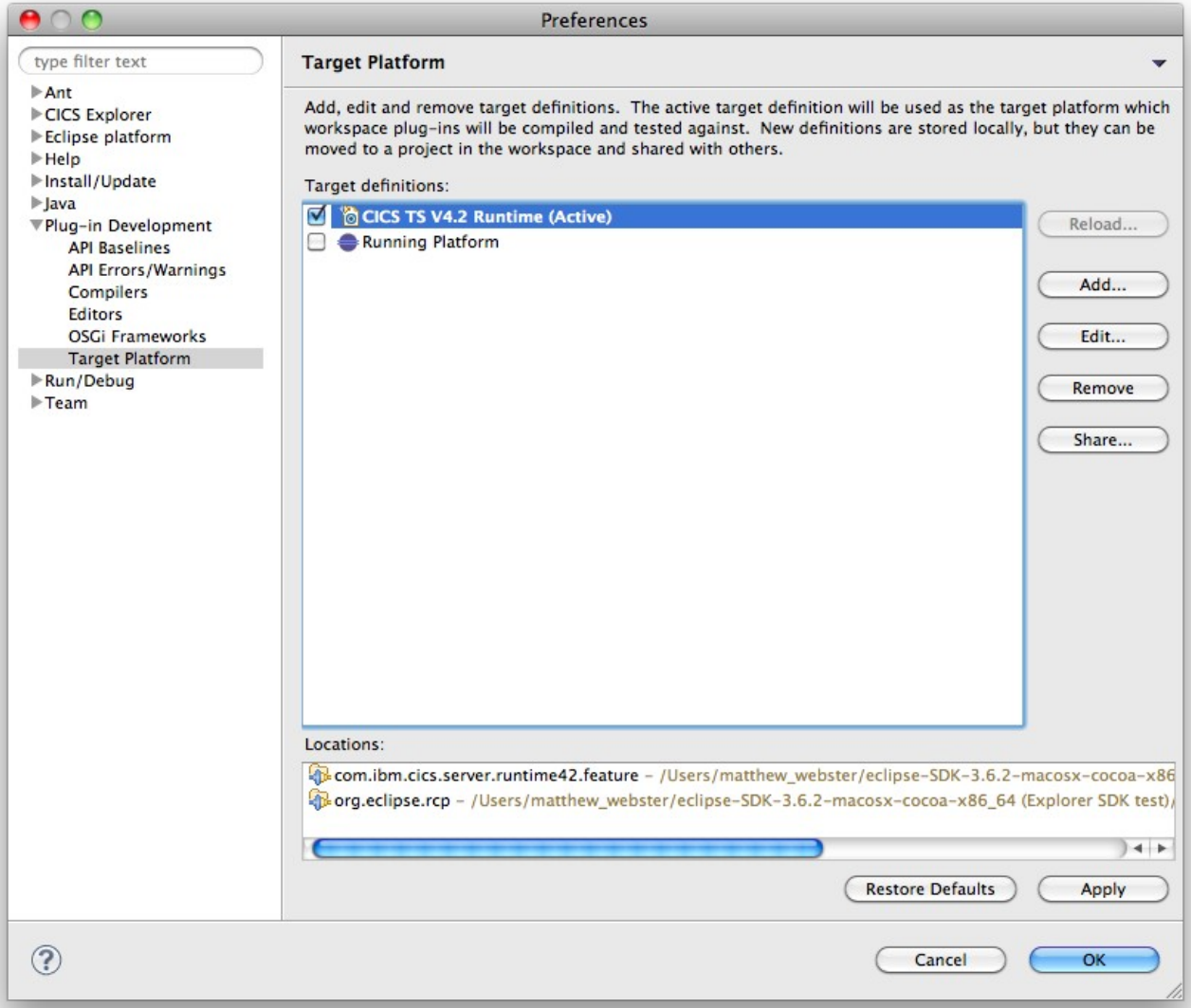
Select the new target



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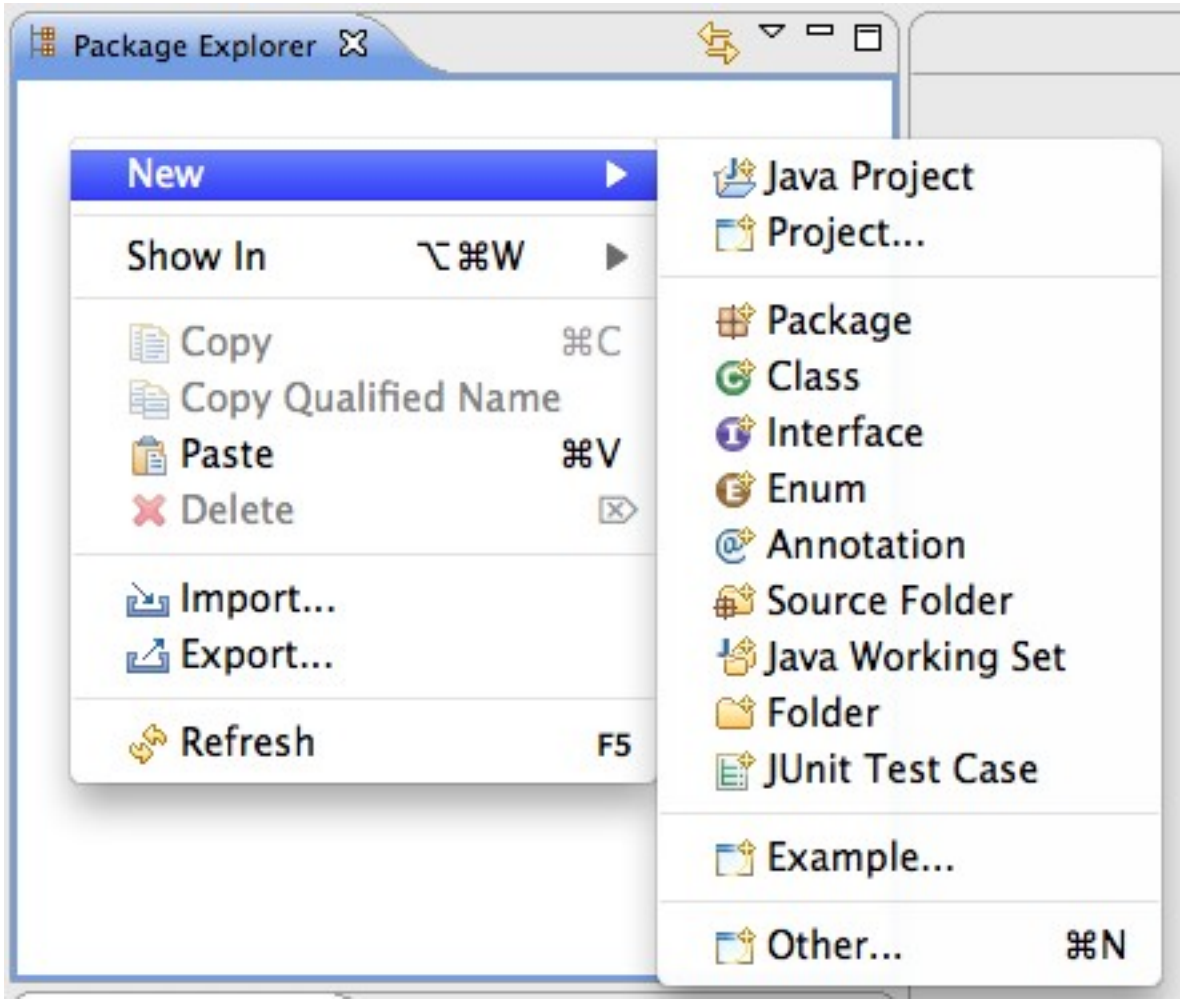
Add the examples (Hello, JCICS & Web) to the workspace



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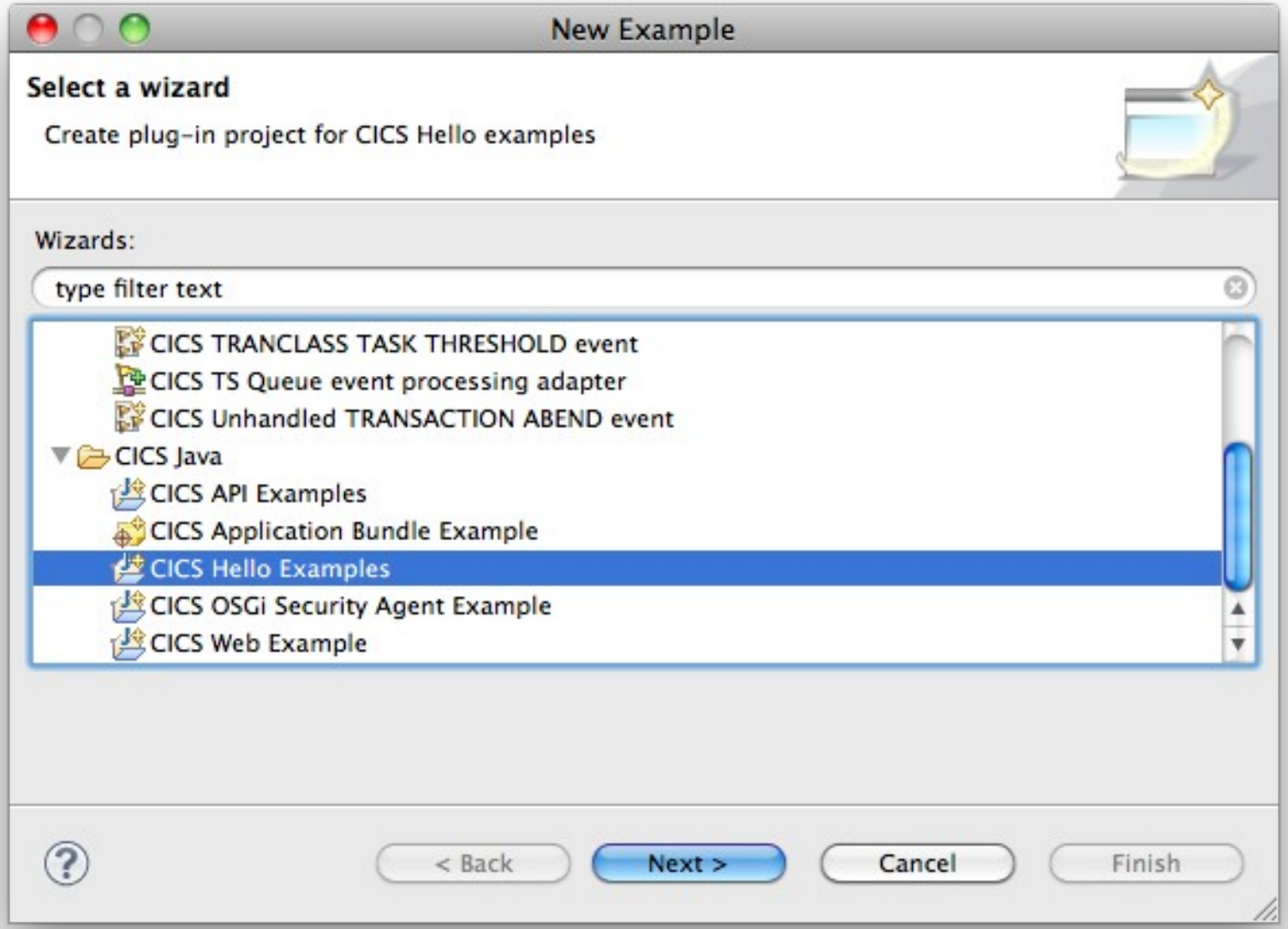
Add OSGi bundle projects



