

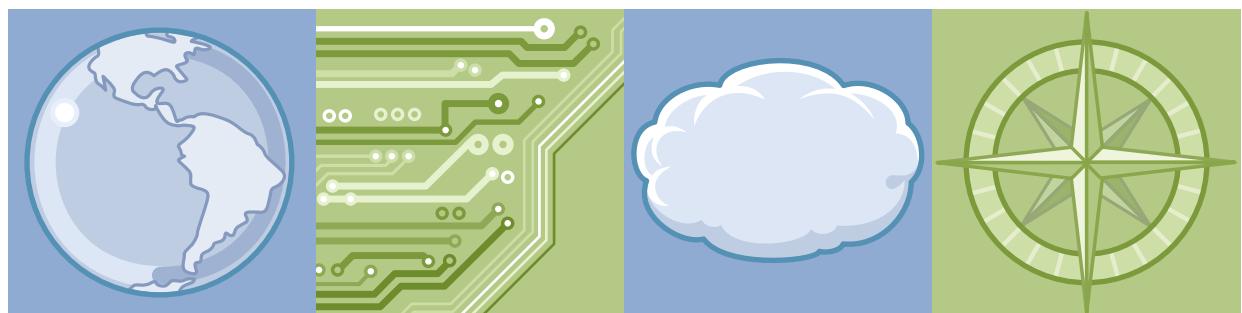


IBM Training

Student Exercises

IBM Business Process Manager V8.5 Problem Determination

Course code WB869 ERC 1.0



WebSphere Education

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Contents

Trademarks	v
Exercises description	vii
Exercise 1. Gathering diagnostic data	1-1
Part 1: Examine troubleshooting	1-2
Part 2: Working with the log files of the application server	1-7
Part 3: Enable and configure HPEL	1-11
Part 4: Use the Log Viewer to examine log data and trace data	1-18
Part 5: Enable tracing for an application server and view trace data by using the Log Viewer	1-22
Part 6: Work with the class loader viewer	1-25
Part 7: Explore diagnostic providers	1-28
Part 8: Examine runtime messages	1-32
Part 9: Enable cross-component trace (XCT)	1-32
Part 10: Examine FFDC, system out and error logs	1-40
Part 11: Working with namespace tools	1-42
Exercise 2. Using IBM Support Assistant	2-1
Part 1: Starting the IBM Support Assistant Team Server V5	2-3
Part 2: Logging in to and exploring the IBM Support Assistant Administration Console ..	2-12
Part 3: Creating a case and starting tools from the Tools tab	2-17
Part 4: Scanning a case	2-26
Part 5: Running the IBM Support Assistant Data Collector tool	2-33
Part 6: Using the Data Collector to automatically collect MustGather data	2-40
Exercise 3. Troubleshooting an online Process Server	3-1
Part 1: Start the servers	3-2
Part 2: Verify the status of the online Process Server	3-9
Part 3: Examine the Server logs	3-10
Part 4: Examine the database table	3-12
Part 5: Examine the connection properties	3-18
Part 6: Examine the authentication alias that is defined in Process Server	3-27
Part 7: Verify the status of the online Process Server	3-34
Exercise 4. Troubleshooting process application deployment	4-1
Part 1: Starting the Process Center servers	4-3
Part 2: Starting the Process Server servers	4-6
Part 3: Trying to install a process application snapshot	4-10
Part 4: Checking administrative group membership	4-15
Part 5: Verifying group membership permissions as appdeployer	4-20
Part 6: Checking tw_admin installation permissions	4-21
Part 7: Check the Process Center SingleClusterMember1 server logs	4-27
Part 8: Checking the IBM Business Process Manager product documentation for process application installation information	4-30
Part 9: Checking the processCenterInstall definition by using wsadmin	4-36
Part 10: Adding appdeployer to the processappadmin installation group	4-41

Part 11: Verifying the fix and process application snapshot installation	4-44
Part 12: Cleaning up the environment	4-47
Exercise 5. Troubleshooting Business Process Manager Standard runtime problems	5-1
Part 1: Start the Process Center environment	5-3
Part 2: Explore the process and run the instance	5-7
Part 3: Explore the Move Token service implementation	5-14
Part 4: Use the Move Token service to close the failed activity and complete the process	5-22
Part 5: Explore the Infinite Loop - Verbose service	5-28
Part 6: Test the Infinite Loop - Verbose loop	5-31
Part 7: Test the Infinite Loop - Script loop	5-36
Exercise 6. Troubleshooting the user interface	6-1
Part 1: Start the Process Center environment	6-2
Part 2: Configure Firefox	6-6
Part 3: Explore the Problem UI interface	6-9
Part 4: Modify and test the Problem UI interface for improved performance.	6-15
Part 5: Run the Lazy Loading tabs coach	6-24
Exercise 7. Troubleshooting an SCA application with runtime errors	7-1
Part 1: Start IBM Integration Designer	7-3
Part 2: Test the imported SOA solution	7-12
Part 3: Troubleshoot the AccountVerification service failure	7-23
Part 4: Clean up the environment	7-39
Part 5: Examining FFDC logs	7-42
Exercise 8. Troubleshooting a long-running business process	8-1
Part 1: Set up the environment	8-2
Part 2: Understand the asynchronous communication in a long-running business process	8-2
Part 3: Examine the audit log entries	8-24
Part 4: Clean up the environment	8-30
Exercise 9. Troubleshooting Advanced Integration services	9-1
Part 1: Start the servers	9-3
Part 2: Change the version of dependency	9-4
Part 3: Collaborate before business object changes	9-14
Part 4: Add an existing service	9-25
Part 5: Add a facade service	9-32
Part 6: Fixing a breakage in the process application	9-41
Part 7: Protect mirrored artifacts in toolkits	9-44
Exercise 10. Troubleshooting WebSphere Adapters	10-1
Part 1: Configure the WebSphere Adapter for Flat Files	10-2
Part 2: Test an adapter in the IBM Integration Designer test environment	10-3
Part 3: Troubleshooting failed events	10-9
Part 4: Problem resolution	10-13

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Exercises description

This course includes the following exercises:

- Exercise 1. Gathering diagnostic data
- Exercise 2. Using IBM Support Assistant
- Exercise 3. Troubleshooting an online Process Server
- Exercise 4. Troubleshooting process application deployment
- Exercise 5. Troubleshooting Business Process Manager Standard runtime problems
- Exercise 6. Troubleshooting the user interface
- Exercise 7. Troubleshooting an SCA application with runtime errors
- Exercise 8. Troubleshooting a long-running business process
- Exercise 9. Troubleshooting Advanced Integration services
- Exercise 10. Troubleshooting WebSphere Adapters

In the exercise instructions, you can check off the line before each step as you complete it to track your progress.

Most exercises include required sections, which should always be completed. It might be necessary to complete these sections before you can start later exercises. Some exercises also include optional sections that you might want to complete if you have sufficient time and want an extra challenge.

Exercise 1. Gathering diagnostic data

What this exercise is about

This exercise covers different types of tools in the administrative console that can be used for problem determination. You explore some of the available tools. You also look at diagnostic data that is available in log and trace files, and content memory dumps of the JNDI namespace.

What you should be able to do

At the end of this exercise, you should be able to:

- Enable tracing on a WebSphere Application Server component and read a trace output log
- Use the administrative console troubleshooting section to view runtime messages and configuration problems
- Enable and configure High Performance Extensible Logging (HPEL)
- Use the class loader view in the administrative console
- Enable and use diagnostic providers in the administrative console
- Examine runtime messages and first-failure data capture (FFDC) logs
- Use the dumpNameSpace tool to dump the contents of a namespace

Introduction

In this exercise, you locate and view log files for the WebSphere Application Server. You use a text editor to view the log files and the Log Analyzer tool to view logs and trace files. You also learn how to enable tracing for an application server by using the administrative console. You also examine other sources of diagnostic data, such as class loaders, memory leaks, and namespaces.

During the lab exercise, you start and stop the servers several times so that some of the administrative console modifications can take effect.

Requirements

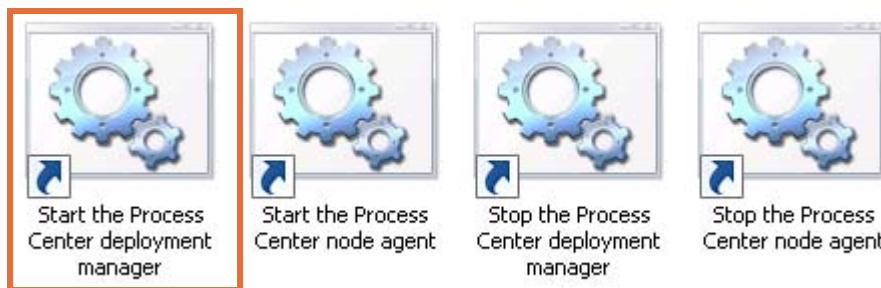
Completing the exercises for this course requires an environment. This environment includes the exercise support files, IBM Process Designer, IBM Process Portal, IBM Process Center, IBM Process Server, and IBM Integration Designer test environment.

Exercise instructions

The troubleshooting area of the administrative console displays messages about runtime events and configuration problems. This area automatically refreshes, and you can view both the runtime messages and configuration problem totals.

Part 1: Examine troubleshooting

- 1. Start the Process Center server.
 - a. From the desktop, open the **Process Center** folder and double-click the **Start the Process Center Deployment Manager** shortcut icon to start the server. Leave the Process Center folder open, as you are going to use it again shortly.

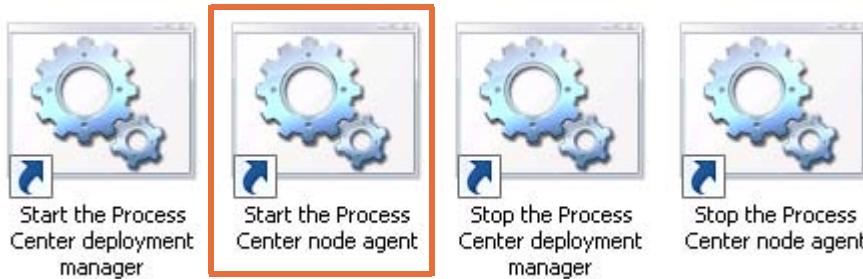


- b. Wait until the start command is successfully completed, and press any key to continue.

A screenshot of a terminal window titled "Start the Process Center deployment manager". The window displays several lines of log output:

```
ADMU0116I: Tool information is being logged in file
          C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\logs\dmgr\startServer.log
ADMU0128I: Starting tool with the DmgrProfile profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server dmgr open for e-business; process id is 4152
Press any key to continue . . .
```

- c. Double-click the **Start the Process Center node agent** shortcut icon.



- d. Wait until the start command is successfully completed, and press any key to continue.

2. Start the administrative console.
- Double-click the **Firefox** icon from the desktop to open the web browser, and enter the following web address:
`http://localhost:9061/ibm/console`
 - In the Untrusted Connection window, click **I Understand the Risks** to expand the option.



This Connection is Untrusted

You have asked Firefox to connect securely to **localhost:9044**, but we can't confirm that your connection is secure.

Normally, when you try to connect securely, sites will present trusted identification to prove that you are going to the right place. However, this site's identity can't be verified.

What Should I Do?

If you usually connect to this site without problems, this error could mean that someone is trying to impersonate the site, and you shouldn't continue.

[Get me out of here!](#)

- ▶ **Technical Details**
- ▶ **I Understand the Risks**

- c. Click **Add Exception**.



This Connection is Untrusted

You have asked Firefox to connect securely to **localhost:9044**, but we can't confirm that your connection is secure.

Normally, when you try to connect securely, sites will present trusted identification to prove that you are going to the right place. However, this site's identity can't be verified.

What Should I Do?

If you usually connect to this site without problems, this error could mean that someone is trying to impersonate the site, and you shouldn't continue.

[Get me out of here!](#)

- ▶ **Technical Details**
- ▼ **I Understand the Risks**

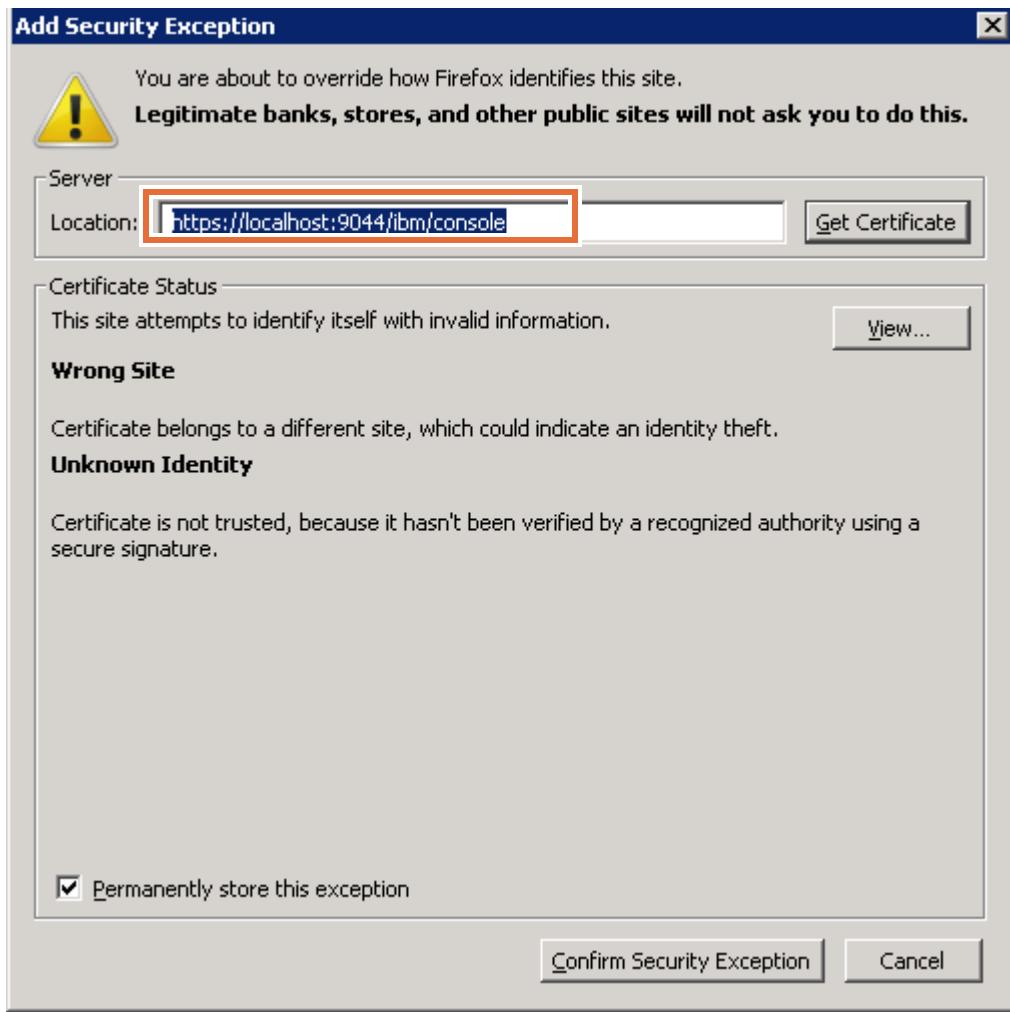
If you understand what's going on, you can tell Firefox to start trusting this site's identification. **Even if you trust the site, this error could mean that someone is tampering with your connection.**

Don't add an exception unless you know there's a good reason why this site doesn't use trusted identification.

[Add Exception...](#)

- __ d. On the Add Security Exception window, the location is the secure port for the deployment manager. Verify that the location is the following web address:

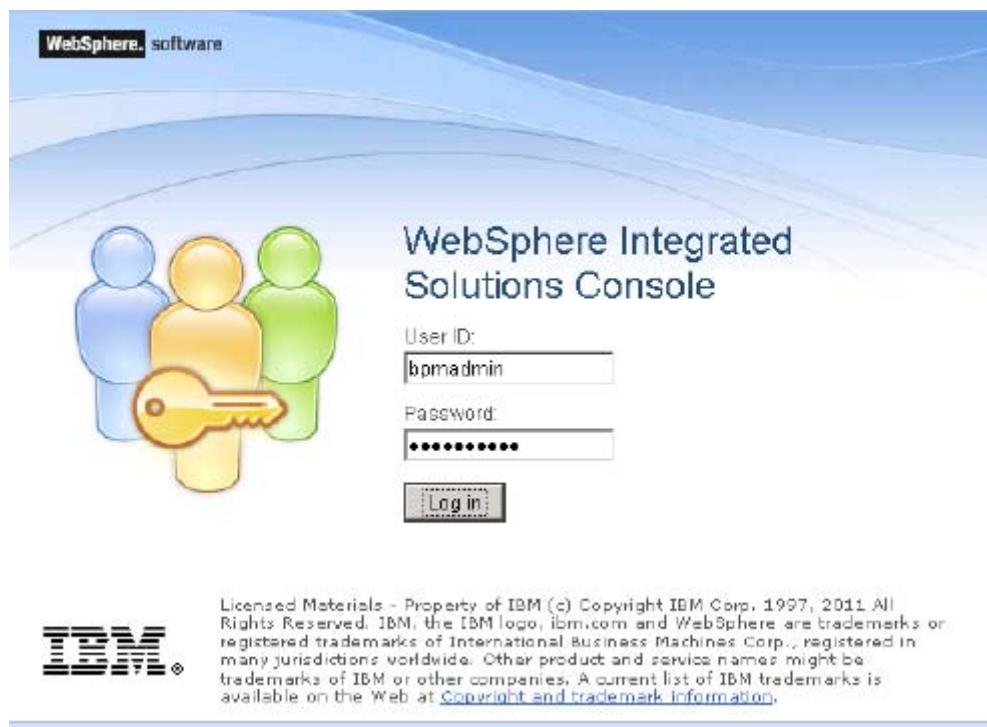
<https://localhost:9044/ibm/console>



- __ e. Click **Confirm Security Exception**. The login page for the Integrated Solutions Console, which is also known as the administrative console, is now visible.

___ f. Log in to the administrative console as:

- **User ID:** bpmadmin
- **Password:** websphere



___ g. In the administration console, expand **Servers > Server Types** and click **WebSphere application servers**.

___ h. Select the **SingleClusterMember1** check box.

___ i. Click **Start**.

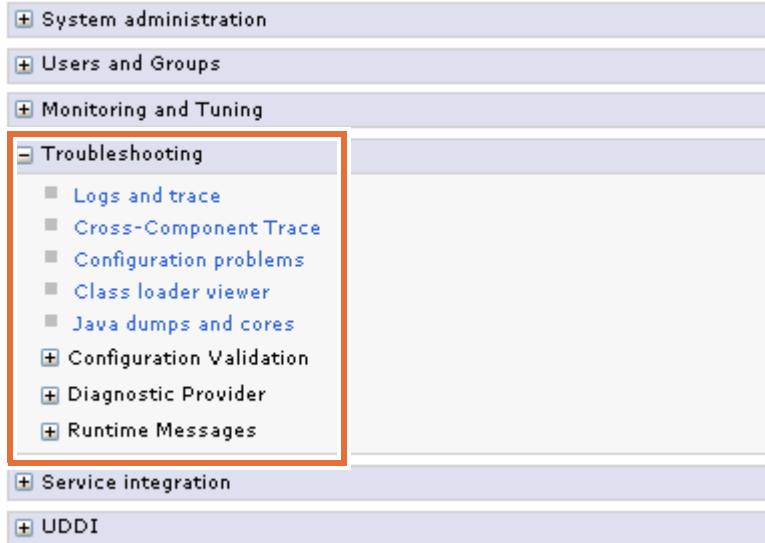


___ j. Wait until the start command is successfully completed, and the status becomes green.

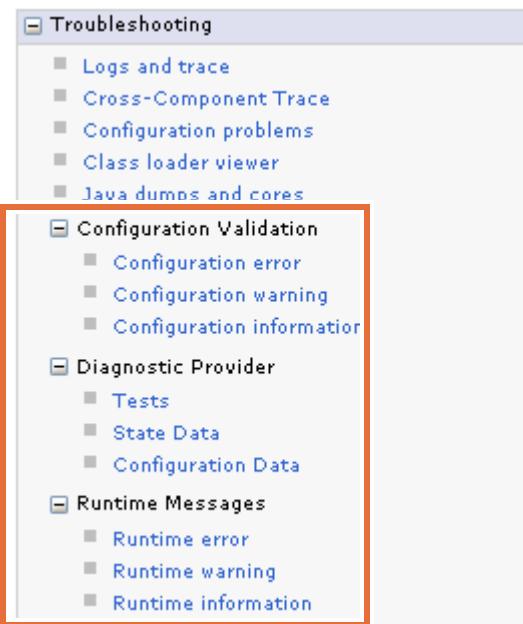
Select	Name	Node	Host Name	Version	Cluster Name	Status
<i>You can administer the following resources:</i>						
<input type="checkbox"/>	SingleClusterMember1	Node1	ws2008r2x64.wetraining.com	ND 8.5.5.1 BPMAdv 8.5.0.1	SingleCluster	

- ___ 3. Examine the **Troubleshooting** menu. The troubleshooting area displays messages about runtime events and configuration problems. This area automatically refreshes, and you can view either the runtime messages or configuration problem totals.

