



CICS Transaction Server V4.2

9607: CICS for Java Developers and Java for System Programmers - Two Sides of the Same Coin

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CICS Transaction Server for z/OS V4.2

Events



- System Events
- Assured Events
- Lifecycle Management

Management



- Transaction Tracking
- Workload Management
- Password Phrases

Java

- 64-bit Applications
- Multithreaded Server
- OSGi Management



Scalability

- More Threadsafe
- Optimised Threadsafe
- 64-bit Exploitation



Connectivity



- Axis2 Web Services
- Web Services Offload
- HTTP & IP Extensions

***new and enhanced
capability across five
major technology areas***

Related CICS TS V4.2 Sessions

- **Monday**
 - **9322: CICS TS V4.2 Technical Overview**
- **Tuesday**
 - **9601: CICS TS V4.2 Scalability**
 - **9605: What's New in CICS V4.2 Systems Management Best Practices**
- **Wednesday**
 - **9599: CICS TS 4.x Connectivity**
- **Thursday**
 - **9607: CICS for Java Developers and Java for System Programmers - Two Sides of the Same Coin**
 - **9330: CICS Event Processing**
- **Friday**

Java

- 64-bit Applications
- Multithreaded Server
- OSGi Management



Themes & Topics

- **User Roles**
- **Platform & Tools**
- **Demonstration**

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.



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)



CICS TS V4.2 JVM Server

- **New 64-bit Java runtime environment**
 - Increases the number of JVMs that can be used in a single CICS region
 - Removes the constraints on heap storage for each JVM
 - Provides performance advantages when running on IBM zEnterprise 196 (z196) hardware
- **JVM server for user programs**
 - Run multiple Java transactions as threads in a single JVM server process
 - Simplified the setup and management of the CICS Java runtime environment
 - Improved portability for Java applications and tools deployed in CICS
- **OSGi bundles for development, deployment & management of Java applications**
 - Java applications packaged as one or more industry standard OSGi bundles and then deployed/installed as a CICS BUNDLE
 - Removes the need to load Java applications from a statically defined class path
 - Provision of application isolation and versioning, cross-package prerequisite checking, and simplified package redeployment

CICS TS V4.2 Pooled JVM

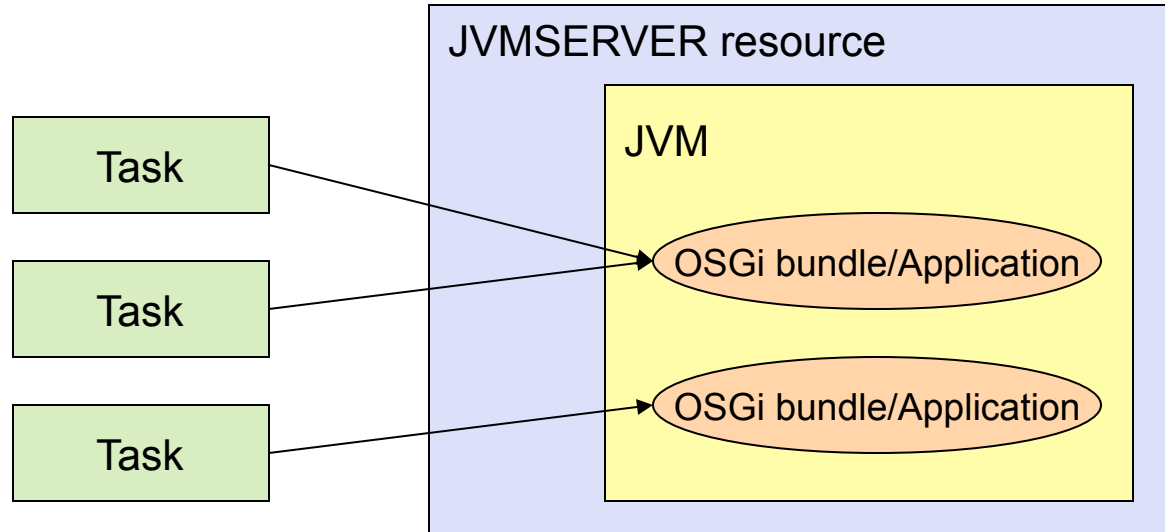
■ Enterprise Java Bean Support

- Enterprise Java Bean (EJB) 1.1 specification and the associated CICS EJB Server components was stabilized in CICS TS V4.1
- Not available in JVM server
- Encouraged to migrate EJB applications to be Java SE components and make them available through web services or the JEE Connector Architecture (JCA)

■ Java pool infrastructure

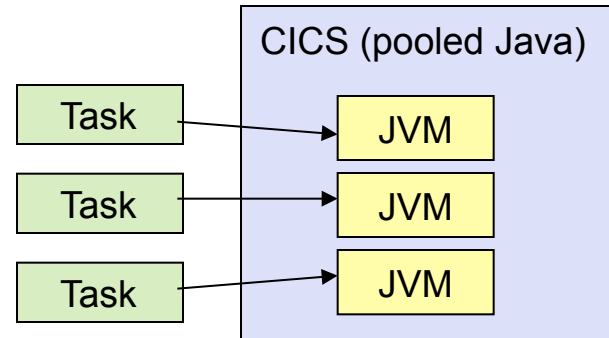
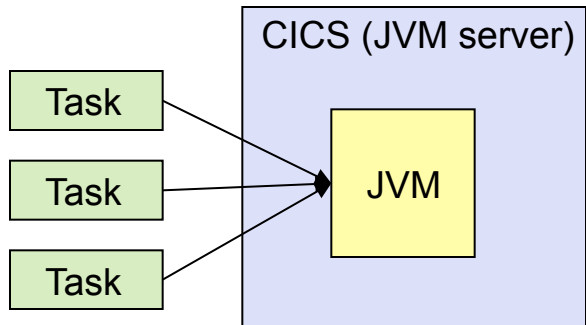
- Infrastructure was stabilized in CICS TS V4.1
- Encouraged to migrate Java applications to OSGi bundles
- See ***Migrating applications using the CICS Explorer SDK*** in the V4.2 Information Center

What is a JVM server...?



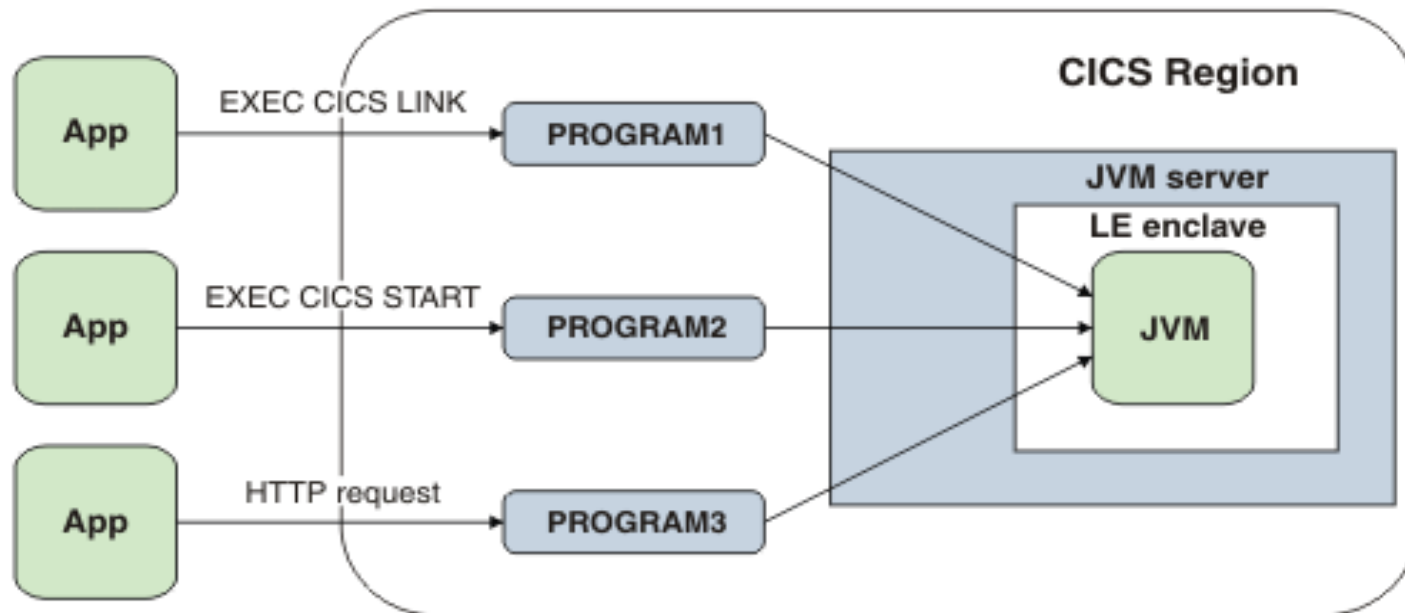
- a new CICS resource containing a **long-running JVM**.
- the strategic direction of Java in CICS
- a JVM that serves **multiple transactions concurrently**.
- a JVM in which applications/tasks run as OSGi bundles.

JVM server vs existing Java support?



Single JVM - serves many tasks (reduced storage) (concurrent, multi-threaded, up to 256 threads per JVM server)	Pool of JVMs - each serves only a single task. 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

Attaching work to a JVMSERVER?



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 development
- **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

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

CICS Explorer & CICS Explorer SDK Demonstration

Java - com.ibm.cics.server.examples.hello/src/examples/hello/HelloCICSWorld.java - Eclipse SDK

File Edit Source Refactor Navigate Search Project Run Window Help

Package Explorer

- com.ibm.cics.server.examples
 - META-INF
 - hello.osgibundle
 - jcics.osgibundle
 - web.osgibundle
- com.ibm.cics.server.examples.hello
 - JRE System Library [J2SE-1.4]
 - Plug-in Dependencies
 - src
 - examples.hello
 - HelloCICSWorld.java
 - HelloWorld.java
 - META-INF
 - OSGI-INF
 - build.properties
 - com.ibm.cics.server.examples.jcics
 - com.ibm.cics.server.examples.web

```

* @start_nonoco_copyright@
package examples.hello;

import com.ibm.cics.server.CommAreaHolder;

public class HelloCICSWorld
{
    public static void main(CommAreaHolder CAH)
    {
        Task t = Task.getTask();
        if ( t == null ) {
            System.err.println("HelloCICSWorld example: Can't get Task");
        }
        else {
            t.out.println("Hello from a Java CICS application");
        }
    }
}

```

Problems @ Javadoc Declaration

com.ibm.cics.server.Task

This class provides a set of methods and variables that correspond to a CICS task.

Since CICS TS version:
1.3

Since package version:
1.0

Help

Contents

- CICS Java Developer Guide
 - What you need to know about...
 - Java programming using JCICS
 - The Java class library for CICS
 - JCICS exception mapping
 - Using JCICS
 - Java restrictions
 - Accessing data from Java applic...
 - Connectivity from Java applicat...
 - Developing and deploying appli...
 - Developing applications usi...
 - Setting up the target environ...
 - Creating a plug-in project
 - Updating the plug-in projec...
 - Creating a CICS Bundle proj...
 - Adding a plug-in to a CICS I...
 - The JCICS samples
 - Packaging existing applicati...
 - Deploying a CICS bundle pr...
 - Deploying a CICS non-OSGi...
 - Enabling a Java security ma...
 - Installing OSGi bundles in a...
- JCICS Javadoc

Go To:
Search Related Topics
Bookmarks Index

Workbench User Guide

Fetching children of

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



Steve the Systems Programmer

Edit supplied DFHOSGI profile and "File > Save As..."

The screenshot shows the Eclipse IDE interface with the CICS SM console open. The console displays two tables of JVM Server Definitions for context IYCWEGG1.

JVM Server Definitions Table 1:

Region	Name	Enable Status	Max Threads	Threads	Install Time

JVM Server Definitions Table 2:

Name	Description	CSDGroup	Change Time	Change User ID
DFHSAXIS	CICS jvmserver to run DFHSAXIS	DFHSAXIS	04-Aug-2011 16:50	MQTEST
DFHSJVMS	CICS jvmserver to run DFHSOSGI	DFHSOSGI	04-Aug-2011 16:50	MQTEST

The Properties view for the selected DFHSJVMS server shows the following details:

Property	Value
Basic	
CSDGroup	DFHSOSGI
Description	CICS jvmserver to run OSGi samples
Enabled Status	ENABLED
JVM Profile	DFHOSGI
LE Runtime Options Program	DFHAXRO
Name	DFHSJVMS
Threadlimit	15
Userdata 1	N/A
Userdata 2	N/A
Userdata 3	N/A
Version	0
Definition Signature	
Change Agent	CSDBATCH
Change Release	0670
Change Time	04-Aug-2011 16:50:30

The right-hand pane shows the contents of the DFHOSGI profile file, which includes required parameters and JVM server specific parameters:

```

#
# Required parameters
# -----
#
# The set of supported CICS options for JVM servers
# differs from those used with JVM pools.
#
# JAVA_HOME specifies the location of the Java directory.
#
#JAVA_HOME=/usr/lpp/java/J6.0/
#JAVA_HOME=/java/java601_bit64_GA/J6.0.1_64
#
# Set the current working directory. If this environment variable is
# set, a change to the specified directory is issued before the JVM
# is initialized, and the STDIN, STDOUT and STDERR streams are
# allocated to this directory.
#
# If you do not specify this option, the current working directory is
# left unchanged and the STDIN, STDOUT and STDERR streams are allocated
# to the /tmp directory.
#
#WORK_DIR=.
#WORK_DIR=/u/webster/CICSEXP1
#
# Specify any directories that contain DLLs required at run time. For
# example, to use the IBM DB2 Driver for JDBC and SQLJ, add the
# directory containing the native DLLs to the LIBPATH_SUFFIX option.
# See the "Application Programming Guide and Reference for Java" relevant
# to the level of DB2 being used.
#
#LIBPATH_SUFFIX=
#
# -----
# JVM server specific parameters
# -----
#
# Use the OSGI_BUNDLES option to specify a list of middleware
# bundles that are installed and activated in the OSGi framework
# when the JVM is initialized.
# The list of bundles must be comma separated.
#
#OSGI_BUNDLES=/u/example/pathToBundleDirectory/B1.jar,\
# /u/example/pathToBundleDirectory/B2.jar
#

```

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

The screenshot displays the CICS Explorer interface. On the left, a tree view shows the CICSplex structure, with the DFHOSGI component selected. The main window shows the configuration table for DFHOSGI, and the right pane shows the configuration file content.