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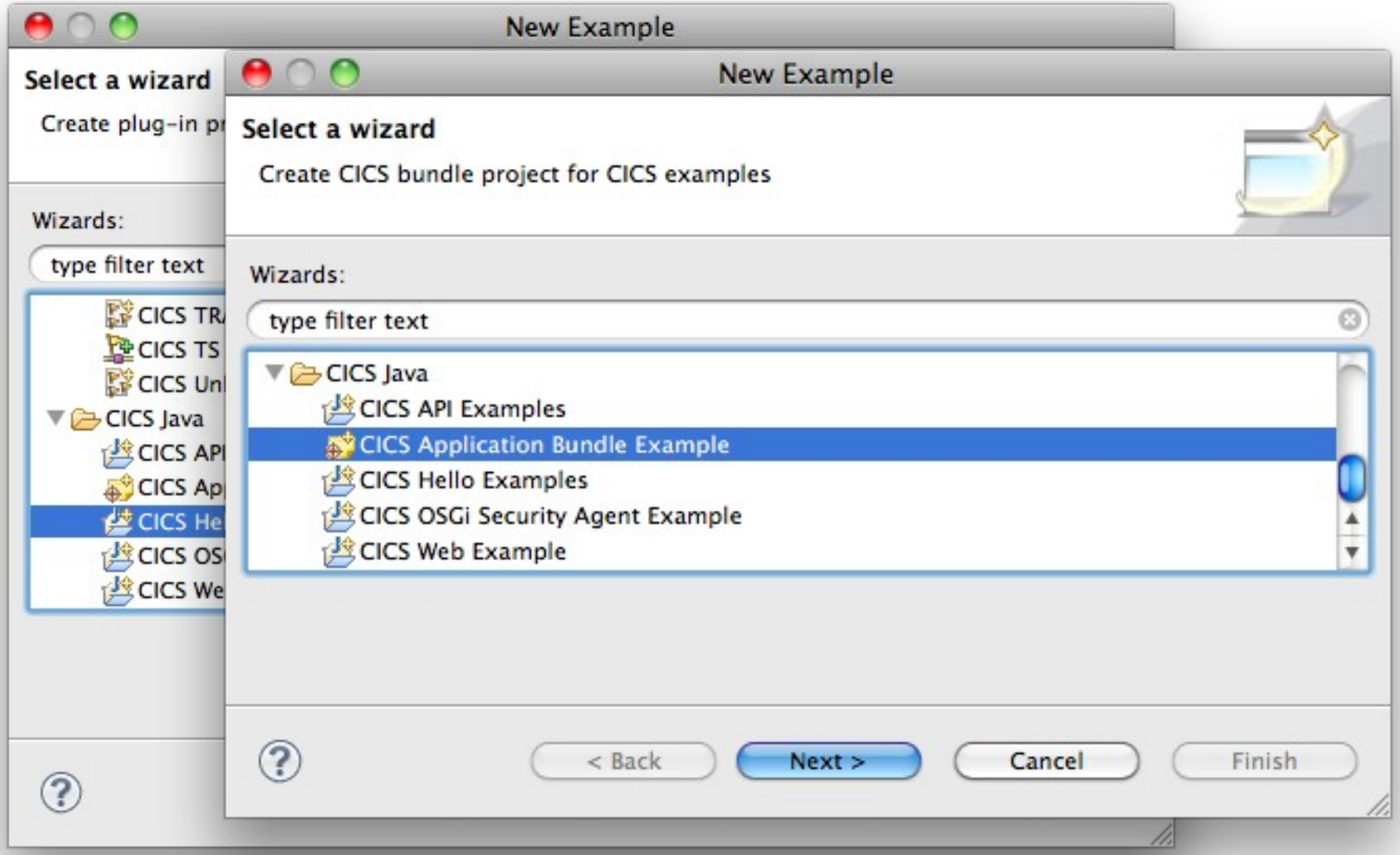
Add CICS bundle project



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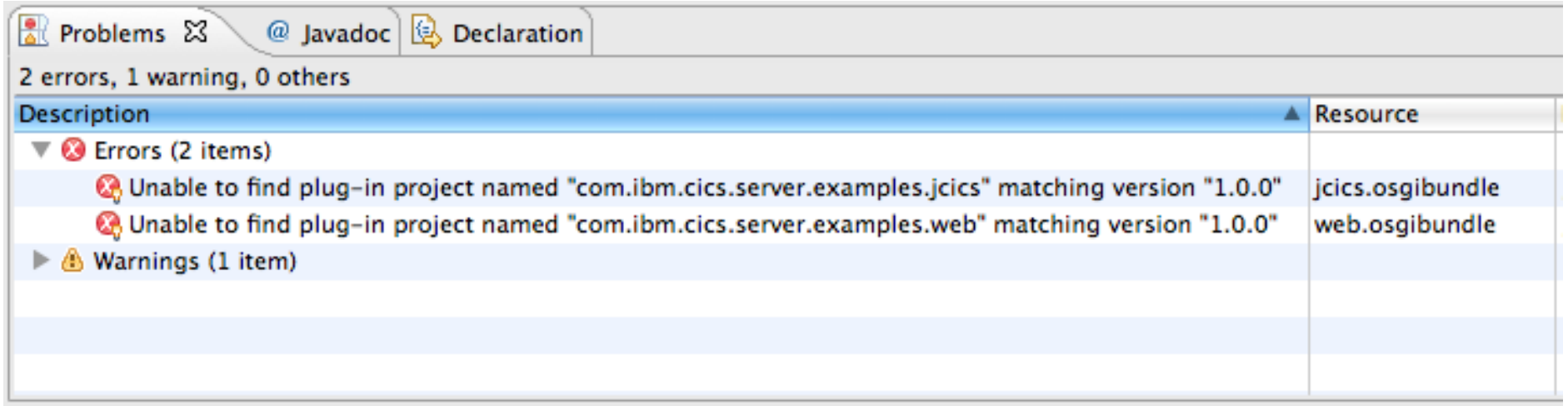
Errors in the Problems view for missing OSGi bundles



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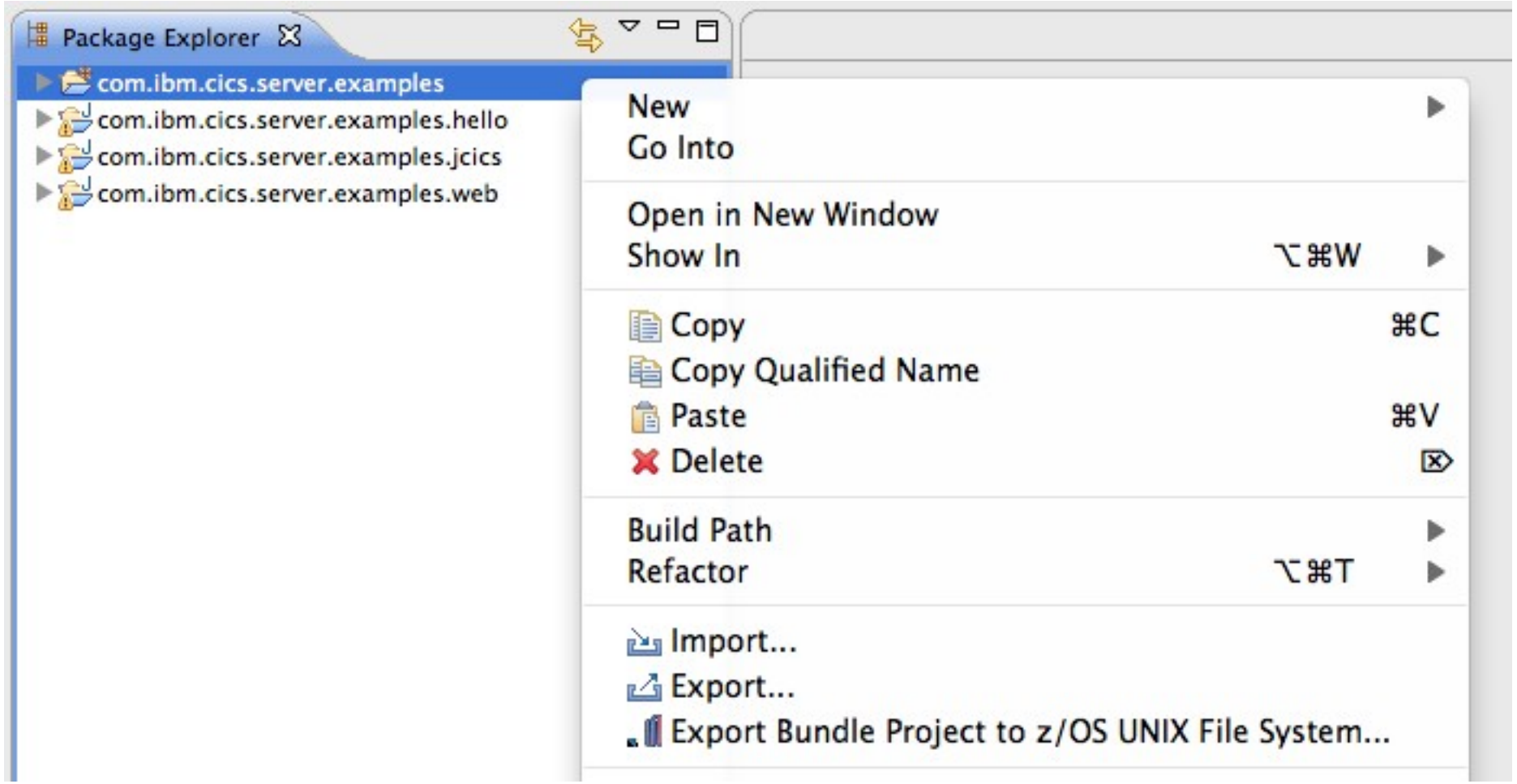
Deploy application as CICS bundle