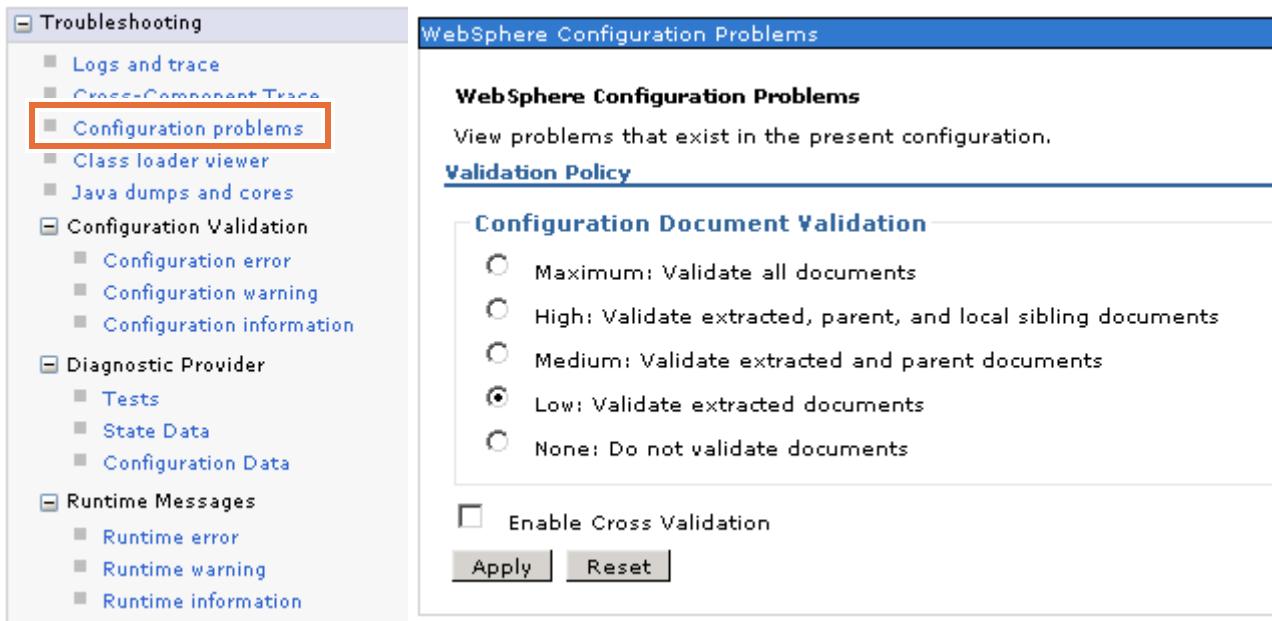
- ___ a. In the administrative console, expand **Troubleshooting** on the left.



- ___ b. Expand **Configuration Validation**, **Diagnostic Provider**, and **Runtime Messages** to view the menu options.



- ___ c. Select Troubleshooting > Configuration Problems from the left pane.



You can set the validation policy to: **None**, **Low**, **Medium**, **High**, or **Maximum**. **Low** is the default policy. When troubleshooting configuration problems, you set the policy to **High** or **Maximum**.

Selecting **High: Validate extracted, parent, and sibling documents** turns on validation for extracted documents and their parent documents, and turns on validation for the sibling documents of the documents that are extracted. For example, if **High** validation is selected, and if the `server.xml` document is extracted during the validation, validation is done on the three documents: `server.xml`, `node.xml`, and `cell.xml`, and on the two sibling documents, `variables.xml` and `resources.xml`, within the `dmgr` directory. Refer to the documentation for information about other policies.

Part 2: Working with the log files of the application server

Change the number of history files and set the maximum size of the log file for `System.out`. The number of historical files grows from zero to the value of the **Maximum Number of Historical Log Files** field. The next rollover deletes the oldest historical file.

- ___ 1. In the left, select Troubleshooting > Logs and trace.

— 2. Click the **dmgr** link.

The screenshot shows the 'Logging and tracing' page. At the top, there is a header bar with the title 'Logging and tracing'. Below the header, there is a section titled 'Logging and tracing' with a brief description: 'Use this page to specify how the server handles log records. You can select an application, choose where log data is stored, and choose a format for log content. You can also specify a log rotation policy.' There is a 'Preferences' button with a plus sign icon. Below this, there are three buttons: a double arrow up-down button, a copy button, and a refresh button. A table follows, with columns for 'Server', 'Node', and 'Host Name'. The table has three rows:

Server	Node	Host Name
SingleClusterMember1	Node1	ws2008r2x64.wetraining.com
dmgr	Dmgr	ws2008r2x64.wetraining.com
nodeagent	Node1	ws2008r2x64.wetraining.com

Total 3

— 3. Click **JVM Logs**.

The screenshot shows the 'General Properties' page. At the top, there is a header bar with the title 'General Properties'. Below the header, there is a section titled 'Diagnostic Types' with a list of links:

- [Diagnostic Types](#)
- [JVM Logs](#)
- [Process Logs](#)
- [IBM Service Logs](#)
- [Change log detail levels](#)
- [NCSA access and HTTP error logging](#)

- ___ 4. Under **General Properties** for System.out, set the **Maximum Size** to 3 MB and the **Maximum Number of Historical Log Files** to 2.

General Properties

System.out

* File Name: \$(LOG_ROOT)/dmgr/SystemOut.log

File Formatting: Basic (Compatible)

Log File Rotation

File Size
Maximum Size: 3 MB

Time
Start Time: 24
Repeat Time: 24 hours

Maximum Number of Historical Log Files. Number in range 1 through 200.
2

Installed Application Output

Show application print statements
 Format print statements

- ___ 5. Click **OK**.
- ___ 6. **Save** the changes to the master configuration.
- ___ 7. View SystemOut.log and SystemErr.log for dmgr in the administrative console.
- ___ a. Click **dmgr**.
- ___ b. Click **JVM Logs**.
- ___ c. Click the **Runtime** tab to see the system log locations.

Configuration Runtime

General Properties

System.out

File Name: C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\logs\dmgr\SystemOut.log

System.err

File Name: C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\logs\dmgr\SystemErr.log



Information

The difference between the Runtime tab and the Configuration tab

The **Runtime** tab is for the currently running code in the server, and resets if the server is rebooted. The **Configuration** tab is for settings that are preserved across restarts of WebSphere Application Server. Applying a change to the **Runtime** tab takes effect immediately. Applying a change to the **Configuration** tab takes effect only after restarting WebSphere Application Server.

- ___ d. Click **View** to the right of the **File Name** field for `System.out`.

The default is to retrieve 250 lines in one step. You can specify the range of lines to be retrieved at the top of the Logging and Tracing window.

- ___ e. Retrieve lines 50 - 80 by typing `50-80` in the **Retrieve Lines** field.

Logging and tracing

Logging and tracing > dmqr > Log File

Display the contents of the given file.

Total: 617, Filtered total: 250

Retrieve Lines (eg. 250-600)

50-80 Refresh

- ___ f. Click **Refresh**.



Information

You can also go to the `C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\logs\dmgr` folder to view the logs with a text editor. This method is preferable because you can use the search features of your text editor.

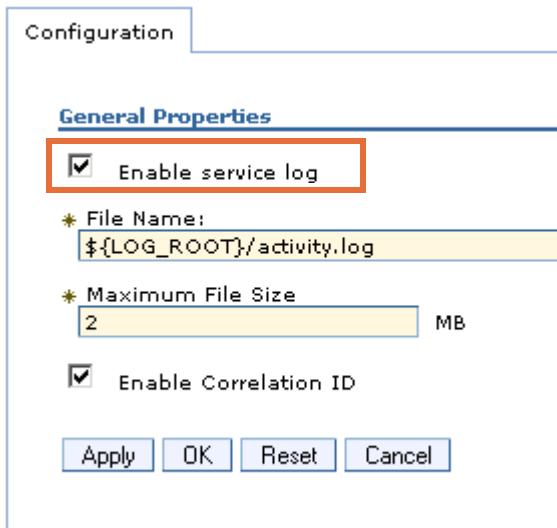
- ___ 8. Configure the IBM service logs in the administrative console. Unlike the JVM logs, the IBM service logs cannot be viewed within the administrative console. You must use a tool such as the Log Analyzer.

- ___ a. Select **Troubleshooting > Logs and trace > dmgr > IBM Service Logs**.

General Properties

- [Diagnostic Trace](#)
- [JVM Logs](#)
- [Process Logs](#)
- **IBM Service Logs**
- [Change log detail levels](#)
- [NCSA access and HTTP error logging](#)

- ___ b. Select the **Enable service log** check box.



- ___ c. Click **OK**.
___ d. Click **Save**.



Information

If you select the **Enable Correlation ID** check box, which is the default, this action causes the generation of a correlation ID that is logged with each message. You can use the correlation ID to correlate activity to a particular client request. You can also use it to correlate activities on multiple application servers, if applicable.

Part 3: Enable and configure HPEL

High Performance Extensible Logging (HPEL) is a mode of logging and tracing in WebSphere Application Server. To take advantage of this new log and trace framework, HPEL mode must be enabled. After HPEL mode is enabled, the JVM logs (typically `SystemOut.log` and `SystemErr.log`), the trace log (typically `trace.log`), and the service log (typically `activity.log`) are no longer written to. Instead, log and trace content is written to a log data or trace data repository in a proprietary binary format and, if configured, to a text log file. To gain the largest performance benefit of HPEL, disable writing results to a text file. A log viewing tool, Log Viewer, is provided to allow for viewing, filtering, monitoring, and formatting the log and trace data in the repositories.

In this section, you enable HPEL mode for the deployment manager server, `dmgr`. Then, you explore and modify the log and trace configurations.

- ___ 1. Enable HPEL for `dmgr`.
- ___ a. Go to the **Logging and tracing** menu by clicking **Troubleshooting > Logs and trace > dmgr**.

- __ b. Enable HPEL by clicking **Switch to HPEL Mode**.

Logging and tracing

[Logging and tracing](#) > dmgr

It is recommended that you switch to High Performance Extensible Logging (HPEL) if you have no existing procedures that prevent you from taking advantage of it.

Switch to HPEL Mode

(Advised for most installations)

Use this page to select a system log to configure, or to specify a log detail level for components and groups of components. Use log levels to control which events are processed by Java logging.

- __ c. Click **Save** to save the configuration.
- __ 2. Switch to HPEL mode for **nodeagent** and **SingleClusterMember1** servers.
- __ a. Go to the **Logging and tracing** menu by clicking **Troubleshooting > Logs and trace > nodeagent**.
- __ b. Enable HPEL by clicking **Switch to HPEL Mode**.
- __ c. Click **Save** to save the configuration.
- __ d. Go to the **Logging and tracing** menu by clicking **Troubleshooting > Logs and trace > SingleClusterMember1**.
- __ e. Enable HPEL by clicking **Switch to HPEL Mode**.
- __ f. Click **Save** to save the configuration.



Note

To save time, you do not restart the servers now. You restart the servers after you modify the configuration settings in the next section.

- ___ 3. Configure HPEL for dmgr.
- ___ a. Go to the **Logging and tracing** menu by clicking **Troubleshooting > Logs and trace > dmgr**.

Logging and tracing > dmgr

Use this page to select a system log to configure, or to specify log detail

General Properties

[Configure HPEL logging](#)
Current status not available

[Configure HPEL trace](#)
Current status not available

[Configure HPEL text log](#)
Current status not available

Related Items

- [View HPEL logs and trace](#)
- [Change log detail levels](#)
- [Change log and trace mode](#)
- [Manage process logs](#)
- [NCSA access and HTTP error logging](#)

The status is not available, and you check the status after you restart the servers.

- ___ 4. Disable the HPEL text log.
- ___ a. In the General Properties section, click **Configure HPEL text log**.
- ___ b. Clear the check box for **Enable text log**.

Logging and tracing > dmgr > HPEL Text Log Configuration

Use this page to configure High Performance Extensible Logging (HPEL) text log options.

Configuration

General Properties

Enable text log

Directory path
\${LOG_ROOT}/ \${SERVER}

Enable log record buffering

Start new log file daily at: Time 12 AM

Log record purging policies

Begin cleanup of oldest records
when log size approaches maximum

- ___ c. Click **OK**.
- ___ d. Click **Save** to save the configuration.

- ___ e. It is necessary to restart the server for this change to take effect. However, wait until you make some other configuration changes before you restart the server.
- ___ 5. Explore the configuration for HPEL logging.
 - ___ a. Go to **Troubleshooting > Logs and trace > dmgr**.
 - ___ b. On the **General properties** tab, click the link **Configure HPEL logging**.
 - ___ c. Notice the different options for configuring HPEL logging. Also, notice that log buffering is enabled. Since buffering improves performance, it is good to keep it enabled.

[**Logging and tracing > dmgr > HPEL Log Configuration**](#)

Use this page to configure High Performance Extensible Logging (HPEL) log options, directory), or using the View HPEL Logs and Trace link.

The screenshot shows the 'HPEL Log Configuration' dialog box. At the top, there are tabs: 'Configuration' (selected), 'Logs', 'Traces', and 'File'. Below the tabs, the 'General Properties' section is visible, containing fields for 'Directory path' (set to \${LOG_ROOT}/\${SERVER}), 'Enable log record buffering' (checked), and 'Start new log file daily at: Time' (set to 12 AM). The 'Log record purging policies' section includes a checkbox for 'Begin cleanup of oldest records when log size approaches maximum', a dropdown menu for 'Log record age limit' (set to 48 hours old), and a field for 'Maximum log size' (set to 50 Megabytes). The 'Out of space action' section has a dropdown menu set to 'Stop logging'. At the bottom of the dialog are 'Apply', 'OK', 'Reset', and 'Cancel' buttons.

- ___ 6. Modify the HPEL log configuration.
 - ___ a. Change **Maximum Log Size** from 50 MB to 20 MB.
 - ___ b. Click **OK**.
 - ___ c. Click **Save** to save the configuration.
- ___ 7. Explore the configuration for HPEL tracing.
 - ___ a. Go to **Troubleshooting > Logs and trace > dmgr**.
 - ___ b. On the **General Properties** tab, click **Configure HPEL trace**.

- ___ c. You have options to trace to a log directory or memory buffer. The default setting is to trace to a log directory.

[Logging and tracing > dmqr > HPEL Trace Configuration](#)

Use this page to configure High Performance Extensible Logging (HPEL) trace options, bin directory), or using the View HPEL Logs and Trace link.

The screenshot shows the 'General Properties' section with the 'Configuration' tab selected. Under 'HPEL Trace Output', the 'Trace to a directory' option is selected. It includes checkboxes for 'Enable log record buffering' and 'Start new log file daily at: Time 12 AM'. The 'Log record purging policies' section contains a checked checkbox for 'Begin cleanup of oldest records' with a dropdown menu set to 'when log size approaches maximum'. Below it are fields for 'Log record age limit' (48 hours old) and 'Maximum log size' (50 Megabytes). An 'Out of space action' dropdown is set to 'Purge old records'. The 'Trace to a memory buffer' section has a 'Memory Buffer Size' field set to 8 MB and a 'Directory to use for tracing and dumping memory buffer' field set to \${LOG_ROOT}/\${SERVER}. At the bottom are 'Apply', 'OK', 'Reset', and 'Cancel' buttons.

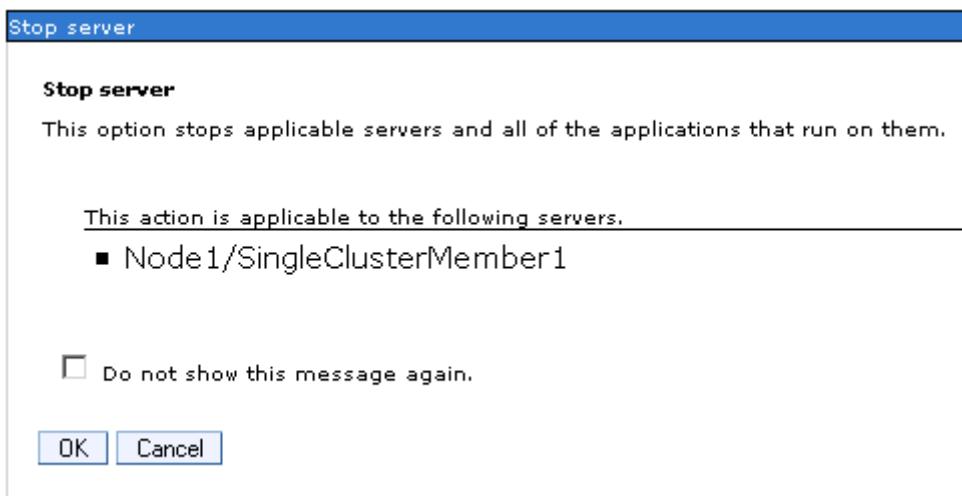
- ___ 8. Modify the HPEL Trace configuration.

- ___ a. Under **Log record purging policies**, configure when to begin cleanup of oldest records by using the drop-down menu to select **when oldest records reach age limit**.
- ___ b. Next, set **Log record age limit** to 72 hours.

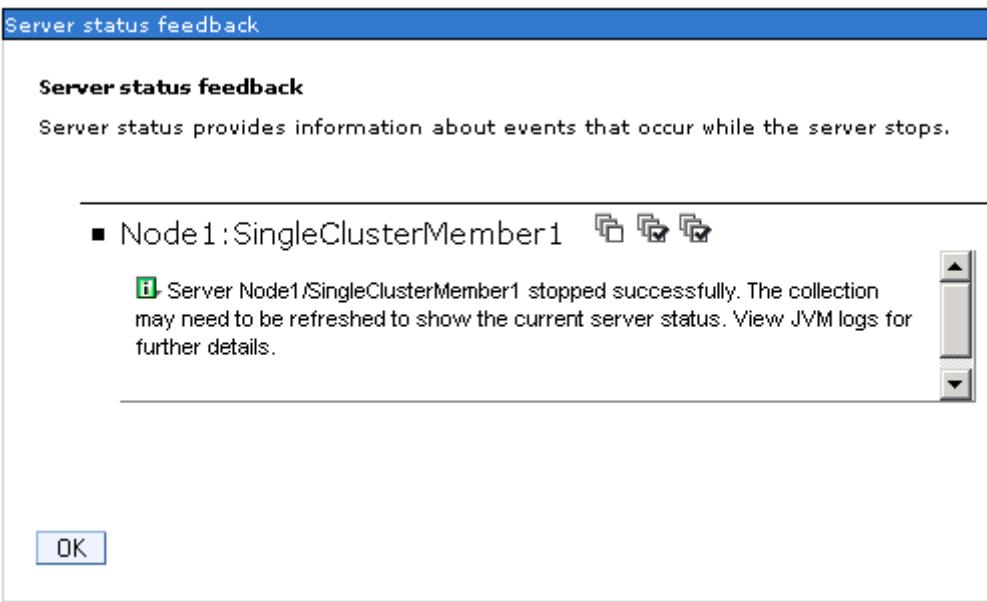
The screenshot shows the 'Log record purging policies' section. The 'when oldest records reach age limit' dropdown is highlighted with a red box. Below it are fields for 'Log record age limit' (72 hours old) and 'Maximum log size' (50 Megabytes).