Property	Value
Basic	
CSDGroup	DFHOSGI
Description	CICS jvmserver to run OSGi samples
Enabled Status	ENABLED
JVM Profile	DFHOSGI
LE Runtime Options Program	DFHAXRO
Name	DFHSJVMS
Threadlimit	15
Userdata 1	N/A
Userdata 2	N/A
Userdata 3	N/A
Version	0
Definition Signature	
Change Agent	CSDBATCH
Change Release	0670
Change Time	04-Aug-2011 16:50:30

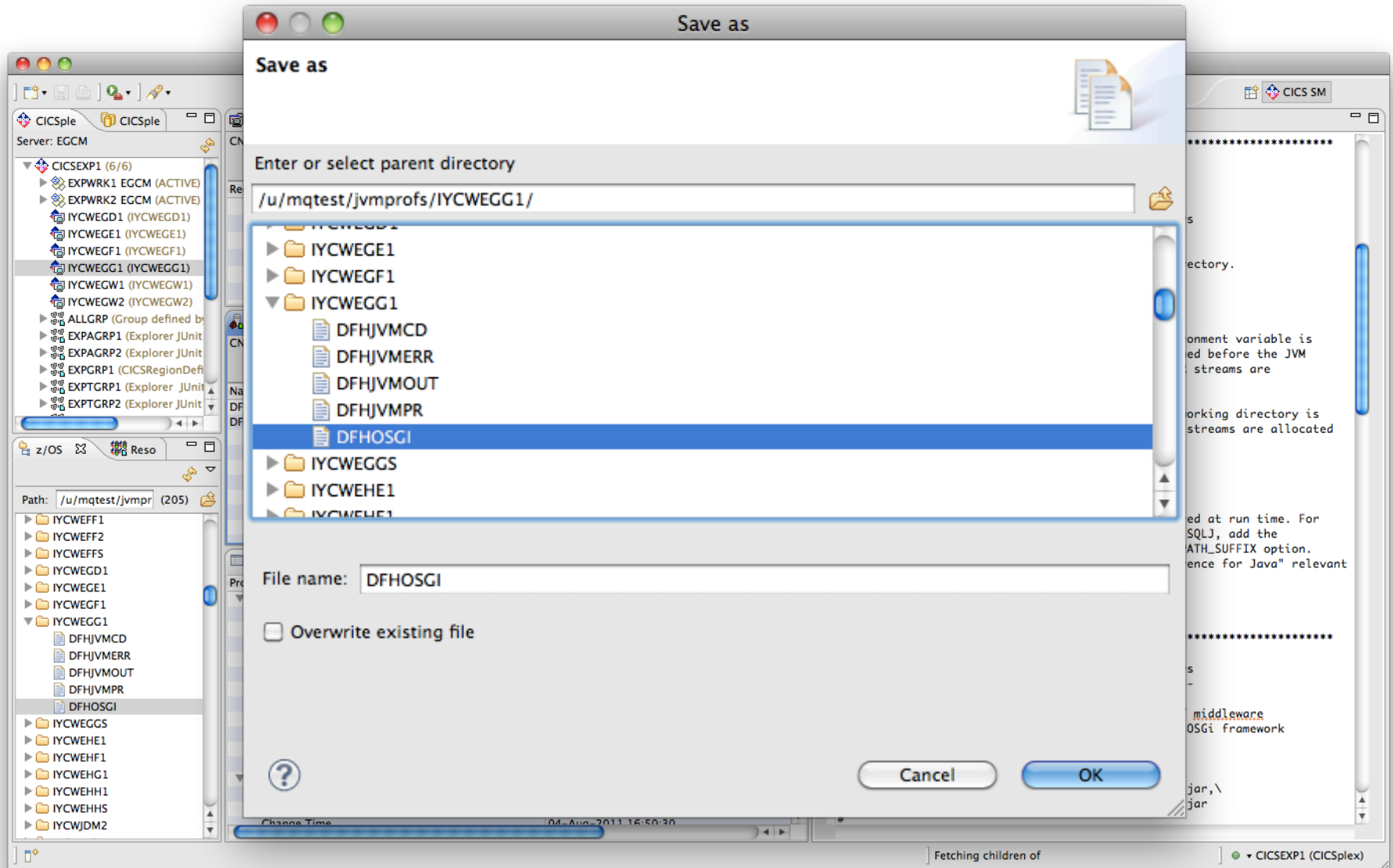
```

# JAVA_HOME specifies the location of the Java directory.
#
#JAVA_HOME=/usr/lpp/java/J6.0/
JAVA_HOME=/java/java601_bit64_GA/J6.0.1_64
#
# Set the current working directory. If this environment variable is
# set, a change to the specified directory is issued before the JVM
# is initialized, and the STDIN, STDOUT and STDERR streams are
# allocated to this directory.
#
# If you do not specify this option, the current working directory is
# left unchanged and the STDIN, STDOUT and STDERR streams are allocated
# to the /tmp directory.
#
#WORK_DIR=.
WORK_DIR=/u/webster/CICSEXP1

# directory containing the native DLLs to the LIBPATH_SUFFIX option.
# See the "Application Programming Guide and Reference for Java" relevant
# to the level of DB2 being used.
#
#LIBPATH_SUFFIX=
#
#-----
#
#           JVM server specific parameters
#-----
#
# Use the OSGI_BUNDLES option to specify a list of middleware
# bundles that are installed and activated in the OSGi framework
# when the JVM is initialized.
# The list of bundles must be comma separated.
#
#OSGI_BUNDLES=/u/example/pathToBundleDirectory/B1.jar,\
/u/example/pathToBundleDirectory/B2.jar
#

```

Edit supplied DFHOSGI profile and "File > Save As..."



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

INSTALL sample DFH\$JVM JVM server

Top Window: CNX0211I Context: IYCWEGG1. Resource: JVMSEV. 0 records collected at 08-Aug-2011 16:20:24

Region	Name	Enable Status	Max Threads	Threads	Install Time

Bottom Window: CNX0211I Context: IYCWEGG1. Resource: JVMSEVDEF. 2 records collected at 08-Aug-2011 16:21:44

Name	Description	CSDGroup	Change Time	Change User ID
DFH\$AXIS	CICS jvmserver to run	DFH\$AXIS	04-Aug-2011 16:50	MQTEST
DFH\$JVMS	CICS jvmserver to run	DFH\$OSGI	04-Aug-2011 16:50	MQTEST

Context Menu (over DFH\$JVMS):

- New...
- Open
- Install...
- Delete
- Copy

INSTALL sample DFH\$JVM JVM server

The screenshot displays the CICS Transaction Server GUI. The main window shows a table with columns: Region, Name, Enable Status, Max Threads, Threads, and Install Time. The context is CNX0211I, Resource: JVMSEV, and 0 records were collected at 08-Aug-2011 16:20:24. A 'Perform Operation' dialog box is open, titled 'Perform INSTALL Operation'. The dialog contains the following information:

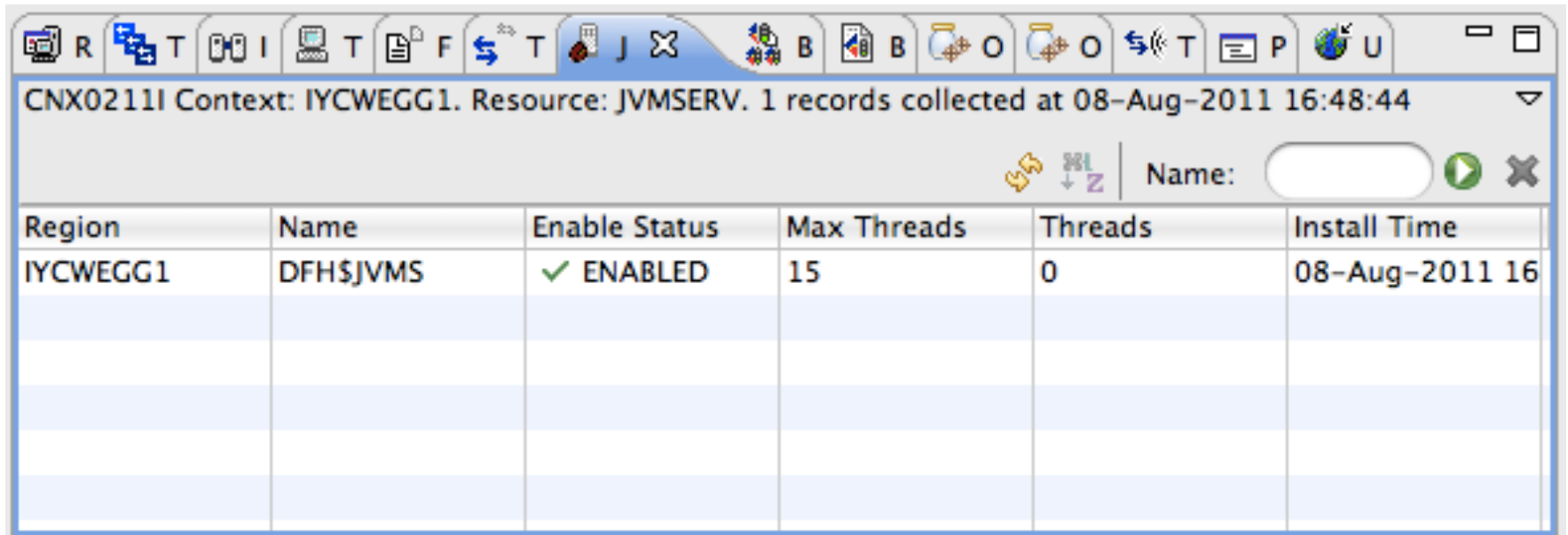
- Perform INSTALL Operation**: INSTALL operation will be performed on all items in the execution queue.
- CICSplex:** CICSEXP1
- Target**: A list box containing 'IYCWEGG1 (IYCWEGG1)' with a checked checkbox.
- Execution Queue:** A table with columns 'State' and 'Object'. The object 'DFH\$JVM' is listed.

The dialog box has 'Cancel' and 'OK' buttons at the bottom right. A 'Copy' button is visible at the bottom of the main window.

Region	Name	Enable Status	Max Threads	Threads	Install Time

State	Object
	DFH\$JVM

JVM server DFH\$JVMS ENABLED



The screenshot shows the CICS Administration Console interface. The title bar indicates the context is IYCWEGG1 and the resource is JVMSERV. The main area displays a table with the following data:

Region	Name	Enable Status	Max Threads	Threads	Install Time
IYCWEGG1	DFH\$JVMS	✓ ENABLED	15	0	08-Aug-2011 16

Check IYCWEGG1.DFH\$JVMS.dfhjvmtrc for any problems

The screenshot shows the Eclipse IDE interface for CICS SM. The main window displays the configuration for the CICS region IYCWEGG1, including JVM definitions and system parameters.

JVM Server Definitions:

Name	Description	CSDGroup	Change Time	Change User ID
DFH\$AXIS	CICS jvmserver to run DFH\$AXIS		04-Aug-2011 16:50	MQTEST
DFH\$JVMS	CICS jvmserver to run DFH\$OSGI		04-Aug-2011 16:50	MQTEST

Properties:

Property	Value
Basdefinver	0
CICS Release	E670
Enable Status	ENABLING
JVM Created (GMT)	
JVM Created (Local time)	
JVM Profile	DFHOSGI
LERUNOPTS	DFHAXRO
Name	DFH\$JVMS
PID	0
Region	IYCWEGG1
Use Count	0
JVM Heap	
GC Events (Major)	0
GC Events (Minor)	0
GC Heap Freed (Major)	0
GC Heap Freed (Minor)	0
GC Min Heap	0
GC Policy	
GC Time (Major)	0
GC Time (Minor)	0
Heap	
Init Heap	0
Max Heap	0

SIT Parameters (SYSI):

```

2011/08/08 15:52:15.361 GMT I Router-Init-Thread com.ibm.cics.r
2011/08/08 15:52:16.712 GMT I Router-Init-Thread com.ibm.cics.r
2011/08/08 15:52:16.764 GMT I Router-Init-Thread com.ibm.cics.r
2011/08/08 15:52:16.782 GMT I Router-Init-Thread com.ibm.cics.r
2011/08/08 15:52:16.824 GMT I Router-Init-Thread com.ibm.cics.r
2011/08/08 15:52:16.843 GMT I Router-Init-Thread com.ibm.cics.r
2011/08/08 15:52:16.854 GMT I Router-Init-Thread com.ibm.cics.r
2011/08/08 15:52:16.893 GMT I Router-Init-Thread com.ibm.cics.r
2011/08/08 15:52:16.934 GMT I Router-Init-Thread com.ibm.cics.r
2011/08/08 15:52:16.960 GMT I Router-Init-Thread com.ibm.cics.r
2011/08/08 15:52:17.088 GMT I Router-Init-Thread com.ibm.cics.r
2011/08/08 15:52:17.089 GMT I Framework Event Dispatcher com.it
2011/08/08 15:52:17.089 GMT I Framework Event Dispatcher org.ec
2011/08/08 15:52:17.090 GMT I Framework Event Dispatcher org.ec
2011/08/08 15:52:17.090 GMT I Framework Event Dispatcher org.ec
2011/08/08 15:52:17.090 GMT I Router-Init-Thread com.ibm.cics.r
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.r
    
```

Resource G: Path: /u/webster (25)

- all.policy
- Blueprint
- BUN1
- bundle
- bundle_dir
- cics.test
- CICSEXP1
 - IYCWEGG1.DFH\$JVMS.dfhjvmerr
 - IYCWEGG1.DFH\$JVMS.dfhjvmin
 - IYCWEGG1.DFH\$JVMS.dfhjvmout
 - IYCWEGG1.DFH\$JVMS.dfhjvmtrc
 - IYCWEGG1.MAWBLUE1.dfhjvmerr
 - IYCWEGG1.MAWBLUE1.dfhjvmin
 - IYCWEGG1.MAWBLUE1.dfhjvmout
 - IYCWEGG1.MAWBLUE1.dfhjvmtrc
 - IYCWEGG1.MAWWEB1.dfhjvmerr
 - IYCWEGG1.MAWWEB1.dfhjvmin
 - IYCWEGG1.MAWWEB1.dfhjvmout
 - IYCWEGG1.MAWWEB1.dfhjvmtrc

Console: CNX0100I Connected user WEBSTER to host cicsexp1host.hursley.ibm.com on port 27062

List of system and “middleware” OSGi bundles installed

```

/u/mqtest/jvmprofs/IYCWEGG1/DFHOSGI  SIT Parameters (SYSIN)  /u/webster/CICSEXP1/IYCWEGG1.DFH$JVMS.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.