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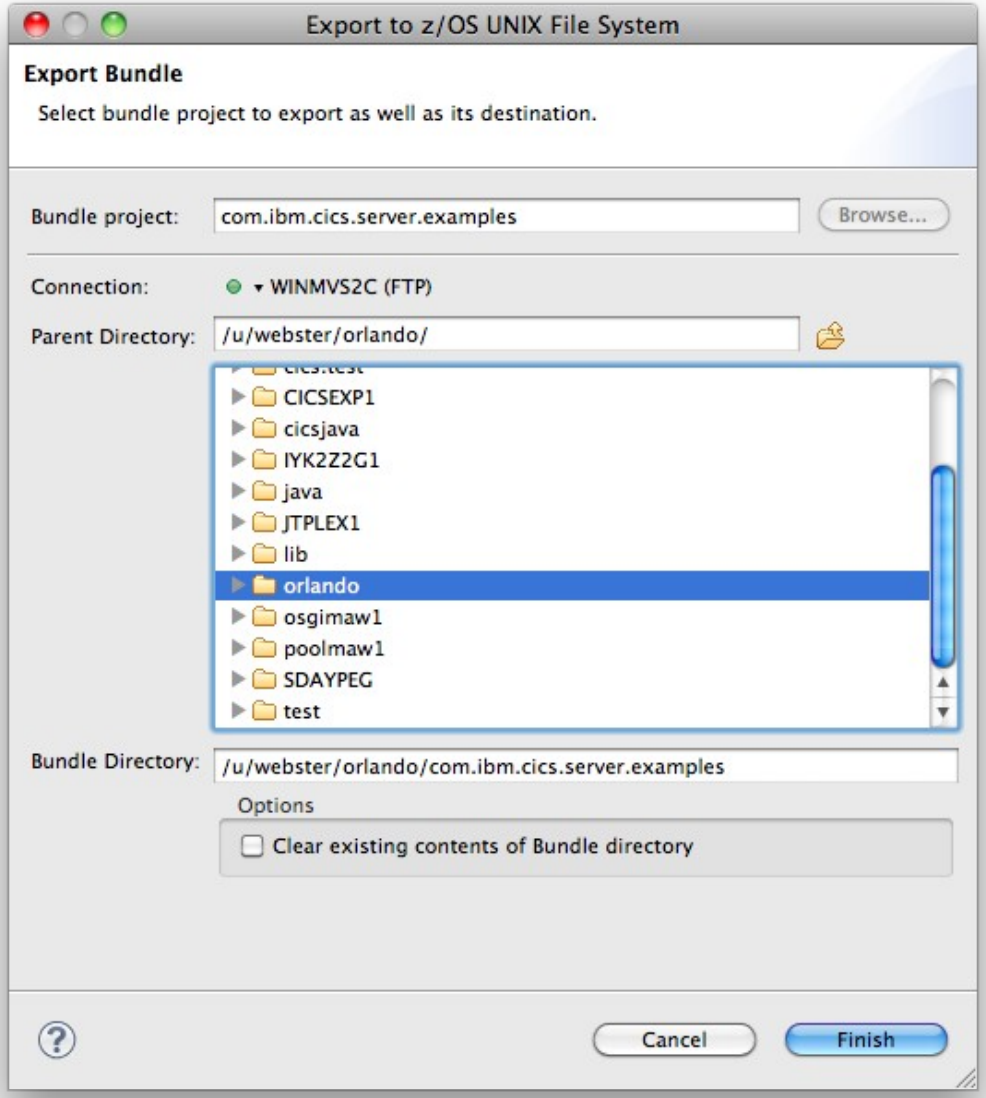
Select CICS bundle directory



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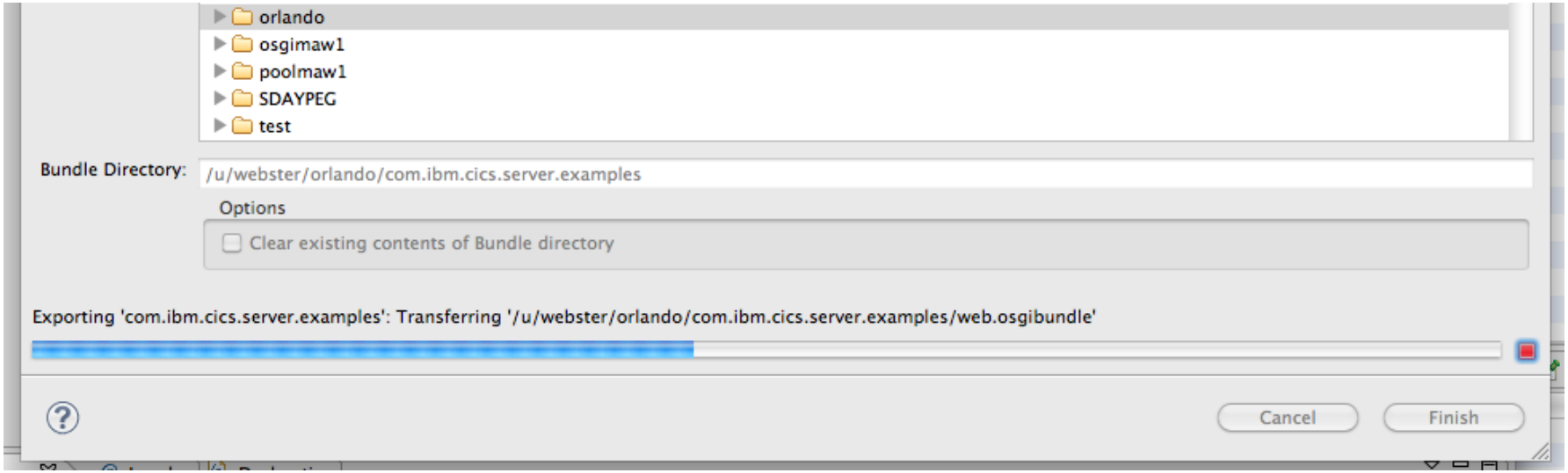
Transfer metadata files



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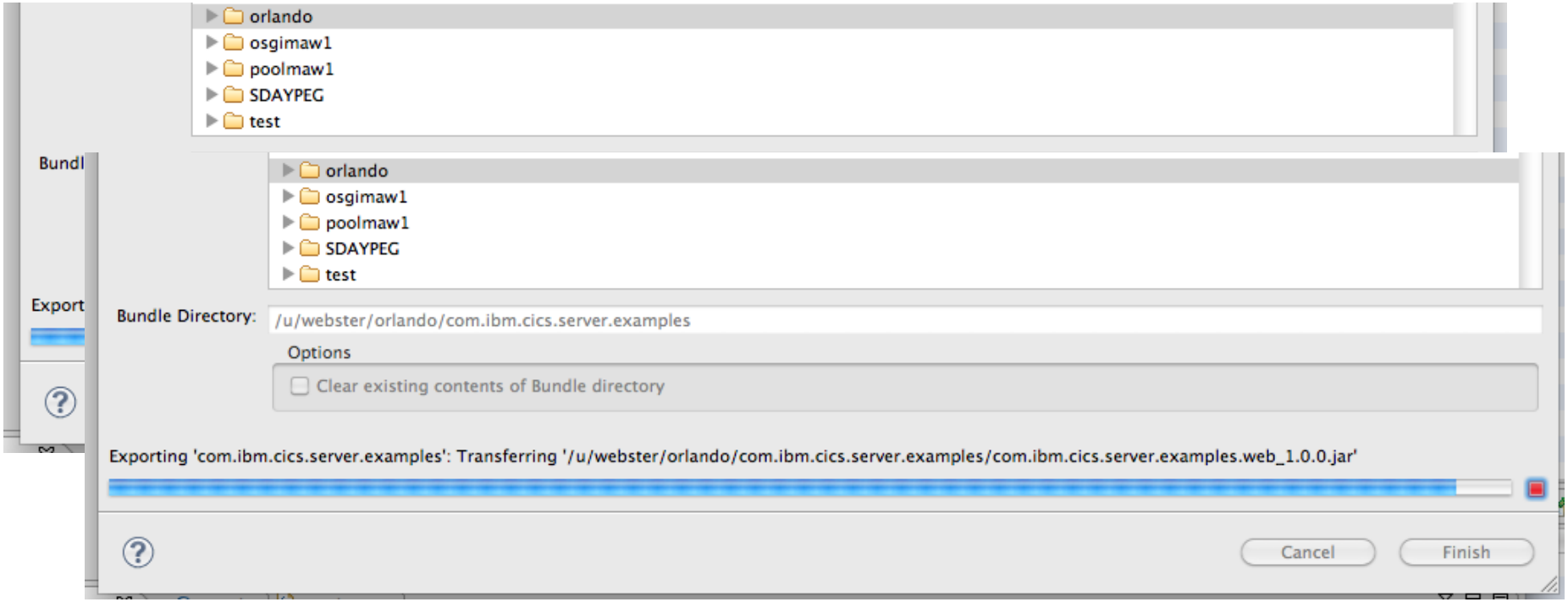
Build, locally export & transfer OSGi bundle JAR files



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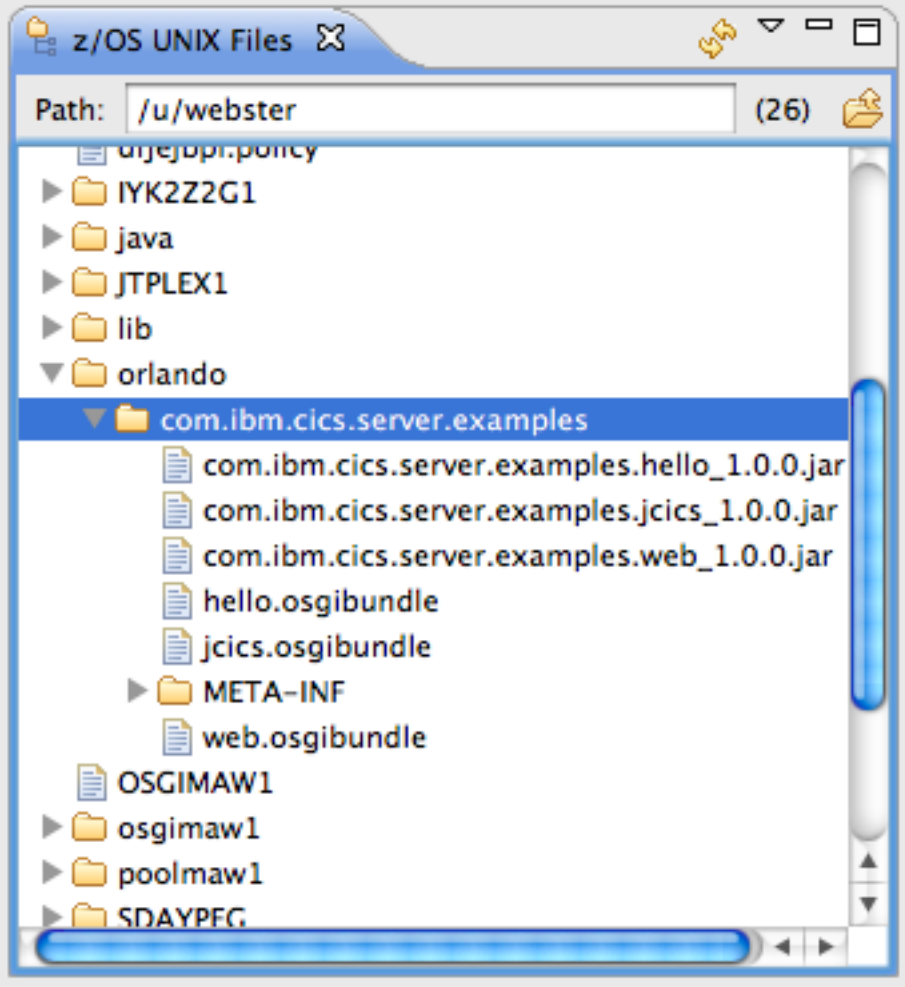
Handoff CICS bundle to Steve



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Steve the Systems Programmer

1. Install application as CICS bundle
2. Validate OSGi bundles and services
3. Ensure TCP/IP service and URI Map available
4. Run the application