- ___ c. Click **OK**.

- ___ d. Click **Save** to save the configuration.
- ___ 9. Restart the servers.
- ___ a. Select **Servers > Server Types > WebSphere application servers**, and select the **SingleClusterMember1**.
- ___ b. Click **Stop**.
- ___ c. Click **OK** to confirm. Wait until the server stops successfully.



- ___ d. Wait until the server stops successfully, and then click **OK**.



- ___ e. Click **Logout**, and minimize the browser.
- ___ f. Double-click the **Stop the Process Center node agent** shortcut icon in the **Process Center** folder on the desktop.
- ___ g. If the "Login at the Target Server" window appears, enter **bpmadmin** in the **User Identity** field and **websphere** in the **User Password** field.

- ___ h. Click **OK**.
 - ___ i. Wait until the stop command is successfully completed, and press any key to continue.
 - ___ j. Double-click the **Stop the Process Center deployment manager** shortcut icon in the **Process Center** folder on the desktop.
 - ___ k. If you are prompted, enter `bpmadmin` in the **User Identity** field and `websphere` in the **User Password** field.
 - ___ l. Click **OK**.
 - ___ m. Wait until the stop command is successfully completed, and press any key to continue.
 - ___ n. Double-click the **Start the Process Center deployment manager** shortcut icon.
 - ___ o. Wait until the start command is successfully completed, and press any key to continue.
 - ___ p. Double-click the **Start the Process Center node agent** shortcut icon.
 - ___ q. Wait until the start command is successfully completed, and press any key to continue.
 - ___ r. Return to the **administrative console** on Firefox browser, and enter `bpmadmin` in the **User ID** field and `websphere` in the **Password** field.
 - ___ s. Click **Log in**.
 - ___ t. In the administration console, expand **Servers > Server Types** and click **WebSphere application servers**.
 - ___ u. Select the **SingleClusterMember1** check box.
 - ___ v. Click **Start**.
 - ___ w. Wait until the start command is successfully completed, and the status becomes started.
- ___ 10. Verify new HPEL configurations after you restart the servers.
- ___ a. Click **Troubleshooting > Logs and trace > dmgr**.
 - ___ b. Verify that all the configuration changes that you made are now in effect.

Logging and tracing

Logging and tracing > dmgr

Use this page to select a system log to configure, or to specify log detail levels for components and groups of components.

General Properties

Configure HPEL logging

Directory	C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\logs\dmgr
For cleanup, delete records older than	Disabled
For cleanup, maximum size of logs	20 Megabytes

Configure HPEL trace

Directory	C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\logs\dmgr
For cleanup, delete records older than	72 Hours
For cleanup, maximum size of trace	Disabled

Configure HPEL text log

Current status:	Disabled
-----------------	----------

In the general properties section, after you restart the servers, you can see the current configuration for the three HPEL repositories. Each has a directory location and cleanup options for age and size of log files.

Part 4: Use the Log Viewer to examine log data and trace data

In this section, you use the Log Viewer in the administrative console to examine the log messages for an application server. You use various filtering functions to customize which log records are displayed.

- 1. Go to the Log Viewer for server.
 - a. Click **Troubleshooting > Logs and trace > dmgr > View HPEL Logs and Trace**.
- 2. Select the most recent instance of the application server.
 - a. Expand **Content and Filtering Details**.
 - b. Expand the **Server Instance** tree, and make sure that the most recent instance of the server is selected (highlighted).

Logging and tracing

[Logging and tracing](#) > [dmgr](#) > [Log Viewer](#)

Use this page to view log data from the HPEL repository (group of common logs) or export the customized view or full repository into a compressed file.

Content and Filtering Details

Server Instance

Server instances grouped by server start date and time:

May 10, 2014

.... 23:56:41



Note

Since you recently enabled HPEL for **dmgr**, you see one instance of the server log repository. An instance is created for each new start of the server and designated with a time stamp. In this example, which uses the default configuration, the instances for each day are stored in a folder that is designated with the date. Any instance can be viewed by selecting it, and the log records are displayed in the Log Viewer.

3. Use the Log Viewer to explore the log records.
- a. In the Log Viewer, click **Next Page** and **Last Page** to browse through the log records. Then, click **First Page**.



- b. Click one or more message ID links to see more details about a message.

TimeStamp	Thread ID	Logger	Level	Message
5/2/14 14:38:46.992	00000001	loggerAdmin	INFO	TRAS0017I : The startup trace state is *=info.
5/2/14 14:38:46.992	00000001	loggerAdmin	INFO	TRASU111I : The message IDs that are in use are deprecated
5/2/14 14:38:47.023	00000001	loggerTracker	INFO	com.ibm.ffdc.osgi.ProviderTracker AddingService FFDC1007I : I com.ibm.ffdc.util.provider.FfdcOnDirProvider@ea4f29c7

You see the message details.

Runtime Message Detail

Details of Runtime Message

Message:	TRAS0017I: The startup trace state is *=info.
Source:	The startup trace state is {0}.
Explanation:	The trace service is started. The startup trace state that is determined from configuration data is displayed here.
User Action:	If a different trace startup state is desired, change the configuration data appropriately and restart the process.

Close

- c. Click **Close**.

- ___ 4. Filter the displayed records by message levels.
- ___ a. Expand **Content and Filtering Details** and select **WARNING** from the **Minimum level** menu in the View Contents section.

View Contents

- System out
- System err
- Logs and trace

Minimum level:

WARNING

Maximum level:

- ___ b. Click **Apply**.
- ___ c. View the records in the Log Viewer. You notice that the records that are displayed have a minimum level of **WARNING**. Browse through the messages to see whether there are any at a higher level such as **SEVERE**. Alternatively, select **SEVERE** as the minimum level in the View Contents section, and click **Apply**.
- ___ d. Clear the **Minimum** and **Maximum** level windows. Click **Apply** to see all the records again.

- ___ 5. Display all records that are associated with a specific thread.

- ___ a. Select **AUDIT** from the **Minimum level** menu in the View Contents section, and enter ***EJB** in the **Message contents**.

View Contents

- System out
- System err
- Logs and trace

Minimum level:

AUDIT

Maximum level:

Filtering

Wild cards: *, ?, % are allowed
Separate multiple entries by a ':'

Include loggers:

Exclude loggers:

Message contents:

*EJB

Event Timing

From: _____ On: _____

Until: _____ On: _____

Apply Content and Filtering Details

Apply Reset

- ___ b. Click **Apply**.

- ___ c. Scroll down to see the results.

Viewing log records from server instance May 2, 2014 14:38:46				
Number of records to show: 20 First				
TimeStamp	Thread ID	Logger	Level	Message
5/2/14 14:39:51.648	000000E2	ionMgrImpl	AUDIT	WSVR02001 : Starting application: ManagementEJB
5/2/14 14:39:53.226	000000E2	ionMgrImpl	AUDIT	WSVR02211 : Application started: ManagementEJB

- ___ d. Select the first row with thread ID and click **Show Only Selected Threads**.

Viewing log records from server instance May 2, 2014 14:38:46				
Number of records to show: 20 First				
TimeStamp	Thread ID	Logger	Level	Message
5/2/14 14:39:51.648	000000E2	ionMgrImpl	AUDIT	WSVR02001 : Starting application: ManagementEJB
5/2/14 14:39:53.226	000000E2	ionMgrImpl	AUDIT	WSVR02211 : Application started: ManagementEJB



Note

The thread ID might not match the one on your screen.

- ___ e. Browse through the resulting records, and you can see that only the messages from the selected Thread ID are displayed. Also, notice that those records are displayed in nearly chronological order (the order in which the server emitted them).

Viewing log records from server instance May 2, 2014 14:38:46				
Number of records to show: 20 First				
TimeStamp	Thread ID	Logger	Level	Message
5/2/14 14:39:51.648	000000E2	ionMgrImpl	AUDIT	WSVR02001 : Starting application: ManagementEJB
5/2/14 14:39:51.648	000000E2	ionMgrImpl	AUDIT	WSVR02041 : Application: ManagementEJB Application
5/2/14 14:39:52.711	000000E2	ntimeImpl-Runtime	INFO	WSVR00371 : Starting EJB jar: mejb.jar
5/2/14 14:39:52.742	000000E2	BinderImpl	INFO	CNTR01671 : The server is binding the javax.management module of the ManagementEJB application. The binding I
5/2/14 14:39:52.756	000000E2	EJBRuntime	INFO	CNTR01671 : The server is binding the javax.management module of the ManagementEJB application. The binding I /mejb/ManagementEJB javax.management.j2ee.Manageme
5/2/14 14:39:52.930	000000E2	ntimeImpl-Runtime	INFO	WSVR00571 : EJB jar started: mejb.jar
5/2/14 14:39:53.226	000000E2	ionMgrImpl	AUDIT	WSVR02211 : Application started: ManagementEJB
5/2/14 14:39:53.226	000000E2	ionMgrImpl	AUDIT	WSVR02001 : Starting application: wimwmm

- ___ f. After viewing the records for the selected thread, click **Show All Threads**.

Part 5: Enable tracing for an application server and view trace data by using the Log Viewer

In this section, you enable tracing on the session management components of **server1**. Use the PlantsByWebSphere Application to generate trace data, and view the trace data in the Log Viewer.

- ___ 1. Configure the diagnostic trace for the session management components of **server1**.
 - ___ a. In the administrative console, click **Troubleshooting > Logs and trace > dmgr**.
 - ___ b. Click **Change log detail levels**.

Related Items

- [View HPEL logs and trace](#)
- **[Change log detail levels](#)**
- [Change log and trace mode](#)
- [Manage process logs](#)
- [NCSA access and HTTP error logging](#)

- ___ c. Select the **Runtime** tab and replace the existing trace string `*=info` with the following trace strings. These strings are for the components and trace levels that are suggested in the IBM Support MustGather documentation for session management problems.

```
*=info:  
com.ibm.ws.session.*=all:  
com.ibm.ws.webcontainer.srt.*=all:  
WAS.j2c=all:  
RRA=all
```

Logging and tracing ?

Logging and tracing > dmgr > Change log detail levels

Use log levels to control which events are processed by Java logging. Click Components to specify a log detail level for individual components, or click Groups to specify a log detail level for a predefined group of components. Click a component or group name to select a log detail level. Log detail levels are cumulative; a level near the top of the list includes all the subsequent levels.

Configuration **Runtime**

General Properties

Save runtime changes to configuration as well

Change log detail levels

Disable logging and tracing of potentially sensitive data (WARNING: This might cause the log detail level setting to be modified when it is applied on the server.)

Select components and specify a log detail level. Log detail levels specified here will apply to the entire server. Expand Components and Groups and click Components to specify a log detail level for individual components, or click Groups to specify a log detail level for a predefined group of components. Click a component or group name to select a log detail level. Log detail levels are cumulative

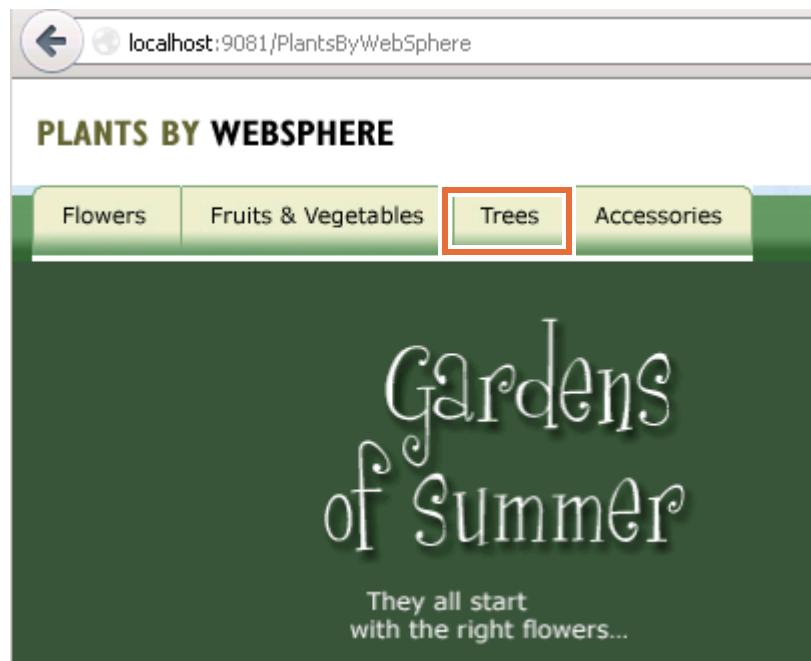
```
*=info:  
com.ibm.ws.session.*=all:  
com.ibm.ws.webcontainer.srt.*=all:  
WAS.j2c=all:  
RRA=all
```

- ___ d. Click **Apply**.
 - ___ e. Click **OK**.
- ___ 2. Access the PlantsByWebSphere application and generate some trace data.

- ___ a. Start a new browser and enter the web address:

`http://localhost:9081/PlantsByWebSphere`

- ___ b. Click the **Trees** tab on the Welcome page.



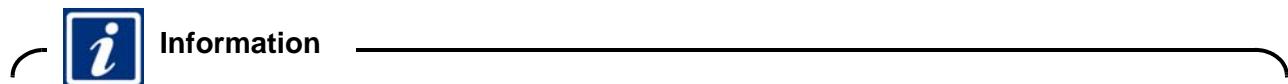
- ___ c. Select any tree that you like, and click **Add to cart**.

Item Selection:

ITEM#	DESCRIPTION	PRICE	QUANTITY
T0003	0.5 gallon mature tree	\$30.00	<input type="text" value="1"/>

Add to cart

- ___ d. This activity is enough to generate some interesting trace data. Close the browser.
- ___ 3. Use the Log Viewer in the administrative console to examine the trace data.
- ___ a. Click **Troubleshooting > Logs and trace > dmgr > View HPEL logs and trace**.
 - ___ b. Expand the **Contents and Filtering Details** tree.



In the View Contents section, you can select **System out**, **System err**, and **Logs and trace**.

Selecting **System out** shows records that were sent to the System Out stream by using an API such as `System.out.println(...)`.

Selecting **System err** shows records that were sent to the System Error stream by using an API such as `System.out.println(...)`.

Selecting **Logs and trace** specifies that log and trace records are included in the log view. Log and trace entries can be further specified to include a minimum or maximum level.

The following are some examples of log and trace filtering:

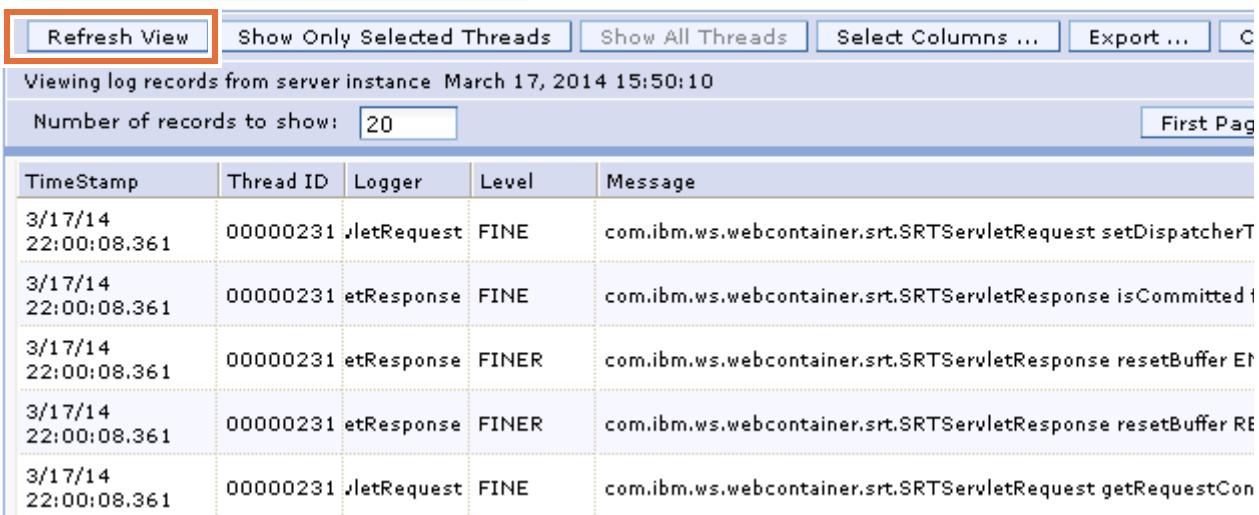
- The result of selecting logs and trace and clearing Minimum level and Maximum level fields is that the log view displays records with any log or trace level (default).
- The result of selecting logs and trace and setting Minimum level to WARNING is that the log view displays log records with levels WARNING, FATAL, or SEVERE.
- The result of selecting logs and trace and setting Maximum level to FINE is that the log view displays trace records with levels FINE, FINER, or FINEST.
- The result of selecting logs and trace and setting Minimum level to DETAIL and Maximum level to AUDIT is that the log view displays log records with levels DETAIL, CONFIG, INFO, or AUDIT.

- ___ c. In the View Contents section, select **FINEST** from the **Minimum level** menu and **FINE** from the **Maximum level** menu.



- ___ d. Click **Apply**.

- ___ e. Click Refresh View.



Viewing log records from server instance March 17, 2014 15:50:10				
Number of records to show: 20 First Page				
TimeStamp	Thread ID	Logger	Level	Message
3/17/14 22:00:08.361	00000231	\jetRequest	FINE	com.ibm.ws.webcontainer.srt.SRTServletRequest setDispatcherT
3/17/14 22:00:08.361	00000231	\etResponse	FINE	com.ibm.ws.webcontainer.srt.SRTServletResponse isCommitted i
3/17/14 22:00:08.361	00000231	\etResponse	FINER	com.ibm.ws.webcontainer.srt.SRTServletResponse resetBuffer ET
3/17/14 22:00:08.361	00000231	\etResponse	FINER	com.ibm.ws.webcontainer.srt.SRTServletResponse resetBuffer RE
3/17/14 22:00:08.361	00000231	\jetRequest	FINE	com.ibm.ws.webcontainer.srt.SRTServletRequest getRequestCon

- ___ f. Use **Next Page** and **Previous Page** to go through the trace data. The level of all records is either **FINE**, **FINER**, or **FINEST**.

- ___ 4. Use the features of the Log Viewer to explore the trace data. Here are a few suggestions.
- ___ a. Set both the minimum level and the maximum level to **FINEST**. This setting shows you only the records at the **FINEST** level, if there are any.
 - ___ b. Select (highlight) any thread ID of interest and click **Show Only Selected Threads**. Observe the number of different loggers that stream messages in that thread.
 - ___ c. Try filtering message content. Look for key words among the message details, such as `*getConnection*` or `*JSESSIONID*`. You can use wildcards. Remember to click **Apply** and **Refresh View**.

— Filtering

Wild cards: *, ?, % are allowed
Separate multiple entries by a ;'

Include loggers:

Exclude loggers:

Message contents:

Part 6: Work with the class loader viewer

- ___ 1. Enable the class loader viewer service.
 - ___ a. In the administration console, expand **Servers > Server Types** and click **WebSphere application servers**.
 - ___ b. Click **SingleClusterMember1**.

- __ c. Scroll down to the bottom of the page. Under Additional Properties, click **Class loader viewer service**.



- __ d. Select the **Enable service at server startup** check box and click **OK**.



- __ e. Save the changes to the master configuration.