```

Lots of useful information about JVM server

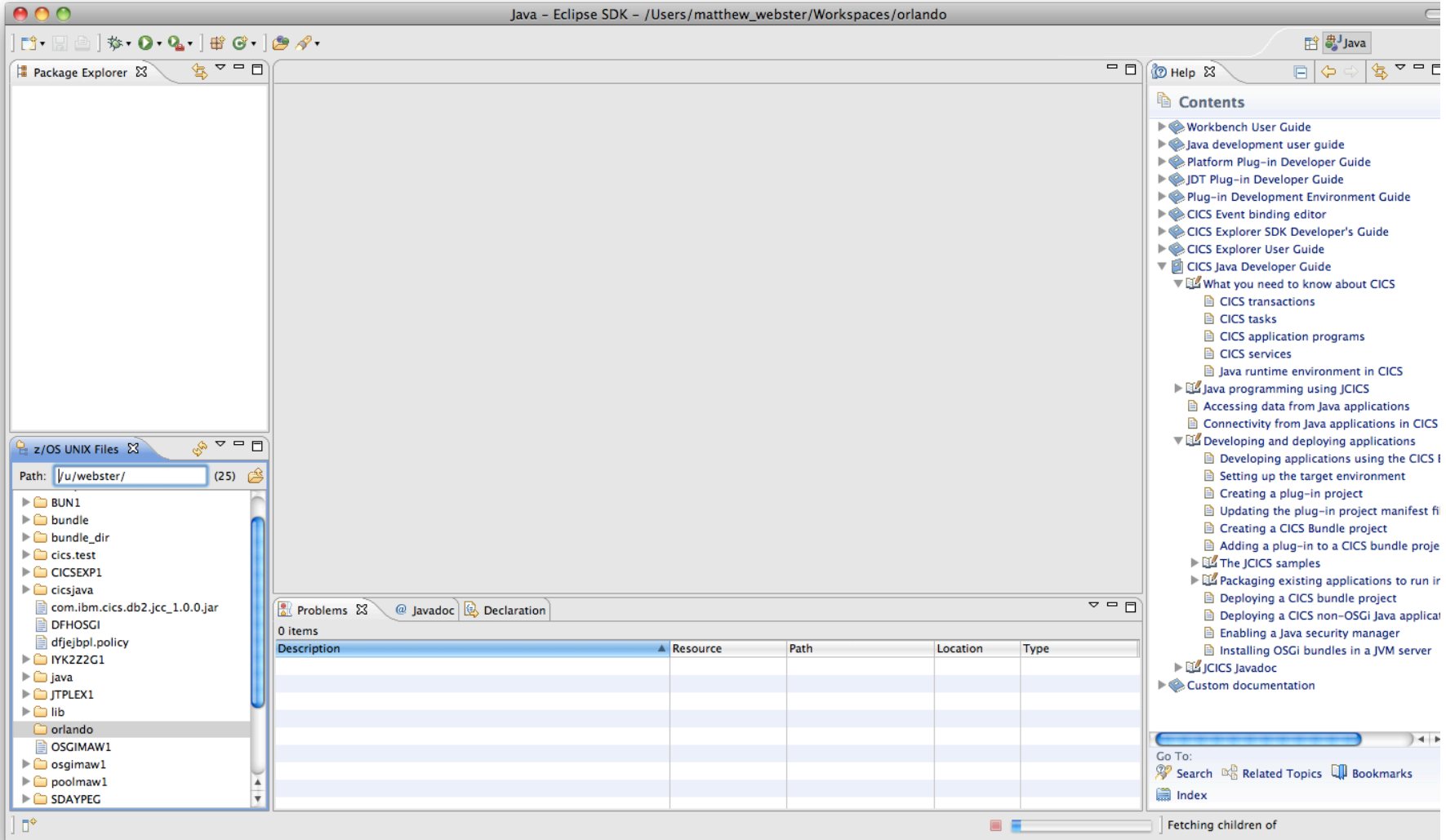
Property	Value
▼ Basic	
Basdefinever	0
CICS Release	E670
Enable Status	ENABLING
JVM Created (GMT)	
JVM Created (Local time)	
JVM Profile	DFHOSGI
LERUNOPTS	DFHAXRO
Name	DFH\$JVMS
PID	0
Region	IYCWEGG1
Use Count	0
▼ JVM Heap	
GC Events (Major)	0
GC Events (Minor)	0
GC Heap Freed (Major)	0
GC Heap Freed (Minor)	0
GC Min Heap	0
GC Policy	
GC Time (Major)	0
GC Time (Minor)	0
Heap	0
Init Heap	0
Max Heap	0
Peak Heap	0
► Resource Signature	
▼ Threads	
Max Threads	15
Peak Threads	0
Peak Waiting Threads	0
Sys Thread Peak Wait	0
Sys Thread Usage	8
Sys Thread Waits	0
Sys Thread Wait Time	0
Threads	0
Thread Waits	0
Thread Wait Time	0
Waiting Threads	0
Waiting Threads (Sys Thread)	0

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

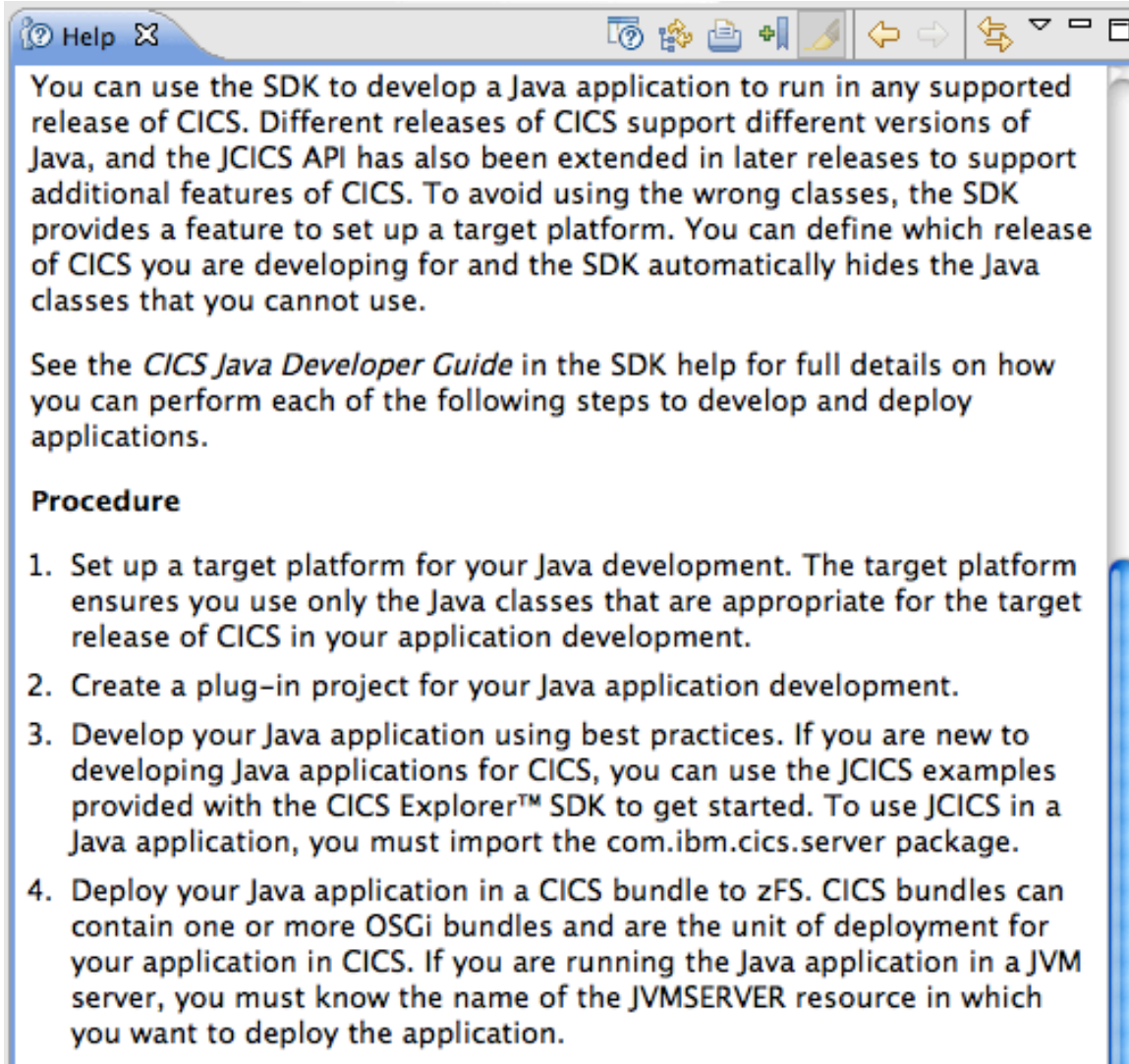


Dave the Application Developer

Empty workspace, empty CICS bundle



Developing applications using the CICS Explorer SDK



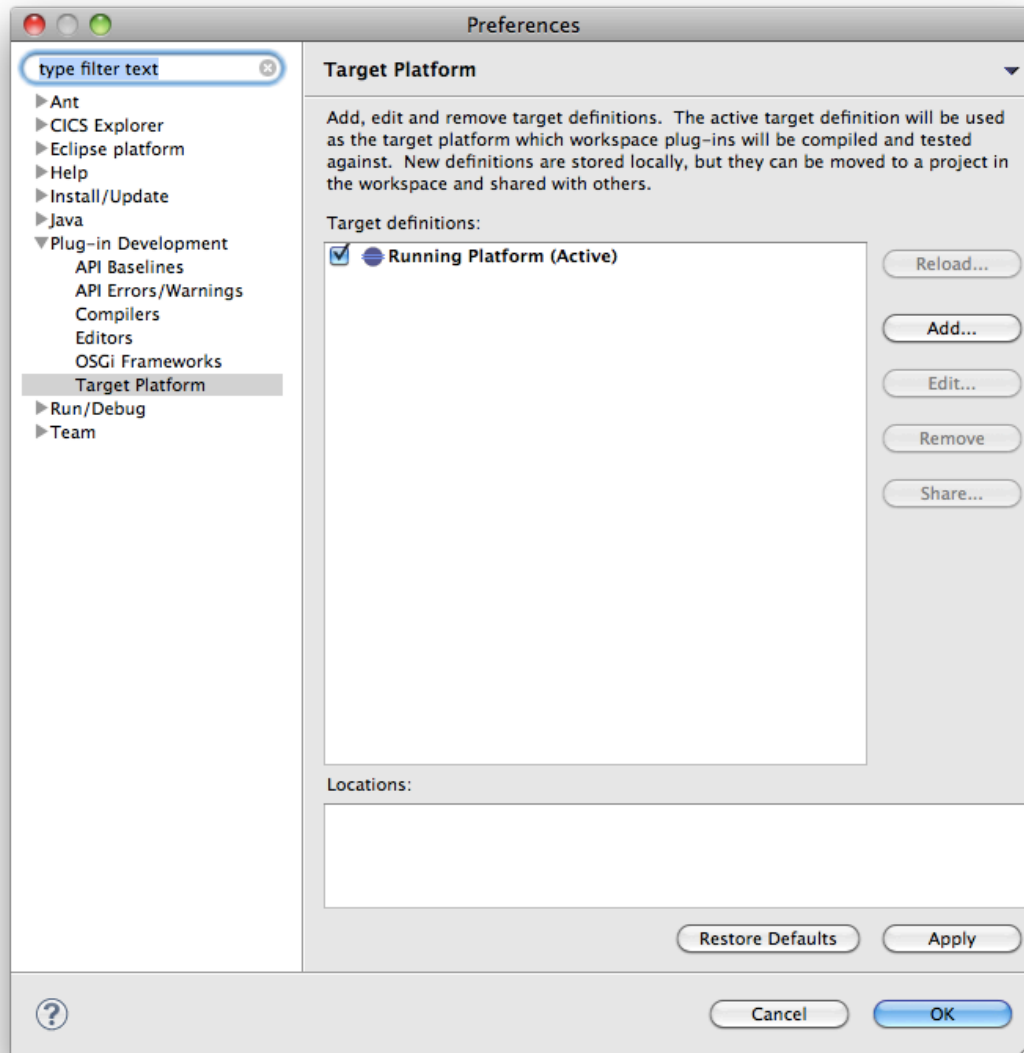
You can use the SDK to develop a Java application to run in any supported release of CICS. Different releases of CICS support different versions of Java, and the JCICS API has also been extended in later releases to support additional features of CICS. To avoid using the wrong classes, the SDK provides a feature to set up a target platform. You can define which release of CICS you are developing for and the SDK automatically hides the Java classes that you cannot use.

See the *CICS Java Developer Guide* in the SDK help for full details on how you can perform each of the following steps to develop and deploy applications.

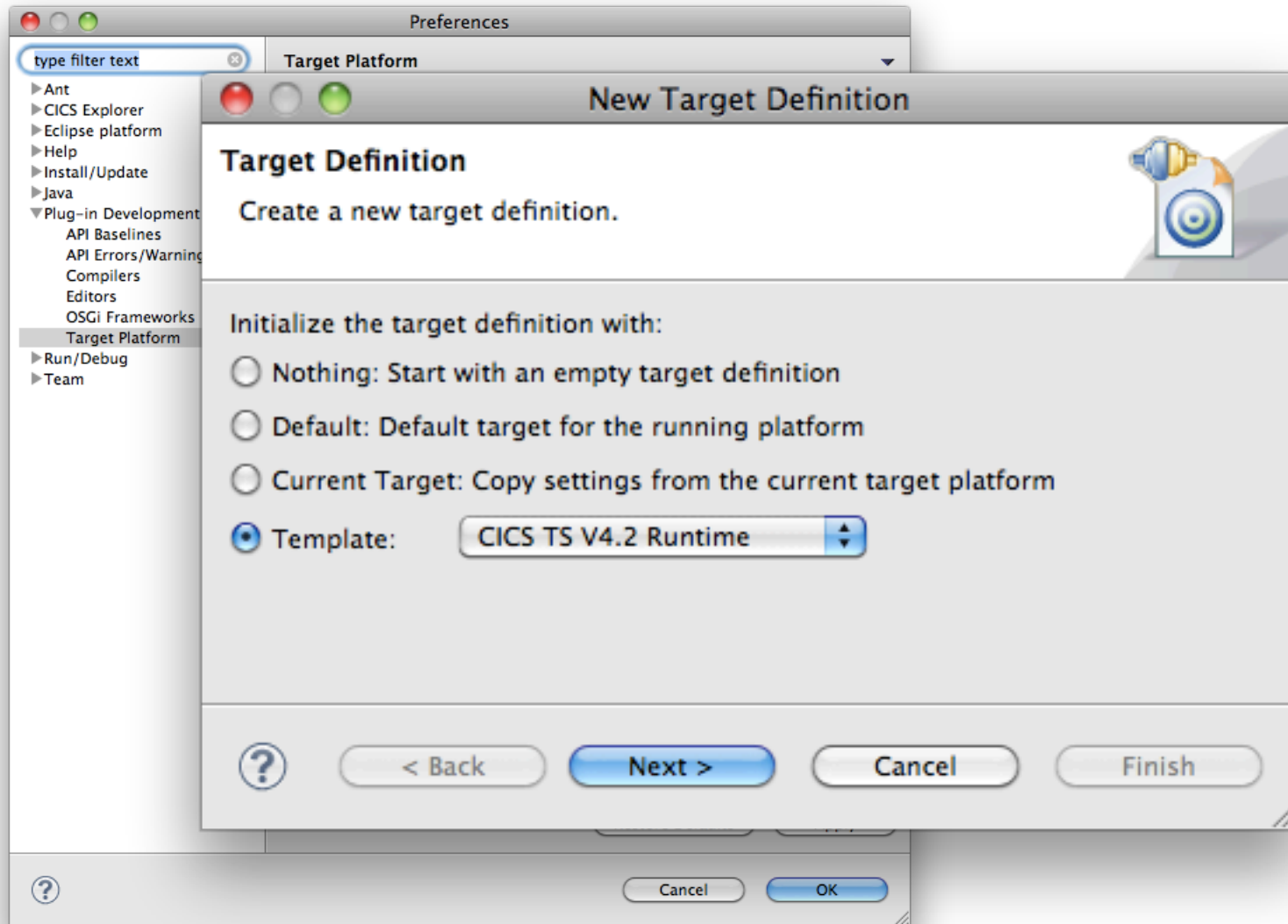
Procedure

1. Set up a target platform for your Java development. The target platform ensures you use only the Java classes that are appropriate for the target release of CICS in your application development.
2. Create a plug-in project for your Java application development.
3. Develop your Java application using best practices. If you are new to developing Java applications for CICS, you can use the JCICS examples provided with the CICS Explorer™ SDK to get started. To use JCICS in a Java application, you must import the `com.ibm.cics.server` package.
4. Deploy your Java application in a CICS bundle to zFS. CICS bundles can contain one or more OSGi bundles and are the unit of deployment for your application in CICS. If you are running the Java application in a JVM server, you must know the name of the JVMSERVER resource in which you want to deploy the application.