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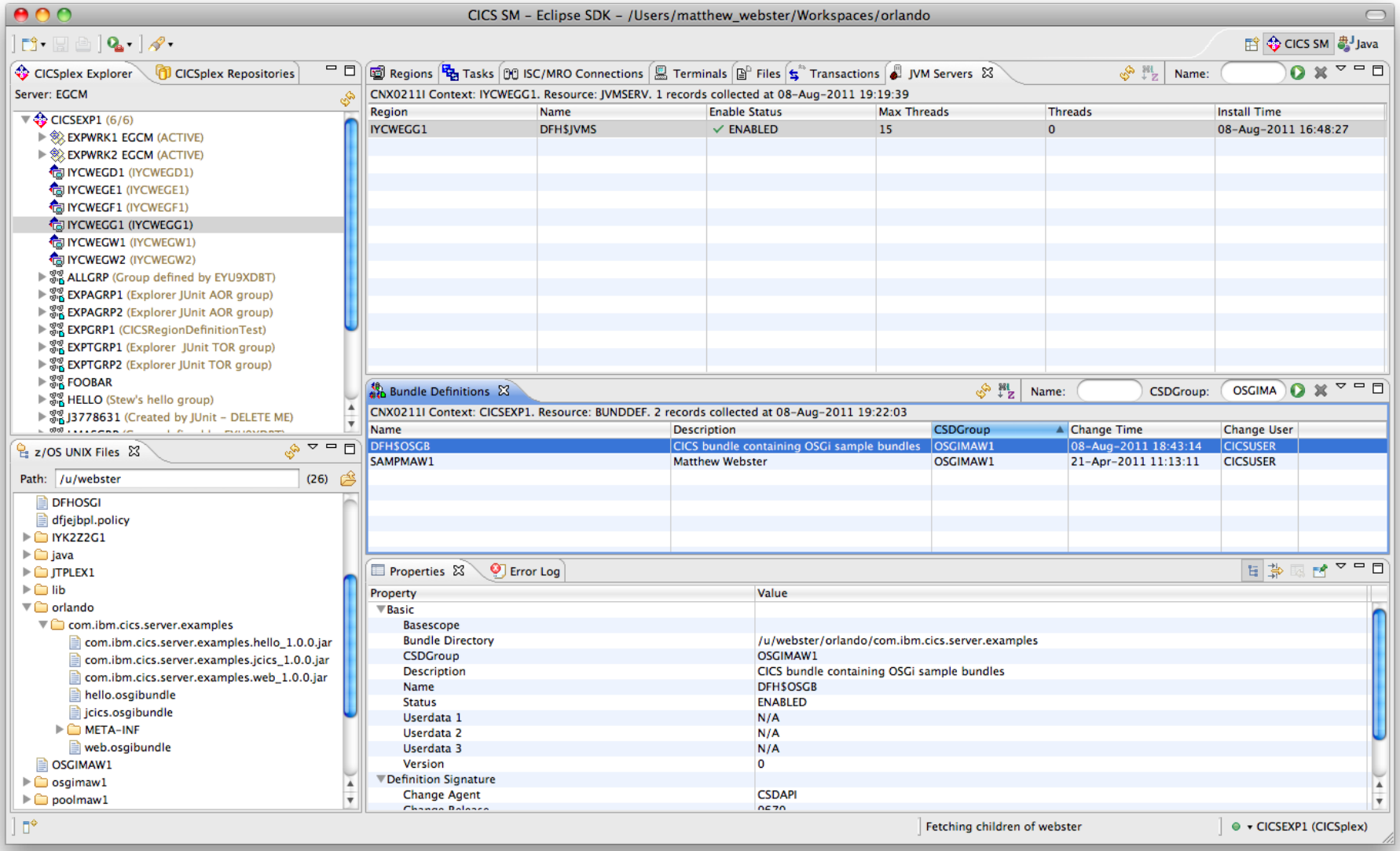
Handoff CICS bundle from Dave



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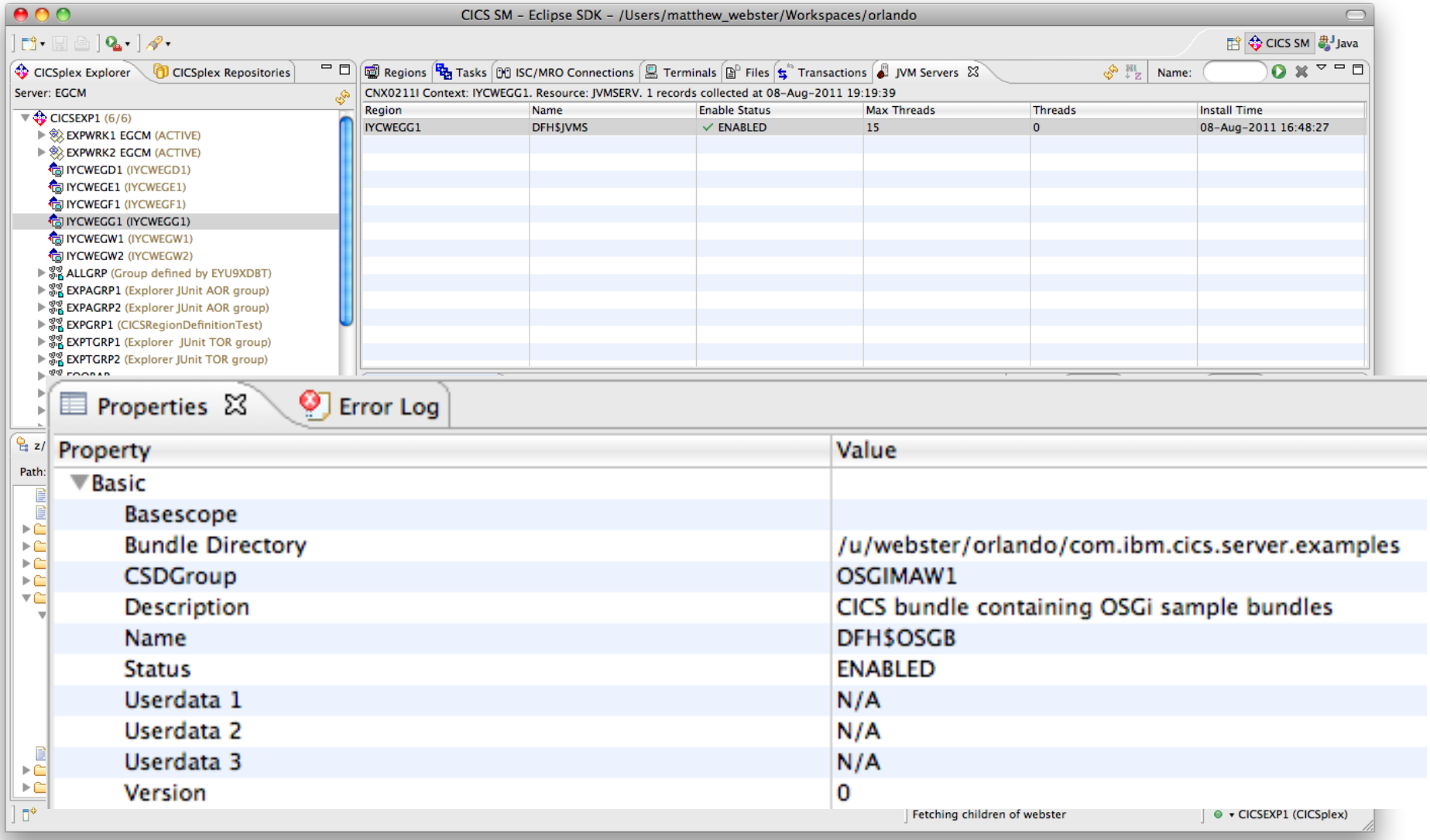
Handoff CICS bundle from Dave



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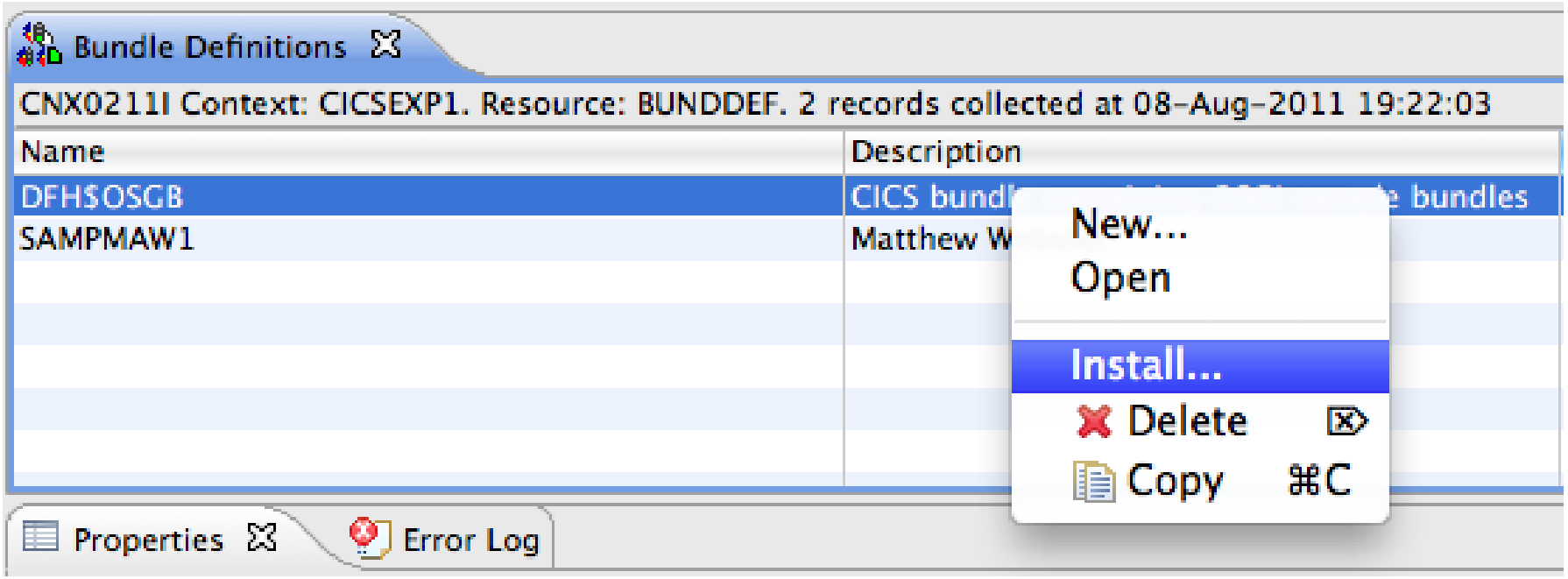
Install application as CICS bundle