 **Note** You need to restart the servers for the new configuration to take effect. To save time, you do not restart the servers now. You restart the servers after you modify the configuration settings in the next section.

- __ 2. Examine class loaders.
__ a. Select **Troubleshooting > Class loader viewer**.

- __ b. In the Enterprise Applications Topology page, expand **PCCell1 > Nodes > Node1 > Server > SingleClusterMember1 > Applications > pbw-ear > Web** modules to show the entries.



- c. Click the **PlantsByWebSphere.war** link under **Web modules**.

- ___ d. Select the **Search Order** tab. You can expand any of the class loaders to see which classes they load and where the classes are located. Try expanding the Module class loaders.

The screenshot shows the 'Search Order' tab selected in a top navigation bar. Below it is a toolbar with 'Export', 'Table View', and 'Search' buttons. The main content area is titled 'ClassLoader - Search Order' and displays a hierarchical tree of class loaders:

- 1 - JDK Extension - sun.misc.Launcher\$ExtClassLoader**
- 2 - JDK Application - sun.misc.Launcher\$AppClassLoader**
- 3 - OSGI - org.eclipse.osgi.internal.baseadaptor.DefaultClassLoader**
- 4 - Extension - com.ibm.ws.bootstrap.ExtClassLoader**
- 5 - WebSphere Application Server Protection Class Loader - com.ibm.ws.classloader.ProtectionClassLoa**
- 6 - Module - com.ibm.ws.classloader.CompoundClassLoader**
 - Classes**
 - Classpath**
 - file:/C:/IBM/BPM/ProcessCenter/v8.5/profiles/Node1Profile/installedApps/PCCell1/pbw-ear.ear/lib/p
- 7 - Module - com.ibm.ws.classloader.CompoundClassLoader**
 - Classes**
 - Classpath**
 - file:/C:/IBM/BPM/ProcessCenter/v8.5/profiles/Node1Profile/installedApps/PCCell1/pbw-ear.ear/Plan
 - file:/C:/IBM/BPM/ProcessCenter/v8.5/profiles/Node1Profile/installedApps/PCCell1/pbw-ear.ear/Plan

- ___ e. Click the **Table View** to display information about the class loaders that are visible to the module in an HTML table format.

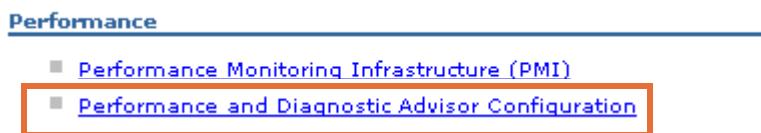
[Enterprise Applications Topology](#) > [Class loader viewer](#) > [Table View](#)

JDK Extension - sun.misc.Launcher\$ExtClassLoader	
Delegation	true
Classpath	<ul style="list-style-type: none"> file:/C:/IBM/BPM/ProcessCenter/v8.5/tivoli/tam/PD.jar file:/C:/IBM/BPM/ProcessCenter/v8.5/tivoli/tam/PolicyDirector/ file:/C:/IBM/BPM/ProcessCenter/v8.5/java/jre/lib/ext/CmpCrmf.jar file:/C:/IBM/BPM/ProcessCenter/v8.5/java/jre/lib/ext/dnsns.jar file:/C:/IBM/BPM/ProcessCenter/v8.5/java/jre/lib/ext/dtfj-interface.jar file:/C:/IBM/BPM/ProcessCenter/v8.5/java/jre/lib/ext/dtfj.jar file:/C:/IBM/BPM/ProcessCenter/v8.5/java/jre/lib/ext/dtfjview.jar

Part 7: Explore diagnostic providers

1. Enable the Performance and Diagnostic Advisor service.
 - a. Expand **Servers > Server Types** and click **WebSphere application servers**.
 - b. Click the **SingleClusterMember1** link.

- ___ c. Scroll down to the Performance section and click **Performance and Diagnostic Advisor Configuration**.

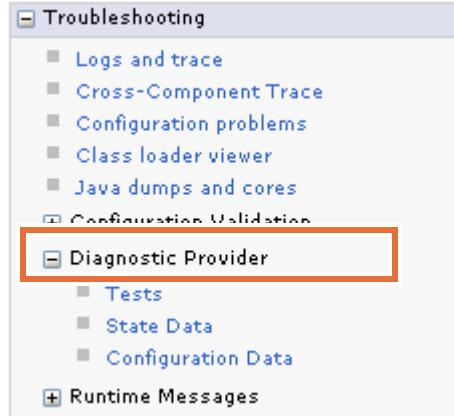


- ___ d. Select the **Runtime** tab.
___ e. Select **Enable Performance and Diagnostic Advisor Framework**.



- ___ f. Click **OK**.
___ g. Click **OK** to confirm the change.
___ h. If prompted, click **Save** to save your changes
- ___ 2. Access diagnostic providers from the administrative console, and explore the diagnostic tests.

- ___ a. Expand **Troubleshooting > Diagnostic Provider**.



- ___ b. Click **Tests** to find a specific diagnostic provider.

- __ c. Expand **Cell > PCCell1 > Servers > Node1.**

Server selection topology



Note

You can also expand the **Clusters** level. At the end of this section, feel free to browse through the clusters and explore the options.

- __ d. Click **SingleClusterMember1**. A list of available diagnostic providers that have a test function is displayed.
- __ e. A memory leak test is a part of the runtime advisor (AdvisorDP) diagnostic provider. To run this provider, select **AdvisorDP**.

Tests Quick Link or Server Selection

Tests Quick Link or Server Selection > Diagnostic Providers

The following is a list of diagnostic providers registered with this selected process. Diagnostic providers are used by diagnostic systems to interrogate the current state of a runtime component. To select a diagnostic provider, click its name.

+ Preferences

Diagnostic Providers ▾

You can administer the following resources:

AdvisorDP (highlighted with a red box)

[ConnMqrDP_BFMIF_SingleCluster/com/ibm/bpe/api/sca/BFMJMS_FAILEDEVENT_REPLY_CF](#)
[ConnMqrDP_bpm/BPDDocMiq/service/deployCF](#)

- ___ f. A list of available tests for this diagnostic provider is displayed.

[Tests Quick Link or Server Selection](#) > [Diagnostic Providers](#) > [Test Selection](#)

Below is a list of tests the diagnostic provider has available to run against its own runtime component. By selecting a test from the list below the test will automatically be run.

+ Preferences

		Test identification ^	Test description
You can administer the following resources:			
ServerRule11		Performs analysis of whether or there are symptoms of a memory leak. Requires Advisor and Memory Leak Rule to be enabled.	
Total 1			

- ___ g. To run the test, click **ServerRule11**. The result is that no memory leak is detected.

[Tests Quick Link or Server Selection](#) > [Diagnostic Providers](#) > [Test Selection](#) > [Test Results](#)

The results of the diagnostic providers test. Use the 'Save' button to save the results of the test to a log file. A message will be displayed with information of where the saved log file location is. To see more detailed test result information, select the message for the test result.

+ Preferences

Save			
Node ^	Server ^	Severity ^	Message
You can administer the following resources:			
Node1	SingleClusterMember1	Informational	TUNE9004I: No memory leak detected {0}.
Total 1			

- ___ h. Click the message to see more details.

[Tests Quick Link or Server Selection](#) > [Diagnostic Providers](#) > [Test Selection](#) > [Test Results](#) > [Test Result Details](#)

The detailed results of the diagnostic providers test. Use the 'Save' button to save the results of the test to a log file. A message will be displayed with information of where the saved log file location is.

+ Preferences

Cancel	Save	
Name ^	value ^	Description
You can administer the following resources:		
memoryLeak-leakDetected	false	No memory leak detected.
Total 1		

**Information**

Certain self-tests and state data are not interesting to view until the system collects data for some time. For example, the algorithms that are used to detect potential memory leaks need time to watch for trends in Java heap usage to make a determination.

Part 8: Examine runtime messages

The Troubleshooting area of the administrative console displays messages about runtime events and configuration problems. This area automatically refreshes, and you can view either the runtime messages or configuration problem totals.

- ___ 1. In the administrative console, expand **Troubleshooting**.
- ___ 2. Expand **Runtime Messages**. You see entries for **Runtime Error**, **Runtime Warning**, and **Runtime Information**.
- ___ 3. Click **Runtime Information** to view all of the messages. The Runtime events option is disabled by default; the event level is **None**, so you do not see any messages.
- ___ 4. To enable all runtime events, select **Info** from the menu, and click **Apply**.
- ___ 5. **Save** the changes to the master configuration.
- ___ 6. In the **Message** column, click a message to see the message details.

Timestamp	Message Originator	Message
May 11, 2014 12:27:03 AM PDT	com.ibm.ws.management.repository.FileRepository	ADMRO0016I: User defaultWIMFileBasedRealm/bpmadmin
Total 1		

Part 9: Enable cross-component trace (XCT)

In this section, you learn how to enable cross-component trace (XCT) for an application server. You also examine the request IDs and other data that XCT provides in the server logs.

- ___ 1. Enable XCT for dmgr.
 - ___ a. In the administrative console, click **Troubleshooting > Logs and trace > nodeagent > Change log detail levels**.
 - ___ b. On the **Configuration** tab, scroll down to the **Correlation** section.

- ___ c. Check the box for **Enable log and trace correlation**, and select **Include request IDs in log and trace records and create correlation log records**.

Correlation

Enable log and trace correlation so entries that are serviced by more than one thread, process, or server will be identified as belonging to the same unit of work.

<input checked="" type="checkbox"/> Enable log and trace correlation
<input type="radio"/> Include request IDs in log and trace records
<input checked="" type="radio"/> Include request IDs in log and trace records and create correlation log records
<input type="radio"/> Include request IDs in log and trace records, create correlation log records, and capture data snapshots

- ___ d. Click **OK**.
 ___ e. Click **Save** to master configuration.



Information

Include request IDs and trace records and create correlation log records:

This setting enables XCT to include request IDs in log and trace files when you want to see which log and trace entries, in all threads and application server processes, are related to the same request. Request IDs are recorded only when using HPEL log and trace mode and can be seen or used for filtering by using the `logViewer` command.

In addition, XCT creates correlation log records when you want to log how requests branch between threads and processes, and see extra information about each request.

Warning: Enabling XCT to create correlation log records might have a significant performance impact on your system, so is best suited for test and development environments.

- ___ 2. Change the trace specification to gather data for HTTP requests.
 ___ a. Click **Troubleshooting > Logs and trace > nodeagent > Change log detail levels**.

- __ b. Select the **Configuration** tab, and change the current trace level to following string:

`*=info: HTTPChannel=all`

General Properties

Save runtime changes to configuration as well

Change log detail levels

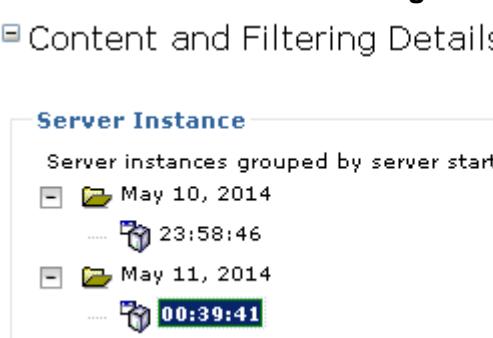
Disable logging and tracing of potentially sensitive data (WARNING: This might cause the log detail to be modified when it is applied on the server.)

Select components and specify a log detail level. Log detail levels specified here will apply to the entire cluster. Expand Components and Groups and click Components to specify a log detail level for individual components. Click Groups to specify a log detail level for a predefined group of components. Click a component or group to select a log detail level. Log detail levels are cumulative.

`*=info: HTTPChannel=all`

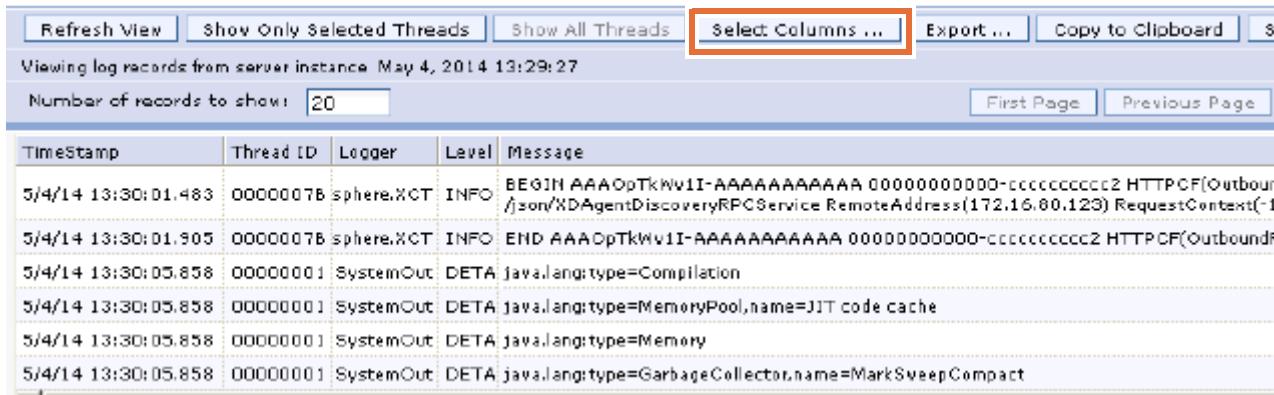
+ Components and Groups

- __ c. Click **OK**.
- __ d. Click **Save** to master configuration.
- __ 3. Restart servers so that the new configuration is in effect.
- __ a. Select **Servers > Server Types > WebSphere application servers**, and select the **SingleClusterMember1**.
- __ b. Click **Stop**.
- __ c. Click **OK** to confirm.
- __ d. Wait until the server stops successfully, and click **OK**.
- __ e. Click **Logout**, and minimize the browser.
- __ f. Double-click the **Stop the Process Center node agent** shortcut icon in the **Process Center** folder on the desktop.
- __ g. If the **Login at the Target Server** window appears, enter `bpmadmin` in the **User Identity** field and `web1sphere` in the **User Password** field.
- __ h. Click **OK**.
- __ i. Wait until the stop command is successfully completed, and press any key to continue.
- __ j. Double-click the **Stop the Process Center deployment manager** shortcut icon.
- __ k. If you are prompted, enter `bpmadmin` in the **User Identity** field and `web1sphere` in the **User Password** field.
- __ l. Click **OK**.
- __ m. Wait until the stop command is successfully completed, and press any key to continue.
- __ n. Double-click the **Start the Process Center deployment manager** shortcut icon.

- ___ o. Wait until the start command is successfully completed, and press any key to continue.
 - ___ p. Double-click the **Start the Process Center node agent** shortcut icon.
 - ___ q. Wait until the start command is successfully completed, and press any key to continue.
 - ___ r. Return to the **administrative console** on Firefox browser, and enter `bpmadmin` in the **User Identity** field and `websphere` in the **User Password** field.
 - ___ s. Click **Log in**.
 - ___ t. In the administration console, expand **Servers > Server Types** and click **WebSphere application servers**.
 - ___ u. Select the **SingleClusterMember1** check box.
 - ___ v. Click **Start**.
 - ___ w. Wait until the start command is successfully completed, and the status becomes started.
4. Generate an HTTP request and examine the XCT data by using the GUI Log Viewer.
- ___ a. Start a new browser and enter the web address:
`http://localhost:9081/PlantsByWebSphere`
 Accessing the Plants By WebSphere Welcome page generates several HTTP requests.
 - ___ b. From the administrative console, click **Troubleshooting > Logs and trace > nodeagent > View HPEL Logs and Trace**.
 - ___ c. Expand the **Contents and Filtering Details** tree. Select the most recent time stamps.

 - ___ d. Under the Filtering section, enter `com.ibm.websphere.XCT` in the **Include loggers** field.

 - ___ e. Click **Apply**. Notice that you see the log records from the `com.ibm.websphere.XCT` logger.

__ f. Click **Select columns**.



Viewing log records from server instance May 4, 2014 13:29:27				
Number of records to show: 20				
TimeStamp	Thread ID	Logger	Level	Message
5/4/14 13:30:01.483	0000007B	sphere.XCT	INFO	BEGIN AAAOpTkWvII-AAAAAAAAAAA 000000000000-cccccccccc2 HTTPCF(Outbound /json/XDAgentDiscoveryRPCService RemoteAddress(172.16.0.123) RequestContext(-1
5/4/14 13:30:01.905	0000007B	sphere.XCT	INFO	END AAAOpTkWvII-AAAAAAAAAAA 000000000000-cccccccccc2 HTTPCF(Outbound /json/XDAgentDiscoveryRPCService RemoteAddress(172.16.0.123) RequestContext(-1
5/4/14 13:30:05.858	00000001	SystemOut	DETA	java.lang:type=Compilation
5/4/14 13:30:05.858	00000001	SystemOut	DETA	java.lang:type=MemoryPool,name=JIT code cache
5/4/14 13:30:05.858	00000001	SystemOut	DETA	java.lang:type=Memory
5/4/14 13:30:05.858	00000001	SystemOut	DETA	java.lang:type=GarbageCollector,name=MarkSweepCompact

__ g. Select only **Message**. Clear the other columns and click **OK**.



Information

When an HTTP request arrives, the server does an XCT BEGIN that indicates that the request started processing. The entry in the logs shows the following information:

- Parent XCT ID
- Current XCT ID
- Type of request (InboundRequest or OutboundRequest)
- URI of request RequestContext object
- ID from HTTPChannel
- RemoteAddress from the connection that the request is originated from

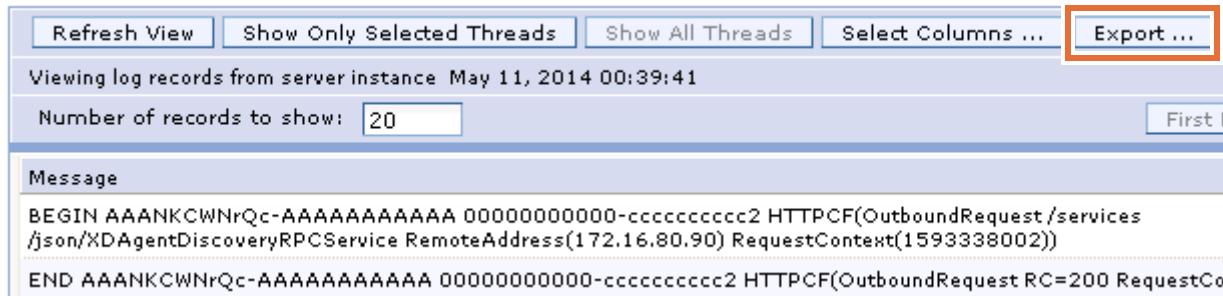
When the request completes processing, the server does an XCT END; this message marks the request as finished. An XCT END for an HTTP request shows the following attributes:

- Parent XCT ID

- Current XCT ID
- The type of request, which includes InboundRequest and OutboundRequest.
- Return code (RC) of the response
- HTTP Channel RequestContext object ID

— 5. Export the XCT data.