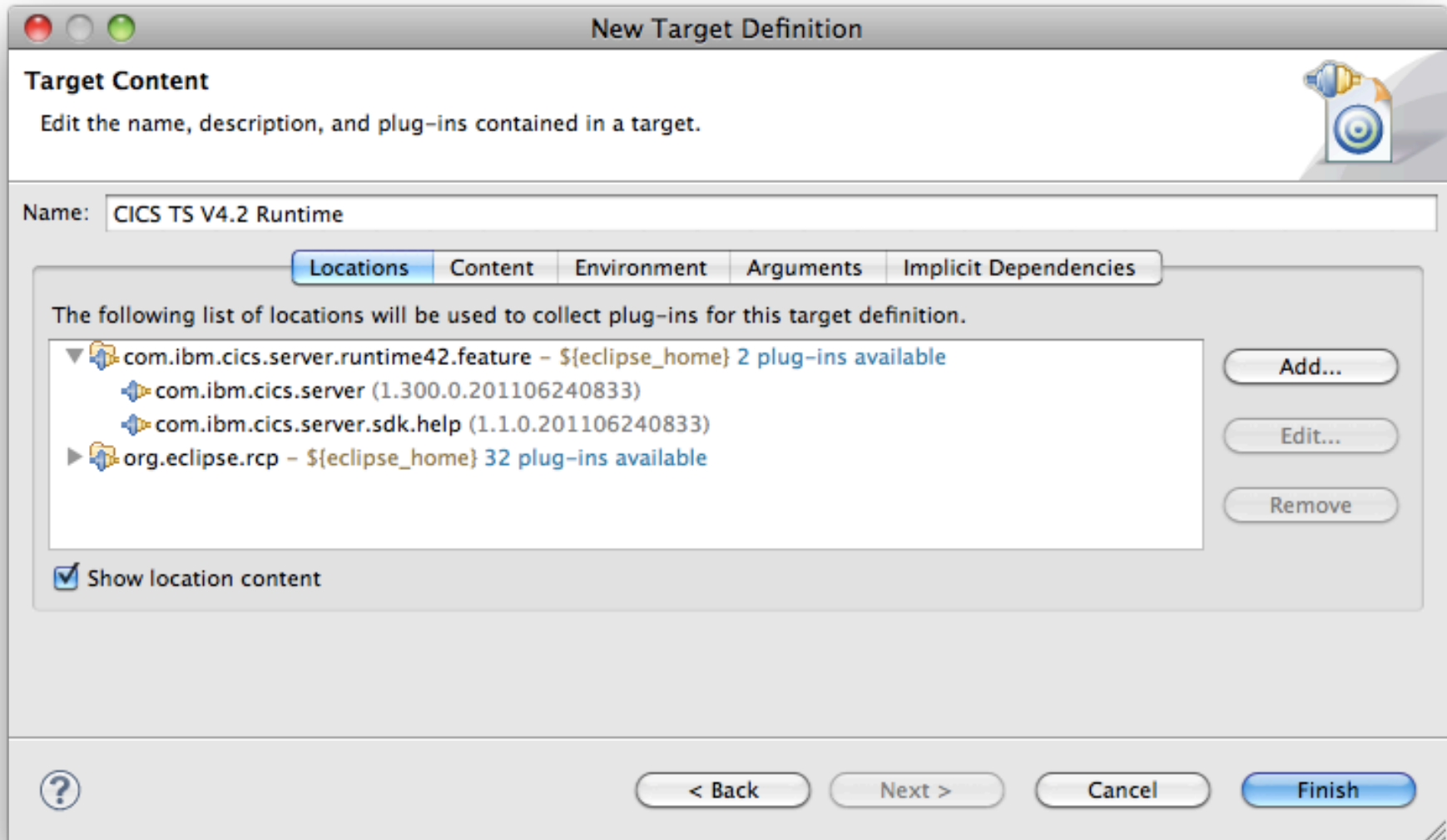
Set Target Platform



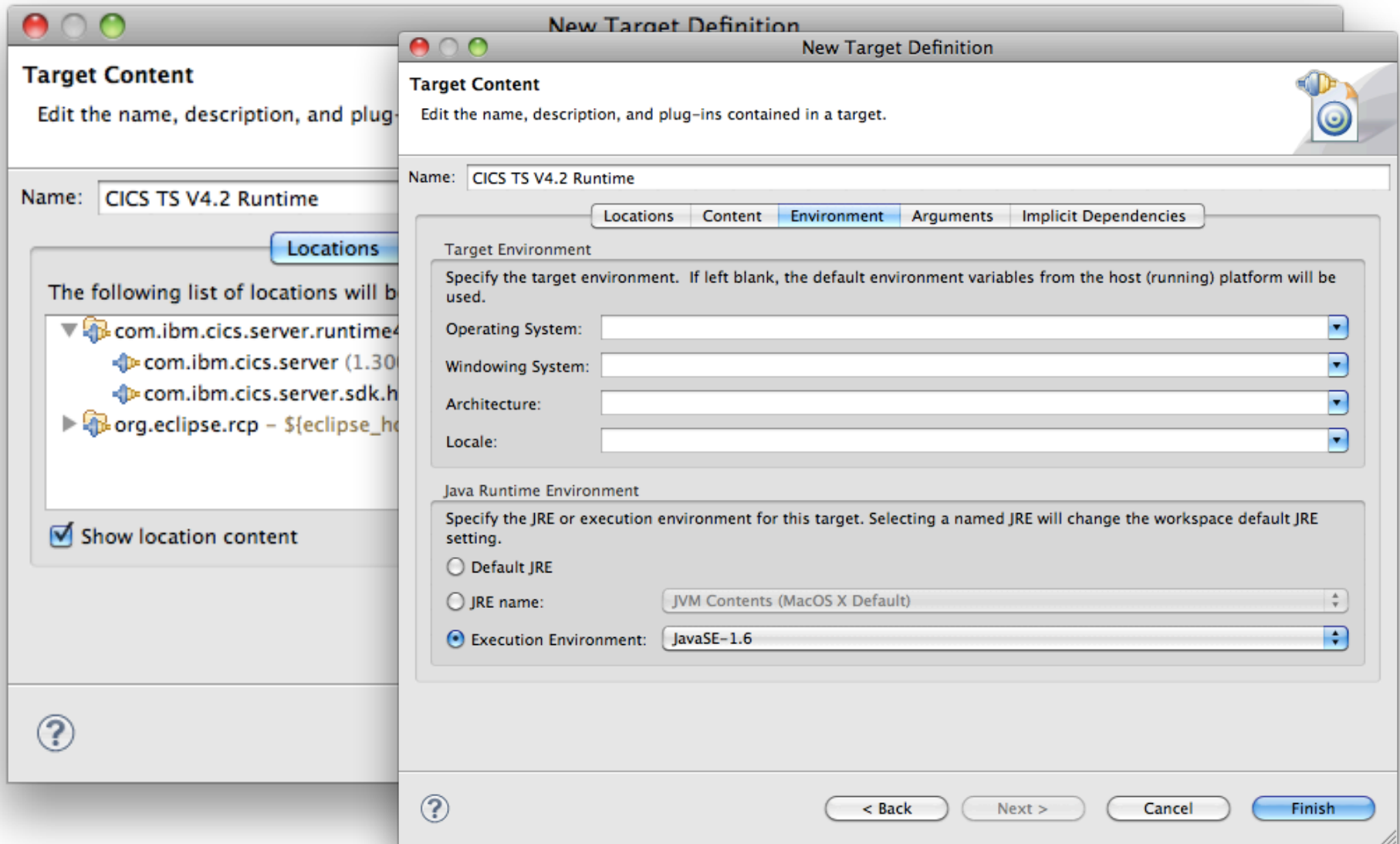
Set Target Platform



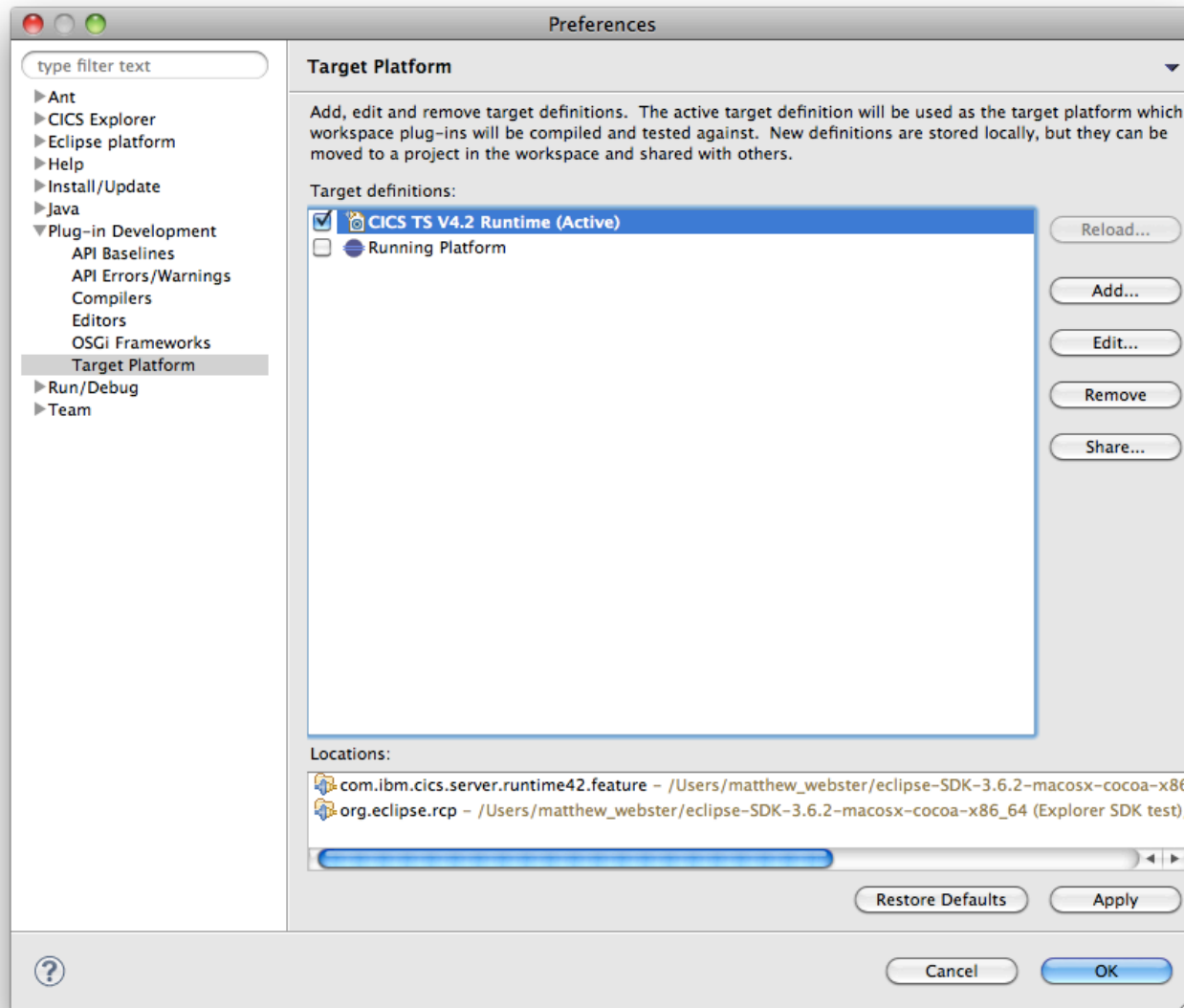
JCICS version 1.300 (V4.2)