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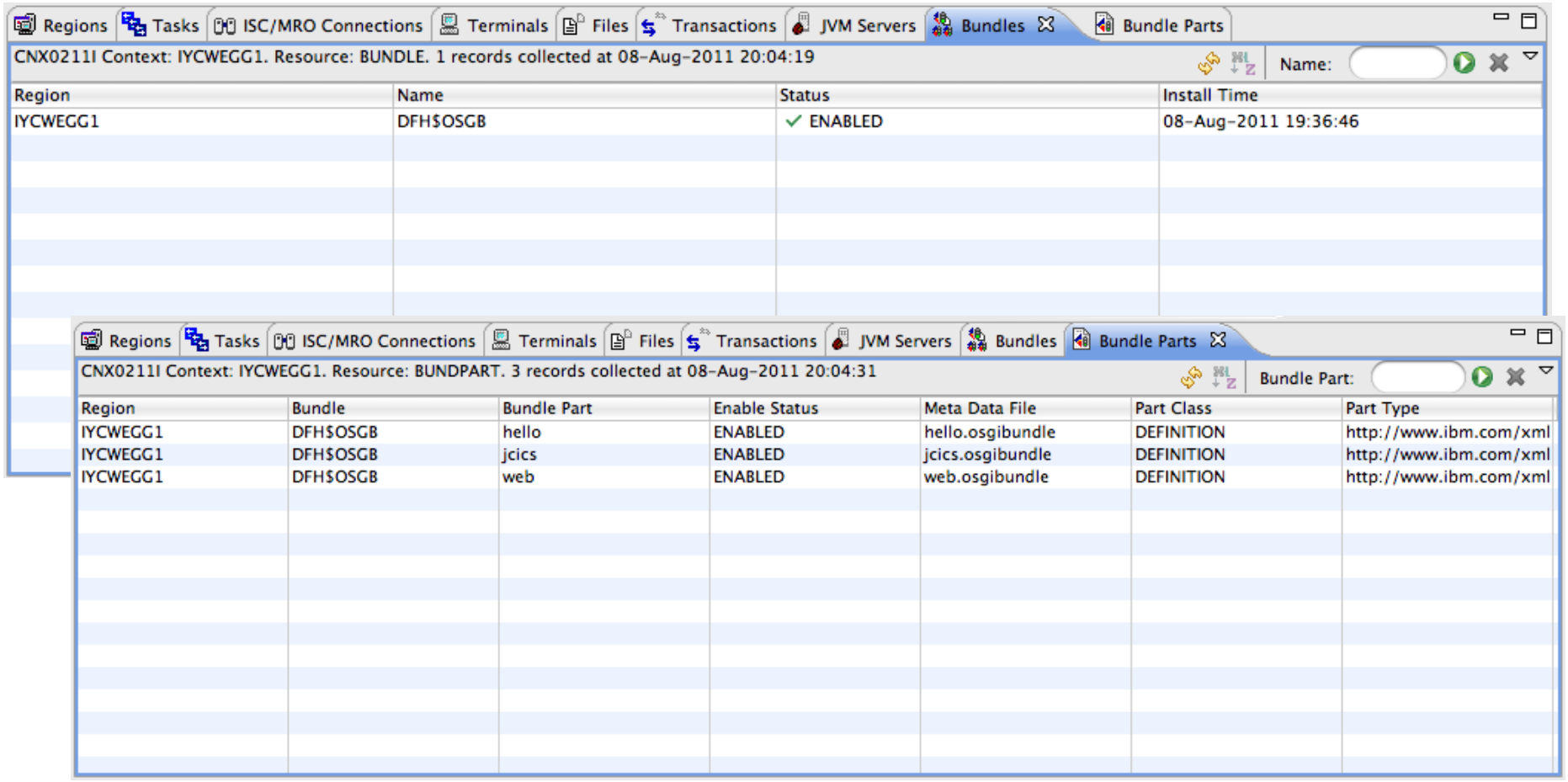
Check CICS bundle and bundle parts



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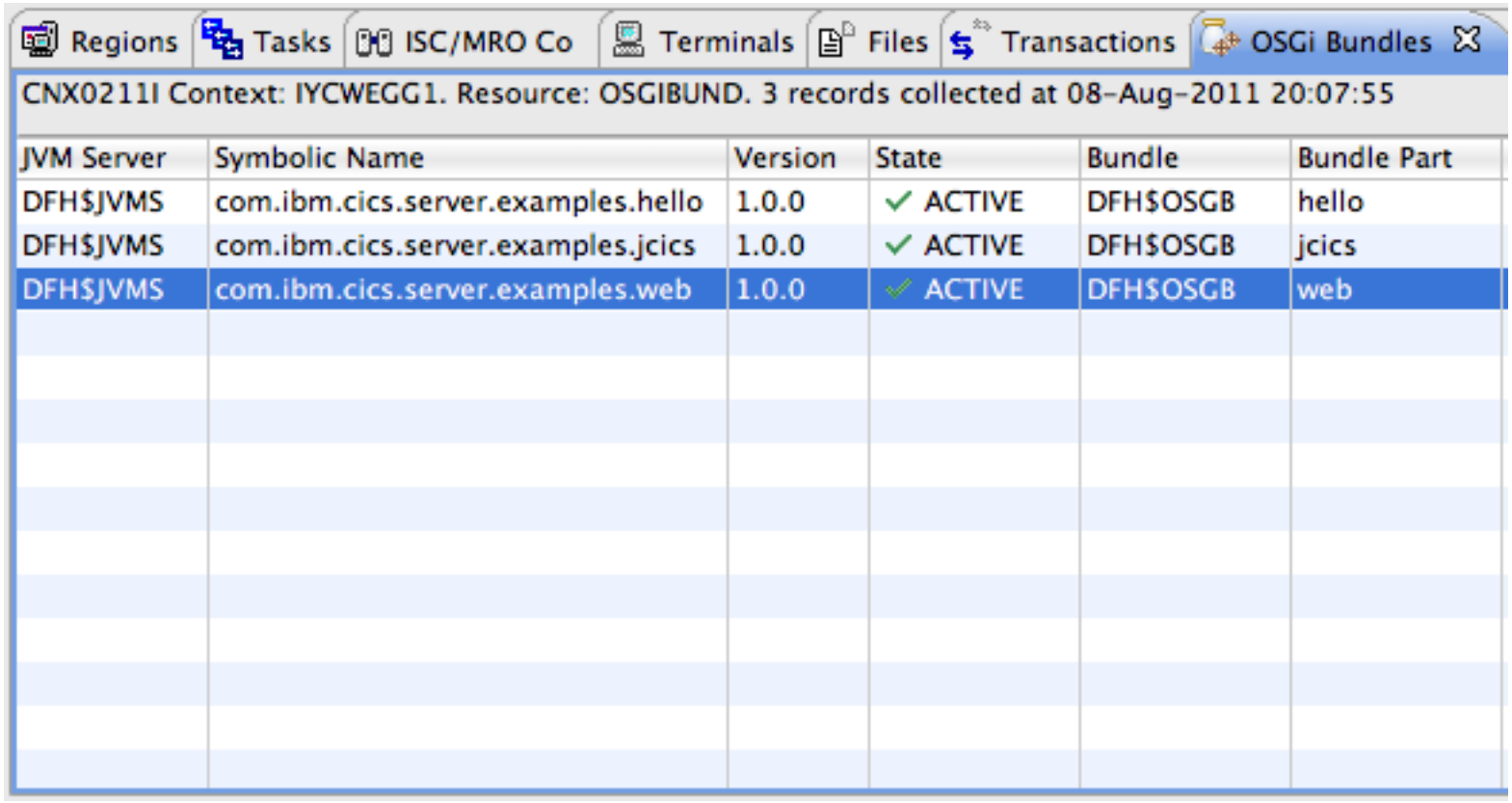
OSGi bundle for Web example



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OSGi service for Web example

Regions | Tasks | ISC/MRO Co | Terminals | Files | Transactions | OSGi Bundles

CNX0211I Context: IYCWEGG1. Resource: OSGIBUND. 3 records collected at 08-Aug-2011 20:07:55

JVM Server	Symbolic Name	Version	State	Bundle	Bundle Part
DFH$JVMS	com.ibm.cics.server.examples.hello	1.0.0	✓ ACTIVE	DFH$OSGB	hello
DFH$JVMS	com.ibm.cics.server.examples.jcics	1.0.0	✓ ACTIVE	DFH$OSGB	jcics
DFH$JVMS	com.ibm.cics.server.examples.web	1.0.0	✓ ACTIVE	DFH$OSGB	web

Regions | Tasks | ISC/MRO Co | Terminals | Files | Transactions | OSGi Bundles | OSGi Services | JVM Servers

CNX0211I Context: IYCWEGG1. Resource: OSGISERV. 9 records collected at 08-Aug-2011 20:08:02

JVM Server	Service Name	OSGi Bundle	Version	Service Status	Bundle	Bundle Part
DFH$JVMS	examples.hello.HelloCICSWorld	com.ibm.cics.server.examples.hello	1.0.0	ACTIVE	DFH$OSGB	hello
DFH$JVMS	examples.hello.HelloWorld	com.ibm.cics.server.examples.hello	1.0.0	ACTIVE	DFH$OSGB	hello
DFH$JVMS	examples.ProgramControl.ClassOne	com.ibm.cics.server.examples.jcics	1.0.0	ACTIVE	DFH$OSGB	jcics
DFH$JVMS	examples.ProgramControl.ClassTwo	com.ibm.cics.server.examples.jcics	1.0.0	ACTIVE	DFH$OSGB	jcics
DFH$JVMS	examples.ProgramControl.ClassThree	com.ibm.cics.server.examples.jcics	1.0.0	ACTIVE	DFH$OSGB	jcics
DFH$JVMS	examples.ProgramControl.ClassFour	com.ibm.cics.server.examples.jcics	1.0.0	ACTIVE	DFH$OSGB	jcics
DFH$JVMS	examples.TDQ.ClassOne	com.ibm.cics.server.examples.jcics	1.0.0	ACTIVE	DFH$OSGB	jcics
DFH$JVMS	examples.TSQ.ClassOne	com.ibm.cics.server.examples.jcics	1.0.0	ACTIVE	DFH$OSGB	jcics
DFH$JVMS	examples.Web.Sample1	com.ibm.cics.server.examples.web	1.0.0	ACTIVE	DFH$OSGB	web

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CICS PROGRAM for Web example

Regions | Tasks | ISC/MRO | Terminals | Files | Transactio | Programs | OSGi Bund | OS

CNX0211I Context: IYCWEGG1. Resource: PROGRAM. 3 records collected at 08-Aug-2011 20:17:34

Region	Name	Status	Use Count	Concurrent Use Count	Language	JVM Class
IYCWEGG1	DFJ$JHE1	✓ ENABLED	0	0	JAVA	examples.hello.HelloWorld
IYCWEGG1	DFJ$JHE2	✓ ENABLED	0	0	JAVA	examples.hello.HelloCICSWorld
IYCWEGG1	DFJ$JWB1	✓ ENABLED	0	0	JAVA	examples.Web.Sample1

Regions | Tasks | ISC/MRO Co | Terminals | Files | Transactions | OSGi Bundles | OSGi Services | JVM Servers

CNX0211I Context: IYCWEGG1. Resource: OSGISERV. 9 records collected at 08-Aug-2011 20:08:02

JVM Server	Service Name	OSGi Bundle	Version	Service Status	Bundle	Bundle Part
DFH$JVMS	examples.hello.HelloCICSWorld	com.ibm.cics.server.examples.hello	1.0.0	ACTIVE	DFH$OSGB	hello
DFH$JVMS	examples.hello.HelloWorld	com.ibm.cics.server.examples.hello	1.0.0	ACTIVE	DFH$OSGB	hello
DFH$JVMS	examples.ProgramControl.ClassOne	com.ibm.cics.server.examples.jcics	1.0.0	ACTIVE	DFH$OSGB	jcics
DFH$JVMS	examples.ProgramControl.ClassTwo	com.ibm.cics.server.examples.jcics	1.0.0	ACTIVE	DFH$OSGB	jcics
DFH$JVMS	examples.ProgramControl.ClassThree	com.ibm.cics.server.examples.jcics	1.0.0	ACTIVE	DFH$OSGB	jcics
DFH$JVMS	examples.ProgramControl.ClassFour	com.ibm.cics.server.examples.jcics	1.0.0	ACTIVE	DFH$OSGB	jcics
DFH$JVMS	examples.TDQ.ClassOne	com.ibm.cics.server.examples.jcics	1.0.0	ACTIVE	DFH$OSGB	jcics
DFH$JVMS	examples.TSQ.ClassOne	com.ibm.cics.server.examples.jcics	1.0.0	ACTIVE	DFH$OSGB	jcics
DFH$JVMS	examples.Web.Sample1	com.ibm.cics.server.examples.web	1.0.0	ACTIVE	DFH$OSGB	web