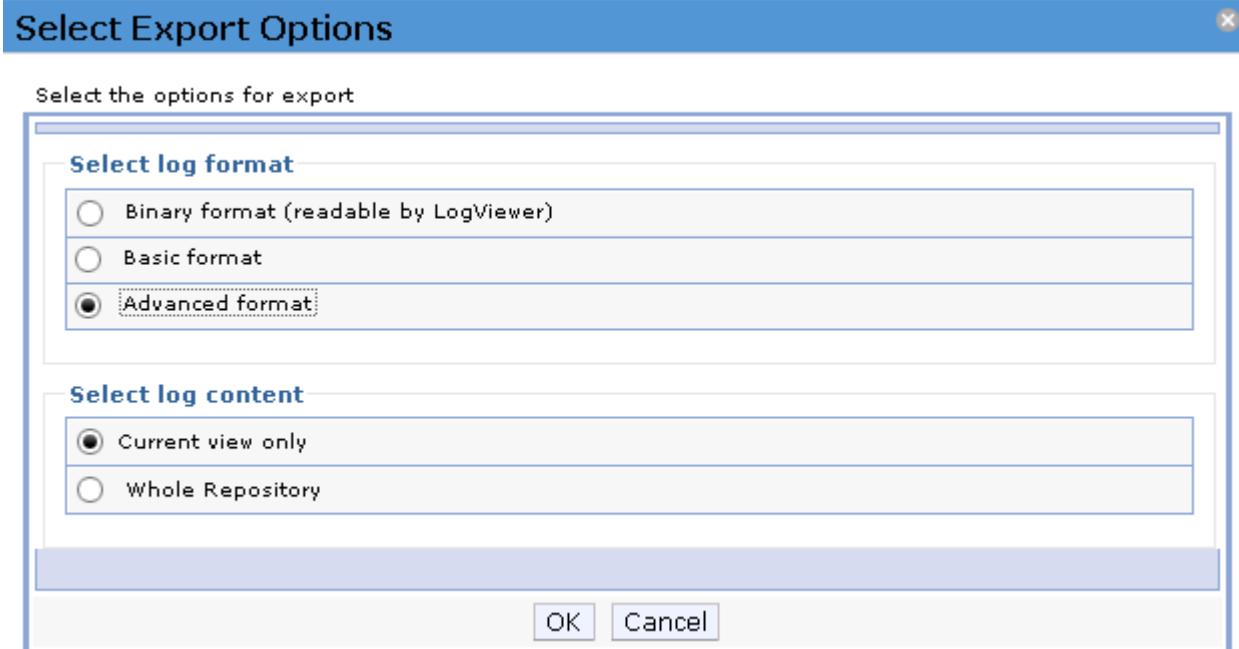
— a. Click **Export**.



The screenshot shows the Log Viewer interface with the following details:

- Toolbar buttons: Refresh View, Show Only Selected Threads, Show All Threads, Select Columns ..., Export ... (highlighted with a red box).
- Text: Viewing log records from server instance May 11, 2014 00:39:41
- Text input: Number of records to show: 20
- Text: First F
- Section: Message
- Text: BEGIN AAANKCWNrQc-AAAAAAAAAAA 000000000000-cccccccc2 HTTPCF(OutboundRequest /services /json/XDAgentDiscoveryRPCService RemoteAddress(172.16.80.90) RequestContext(1593338002))
- Text: END AAANKCWNrQc-AAAAAAAAAAA 000000000000-cccccccc2 HTTPCF(OutboundRequest RC=200 RequestContext(1593338002))

— b. In Select Export Options, select **Advanced format** and **Current view only**.



— c. Click **OK**.

— d. Click **Open with Windows Explorer (default)**.

— e. Click **OK**.

— f. Double-click the **logs_PCCell1_Node1_nodeagentnnnn.txt** file to examine the data.

- ___ g. The log records show the unit of work (UOW), which includes the XCT logger and the requestID.

```
[5/11/14 0:40:19:672 PDT] 00000081 I UOW= source=com.ibm.websphere.XCT
org=null prod=null component=null thread=[Thread-56]
requestID=[AAANKCWNrQc-AAAAAAAAAAA]

    BEGIN AAANKCWNrQc-AAAAAAAAAAA 000000000000-cccccccccc2
HTTPCF(OutboundRequest /services/json/XDAgentDiscoveryRPCService
RemoteAddress(172.16.80.90) RequestContext(1593338002))
[5/11/14 0:40:19:875 PDT] 00000081 I UOW= source=com.ibm.websphere.XCT
org=null prod=null component=null thread=[Thread-56]
requestID=[AAANKCWNrQc-AAAAAAAAAAA]

    END   AAANKCWNrQc-AAAAAAAAAAA 000000000000-cccccccccc2
HTTPCF(OutboundRequest RC=200 RequestContext(1593338002))
```

- ___ h. Close the logs_PCCell1_Node1_nodeagentnnnn.txt file when you are finished examining it.



Note

You can also use the command prompt Log Viewer to examine the XCT data

- Open a command prompt window and go to:
C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile\bin
- Find the instance ID of the running server by entering the following command:

```
logViewer.bat -listInstances
```

- At the command prompt, enter 1 to select the nodeagent server, and press the Enter key.

```
Administrator: Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows>cd C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile\bin

C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile\bin>logViewer.bat -listInstances
Please select a server
1) nodeagent
2) SingleClusterMember1
[1-2]: 1
Using C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile\logs\nodeagent as temporary directory.

Instance ID          Start Date
1399064482322      05/02/14 14:01:22.322 PDT
1399066856023      05/02/14 14:40:56.023 PDT
1399071044208      05/02/14 15:50:44.208 PDT
1399075696595      05/02/14 17:08:16.595 PDT
```

- Enter the most recent instance ID here: _____
- Enter the following command to redirect the output.

```
logViewer.bat -includeLoggers "com.ibm.websphere.XCT" -format advanced
-instance <your_Instance_ID> > C:\xct_data.txt
```

- Enter 1 to select the nodeagent server, and press **Enter**.

```
C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile\bin>logViewer.bat -inc]
ggers "com.ibm.websphere.XCT" -format advanced -instance 1399075696595 > C:
...a.txt
1
```

```
C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile\bin>_
```



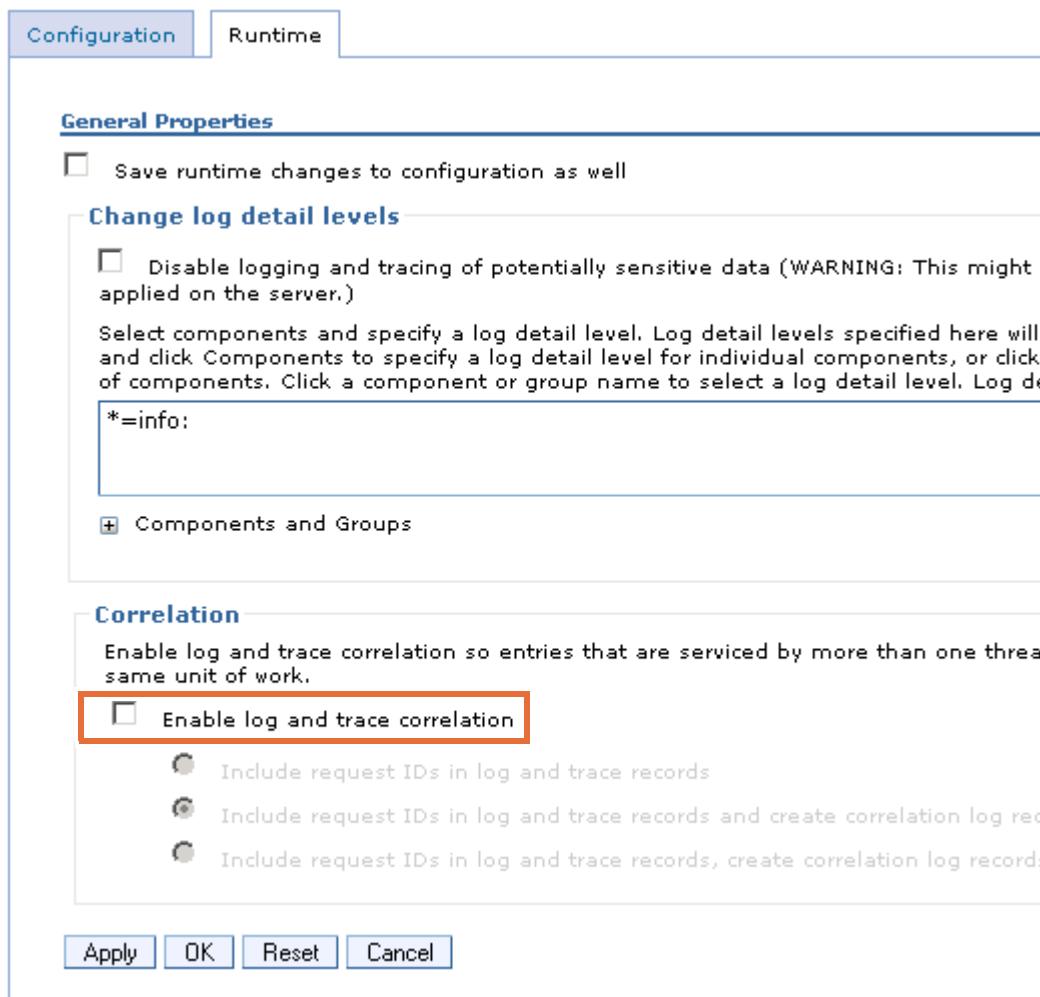
Information

IBM Cross Component Trace Log Viewer

Available in the IBM Support Assistant, IBM WebSphere Cross Component Trace Log Viewer provides enhanced log file views for logs that are augmented with cross-component trace correlation log records. Logs can be displayed in flat or hierarchical layouts, and multiple logs can be loaded and viewed simultaneously with log entries related to each request conveniently grouped.

- ___ 6. Clear the HTTP trace strings and disable XCT.
 - ___ a. Click **Troubleshooting > Logs and trace > nodeagent > Change log detail levels**.
 - ___ b. Click the **Runtime** tab.
 - ___ c. Remove `HTTPChannel=all` from **Change log detail levels**.

- ___ d. Scroll down to the Correlation section and clear the box for **Enable log and trace correlation**.



- ___ e. Click **OK**.
___ f. Click **Save**.

Part 10: Examine FFDC, system out and error logs

The first-failure data capture (FFDC) log files save information that is generated from a processing failure (for example, a Java exception). Captured data is saved in log files for use in analysis. These files include an index file that references all of the exceptions that FFDC logs, and an exception file for each exception type from each probe. These files are deleted after a maximum number of days. FFDC is enabled by default since capturing FFDC data does not affect performance.

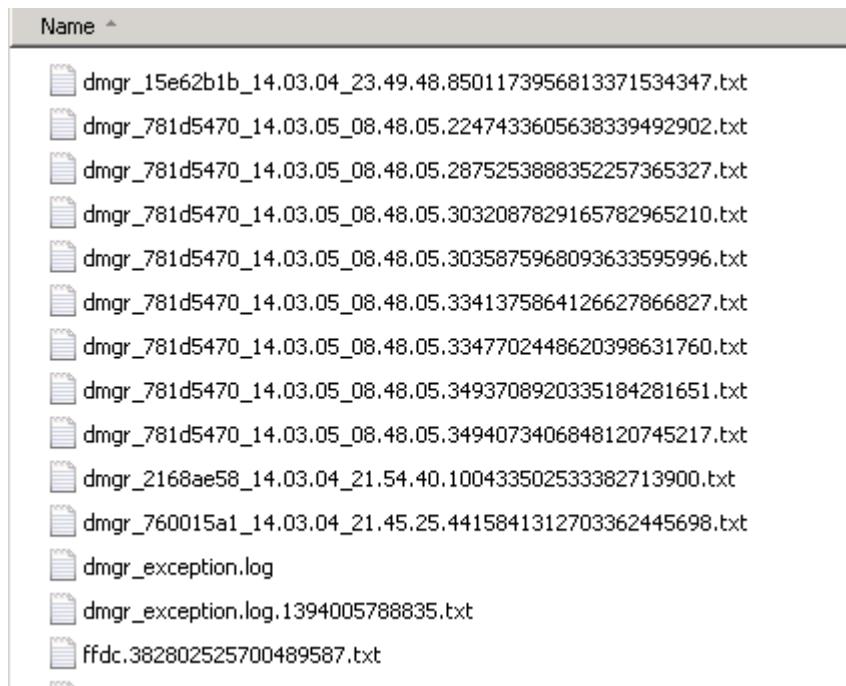
- ___ 1. Examine the FFDC logs for **dmgr** profile.

- ___ a. Use Windows Explorer to go to:

C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\logs\ffdc

- ___ b. Typically, you see dozens of files in the `ffdc` directory. These files include:

`dmgr.<Thread_ID>.<Timestamp>.<Seq_No>.txt` (several)
`dmgr_exception.log`
`dmgr.<Thread_ID>.<Timestamp>.<Seq_No>.txt` (several)
`dmgr_exception.log` (one per application server)



The `SystemOut.log` file for the node agent and the application servers contains messages that the **FfdcProvider** writes for each failure incident. These messages point to the relevant text file in the `ffdc` directory, which contains the exception and the stack trace (call stack).

- ___ 2. Examine a particular FFDC incident.

- ___ a. Use Notepad to open one of the older server exception logs with a name like the `dmgr_exception.log.<Seq_No>.txt` file. Each row has an index and a count number. The count is the number of occurrences of the exception and is useful for seeing whether there is an unusual number of occurrences of any particular exception.

Index	Count	Time of first occurrence	Time of last occurrence	Exception
0	3	3/4/14 21:45:25:425 PST	3/4/14 21:49:27:846 PST	java.io.I
1	1	3/4/14 21:54:40:100 PST	3/4/14 21:54:40:100 PST	java.lang
2	1	3/4/14 23:45:39:865 PST	3/4/14 23:45:39:865 PST	com.ibm.w

- ___ b. Select any exception of interest and record its text file name that is at the end of each line:

- ___ c. Locate the text file in the `ffdc` directory and open it with Notepad. In this file, you see the actual Java exception and the stack trace.

- ___ d. After you are done examining the text file, close it.
- ___ 3. Examine the `SystemErr.log` file.
 - ___ a. Use Windows Explorer to go to:
`C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile\logs\nodeagent`
 - ___ b. Select the **SystemErr.log** file and open it with Notepad.

This log file contains Java exceptions and stack traces. Enterprise applications and their associated application servers detect these exceptions. An empty `SystemErr.log` file does not necessarily indicate success since not all error messages from an application are considered to be error messages by the operating system. You must also examine the contents of the `SystemOut.log` file.
- ___ 4. Examine the `SystemOut.log` file.
 - ___ a. Use Windows Explorer to go to
`C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile\logs\nodeagent`
 - ___ b. Select the **SystemOut.log** file and open it with Notepad.

This log file contains messages that are generated when the applications that are running inside the application server are being started or stopped. This log file does not contain error messages such as the messages that appear in the `SystemErr.log` file. However, this log file contains error messages that the operating system does not see as error messages.

Both the `SystemOut.log` file and the `SystemErr.log` file should be checked after starting an application server. This check is to confirm that the applications inside the application server that is started also already started successfully.

Part 11: Working with namespace tools

- ___ 1. Use the `dumpNameSpace` tool to dump namespaces from different root contexts and different name servers. You can use the `dumpNameSpace` tool to dump the contents of a namespace that is accessed through a name server. The `dumpNameSpace` tool is based on the Java Naming and Directory Interface (JNDI). When you run the `dumpNameSpace` tool, the naming service must be active.
 - ___ a. In a command prompt window, change the directory to:
`C:\IBM\BPM\ProcessCenter\v8.5\bin`
 - ___ b. To dump the namespace from the cell root with **SingleClusterMember1**'s name service, enter the following command:

```
dumpNameSpace.bat -root cell -port 9810 -user bpmadmin -password web1sphere
```


Note

The port number in this case is the bootstrap port, which is 9810 by default. You can find the ports for any server on the configuration tab in the administrative console.

- c. Verify that a name space dump is listed.

```
C:\IBM\BPM\ProcessCenter\v8.5\bin>dumpNameSpace.bat -root cell -port 9810 -user pcdeadmin -pass... [x]

C:\IBM\BPM\ProcessCenter\v8.5\bin>dumpNameSpace.bat -root cell -port 9810 -user
pcdeadmin -password websphere

Getting the initial context
Getting the starting context
=====
Name Space Dump
Context factory: com.ibm.websphere.naming.WsnInitialContextFactory
Provider URL: corbaloc:iiop:localhost:9810
Requested root context: cell
Starting context: <top>=PCCell1
Formatting rules: jndi
Time of dump: Fri May 02 23:16:35 PDT 2014
=====

=====
Beginning of Name Space Dump
=====
1 <top>
2 <top>/persistent                                     javax.naming.Context
3 <top>/persistent/cell                                javax.naming.Context
3   Linked to context: PCCell1
4 <top>/persistent/sca                                 javax.naming.Context
5 <top>/persistent/sca/BFMIF_SingleCluster           javax.naming.Context
6 <top>/persistent/sca/BFMIF_SingleCluster/export    javax.naming.Context
7 <top>/persistent/sca/BFMIF_SingleCluster/export/com javax.naming.Context
7
8 <top>/persistent/sca/BFMIF_SingleCluster/export/com/ibm javax.naming.Context
8
9 <top>/persistent/sca/BFMIF_SingleCluster/export/com/ibm/bpe javax.naming.Context
9
10 <top>/persistent/sca/BFMIF_SingleCluster/export/com/ibm/bpe/api javax.naming.Context
10
11 <top>/persistent/sca/BFMIF_SingleCluster/export/com/ibm/bpe/api/sca javax.naming.Context
11
```

- __ d. Feel free to explore the name space dump. If you want the name space dump to be stored in a file, you can direct the output by running the following command:

```
dumpNameSpace.bat -root cell -port 9810 -user bpmadmin -password web1sphere >  
C:\NameSpaceDump.log
```

This command generates the output file C:\NameSpaceDump.log on your folder.

- __ e. Close any open browsers and the command prompt window.



Information

You cannot use the dumpNameSpace tool to dump a `java:` or `local:` namespace because the dumpNameSpace tool cannot access those namespaces.

The **java:** namespace of a Java Platform, Enterprise Edition (Java EE) application is accessible only by that application. You can invoke a NameServer MBean to dump the java: namespace for any Java EE application that runs in the same server process.

The **local:** namespace contains references to enterprise beans with local interfaces. There is only one local: namespace in a server process. You can invoke the NameServer MBean associated with that server process to dump the local: namespace.

Use the scripting tool to invoke the NameServer MBean running in the application's server process to generate dumps of java:, local:, or server namespaces.



End of exercise

Exercise review and wrap-up

In this exercise, you located and viewed log files for the WebSphere Application Server. You used a text editor to view the log files and the Log Analyzer tool to view logs and trace files. You also learned how to enable tracing for an application server by using the administrative console. You also examined other sources of diagnostic data, such as class loaders, memory leaks, and namespaces.

Exercise 2. Using IBM Support Assistant

What this exercise is about

This exercise demonstrates how to use various tools and features in IBM Support Assistant Team Server V5 and IBM Support Assistant Data Collector.

What you should be able to do

At the end of this exercise, you should be able to:

- Start and stop IBM Support Assistant Team Server
- Administer IBM Support Assistant Team Server
- Run report generator tools and examine the reports
- Use the Case Manager to create a case and add diagnostic data
- Run interactive desktop tools
- Use Automated Analysis to scan a case and examine the results
- Run the Data Collector tool
- Collect MustGather data for IBM Business Process Manager by using the automated Data Collector tool

Introduction

IBM Support Assistant is a web-based application to assist with organizing, analyzing, and diagnosing issues with software. It applies the concept of cases to grouping problem diagnostic files together regarding an overlying issue. Using an intuitive interface, it provides easy case management, file management, problem determination capabilities, and automated data collection capabilities.

IBM Support Assistant V5 includes its own server that is easily configured and maintained. IBM Support Assistant can be installed as a Team Server so that a group of users can all access a single, shared instance of IBM Support Assistant by pointing their browsers to it. Alternatively, it can also be installed as a single-user desktop application and can be accessed through a browser by pointing to the local server.

The Data Collector tool is included with the installation of Business Process Manager V8.5. Data Collector is a command-line tool that you can use to automatically collect data. This data can help IBM support troubleshoot your issue.

Requirements

Completing the exercises for this course requires a lab environment. This environment includes the exercise support files, IBM Process Designer, IBM Process Portal, IBM Process Center, IBM Process Server, and IBM Integration Designer test environment. Additionally, IBM Support Assistant Team Server V5 and the IBM Data Collector tools must be installed.