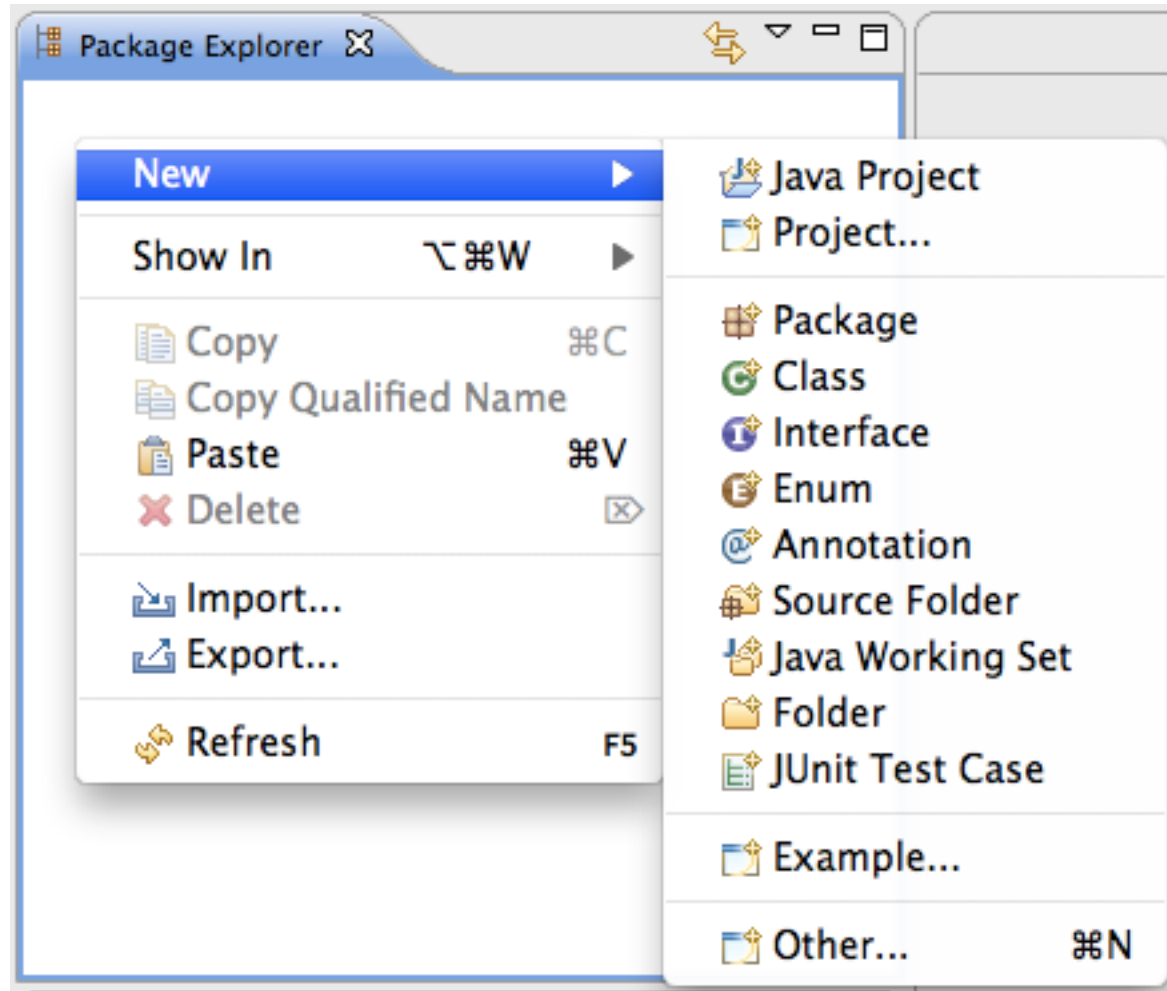
Java 1.6



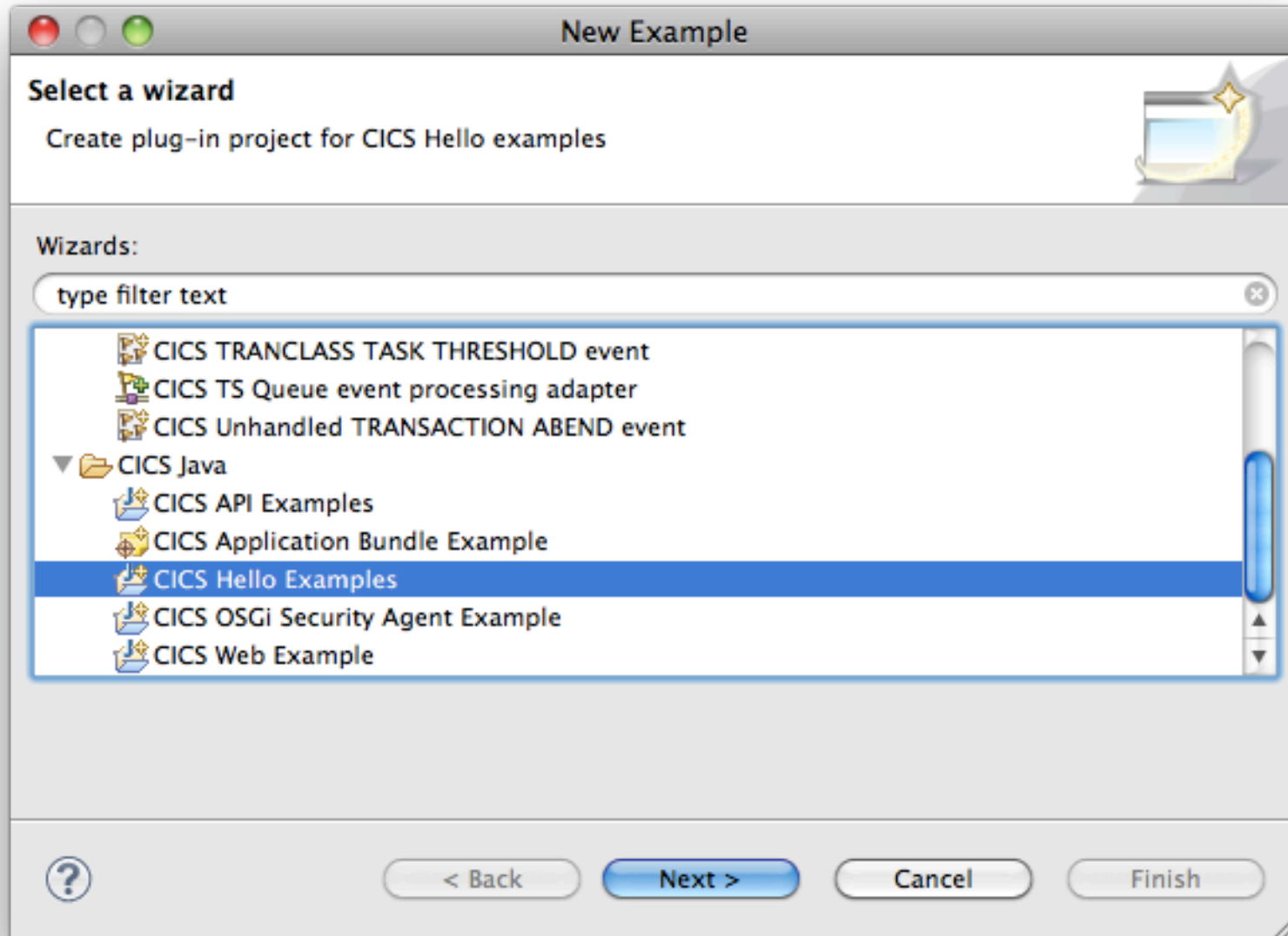
Select the new target



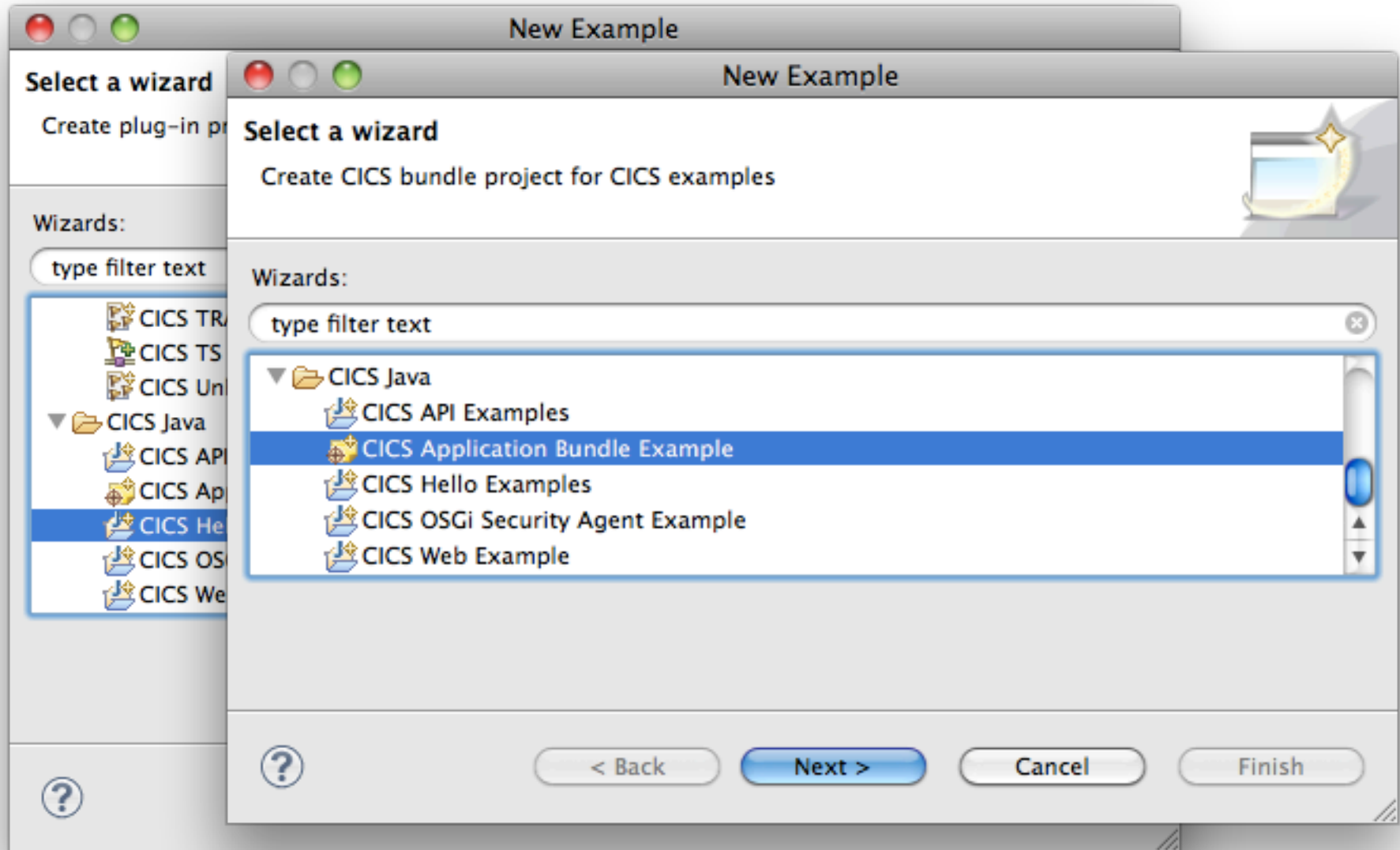
Add the examples (Hello, JCICS & Web) to the workspace



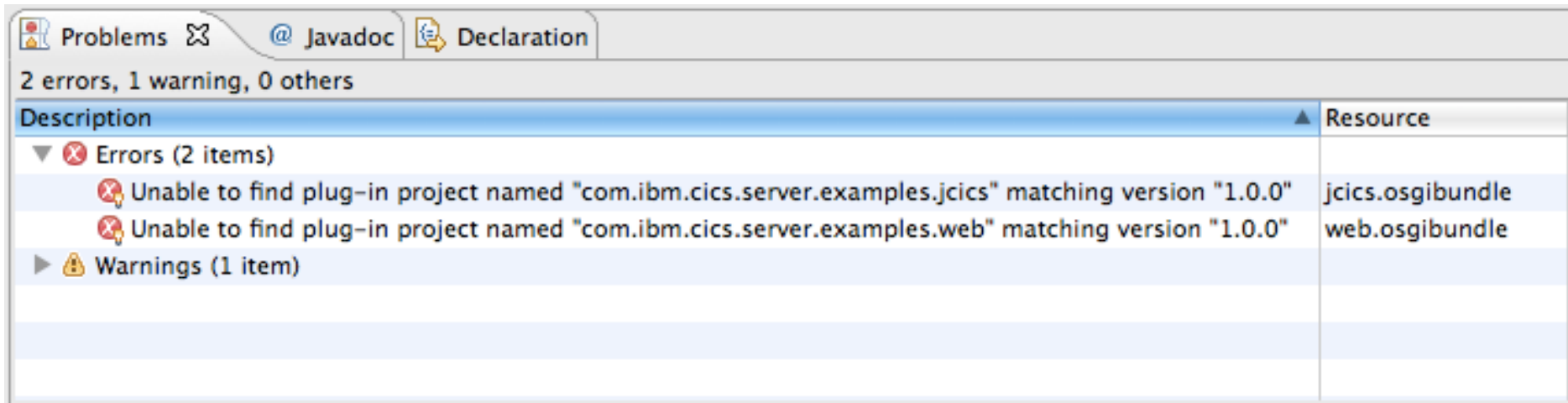
Add OSGi bundle projects



Add CICS bundle project



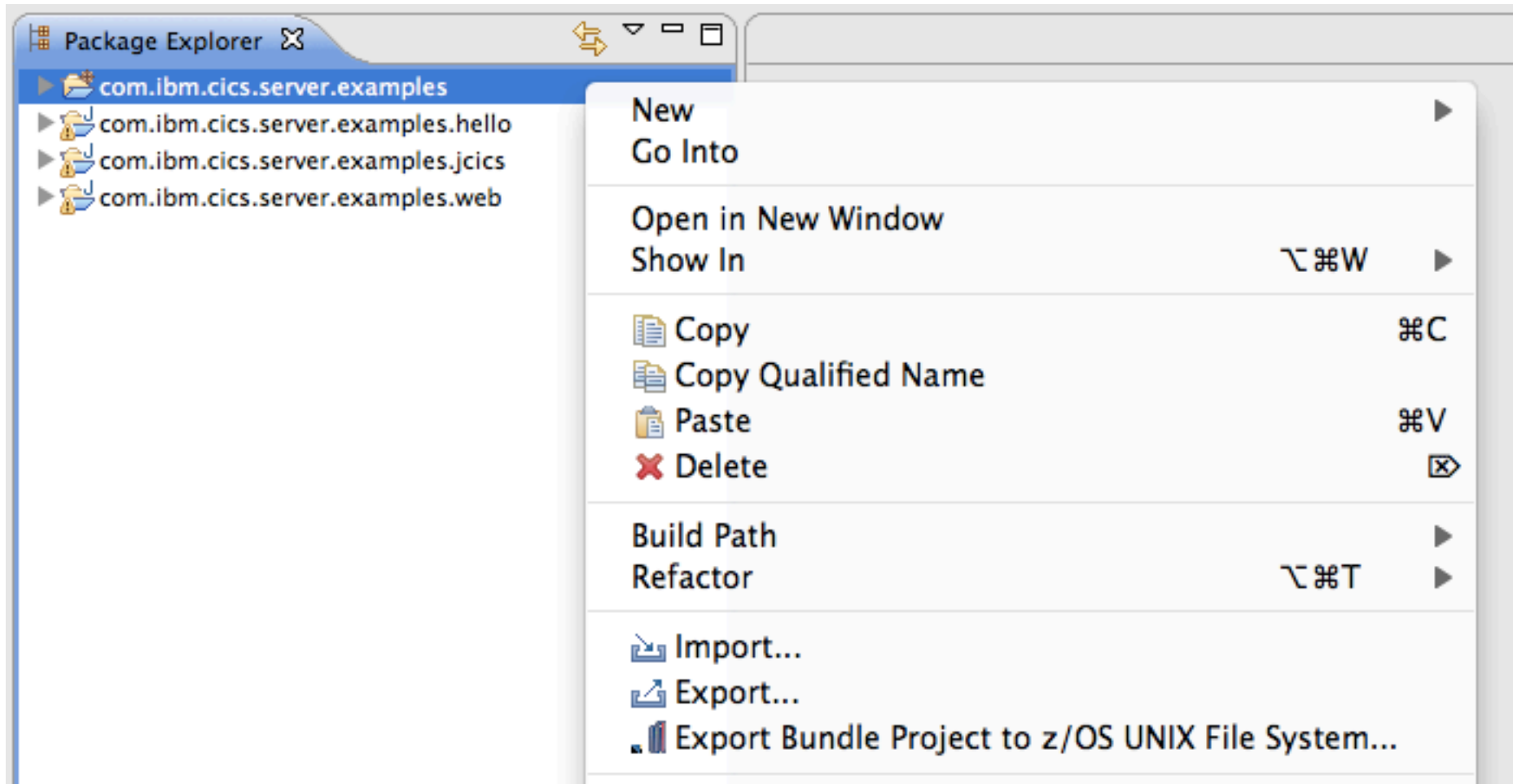
Errors in the Problems view for missing OSGi bundles



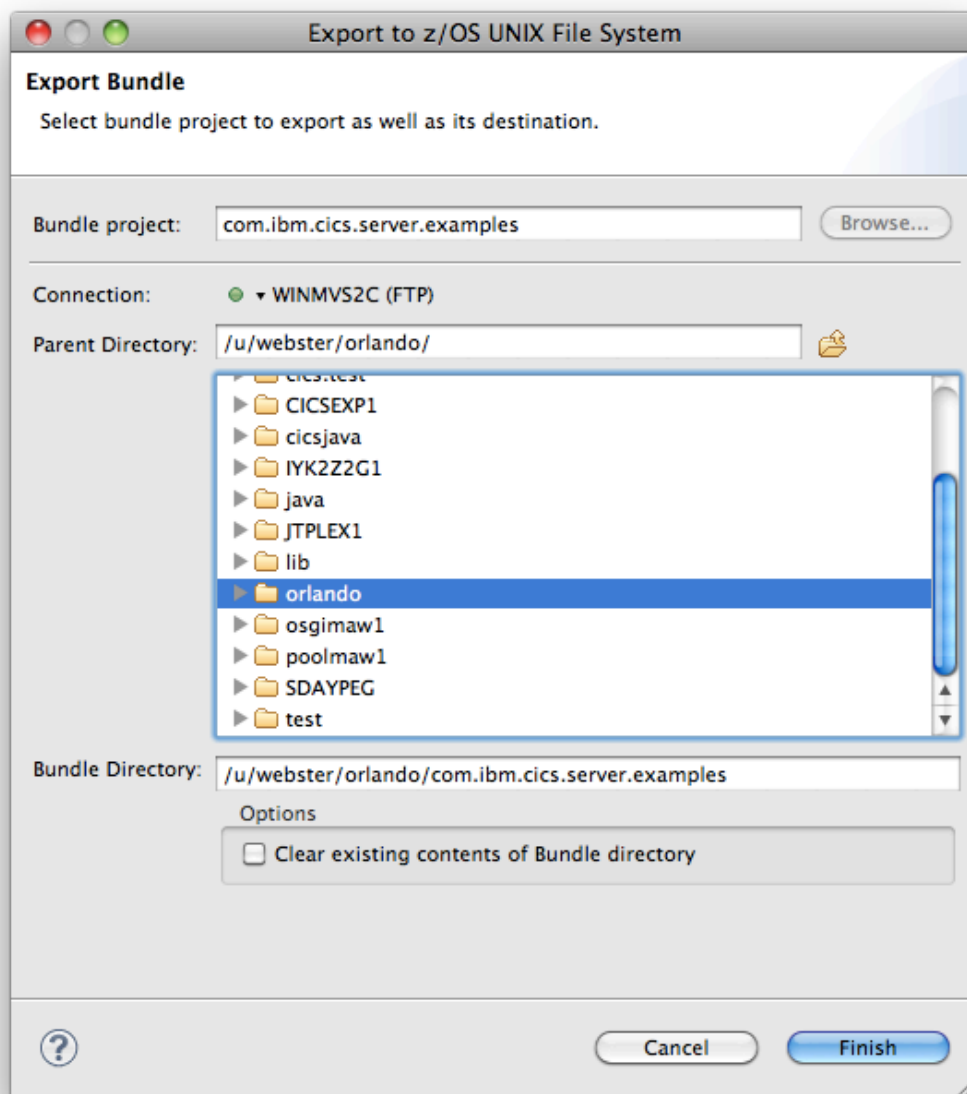
The screenshot shows the Eclipse IDE's Problems view. The view is titled "Problems" and has tabs for "Problems", "Javadoc", and "Declaration". Below the tabs, it indicates "2 errors, 1 warning, 0 others". The main area is a table with two columns: "Description" and "Resource".