Check IYCWEGG1.DFH$JVMS.dfhjvmtrc for any problems

/u/webster/CICSEXP1/IYCWEGG1.DFH /u/webster/CICSEXP1/IYCWEGG1.DFH

```
2011/08/08 18:36:46.733    GMT I ENABLE_OSGIBUNDLE:Thread-24 com.ibm.cics.s
2011/08/08 18:36:46.733    GMT I ENABLE_OSGIBUNDLE:Thread-24 com.ibm.cics.s
2011/08/08 18:36:46.735    GMT I ENABLE_OSGIBUNDLE:Thread-24 com.ibm.cics.s
2011/08/08 18:36:46.735    GMT I ENABLE_OSGIBUNDLE:Thread-24 com.ibm.cics.s
2011/08/08 18:36:46.735    GMT I Framework Event Dispatcher com.ibm.cics.se
2011/08/08 18:36:46.735    GMT I ENABLE_OSGIBUNDLE:Thread-24 com.ibm.cics.o
Bundles:
0 org.eclipse.osgi 3.6.1.R36x_v20100806 ACTIVE
1 org.eclipse.osgi.services 3.2.100.v20100503 ACTIVE
2 org.eclipse.equinox.log 1.2.100.v20100503 ACTIVE
3 com.ibm.cics.server 1.300.0 ACTIVE
4 com.ibm.cics.ras 1.300.0 ACTIVE
5 com.ibm.ras 1.300.0 ACTIVE
6 com.ibm.record 1.0.0 ACTIVE
7 com.ibm.cics.domains 1.300.0 ACTIVE
8 com.ibm.cics.osgi 1.0.0 ACTIVE
9 com.ibm.cics.osgi.impl 1.0.0 ACTIVE
10 com.ibm.cics.server.examples.hello 1.0.0 ACTIVE
11 com.ibm.cics.server.examples.jcics 1.0.0 ACTIVE
12 com.ibm.cics.server.examples.web 1.0.0 RESOLVED
```

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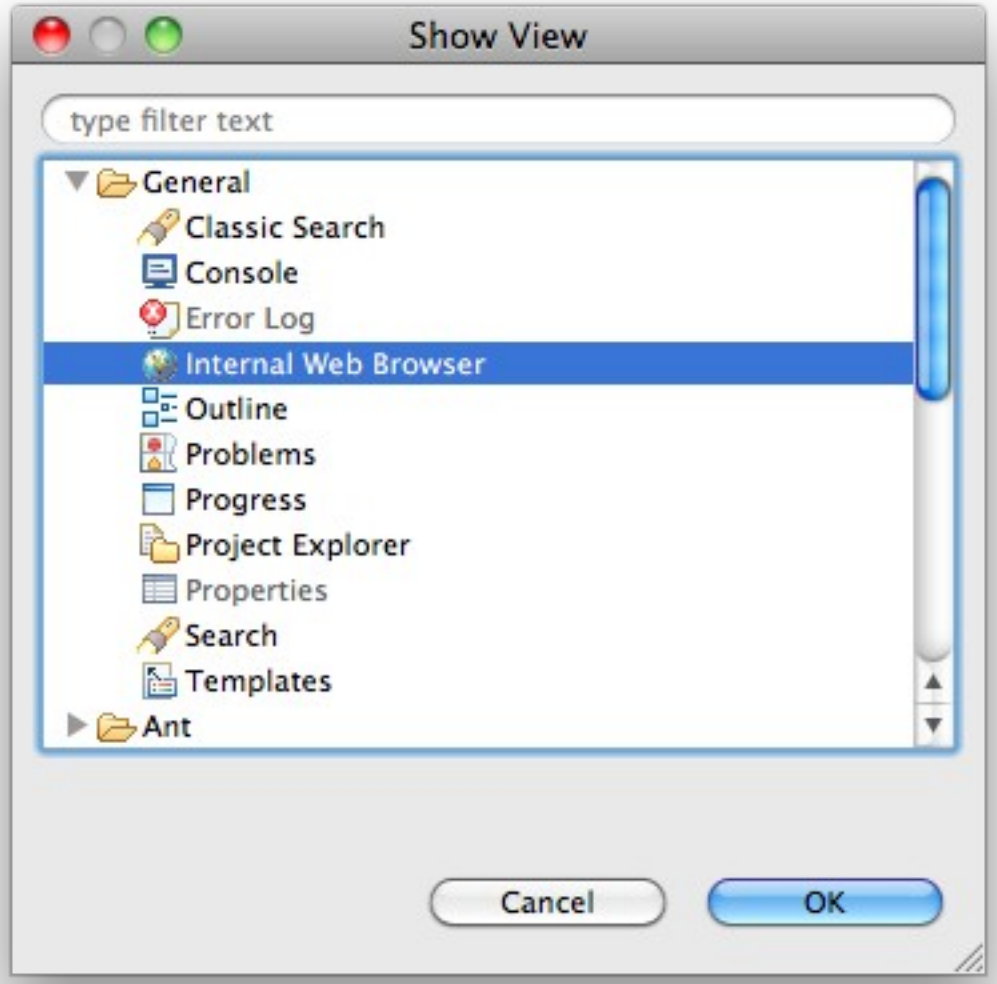
Open the Internal Web Browser to test DFJ$JWB1



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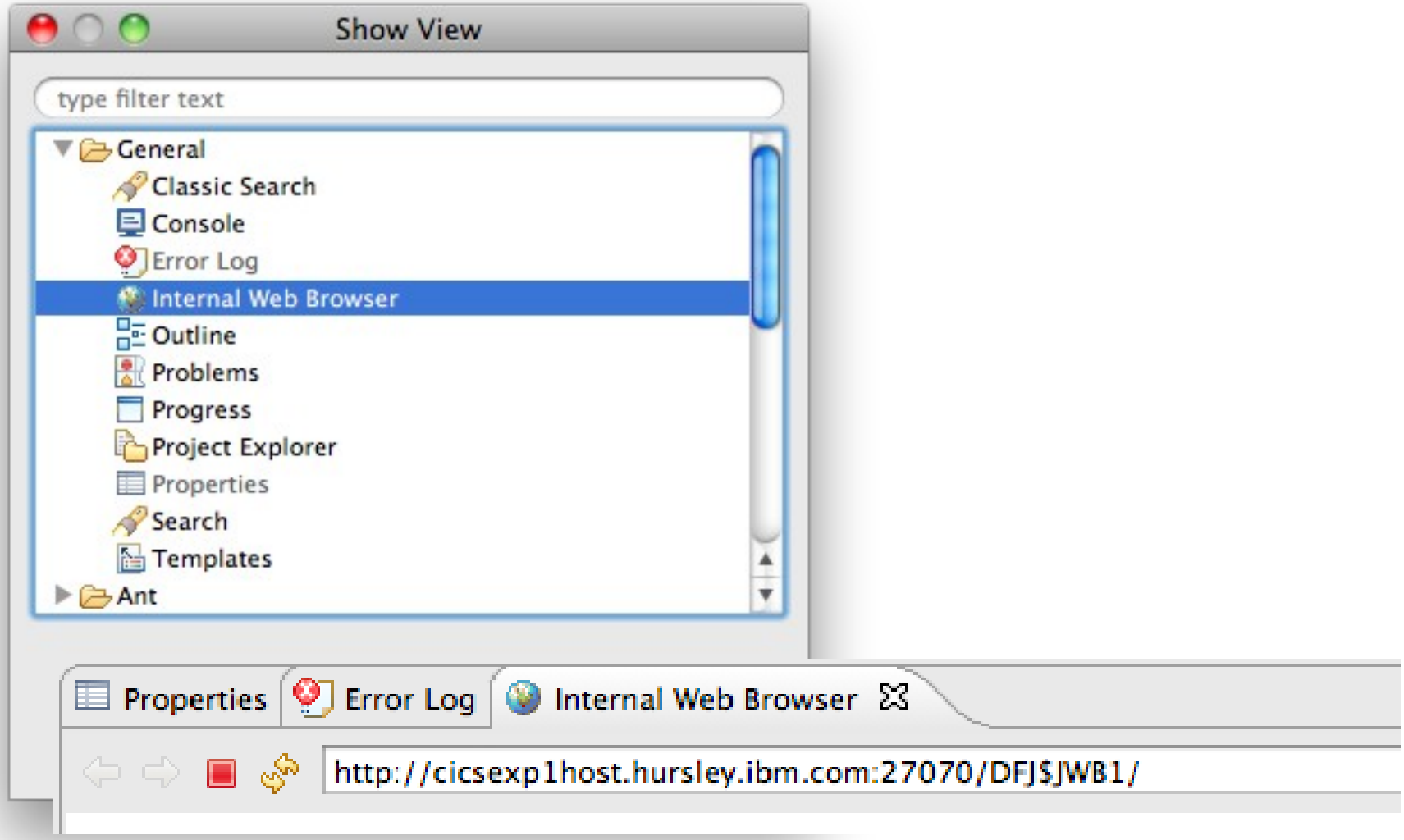
Enter Web example URL