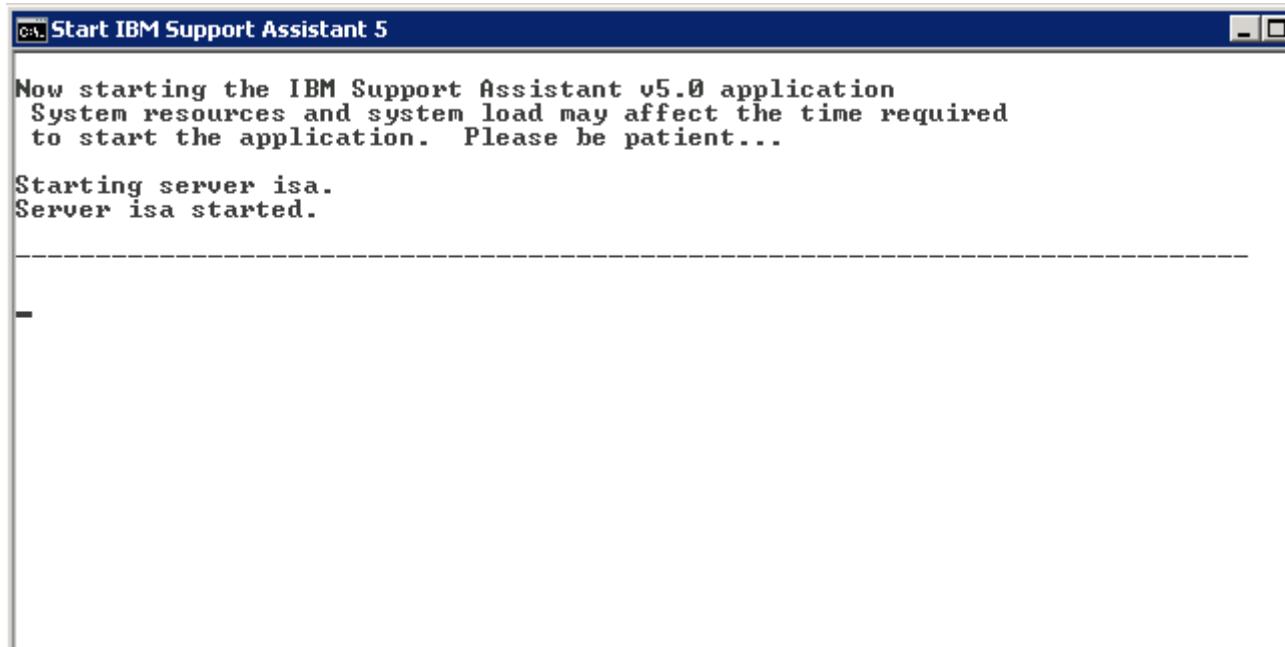
Exercise instructions

Part 1: Starting the IBM Support Assistant Team Server V5

IBM Support Assistant Team Server is an application server that hosts Java EE applications. In particular, the `ISA.ear` application implements the web client and other services. All of the problem determination tools are installed on the server as WAR files.

- ___ 1. Start IBM Support Assistant Team Server V5.
 - ___ a. Go to **Start > All Programs > IBM Support Assistant 5**, and then click **Start IBM Support Assistant 5**.

A command prompt window opens that shows status messages for IBM Support Assistant V5.



```
Start IBM Support Assistant 5

Now starting the IBM Support Assistant v5.0 application
System resources and system load may affect the time required
to start the application. Please be patient...

Starting server isa.
Server isa started.
```

After IBM Support Assistant is started, the window closes.

- ___ 2. Start the IBM Support Assistant client in a web browser.
 - ___ a. Start Firefox and enter the following web address:
`http://localhost:10911/isa5`
 - ___ b. In the Untrusted Connection window, click **I Understand the Risks** to expand the option.
 - ___ c. Click **Add Exception**.
 - ___ d. Click **Confirm Security Exception**.

- __ e. At the First Time Use window, clear the **Enable usage statistics** check box, and click **Submit**.



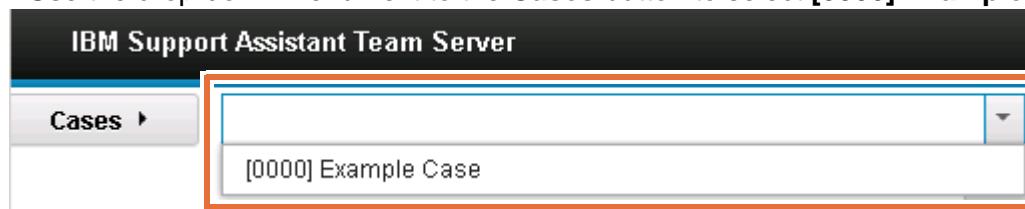
You should now see IBM Support Assistant Team Server in the web browser.

The screenshot shows the IBM Support Assistant Team Server interface. The title bar says 'IBM Support Assistant Team Server'. The main navigation bar includes 'Administration' and 'Language' dropdowns, and tabs for 'Cases', 'Files' (which is selected), 'Tools', 'Reports', 'Overview', 'Symptoms', and 'Knowledge'. Below the navigation is a 'Tree View' sidebar and a search bar for 'Search File Content'. The main content area features a 'Name Filter' input field and a table for managing files. The table columns are: Name, Modified (GMT-08:00), Type, Size, Sym, KB, F-TS, and L-TS. The table is currently empty. At the bottom right of the interface, there is a copyright notice: '© IBM Corp. 2011, 2013.'

- __ f. You can bookmark IBM Support Assistant in the browser for future use.

___ 3. View the provided example case.

___ a. Use the drop-down menu next to the **Cases** button to select [0000] Example Case.



___ b. When the case is selected, the **Files** tab comes into focus, and the Navigator pane displays folders that contain diagnostic data for this case.

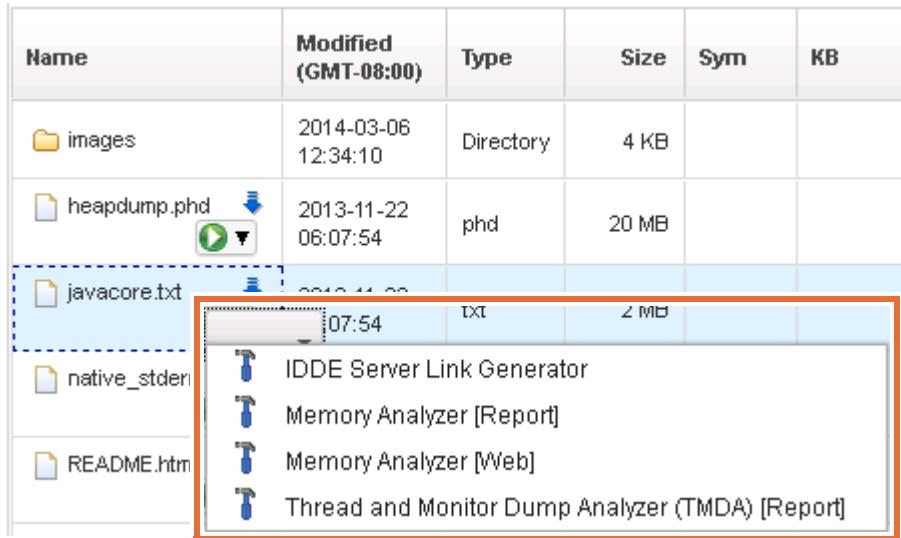
Name	Modified (GMT-08:00)	Type	Size	Sym
images	2014-03-06 12:34:10	Directory	4 KB	
heapdump.phd	2013-11-22 06:07:54	phd	20 MB	
javacore.txt	2013-11-22 06:07:54	txt	2 MB	
native_stderr.log	2013-11-22 06:07:58	log	387 KB	
README.html	2013-11-22	html	16 KB	

Notice that the right pane shows the files and folder that are contained in the folder for Case 0000. In this example case, diagnostic data was added in the form of heapdump.phd, javacore.txt, native_stderr.log, and SystemOut.log files.

___ 4. Explore some of the tools that you can use with the example case files.

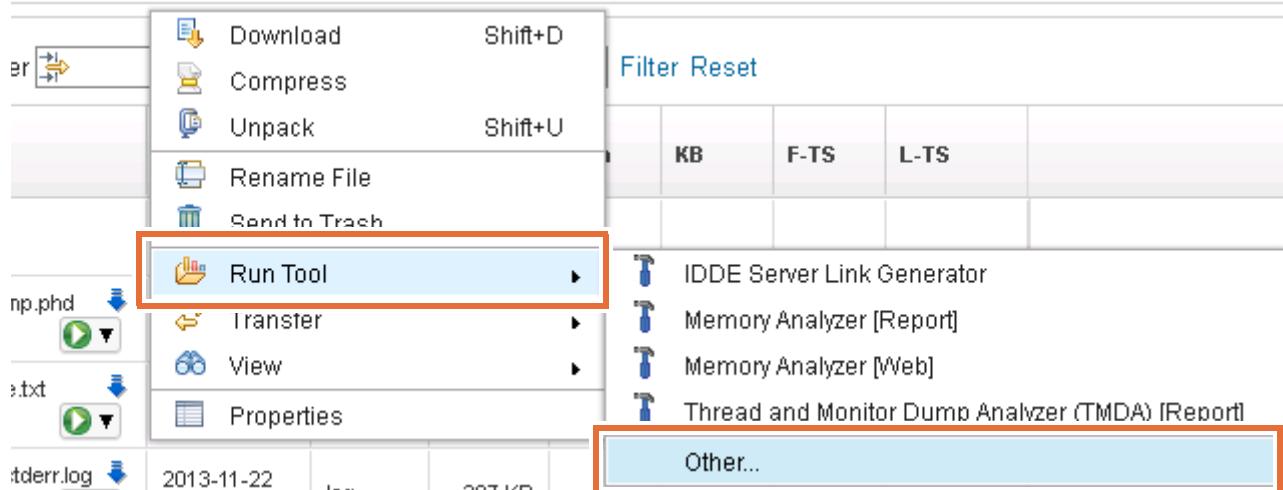
Each of the files in the provided example case has a green Quick Tool Launcher icon beside its name: 

- __ a. Click the launcher on the `javacore.txt` file to see the preferred tools for processing this file.



It is also possible to start a tool that is not listed as a preferred tool.

- __ b. Right-click the name of a file and from its menu, select **Run Tool > Other**.



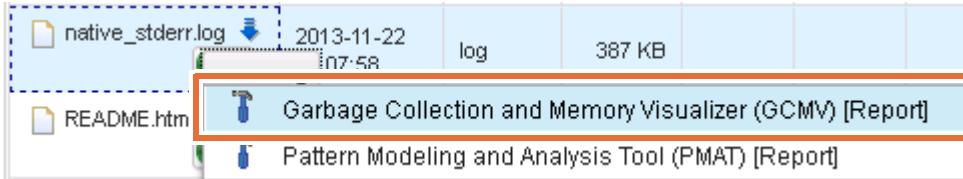
The “Select a tool to launch” window opens, and it lists the available tools for the file.

Select a tool to launch

Garbage Collection and Memory Visualizer (GCMV) [Report]

- IDDE Server Link Generator
- Memory Analyzer [Report]
- Memory Analyzer [Web]
- Pattern Modeling and Analysis Tool (PMAT) [Report]
- Portal Log Analyzer [Report]
- Profile Port Checker [Report]
- Thread and Monitor Dump Analyzer (TMDA) [Report]
- WebSphere Application Server Configuration Visualizer [Report]

- ___ c. Examine each of the other files in this case to see what tools are available for it.
Selecting any of the tools that are listed starts the tool against the diagnostic data file.
 - ___ d. Click **Cancel**.
- ___ 5. Use the Quick Tool Launcher to run Garbage Collection and Memory Visualizer (GCMV) against the `native_stderr.log` file.
- ___ a. Click the launcher for the `native_stderr.log` file and select **Garbage Collection and Memory Visualizer (GCMV) [Report]**.



- __ b. Select the **generateTableData** check box, and click **Submit**.

Run Tool

Garbage Collection and Memory Visualizer (GCMV) [Report]

Version 2.7.0.201305232002

Input Files and Folders

/IBM/ISA/ISA5/isa/cases/0000/native_stderr.log

Parameters

Parameter	Description	Value
generateTableData	Save parsed data in .txt file. WARNING: This is time and memory consuming	<input checked="" type="checkbox"/>

Run as background task:

Submit

Cancel



Note

Notice the **Run as background task** check box.

This box is selected by default. This option is an artifact from a previous version, and the behavior for running the tool is the same regardless of whether the box is selected or not. When the box is selected, you immediately see a yellow alert message with the **Go to output folder** option. If the box is not selected, then you see a yellow alert message when the tool finishes running and there is a link to the report.

- __ c. On the message, click **Go to output folder**.

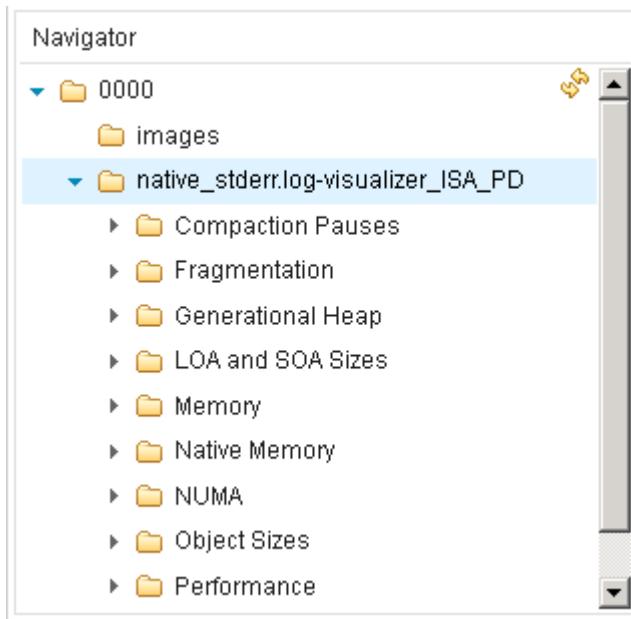
i The Garbage Collection and Memory Visualizer (GCMV) [Report] tool request has been submitted.
[Go to output folder](#) [View active tool requests.](#)

The GCMV tool can take several minutes to analyze the `native_stderr.log` file and generate a report. The report shows as a new folder in the Navigator pane.

- __ d. Wait until the report is available, and then expand the `native_stderr.log-visualizer_ISA_PD` folder to view its contents.

**Note**

If you do not see contents in the **native_stderr.log-visualizer_ISA_PD** folder, click the Refresh icon:



- ___ e. Click the **Generational Heap** folder and double-click the **Results.html** file in the right pane.

Name	Modified (GMT-08:00)
Report	2014-03-07 12:49:32
Line plot.png	2014-03-07 12:49:32
Results.html	2014-03-07 12:49:32

The results are displayed in a new browser tab.



- ___ f. Click **Report**. Examine the contents of the report.



Information

Reviewing the analysis report

GCMV generates a simple high-level report with links to the full report, a line plot of the data, and a table of the data. The full report shows you a table of contents on the left and a series of analysis sections.



For this exercise, you want to focus on the **Tuning Recommendation** section. You notice that the red X icon and yellow triangles indicate an important alert and several warnings.

As you read through the tuning recommendations, you see that GCMV alerts you that the application appears to be leaking memory. There are more warnings about the use of large objects and long garbage collection pause times. It might be that you missed something in your coding and testing, but at least GCMV alerts you to a problem.

Scroll down through the report to see data about VM settings, free heap, and heap size.

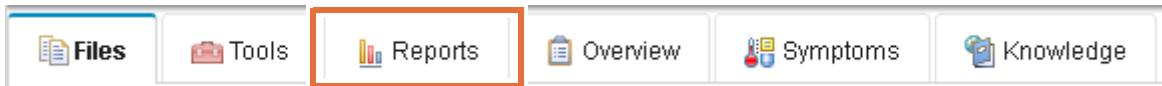
- ___ 6. View the line plot.

- ___ a. Use the back arrow on your browser, and click **Line plot** to view a graph of the plotted data from the `native_stderr.log` file.

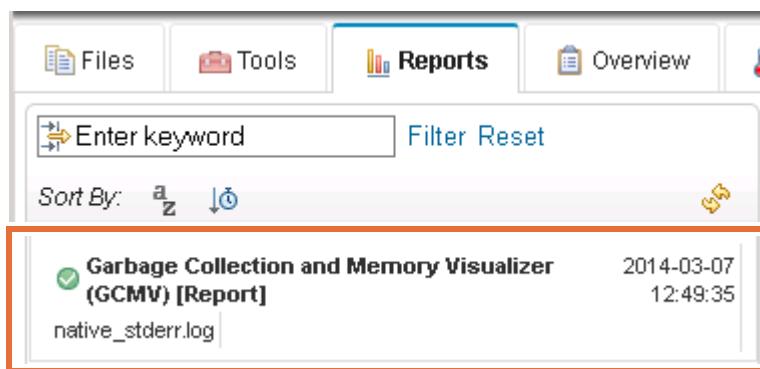
- __ b. The line plot shows **Heap size** (top line) and **Free heap after collection** (bottom line).
 - __ c. Close the **Generational Heap** browser window.
7. Use the **Reports** tab to view reports.

Reports from the report version of a tool are also saved in the **Reports** tab for a case.

- __ a. Click the **Reports** tab.



All reports that were generated for the case are listed in the left pane.



Note

If you do not see any reports, click the **Refresh** icon:

- __ b. Click the report to view its contents.

The screenshot shows the GCMV interface with the title "Garbage Collection and Memory Visualizer (GCMV) [Report]". The main content area is titled "Templates". Below it, there is a section titled "Memory" with the following text:
Properties of the heap.
Useful for diagnosing memory leaks or suboptimal heap sizing.
Below this, there are two links: "Report" and "Line plot".
Under the "Performance" section, there is the following text:
Garbage collection pauses.
Useful for investigating performance problems.

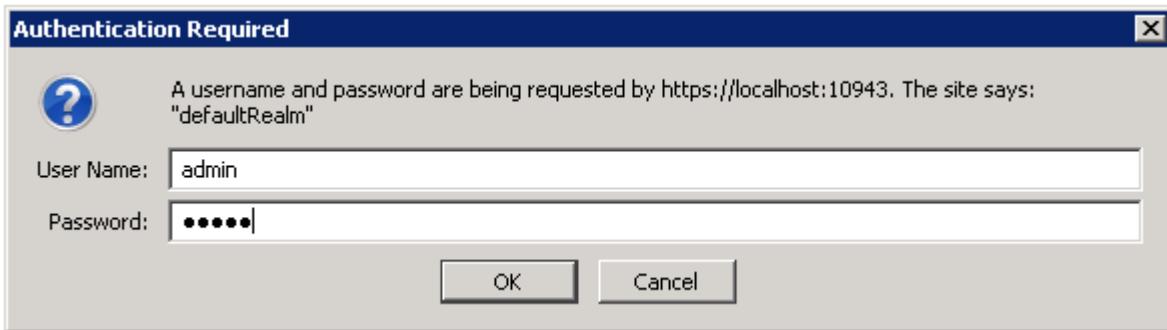
Part 2: Logging in to and exploring the IBM Support Assistant Administration Console

The **Tools Administration** tab in the administration console shows a list of all problem determination tools that are available for IBM Support Assistant Team Server V5. An administrator can log in to this tab and install, update, and uninstall problem determination tools.

- __ 1. Log in to the IBM Support Assistant administration console.
__ a. On the banner for IBM Support Assistant, go to **Administration > Tool Administration**.



- ___ b. When you are prompted to authenticate, enter `admin` in the **User Name** and **Password** fields, and click **OK**.



Information

You are logging in with the default IBM Support Assistant administrator credentials. They can be changed by editing the `server.xml` file for the IBM Support Assistant server.

- __ 2. Explore the Tools Administration console. After logging in, you see the catalog of IBM Support Assistant tools, or the “Tool catalog.”