Description	Resource
▼ [Error] Errors (2 items)	
[Error] Unable to find plug-in project named "com.ibm.cics.server.examples.jcics" matching version "1.0.0"	jcics.osgibundle
[Error] Unable to find plug-in project named "com.ibm.cics.server.examples.web" matching version "1.0.0"	web.osgibundle
▶ [Warning] Warnings (1 item)	

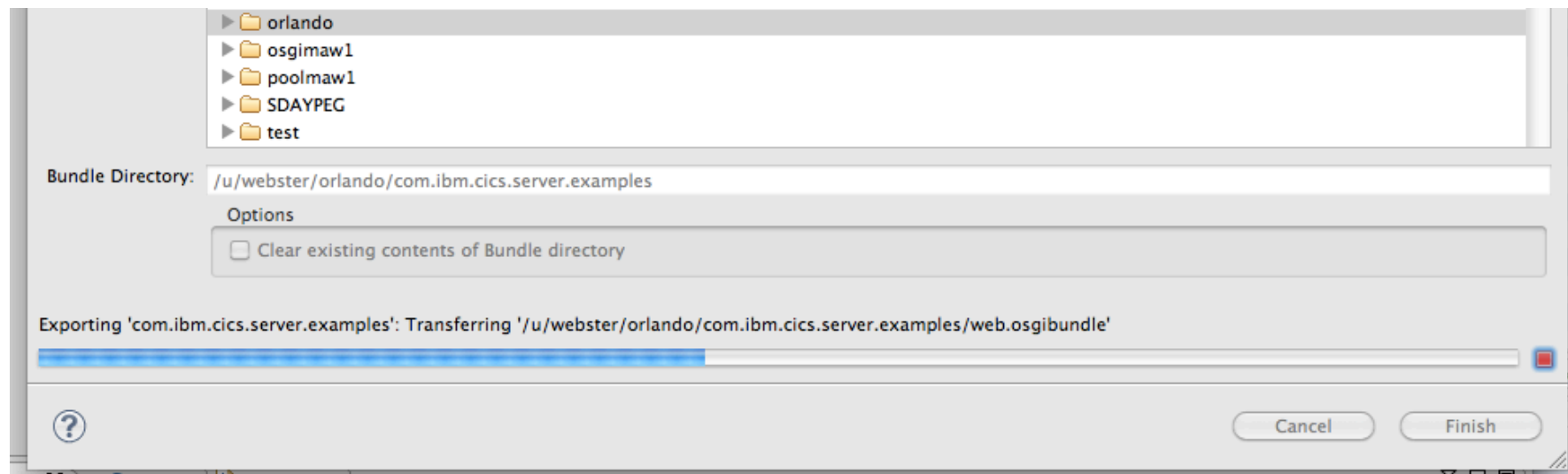
Deploy application as CICS bundle



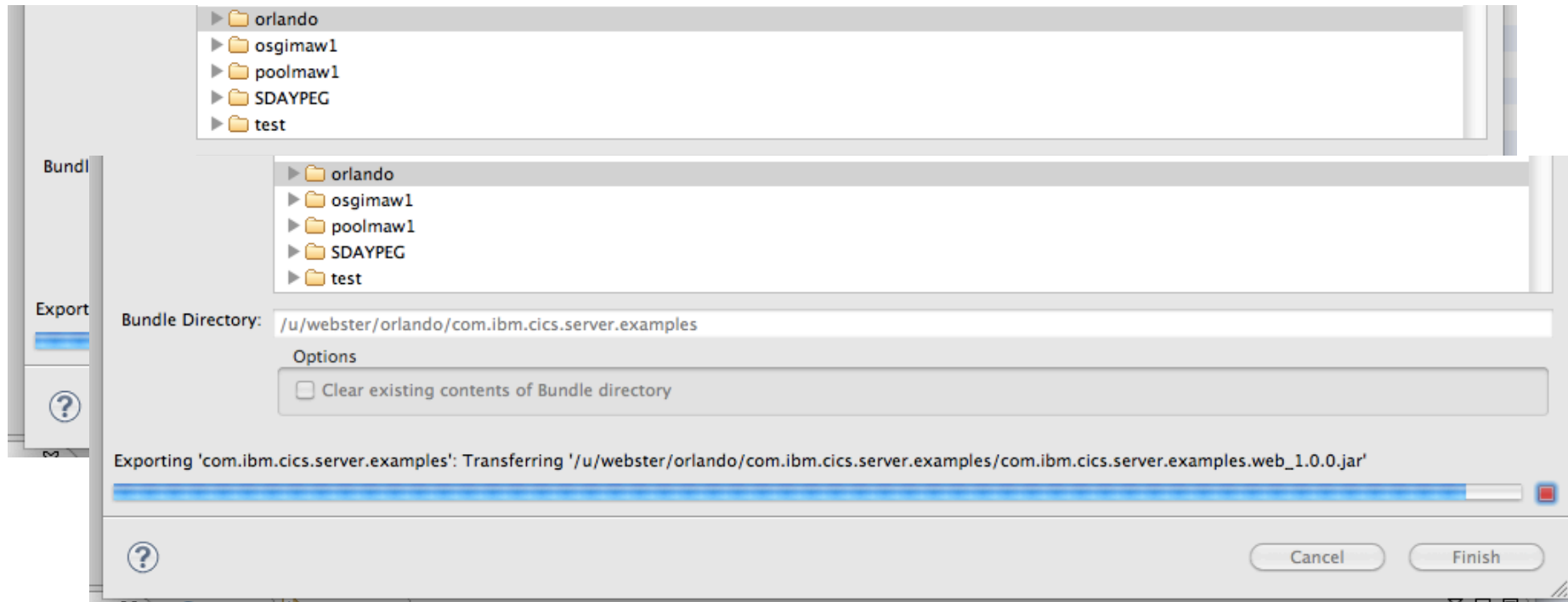
Select CICS bundle directory



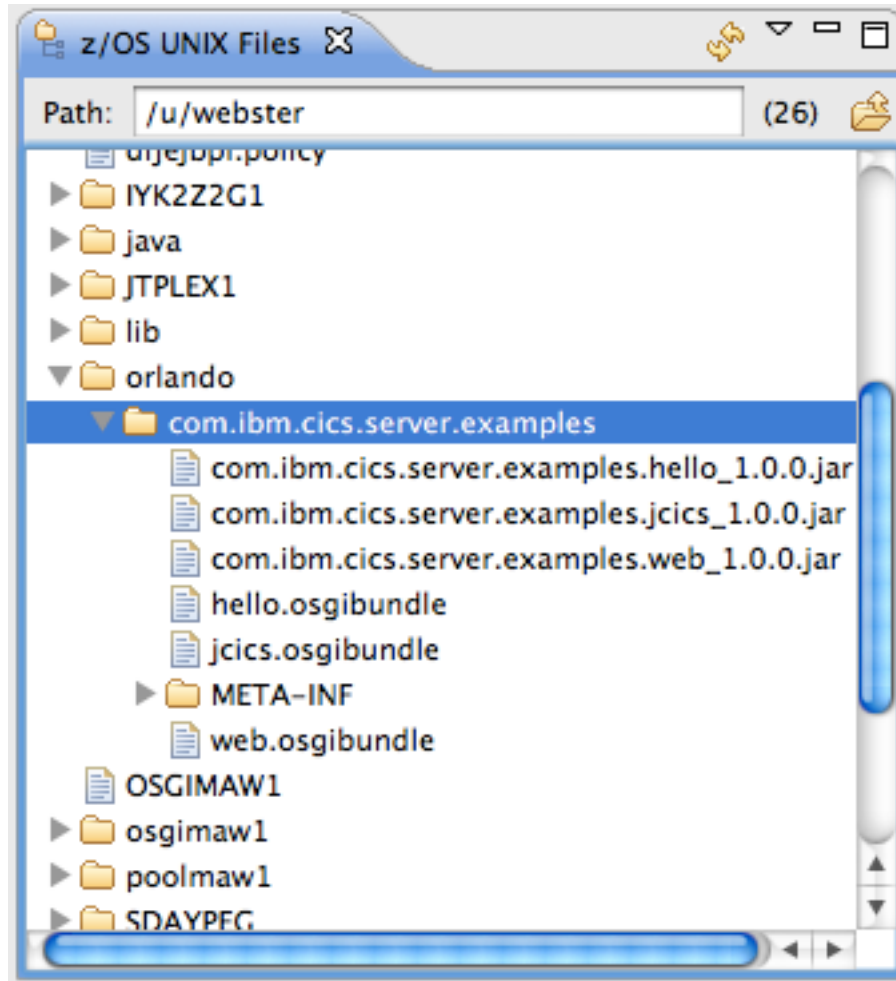
Transfer metadata files



Build, locally export & transfer OSGi bundle JAR files



Handoff CICS bundle to Steve



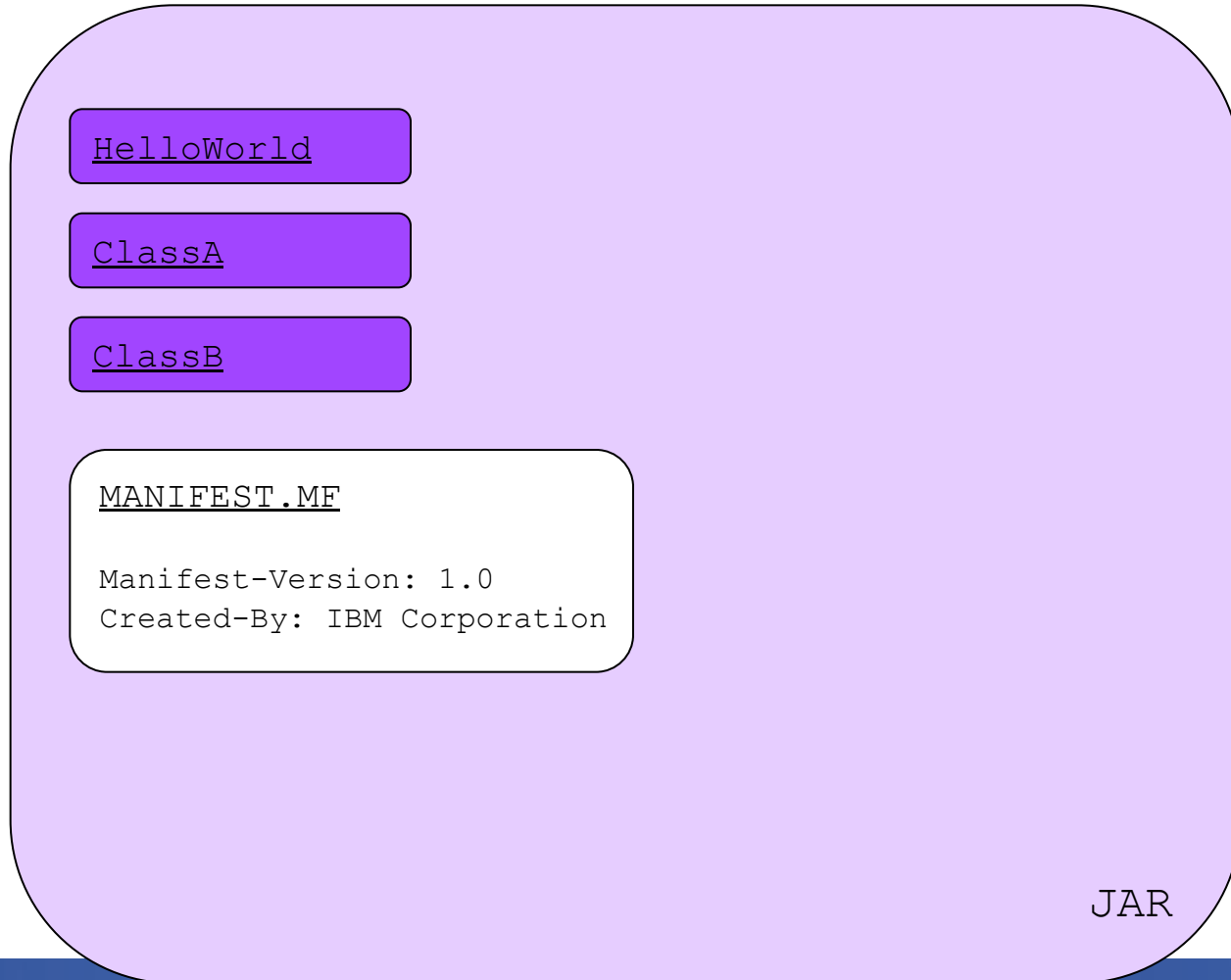
What is an OSGi Bundle?



What is an OSGi Bundle?



What is an OSGi Bundle?



What is an OSGi Bundle?