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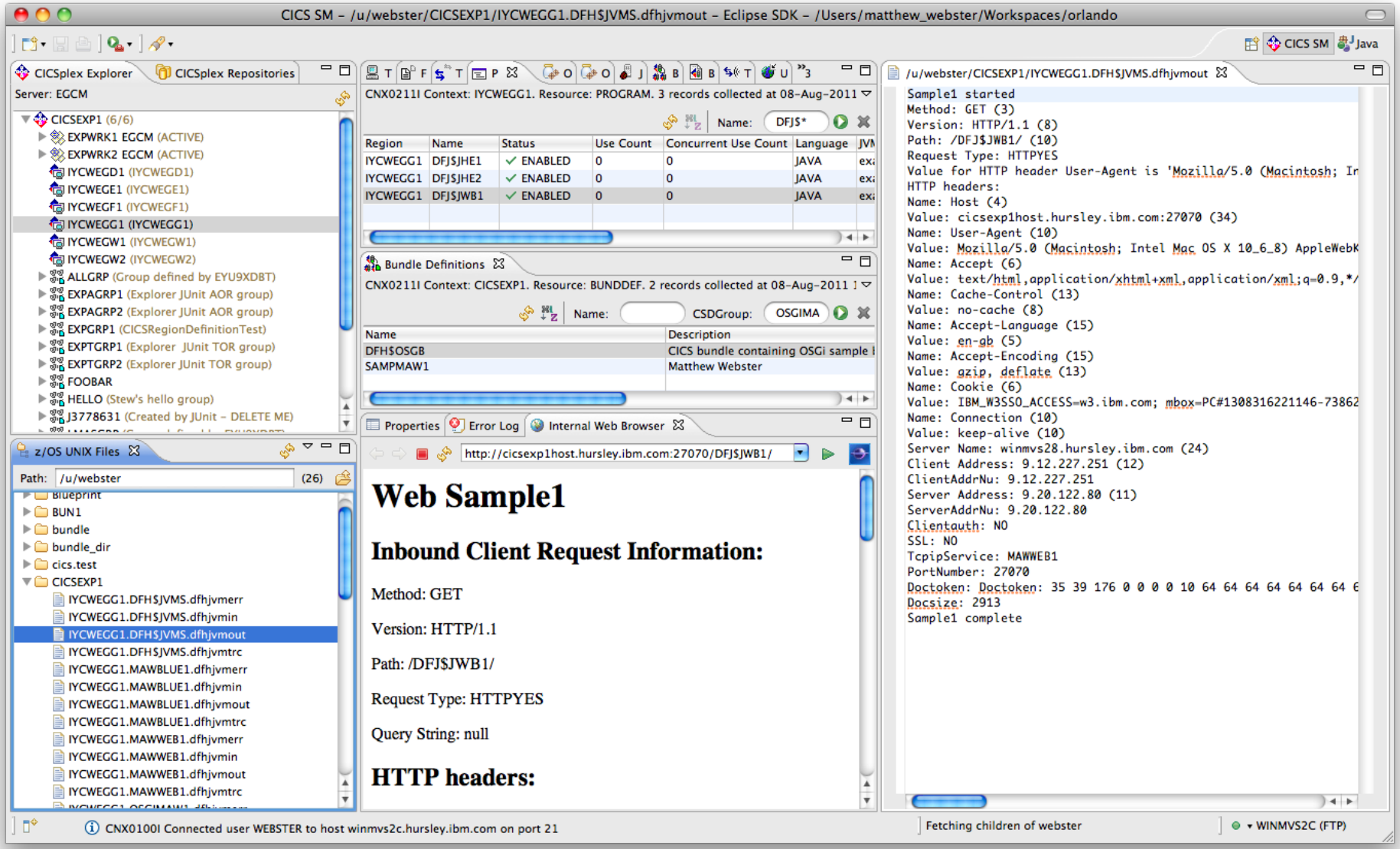
Success!



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Agenda Overview

Time	Description
8:30 – 9:00	Registration & Coffee
9:00 – 9:15	Welcome and Introductions
9:15 – 10:45	CICS TS V4.2 technical introduction – CICS TS V4.2 became generally available on 26th June. This presentation will provide you with a technical overview of all new and enhanced technology.
10:45 – 11:00	Morning tea
11:00 – 12:00	Java as an application development option
12:00 – 12:50	CICS Explorer and Tools update
12:50 – 13:00	Wrap up

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CICS Explorer and Tools

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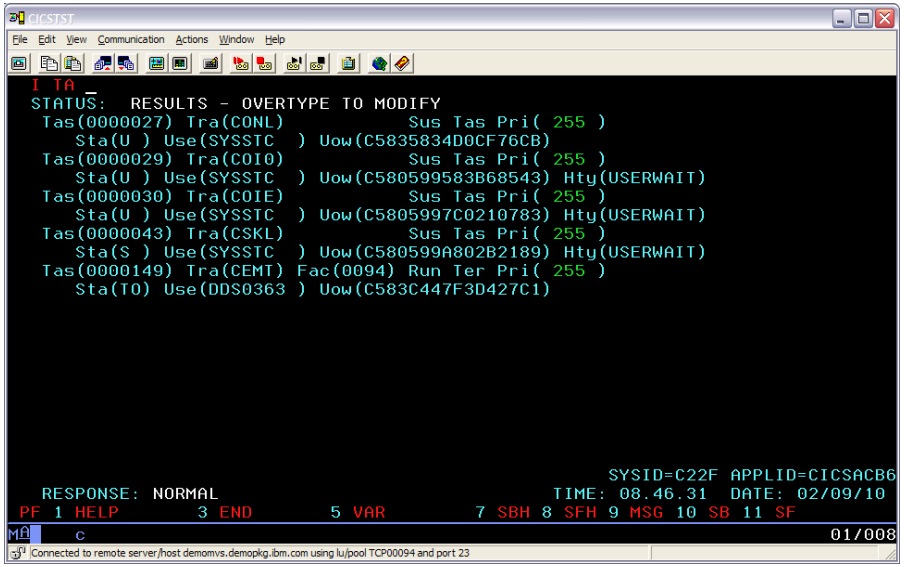
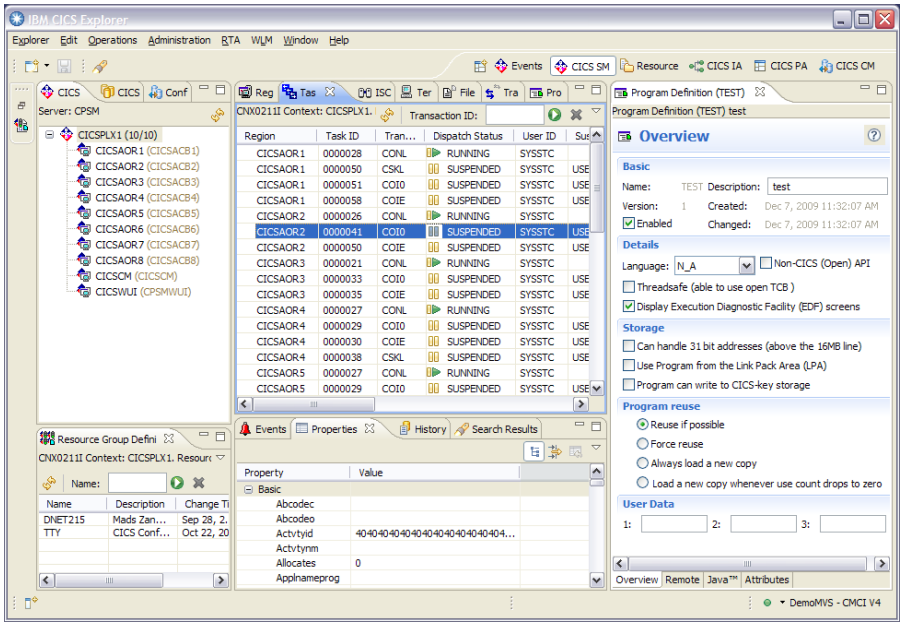
CICS Explorer

- **"The New Face Of CICS"**
  - A new user interface for interacting with CICS
  - Built on the Eclipse Rich Client Platform
  - Rich UI allows more sophisticated methods of interaction
- **Offers similar functionality as existing interfaces**
  - Web UI, CICS resource changes
- **And some functionality you can't do through existing interfaces**
  - Transaction Tracking, Event Binding Editor, OSGi bundle deployment





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CICS Explorer

- **Simplify CICS**
  - Single user interface for CICS & CICSPlex SM
    - Common, intuitive, Eclipse-based tooling environment for new and experienced
      - Architects and Developers
      - System administrators and System programmers
      - Operators
- **Integration platform - Value of the sum exceeds the part**
  - First class cross tooling integration
  - Consistent views across tooling
  - Consolidated tooling with a central view into the CICS world
  - Supports CICS runtime, CICS tools, CICS connectors, plus other IBM and third-party software
- **CICS Explorer SDK (Software Development Kit)**
  - Provides separately packaged plug-ins for any Eclipse-based environment
  - API allows 3rd parties to extend or integration existing capability
  - Layered architecture allows Eclipse-independent components to be used in any environment

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DEMO

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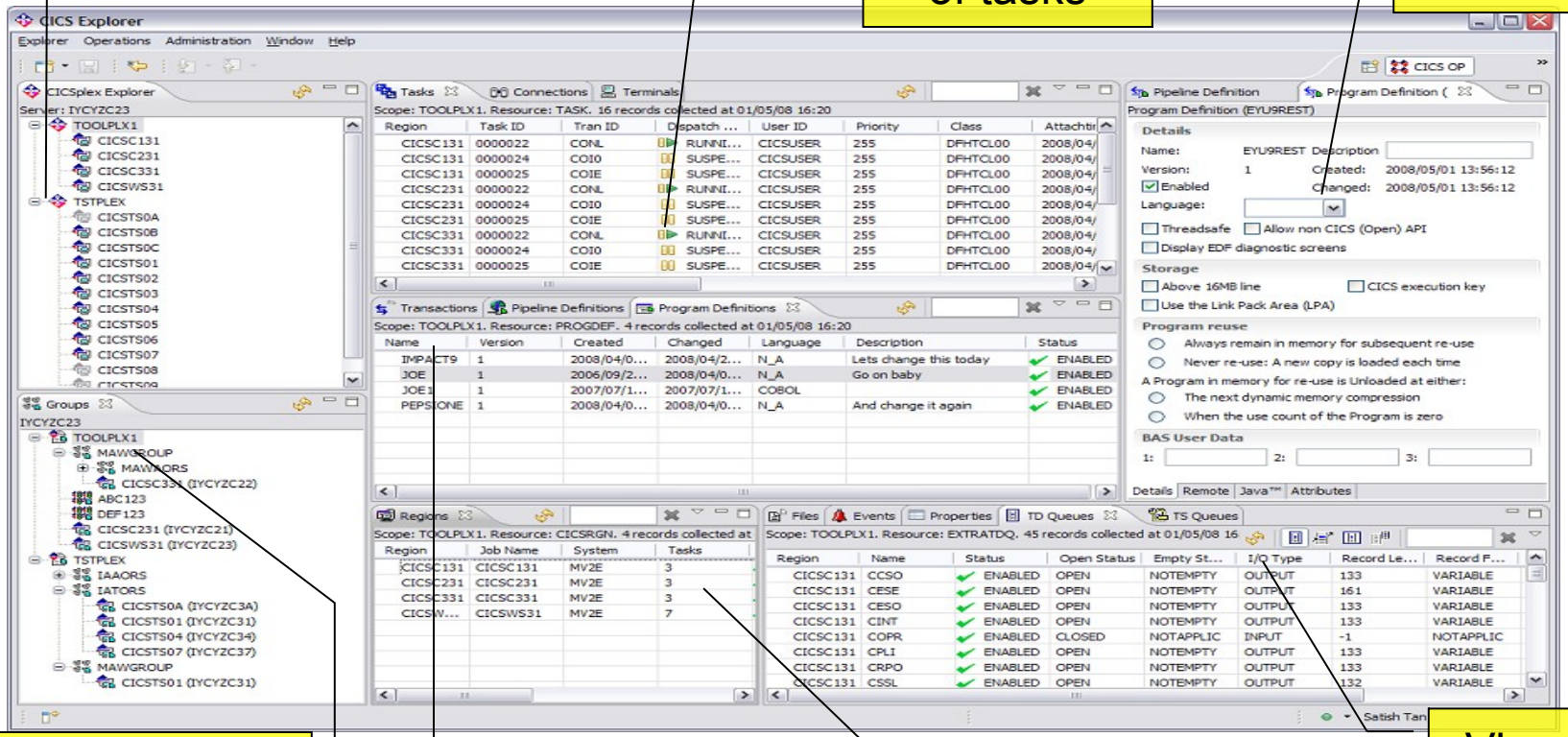
CICS Explorer