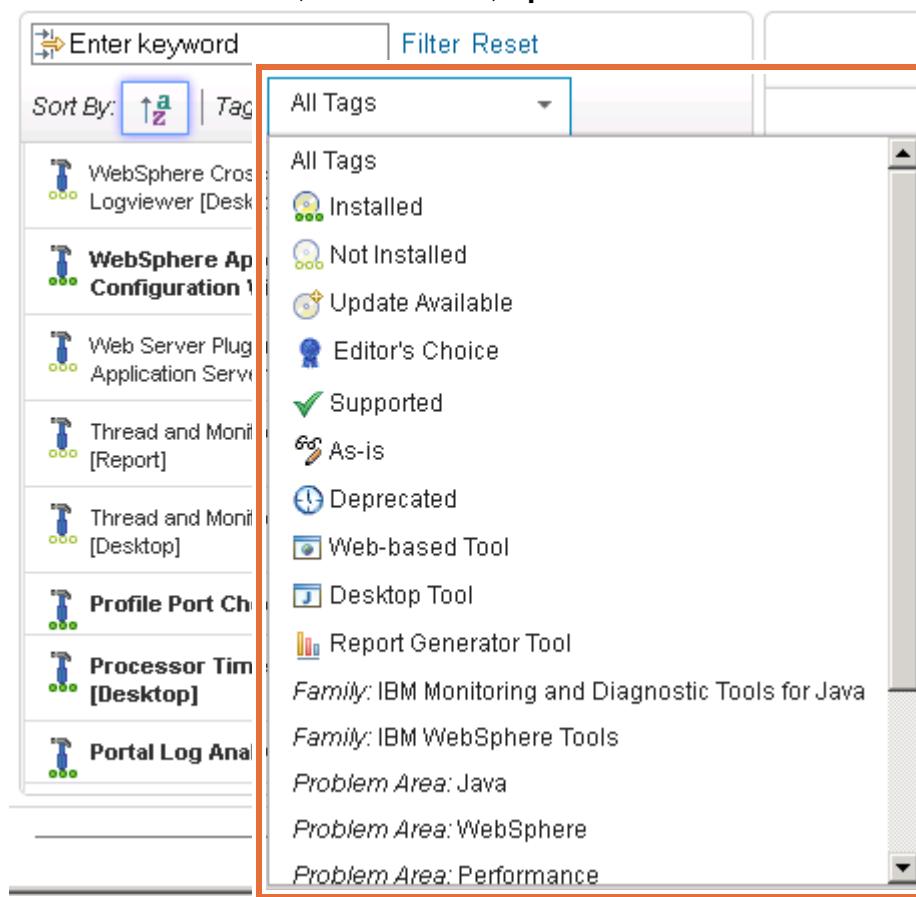
The screenshot shows the Administration Console interface with the title bar "Administration Console". Below it is a navigation bar with "Application Settings" and "Tool Administration" tabs. A "Refresh Catalog" button is visible. A search bar with "Enter keyword" and "Filter Reset" buttons is present. A sorting section allows "Sort By" (with "a-z" and "z-a" options) and "Tag" (set to "All Tags"). The main area displays a list of tools:

Icon	Name	Actions
Classloader Analyzer [Desktop]		
FileNet Optical Storage And Retrieval (OSAR)		
Cable Tool [Desktop]		
Garbage Collection and Memory Visualizer (GCMV) [Desktop]	✓	
Garbage Collection and Memory Visualizer (GCMV) [Report]	✓	
Health Center [Desktop]	✓	
HeapAnalyzer [Desktop]		

- __ a. Click Refresh Catalog and sort the catalog.

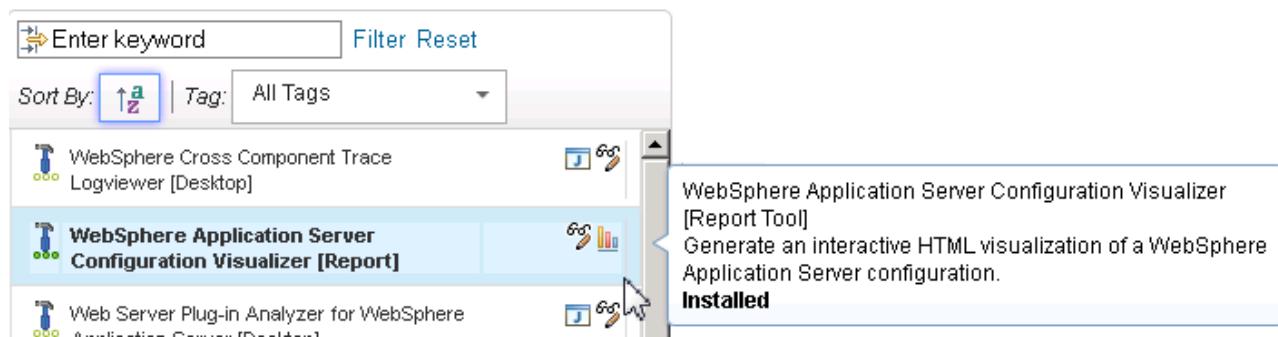
This screenshot is similar to the previous one, showing the Administration Console with the "Tool Administration" tab selected. The "Refresh Catalog" button and the "Sort By" dropdown are both highlighted with red boxes. The rest of the interface and tool catalog list are identical to the first screenshot.

- ___ b. Filter the tools by using different tags, such as **Installed** and **Not Installed**, and click **Refresh Catalog**. Recall from the lecture that the catalog uses visual clues to signal the status of a tool: **Installed**, **Not Installed**, **Update Available**.



You can also hover the cursor over any tool in the catalog to see information about its status.

- ___ c. Hover the cursor over any of the tools. You see the name and a short description of the tool, and its installation status.



- ___ d. Search for one of the tools in the catalog that are not installed, such as **Pattern Modeling and Analysis Tool (PMAT) [Desktop]**, and click its name to see details about it in the right pane.

Pattern Modeling and Analysis Tool (PMAT) [Desktop] Version 4.5.3.0

 [Install](#)

IBM Pattern Modeling and Analysis Tool for Java Garbage Collector (PMAT)

PMAT parses verbose GC traces and performs pattern modeling analysis of Java heap usage. Based on this analysis (and subject to JVM implementation limitations), PMAT recommends values for the following configuration parameters:

- *maximum tenured generation size*
- *maximum permanent generation size*
- *maximum Java heap size*

...

[\(more\)](#)

What's New:

- V4.5.3.0: addresses garbage collection log parser issues
- V4.5.2.0: detects excessive explicit garbage collections
- V4.4.7.1: update for IBM Support Assistant 5 GA
- V4.4.7.0: addresses truncated traces
- V4.4.5.2: doc update

Notice that you can see a description of the tool and what is new. If you scroll in the description window, you can also see tags for the tool.

Since the tool is not installed, you can use an **Install** link to install the tool. To install a tool, you need an IBM ID, so you are not going to install tools in this lab exercise.

- ___ e. Continue to explore other tools by clicking their names in the catalog, as time permits.
- ___ f. When you are done exploring, close the IBM Support Assistant Administration Console window.



Note

IBM Support Assistant administrator credentials

The administrator user name and password are cached in the browser. You must clear the browser cache.

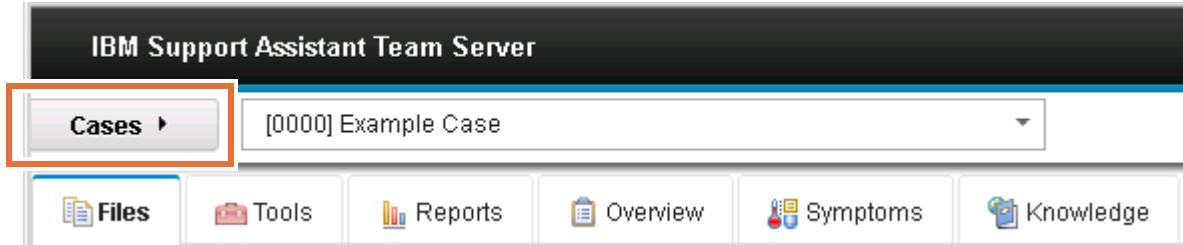
If you do not clear the browser cache, the next user is not prompted to log in, and the administration console is not protected.

Part 3: Creating a case and starting tools from the Tools tab

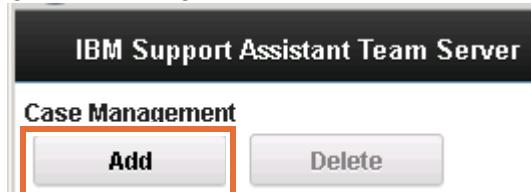
Before you begin troubleshooting a problem, you can create a case to manage related diagnostic files. Cases allow you to organize diagnostic artifacts by problem incident, failing system, time, or any other logical categories that you like. When you create a case, you assign a summary and you can optionally add details.

- ___ 1. Create a case.

- ___ a. On the IBM Support Assistant Team Server home page, click **Cases**.



- ___ b. In the Case Management dialog box, click **Add**.



- ___ c. Enter **MyCase** in the **Summary** field. You can provide an optional description, such as:
This case is an example case for the IBM Support Assistant lab exercise.

Case ID:	[New]		
Summary:	MyCase		
Description:	This case is an example case for the IBM Support Assistant lab exercise.		

Notice that the **Case ID** field is not editable. The case ID is automatically assigned when you save the case.

- ___ d. Click the green check mark to save the case.

Case ID:	0001		
----------	------	--	--

Notice that the Case ID that is assigned is 0001.

- ___ e. Click anywhere outside of the Case Management dialog box to exit it.

- ___ f. Select the **Files** tab and make sure that [0001] MyCase is listed in the **Cases** field.

The screenshot shows the IBM BPM V8.5 interface with the 'Cases' tab selected, displaying '[0001] MyCase'. Below the tabs are buttons for 'Tools', 'Reports', 'Overview', 'Symptoms', and 'Knowledge'. A 'Tree View' button is selected, showing a folder structure for '0001/*'. On the left, a 'Navigator' pane shows a folder for '0001'. A large 'Add files...' button is highlighted with a red box. To its right is a placeholder 'Or drag files into browser to add'. A 'Name Filter' button is also present. A table below lists files with columns for Name, Modified (GMT-08:00), and Type. One file entry is visible: Name [0001] MyCase, Modified 2014-09-16 10:45:00, Type File.

- ___ 2. Add diagnostic data files to the case.

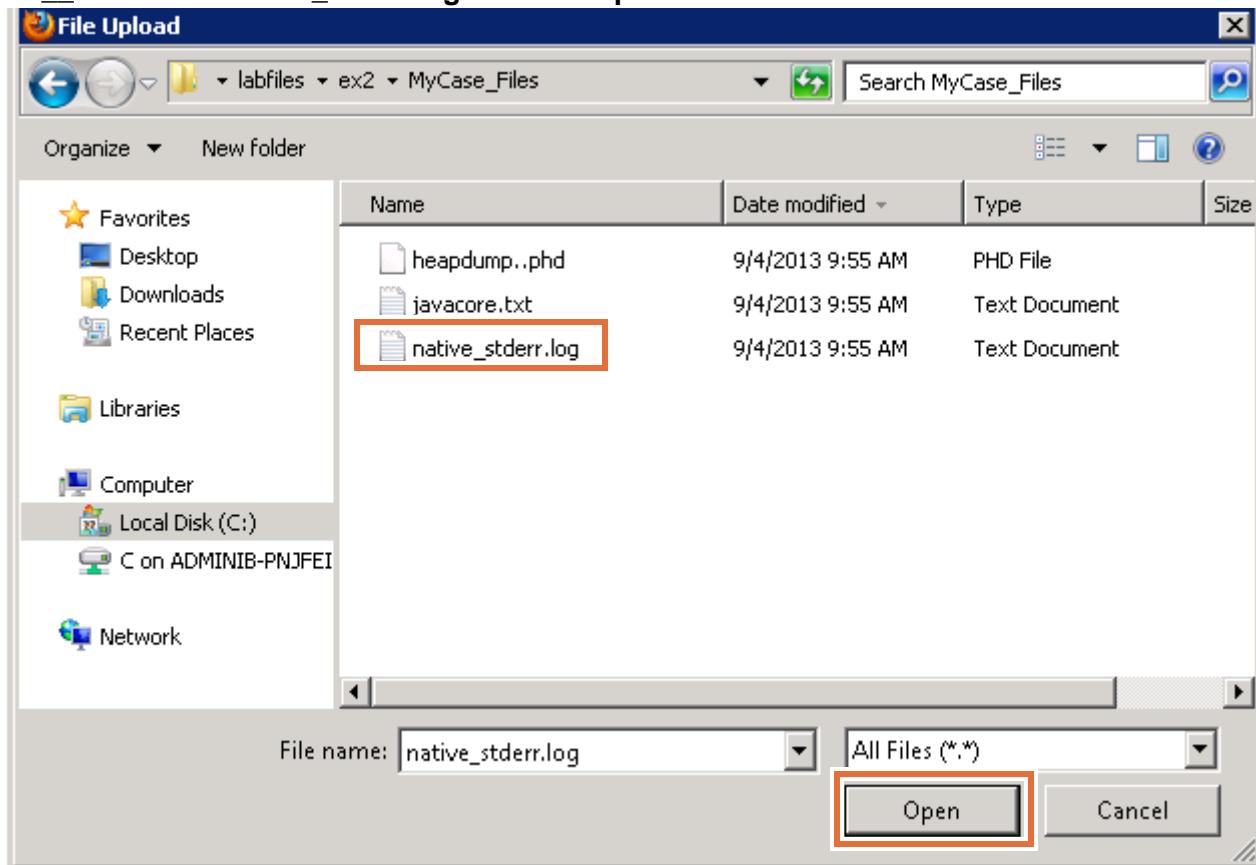
Information

In the rest of this course, you learn how to gather diagnostic data. For this exercise, a set of diagnostic data files is provided for you.

- ___ a. Click **Add files** and go to C:\labfiles\ex2\MyCase_Files.

The screenshot shows the same interface as before, but the 'Add files...' button in the 'Tree View' panel is now highlighted with a red box. The rest of the interface remains the same, including the 'Cases' dropdown, 'Tree View' selection, and the 'Add files...' button itself.

- ___ b. Select **native_stderr.log** and click **Open**.



You see a message that shows the file was successfully added, and the file is listed in the case pane.

The screenshot shows the IBM Support Assistant interface. At the top, there's a yellow notification bar with an info icon and the text 'Successfully added the file (click this notification to hide)'. To the right of the notification is a 'Scan this Case' button. Below the notification, there's a search bar with the placeholder 'Search...'. The main area is titled 'Case pane' and contains three tabs: 'Overview', 'Symptoms', and 'Knowledge'. Under the 'Overview' tab, there's a 'Name Filter' input field and a table of files. The table has columns: Name, Modified (GMT-08:00), Type, and Size. One row in the table is highlighted with a dashed blue box. The 'Name' column for the file 'native_stderr.log' is highlighted with a dashed blue box. The 'Modified' column shows '2014-03-07 16:57:13', the 'Type' column shows 'log', and the 'Size' column shows '141 KB'.

- ___ c. Click the notification to make it go away.

**Note**

You can also add files by dragging them into the browser. If your browser supports dragging, you see the following message next to the **Add Files** button:

Or drag files into the browser to add



__ d. Add the other two files:

- heapdump.phd
- javacore.txt

__ e. Verify that the three files are listed in the Files section.

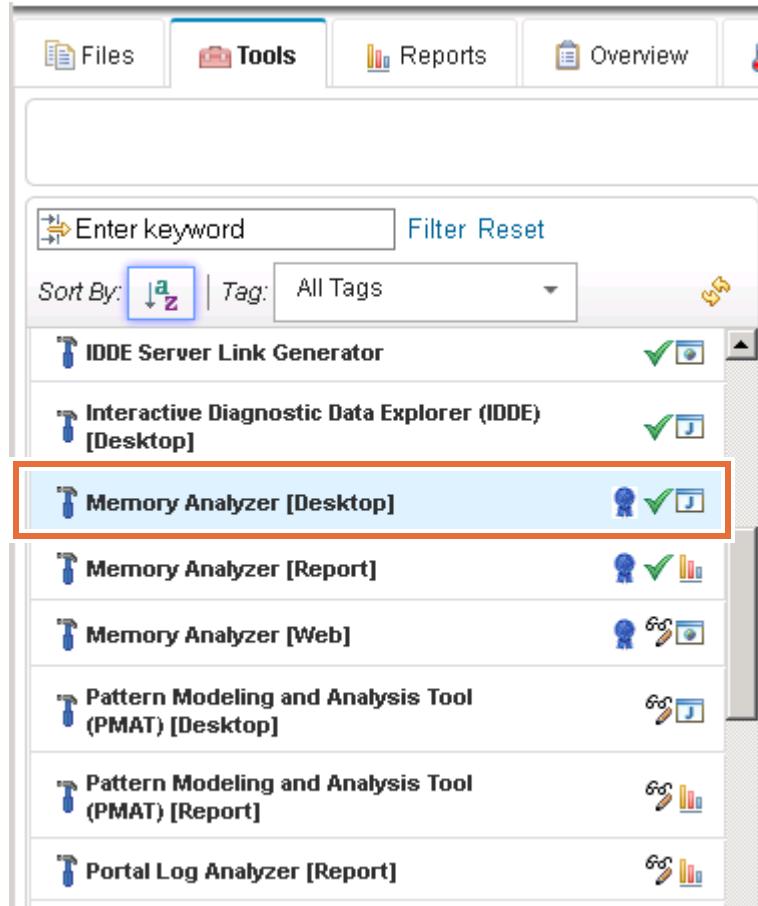
Name Filter <input type="text"/> Filter Reset				
Name	Modified (GMT-08:00)	Type	Size	Sym
heapdump.phd	2014-03-07 17:48:00	phd	15 MB	
javacore.txt	2014-03-07 17:03:06	txt	2 MB	
native_stderr.log	2014-03-07 16:57:13	log	141 KB	

__ 3. Find and start the Memory Analyzer desktop tool from the **Tools** tab.

Earlier in this exercise, you learned how to use the Quick Tool Launcher to run a report tool, but desktop tools must be started from the **Tools** tab.

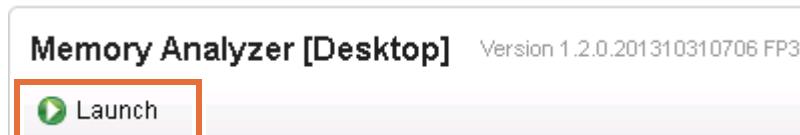
__ a. From the IBM Support Assistant, click the **Tools** tab.

- __ b. Scroll down the list of tools and click **Memory Analyzer [Desktop]**.



A **Launch** button is on the tool description pane. Notice that this view is different from the Administration console view, where you see an **Uninstall** link.

- __ c. Click **Launch**.



- ___ d. In the Run Tool window, click **Submit**.
-

Run Tool

Memory Analyzer [Desktop]

Version 1.2.0.201310310706 FP3

This tool is a desktop application. It will be launched using Java Web Start and will run on your workstation, so diagnostic files it analyzes must be accessible from your workstation. If a file is located on a remote server, you can download the file to your local file system or access the file through a shared storage area. All other files stored on the workstation may also be accessed by the tool.