HelloWorld

ClassA

ClassB

MANIFEST.MF

Manifest-Version: 1.0

Created-By: IBM Corporation

Bundle-SymbolicName: com.ibm.cics.server.examples.hello

Bundle-Version: 1.0.0

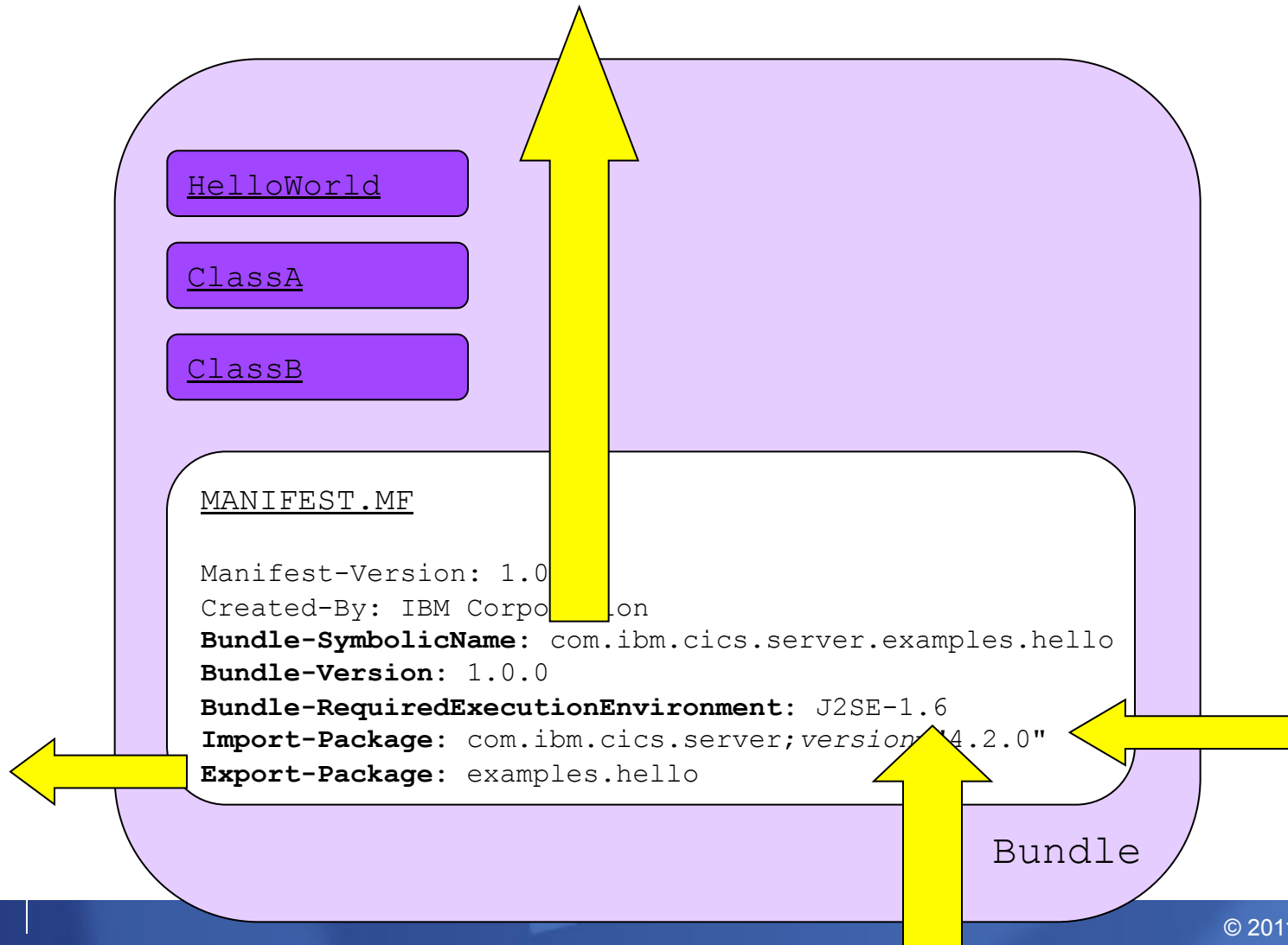
Bundle-RequiredExecutionEnvironment: J2SE-1.6

Import-Package: com.ibm.cics.server;version="4.2.0"

Export-Package: examples.hello

Bundle

What is an OSGi Bundle?



What is an OSGi Bundle?

HelloWorld

ClassA

ClassB

MANIFEST.MF

Manifest-Version: 1.0

Created-By: IBM Corporation

Bundle-SymbolicName: com.ibm.cics.server.examples.hello

Bundle-Version: 1.0.0

Bundle-RequiredExecutionEnvironment: J2SE-1.6

Import-Package: com.ibm.cics.server;version="4.2.0"

Export-Package: examples.hello

JAR

- 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**



Steve the Systems Programmer

Handoff CICS bundle from Dave

The screenshot displays the Eclipse IDE interface for CICS SM. The main console area shows two tables:

Regions Table:

Region	Name	Enable Status	Max Threads	Threads	Install Time
IYCWEGG1	DFH\$JVMS	✓ ENABLED	15	0	08-Aug-2011 16:48:27

Bundle Definitions Table:

Name	Description	CSDGroup	Change Time	Change User
DFH\$OSGB	CICS bundle containing OSGi sample bundles	OSGIMAW1	08-Aug-2011 18:43:14	CICSUSER
SAMPMAW1	Matthew Webster	OSGIMAW1	21-Apr-2011 11:13:11	CICSUSER

The Properties view at the bottom right shows the following details for the selected bundle:

Property	Value
Basic	
Bascope	
Bundle Directory	/u/webster/orlando/com.ibm.cics.server.examples
CSDGroup	OSGIMAW1
Description	CICS bundle containing OSGi sample bundles
Name	DFH\$OSGB
Status	ENABLED
Userdata 1	N/A
Userdata 2	N/A
Userdata 3	N/A
Version	0
Definition Signature	
Change Agent	CSDAPI
Change Balance	0670

Handoff CICS bundle from Dave

CICS SM – Eclipse SDK – /Users/matthew_webster/Workspaces/orlando

CICSplex Explorer Server: EGCM

CICSEXP1 (6/6)

- EXPWRK1 EGCM (ACTIVE)
- EXPWRK2 EGCM (ACTIVE)
- IYCWEGD1 (IYCWEGD1)
- IYCWEGE1 (IYCWEGE1)
- IYCWEGF1 (IYCWEGF1)
- IYCWEGG1 (IYCWEGG1)
- IYCWEGW1 (IYCWEGW1)
- IYCWEGW2 (IYCWEGW2)
- ALLGRP (Group defined by EYU9XDBT)
- EXPAGRP1 (Explorer JUnit AOR group)
- EXPAGRP2 (Explorer JUnit AOR group)
- EXPGRP1 (CICSRegionDefinitionTest)
- EXPTGRP1 (Explorer JUnit TOR group)
- EXPTGRP2 (Explorer JUnit TOR group)

Regions Tasks ISC/MRO Connections Terminals Files Transactions JVM Servers

CNX0211I Context: IYCWEGG1. Resource: JVMSEV. 1 records collected at 08-Aug-2011 19:19:39

Region	Name	Enable Status	Max Threads	Threads	Install Time
IYCWEGG1	DFH\$JVMS	✓ ENABLED	15	0	08-Aug-2011 16:48:27

Properties Error Log

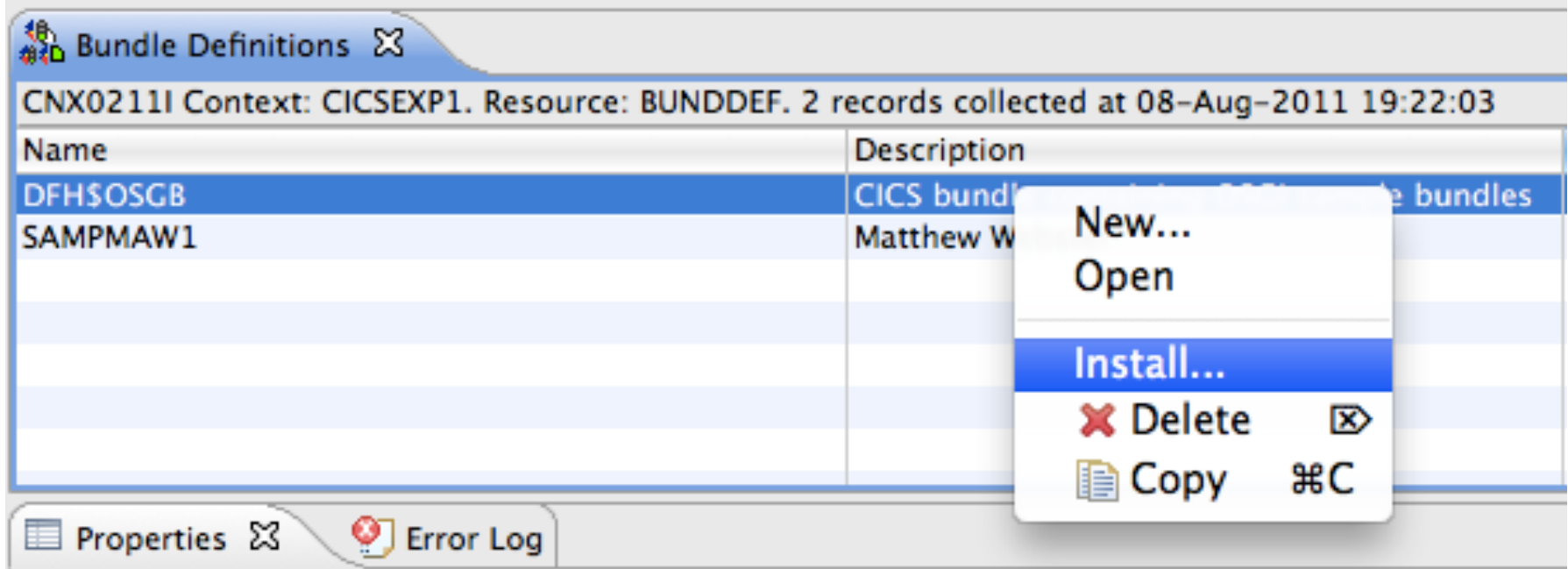
Property	Value
Basic	
Basescape	
Bundle Directory	/u/webster/orlando/com.ibm.cics.server.examples
CSDGroup	OSGIMAW1
Description	CICS bundle containing OSGi sample bundles
Name	DFH\$OSGB
Status	ENABLED
Userdata 1	N/A
Userdata 2	N/A
Userdata 3	N/A
Version	0

z/ Path:

Fetching children of webster

CICSEXP1 (CICSplex)

Install application as CICS bundle



Regions Tasks ISC/MRO Connections Terminals Files Transactions JVM Servers Bundles Bundle Parts

CNX0211I Context: IYCWEGG1. Resource: BUNDLE. 1 records collected at 08-Aug-2011 20:04:19

Region	Name	Status	Install Time
IYCWEGG1	DFHSOSGB	✓ ENABLED	08-Aug-2011 19:36:46

Check CICS bundle and bundle parts

Regions Tasks ISC/MRO Connections Terminals Files Transactions JVM Servers Bundles Bundle Parts

CNX0211I Context: IYCWEGG1. Resource: BUNDLE. 1 records collected at 08-Aug-2011 20:04:19

Region	Name	Status	Install Time
IYCWEGG1	DFHSOSGB	✓ ENABLED	08-Aug-2011 19:36:46

Regions Tasks ISC/MRO Connections Terminals Files Transactions JVM Servers Bundles Bundle Parts

CNX0211I Context: IYCWEGG1. Resource: BUNDPART. 3 records collected at 08-Aug-2011 20:04:31

Region	Bundle	Bundle Part	Enable Status	Meta Data File	Part Class	Part Type
IYCWEGG1	DFHSOSGB	hello	ENABLED	hello.osgibundle	DEFINITION	http://www.ibm.com/xml
IYCWEGG1	DFHSOSGB	jcics	ENABLED	jcics.osgibundle	DEFINITION	http://www.ibm.com/xml
IYCWEGG1	DFHSOSGB	web	ENABLED	web.osgibundle	DEFINITION	http://www.ibm.com/xml

OSGi bundle for Web example

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

OSGi service for Web example

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

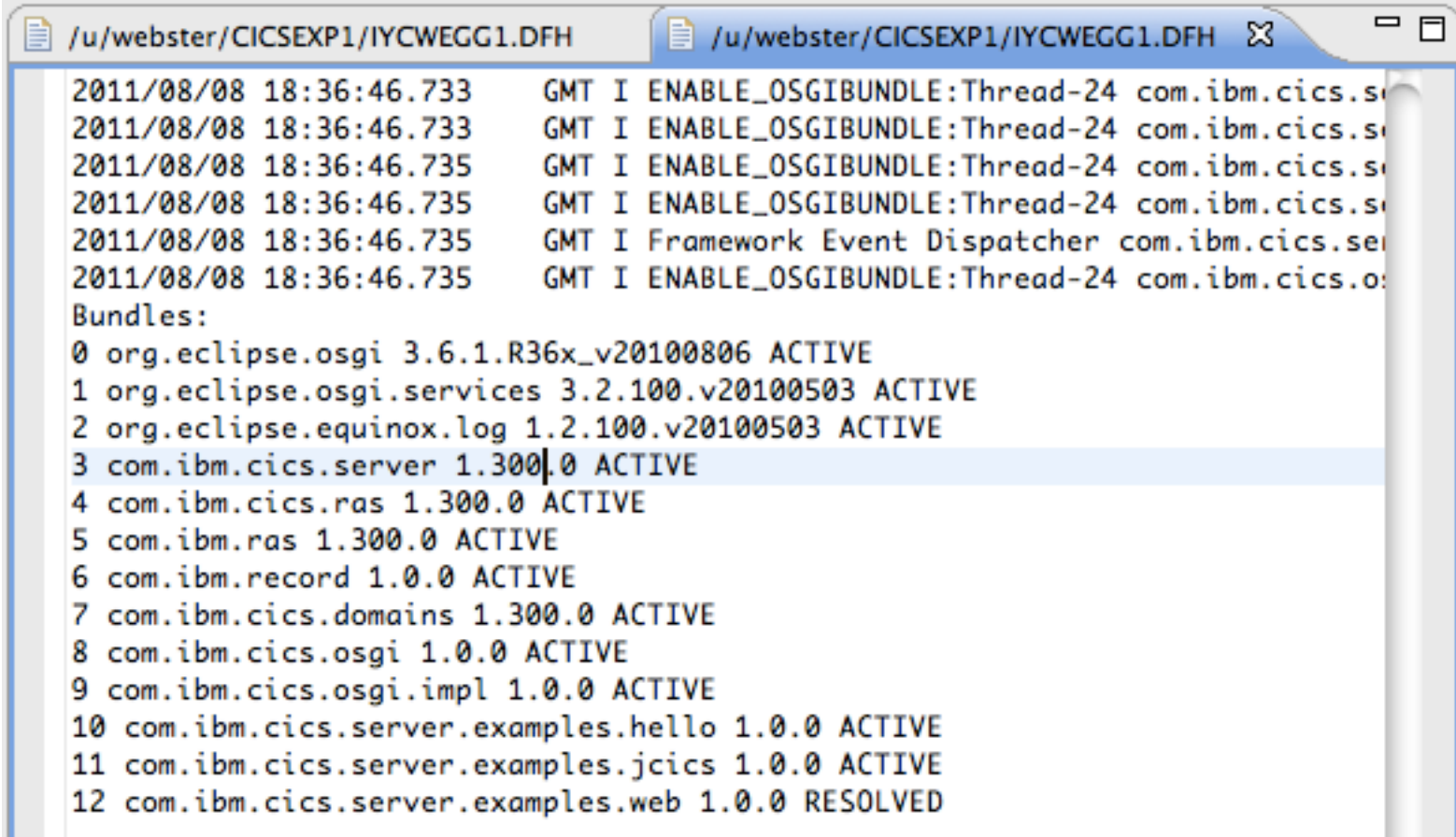
JVM Server	Service Name	OSGi Bundle	Version	Service Status	Bundle	Bundle Part
DFH\$JVMS	examples.hello.HelloCICSWorld	com.ibm.cics.server.examples.hello	1.0.0	ACTIVE	DFH\$OSGB	hello
DFH\$JVMS	examples.hello.HelloWorld	com.ibm.cics.server.examples.hello	1.0.0	ACTIVE	DFH\$OSGB	hello
DFH\$JVMS	examples.ProgramControl.ClassOne	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