View Systems

View status of tasks

Edit Resource Definitions



Resource and System Groups

Views Program Definitions

Active CICS Systems in the selected PLEX

View Queue Information

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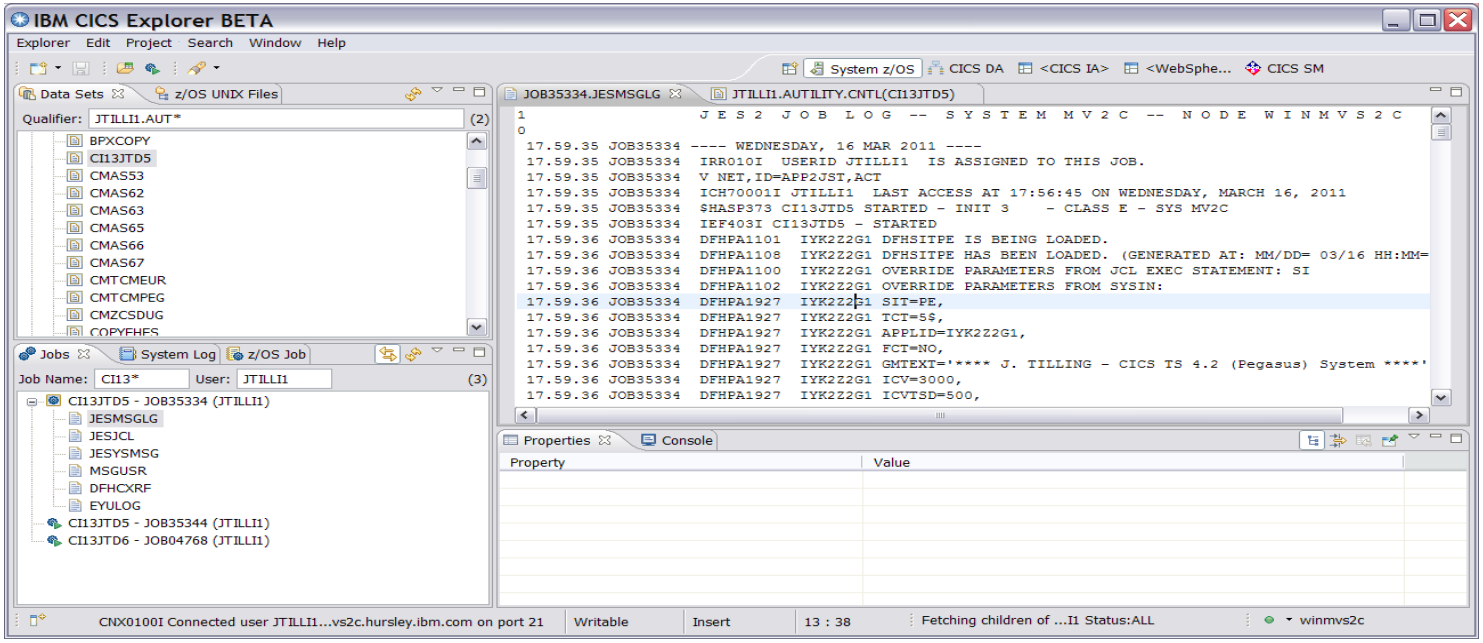
CICS Explorer

- **z/OS perspective**
  - Contains new views to help you manage your system z artifacts
    - Data Sets, Jobs, z/OS Unix Files and the Console
  - **Many other significant enhancements in V1.1 - June 2011**
    - Release notes
    - Broad range of Windows & Linux, 32- and 64-bit platforms - system requirements



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CICS Explorer

- **CICS Tools Plug-ins**
  - Communicate with the tool's value
  - Add value to the base CICS Explorer
    - Familiar interface extended without needing to re-create the base
  - Leverage the base CICS Explorer
- **The whole exceeds the sum of the parts**
  - Deployment Assistant
  - Configuration Manager
  - Interdependency Analyzer
  - Performance Analyzer
  - CICS Transaction Gateway

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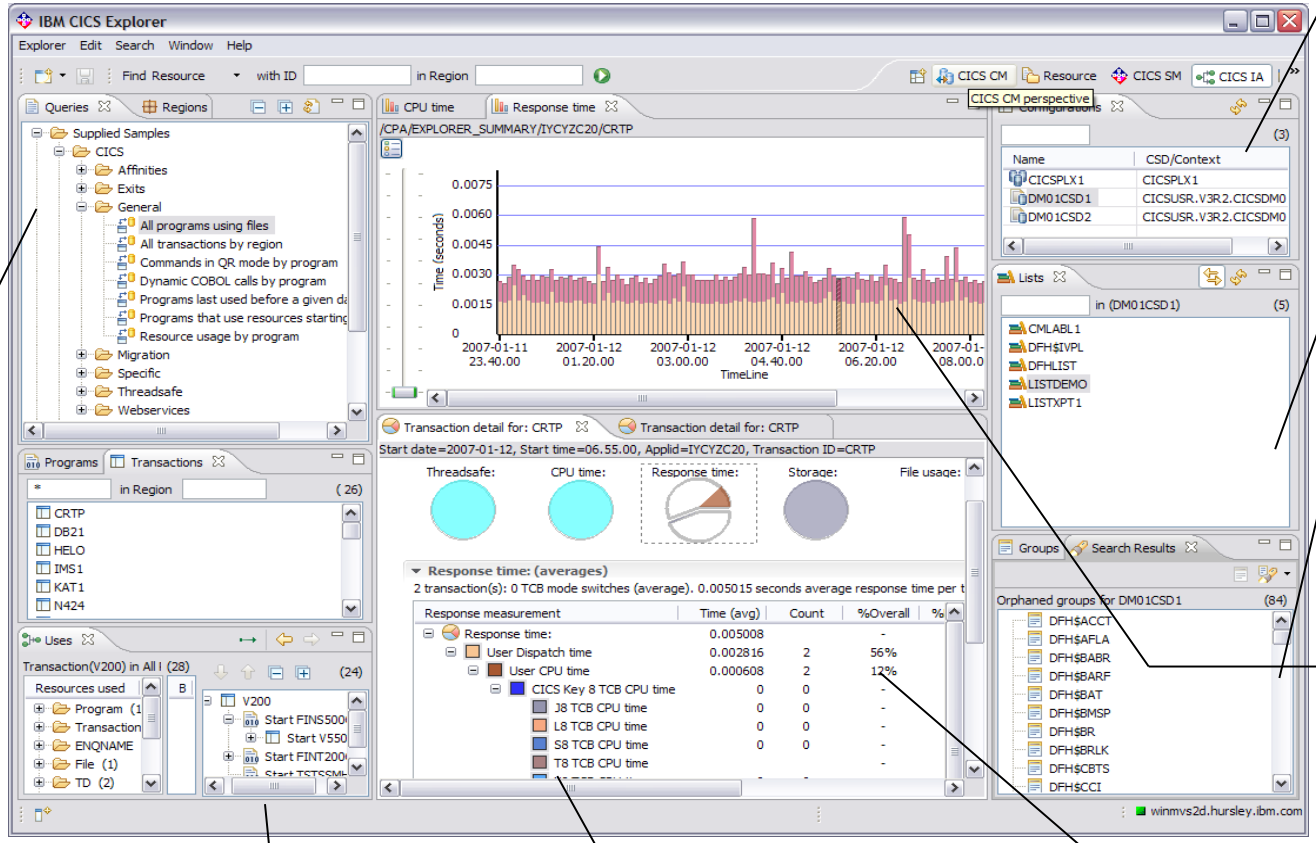
CICS Explorer



Single point of control for CSDs and DREPs

Lists and ResDescs

Search for Orphaned groups

Timeline of response times

CICS IA Shipped Sample Queries

CICS IA View tree of resources used

CICS PA Resources used by a transaction

CICS PA Drilldown into transaction

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Key Investment Areas

- **Autonomics**
  - CICS looking after itself
  - Streamline CICS upgrades (runtime currency)
    - Make moving to the latest version cheaper, simple and with reduced risk
- **Agility**
  - Provide an improved business-value oriented deployment and management experience.
  - Deploying applications is complex configuration due to number of artifacts
  - Cloud provisioning of resources that match business environment
- **Scalability**
  - Manage a large topology of regions created to ensure application scaling/availability
  - Difficult-to-manage environments due to significant workload dynamics
  - Refine instrumentation required to monitor and manage workload management
- **Ease of Use**
  - Intuitive user interfaces for the tools and runtime adapted for both new and experienced users
  - Tools and runtime working together to deliver integrated solutions
  - Policy definition and use in automated deployment and management solutions

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Tooling Directions

- **CICS Deployment Assistant V1.1**
  - Policy and autonomics with the next generation of CICS TS
  - Modeling and simulation
  - Integrate with Cloudscape solution
  - Off-line (or DR) site support
  - Common business application interchange
- **CICS Interdependency Analyzer v3.2 (GA September 2011)**
  - Policy/knowledge DB
  - Common business application interchange
- **CICS Performance Analyzer V3.2**
  - Policy/knowledge DB
  - Common business application interchange
- **CICS Configuration Manager V2.1**
  - Packaging and migration support
  - Expand support for non-CSD/Bas resource types
  - Common business application interchange
- **CICS Transaction Gateway**
- **CICS Deployment Assistant and Workload Manager (WLM) support**
- **IBM Session Manager V3.1**
  - Cloud deployment support
- **CICS VSAM Recovery V4.3**
  - Advanced recovery options
- **CICS Batch Application Control V1.1.1**
  - CICS Deployment Assistant support
- **CICS Explorer V1.1**
  - Integrated delivery platform for the above capabilities

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IBM CICS Explorer™ V1.1

New!

Session and user views, Configuration, Broadcast, User and Admin commands

ISM

Daemon & Connection Status & Test

TG

Develop
Test
Etc

RDz

Configuration
Status
Control, Test

MQ

Status
Situations
Topology

XE

New!

Manipulate, browse z/OS data sets, z/FS, MQ

FM

CICS, IMS, DB2, & z/OS Abend Reporting & Diagnosis

FA

Threadsafe, File, CPU, Response Time, Statistics, Alerts, Graphical and Sheet views

PA

Deployment, Discovery, Visualization, Cloning, Automation & Control

DA

CICS, IMS, DB2, & z/OS Application Debugging

DT

CICS, IMS, DB2, & z/OS Observation Requests & Reporting

APA

Execution Tree
Dependencies
Queries
Command Flow

IA

CRUD/Install
History, Audit
Backout
Search, Compare

CM

CRUD/Install, Control, Filter, Sort, Topology, Events, ATOM. Java, z/OS, Txn Tracking, WLM

SM

Enhanced!

ibm.com/cics
ibm.com/cics/tools
ibm.com/cics/explorer

CICS TS

SM	CICS Transaction Server
IA	CICS Interdependency Analyzer
PA	CICS Performance Analyzer
CM	CICS Configuration Manager
DA	CICS Deployment Assistant
TG	CICS Transaction Gateway
ISM	IBM Session Manager

APA	Application Performance Analyzer
FA	Fault Analyzer
DT	Debug Tool
FM	File Manager
MQ	WebSphere MQ
XE	OMEGAMON XE for CICS
RDz	Rational Developer for System z

Updated: Monday, 04 July 2011

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Thank you!

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