CICS PROGRAM for Web example

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

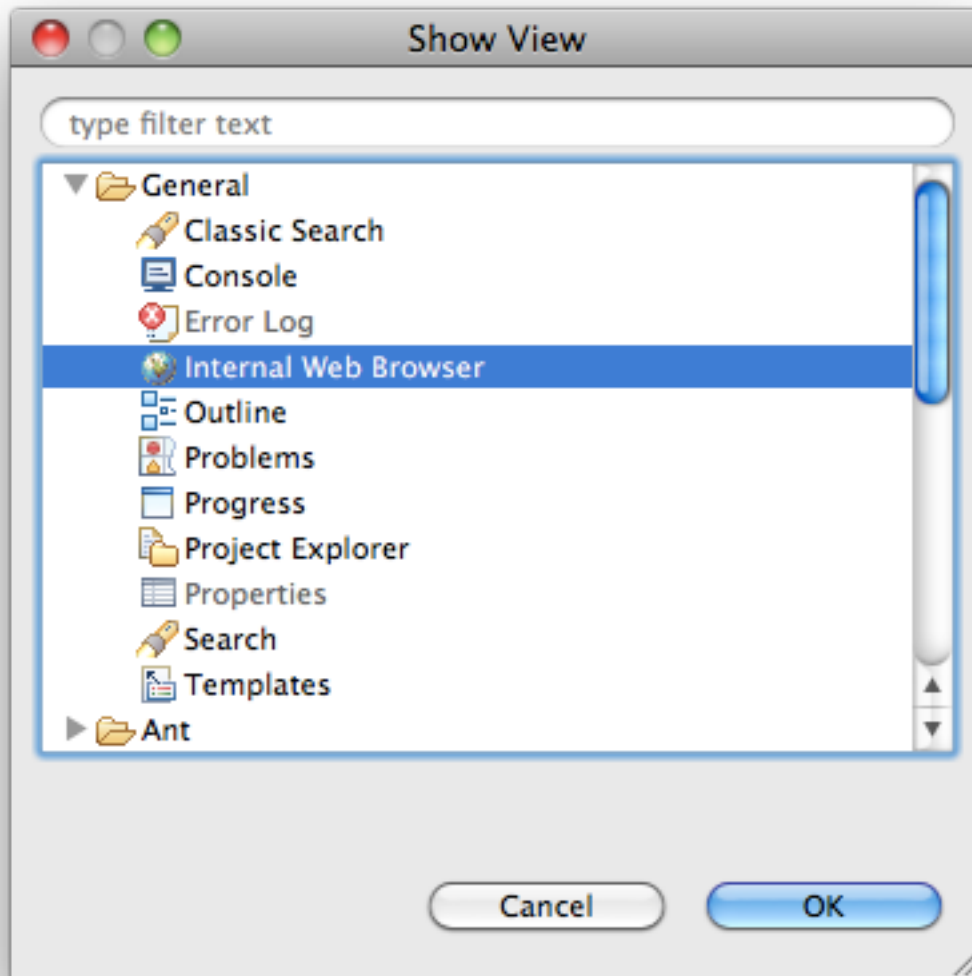
Region	Name	Status	Use Count	Concurrent Use Count	Language	JVM Class
IYCWEGG1	DFJ\$JHE1	✓ ENABLED	0	0	JAVA	examples.hello.HelloWorld
IYCWEGG1	DFJ\$JHE2	✓ ENABLED	0	0	JAVA	examples.hello.HelloCICSWorld
IYCWEGG1	DFJ\$JWB1	✓ ENABLED	0	0	JAVA	examples.Web.Sample1

Check IYCWEGG1.DFH\$JVMS.dfhjvmtrc for any problems

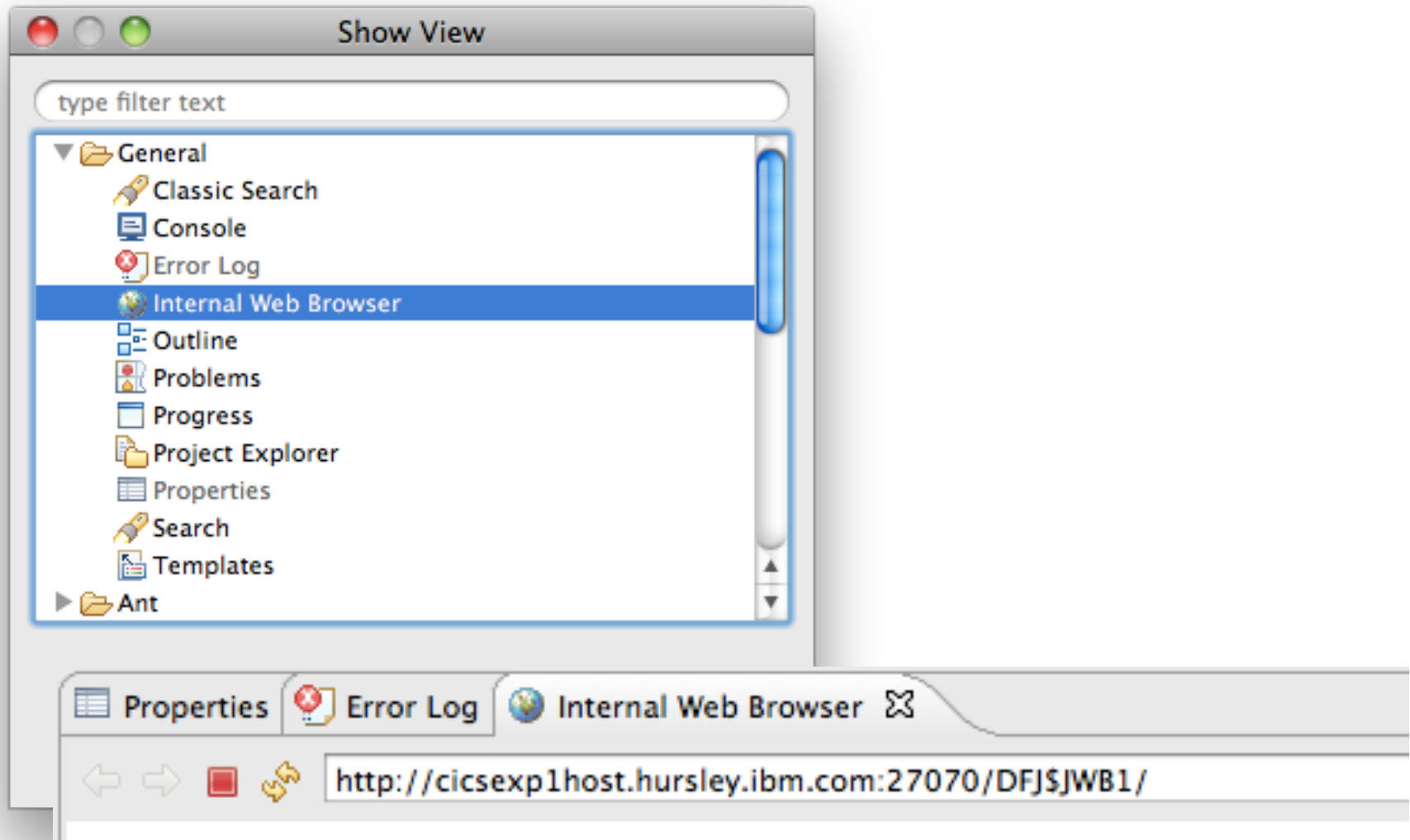


```
/u/webster/CICSEXP1/IYCWEGG1.DFH /u/webster/CICSEXP1/IYCWEGG1.DFH
2011/08/08 18:36:46.733 GMT I ENABLE_OSGIBUNDLE:Thread-24 com.ibm.cics.s
2011/08/08 18:36:46.733 GMT I ENABLE_OSGIBUNDLE:Thread-24 com.ibm.cics.s
2011/08/08 18:36:46.735 GMT I ENABLE_OSGIBUNDLE:Thread-24 com.ibm.cics.s
2011/08/08 18:36:46.735 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
```

Open the Internal Web Browser to test DFJ\$JWB1



Enter Web example URL



Success!

CICS SM - /u/webster/CICSEXP1/IYCWEGG1.DFH\$JVMS.dfhjvmout - Eclipse SDK - /Users/matthew_webster/Workspaces/orlando

CICSplex Explorer
Server: EGCM

- ▼ CICSEXP1 (6/6)
 - ▶ EXPWRK1 EGCM (ACTIVE)
 - ▶ EXPWRK2 EGCM (ACTIVE)
 - ▶ IYCWEGD1 (IYCWEGD1)
 - ▶ IYCWE1 (IYCWE1)
 - ▶ IYCWEF1 (IYCWEF1)
 - ▶ IYCWEGG1 (IYCWEGG1)
 - ▶ IYCWEW1 (IYCWEW1)
 - ▶ IYCWEW2 (IYCWEW2)
 - ▶ ALLGRP (Group defined by EYU9XDBT)
 - ▶ EXPAGRP1 (Explorer JUnit AOR group)
 - ▶ EXPAGRP2 (Explorer JUnit AOR group)
 - ▶ EXPGRP1 (CICSRegionDefinitionTest)
 - ▶ EXPTGRP1 (Explorer JUnit TOR group)
 - ▶ EXPTGRP2 (Explorer JUnit TOR group)
 - ▶ FOOBAR
 - ▶ HELLO (Stew's hello group)
 - ▶ J3778631 (Created by JUnit - DELETE ME)

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

Region	Name	Status	Use Count	Concurrent Use Count	Language	JVM
IYCWEGG1	DFJSJHE1	✓ ENABLED	0	0	JAVA	exi
IYCWEGG1	DFJSJHE2	✓ ENABLED	0	0	JAVA	exi
IYCWEGG1	DFJSJWB1	✓ ENABLED	0	0	JAVA	exi

Bundle Definitions

CNX0211I Context: CICSEXP1. Resource: BUNDEF. 2 records collected at 08-Aug-2011

Name	Description
DFHSOSGB	CICS bundle containing OSGI sample
SAMPMAW1	Matthew Webster

Internal Web Browser

http://cicsexp1host.hursley.ibm.com:27070/DFJSJWB1/

```
Sample1 started
Method: GET (3)
Version: HTTP/1.1 (8)
Path: /DFJSJWB1/ (10)
Request Type: HTTPYES
Value for HTTP header User-Agent is 'Mozilla/5.0 (Macintosh; Ir
HTTP headers:
Name: Host (4)
Value: cicsexp1host.hursley.ibm.com:27070 (34)
Name: User-Agent (10)
Value: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_6_8) AppleWebK
Name: Accept (6)
Value: text/html,application/xhtml+xml,application/xml;q=0.9,*/*
Name: Cache-Control (13)
Value: no-cache (8)
Name: Accept-Language (15)
Value: en-gb (5)
Name: Accept-Encoding (15)
Value: gzip, deflate (13)
Name: Cookie (6)
Value: IBM_W3SSO_ACCESS=w3.ibm.com; mbox=PC#1308316221146-73862
Name: Connection (10)
Value: keep-alive (10)
Server Name: winmvs28.hursley.ibm.com (24)
Client Address: 9.12.227.251 (12)
ClientAddrNu: 9.12.227.251
Server Address: 9.20.122.80 (11)
ServerAddrNu: 9.20.122.80
Clientauth: NO
SSL: NO
TcpiService: MAWWEB1
PortNumber: 27070
DocToken: DocToken: 35 39 176 0 0 0 0 10 64 64 64 64 64 64 64 64
Docsize: 2913
Sample1 complete
```

z/OS UNIX Files

Path: /u/webster (26)

- ▶ Blueprint
- ▶ BUN1
- ▶ bundle
- ▶ bundle_dir
- ▶ cics.test
- ▼ CICSEXP1
 - ▶ IYCWEGG1.DFH\$JVMS.dfhjvmerr
 - ▶ IYCWEGG1.DFH\$JVMS.dfhjvmin
 - ▶ IYCWEGG1.DFH\$JVMS.dfhjvmout
 - ▶ IYCWEGG1.DFH\$JVMS.dfhjvmtrc
 - ▶ IYCWEGG1.MAWBLUE1.dfhjvmerr
 - ▶ IYCWEGG1.MAWBLUE1.dfhjvmin
 - ▶ IYCWEGG1.MAWBLUE1.dfhjvmout
 - ▶ IYCWEGG1.MAWBLUE1.dfhjvmtrc
 - ▶ IYCWEGG1.MAWWEB1.dfhjvmerr
 - ▶ IYCWEGG1.MAWWEB1.dfhjvmin
 - ▶ IYCWEGG1.MAWWEB1.dfhjvmout
 - ▶ IYCWEGG1.MAWWEB1.dfhjvmtrc

Web Sample1

Inbound Client Request Information:

Method: GET

Version: HTTP/1.1

Path: /DFJSJWB1/

Request Type: HTTPYES

Query String: null

HTTP headers:

Summary

- Platform

- Highly scalable runtime
- Application lifecycle and versioning

- Tools

- System programmer manages Java workloads using strategic interfaces consistent with other modern CICS workloads
- Application developer leverages existing skills, tools and processes
- Natural handoff between roles

Questions

Other Sessions

- **Monday**
 - 9322: [CICS TS V4.2 Technical Overview](#)
- **Tuesday**
 - 9600: [CICS TS and the Cloud](#)
 - 9331: [CICS Explorer: The New Frontier](#)
- **Wednesday**
 - 9319: [CICS Emerging Technologies Hands-on Lab Part 1 of 2](#)
 - 9320: [CICS Emerging Technologies Hands-on Lab Part 2 of 2](#)
- **Thursday**
 - 9606: [CICS ... It's Not Just COBOL: Java Support](#)
 - 9607: [CICS for Java Developers and Java for System Programmers - Two Sides of the Same Coin](#)
 - 9613: [CICS Question Box and Pot Luck](#)
- **Friday**
 - 9614: [CICS Nuts, Bolts and Gotchas](#)

More Information



- **IBM CICS Explorer**

- <http://www.ibm.com/software/htp/cics/explorer/>

- **SHARE (Past Conferences)**

- 8514: CICS Explorer Update

- <http://share.confex.com/share/116/webprogram/Session8514.html>

- 8265: CICS JVM Server

- <http://share.confex.com/share/116/webprogram/Session8265.html>

- 8272: Best Practices for CICS Systems Management

- <http://share.confex.com/share/116/webprogram/Session8272.html>

- **Podcasts**

- <http://www-01.ibm.com/software/htp/cics/tserver/v42/library/index4.html>

- **Blog**

- <http://masterterminal.wordpress.com/>



- **developerWorks Forum**

- <http://www.ibm.com/developerworks/forums/forum.jspa?forumID=1475>