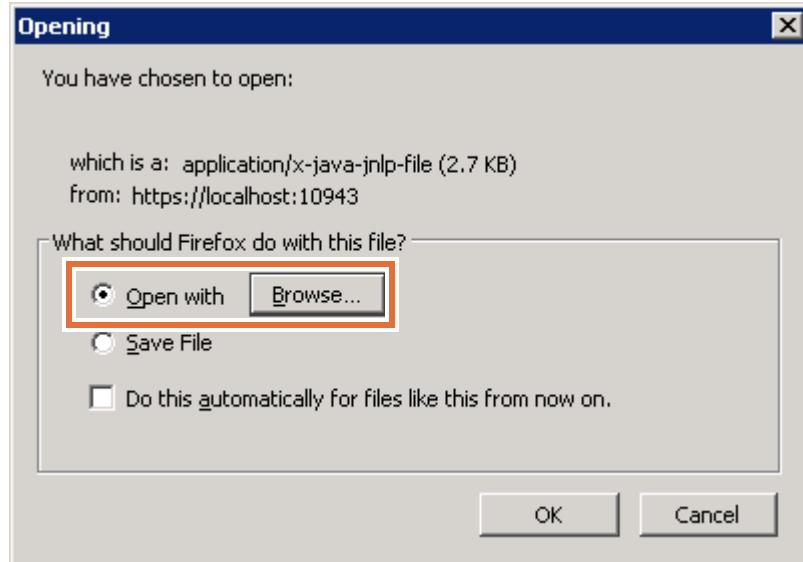
In some cases, analysis of files on your workstation can noticeably degrade performance of other applications running on your workstation.

Click 'Submit' below to begin.

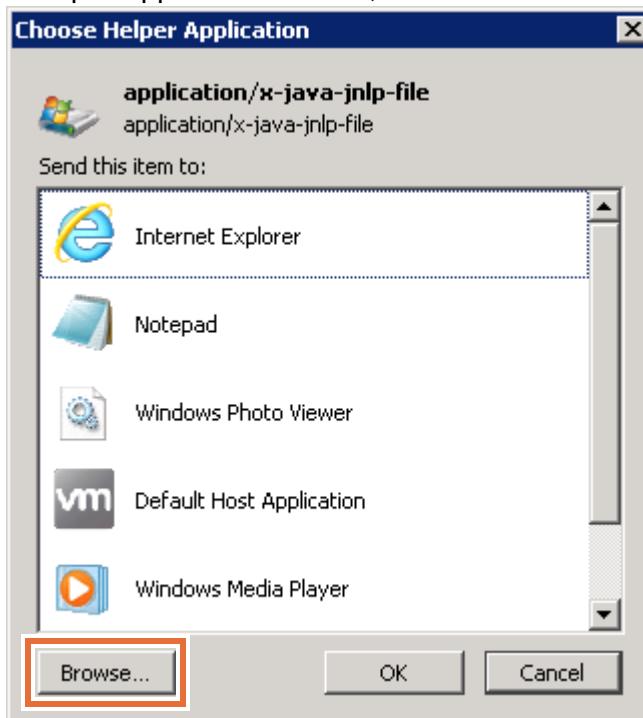


The IBM Support Assistant desktop tools require Java Web Start, or `javaws.exe`.

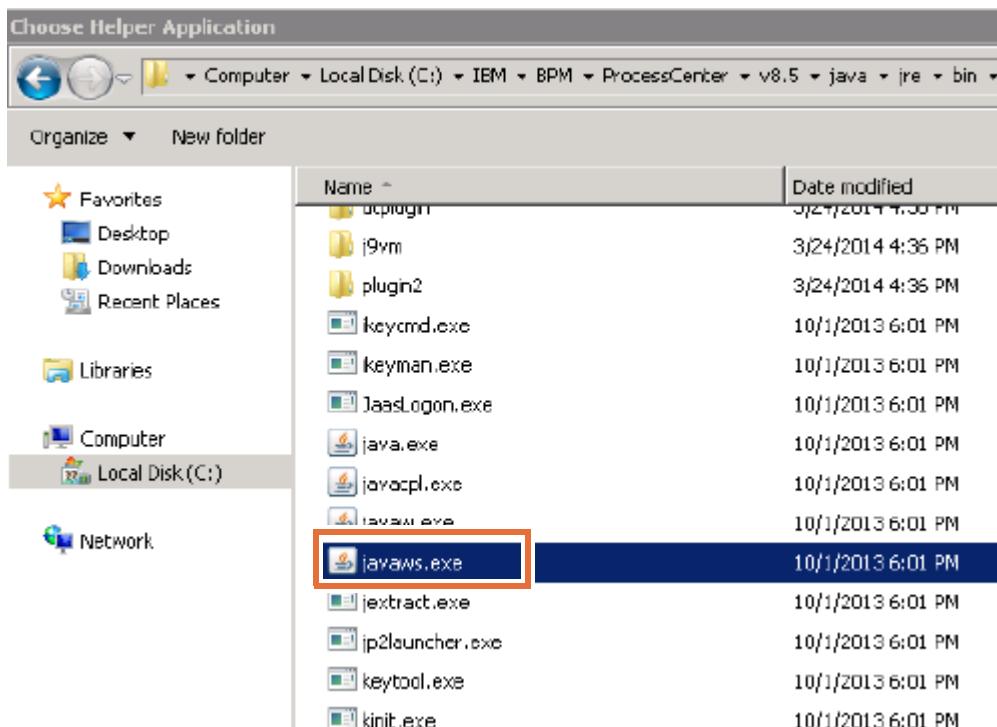
- ___ 4. Find the `javaws.exe` file for WebSphere Process Center, and use it to start the Memory Analyzer desktop tool.
- ___ a. In the Opening window, select **Open with**, and click **Browse**.



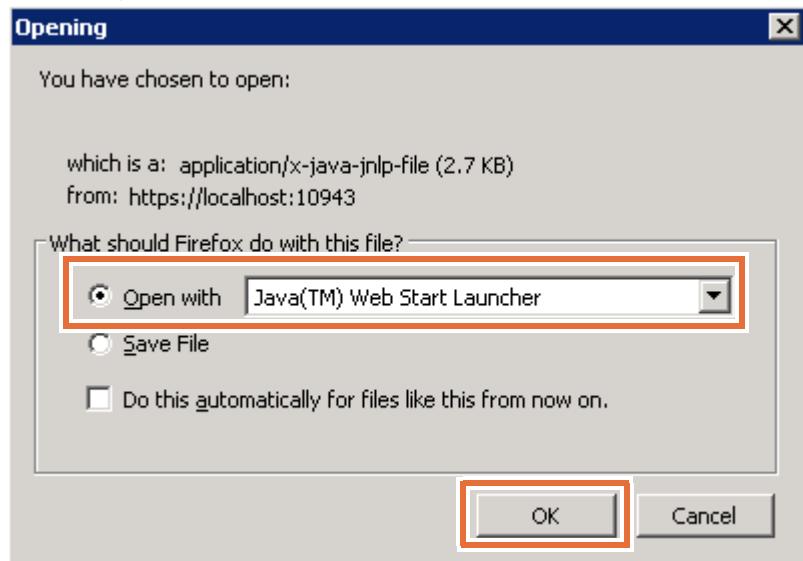
- ___ b. In the Choose Helper Application window, click **Browse**.



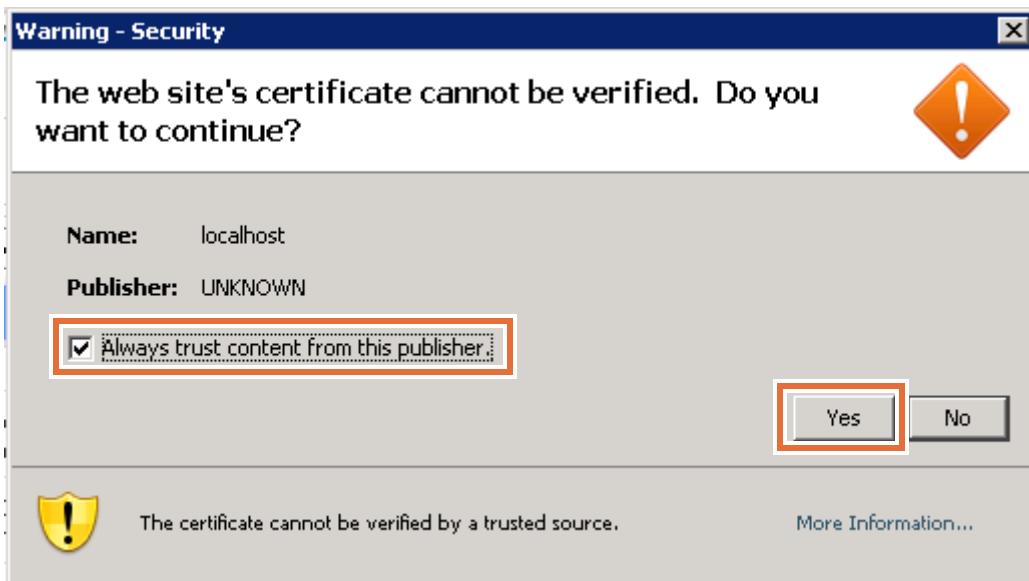
- ___ c. Go to C:\IBM\BPM\ProcessCenter\v8.5\java\jre\bin, click javaws.exe, and click Open.



- ___ d. Back in the Opening window, confirm that **Java(TM) Web Start Launcher** is in the **Open with** field, and click **OK**.



- ___ e. In the security warning window, select **Always trust content from this publisher** and click **Yes** to continue.



A Java Web Start window opens that shows the download status of the Memory Analyzer tool. Wait until the download is complete.

- ___ f. In the security warning window, select **Always trust content from this publisher** and click **Run**.



The Memory Analyzer Desktop tool starts in its own window.

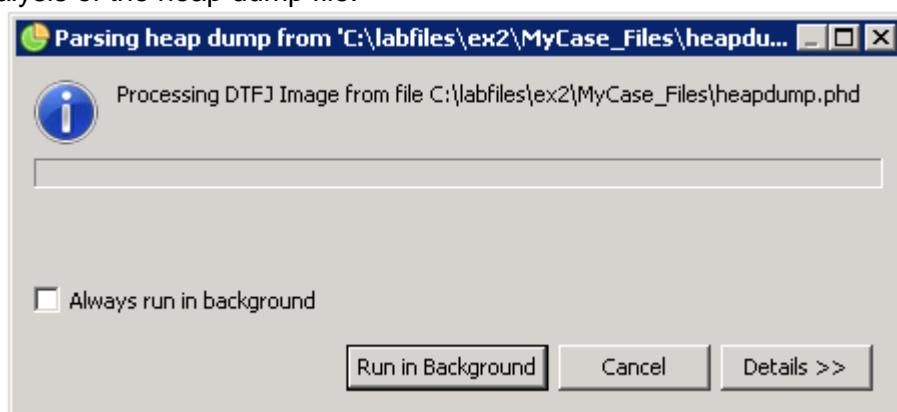
- ___ 5. Upload a heap dump file for analysis.

- ___ a. Click **File > Open Heap Dump**.



- ___ b. In the Open Snapshot window, browse to C:\labfiles\ex2\MyCase_Files, select heapdump.phd, and click **Open**.

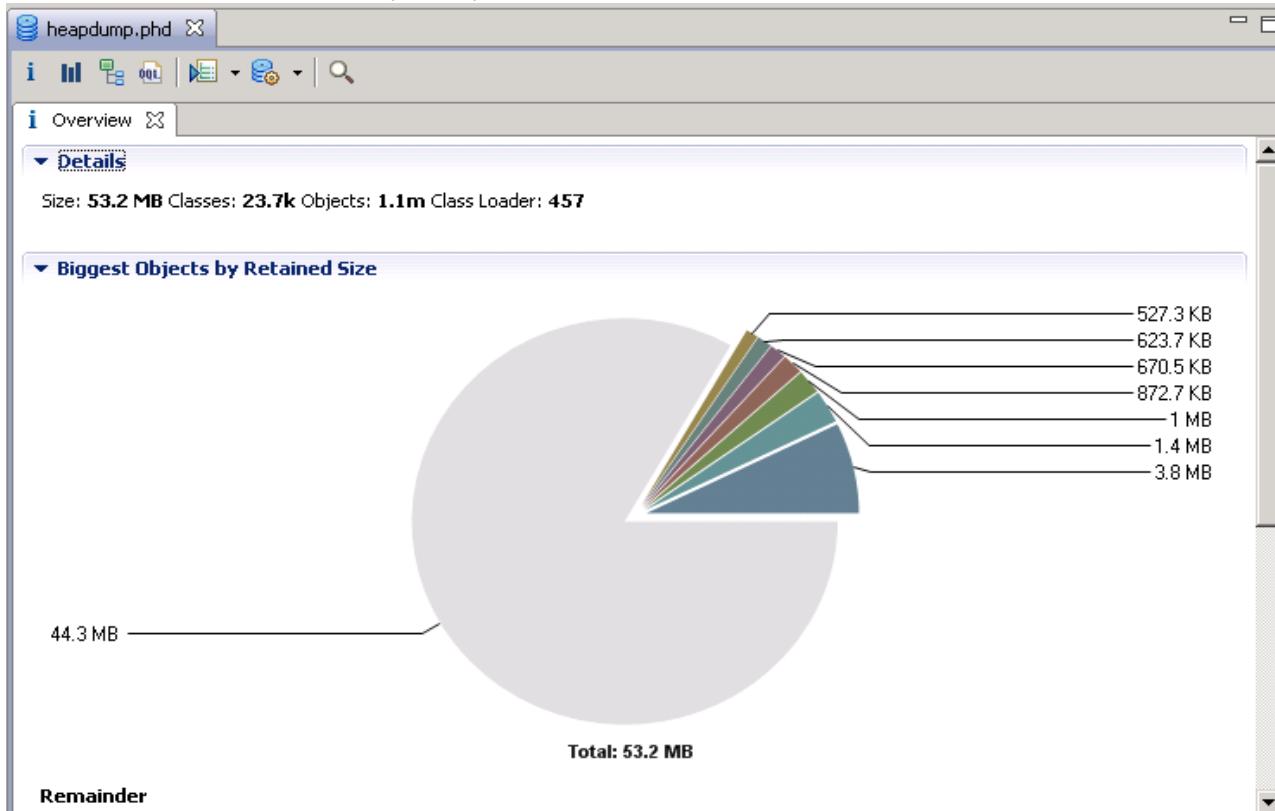
A "Parsing heap dump" window opens. Wait until Memory Analyzer completes its analysis of the heap dump file.



After the analysis is complete, a Getting Started wizard opens, and you can choose to run two kinds of reports:

- Leak Suspects report: Helps you to identify possible memory leak suspects
- Component report: Outlines the top memory consumers and provides information on potential memory inefficiencies in any selected component

c. For this exercise, you do not need to run a report. Click **Cancel** to close the wizard and to view the Memory Analyzer **Overview** tab.



- d. As time permits, explore the different options in Memory Analyzer.
 6. Close Memory Analyzer.
 a. In the Memory Analyzer window, click **File > Exit**.



Part 4: Scanning a case

IBM Support Assistant Team Server provides a service that scans all the files that are contained in a case. During that automated scan, any anomalies that are found in each file, such as unexpected errors or warnings, are collected as "symptoms." Then, these anomalies are searched in various IBM Knowledge Bases such as technotes and authorized program analysis reports (APARs) to find

known potential solutions. The data that is collected from the scan and analysis is then shown in the IBM Support Assistant views to help identify the root cause of the problem.

To scan a case, the IBM Support Assistant Team Server needs access to the Internet to search the IBM Knowledge Base of APARs and technotes.

- 1. Work with the Example Case.
- a. From the IBM Support Assistant, select [0000] Example Case from the menu next to the **Cases** button.



When a case is scanned, information about the case is written to the tabs: **Overview**, **Symptoms**, and **Knowledge**.

- b. Click the **Overview** tab, the **Symptoms** tab, and the **Knowledge** tab to see that they currently do not contain any information.

 A screenshot of the IBM Support Assistant 5.0 interface. The top navigation bar includes '0000 - IBM Support Assistant 5.0', a plus sign button, and a URL bar with 'https://localhost:10943/isa5/#view=overview&id=0000'. The main title is 'IBM Support Assistant Team Server' with 'Administrator' to its right. Below is a 'Cases' dropdown menu with '[0000] Example Case' selected. A 'Scan this Case' button is visible on the right. The bottom navigation bar features tabs for 'Files', 'Tools', 'Reports', 'Overview' (which is highlighted), 'Symptoms', and 'Knowledge'. A message at the bottom states: 'There is currently no scan data available for this case. Click [here](#) to scan this case.'.

- 2. Scan the Example Case.

- a. Click **Scan this Case**.

A screenshot of the IBM Support Assistant 5.0 interface. The top navigation bar includes '0000 - IBM Support Assistant 5.0', a plus sign button, and a URL bar with 'https://localhost:10943/isa5/#view=overview&id=0000'. The main title is 'IBM Support Assistant Team Server' with 'Administration' to its right. Below is a 'Cases' dropdown menu with '[0000] Example Case' selected. The 'Scan this Case' button is highlighted with a red box. The bottom navigation bar features tabs for 'Files', 'Tools', 'Reports', 'Overview', 'Symptoms', and 'Knowledge'.

Before the scan begins, you are prompted to select among the following options:

- **force_rescan**
- **ignore_failed**
- **update_KB**

- ___ b. Leave the **update_KB** check box selected, and leave the **force_rescan** and **ignore_failed** check boxes clear. Because this scan is the first one you are running on this case, the **force_rescan** and **ignore_failed** options do not apply.

Run Tool X

Automated Analysis

Parameter	Description	Value
force_rescan	This parameter controls the type of scan. Default is an incremental scan, scanning only new files. Check here to force a re-scan of ALL THE FILES within this case.	<input type="checkbox"/>
ignore_failed	This parameter controls handling of previous failures. By default, a scan will not run if a previous scan has failed. Check here to force a scan regardless of the previously failed one. Note: Even with this setting, the scan will be terminated if it runs longer than 1 hour.	<input type="checkbox"/>
update_KB	This parameter controls the update of the local knowledge base database prior to performing the scan. The current version 1.0.0.20131001-2059 was installed Tue, Oct 1, 2013. A newer version 1.0.0.20140223-1027 with the size of 60 MB is available.	<input checked="" type="checkbox"/>

Run as background task:

Submit Cancel

- ___ c. Click **Submit**.

It takes few minutes for the request submission to complete, at which time, you see the following notification.

The Automated Analysis tool request has been submitted.



The **Automated Analysis** tool request has been submitted.
[Go to output folder](#) | [View active tool requests](#).

- ___ d. Click **Go to output folder**.

The link takes you back to the **Files** tab. You see a new entry in the Navigator pane for the Automated Analysis files.



Note

If the message disappears before you can click the **Go to output folder** link, you can go to the **Files** tab to see the Automated Analysis files.

The screenshot shows the IBM Support Assistant interface. On the left is a 'Navigator' pane with a tree view of file structures. A folder named 'com.ibm.esupport.p1pd' under 'pdtools' is highlighted with a red box. On the right is a 'File List' table showing various files with their names, modified dates, and types. The table has columns for 'Name', 'Modified (GMT-08:00)', and 'Type'. Several files are shown, including 'aex-tool-status.end', 'aex-tool-status.start', 'filelist.properties', 'metrics_t0310.224553.345', 'p1pd.log', 'P1PD_DB_t0310.224553.3', and 'scan.properties'.

Name	Modified (GMT-08:00)	Type
aex-tool-status.end	2014-03-10 22:46:26	end
aex-tool-status.start	2014-03-10 22:45:57	start
filelist.properties	2014-03-10 22:46:26	properties
metrics_t0310.224553.345	2014-03-10 22:46:26	log
p1pd.log	2014-03-10 22:46:26	log
P1PD_DB_t0310.224553.3	2014-03-10 22:46:26	jar
scan.properties	2014-03-10 22:46:26	properties

You can explore the tabs that contain the results of the scan.

- 3. Explore the information in the **Overview** tab.
- a. Click the **Overview** tab.
- b. Click **Collapse All**.

The screenshot shows the 'Overview' tab results. At the top, there are buttons for 'Collapse All' (highlighted with a red box), 'Scan Coverage' (with a progress bar), and 'Printable version'. Below these are sections for 'General Information From a Scan of This Ticket' and 'Scan Coverage'. The 'General Information' section contains text about the scan and a link to 'Scan this Ticket'. The 'Scan Coverage' section displays a large green bar indicating coverage.

You now see a listing of all entries.

The screenshot shows a software interface with a top navigation bar containing tabs: Files, Tools, Reports, Overview (which is highlighted with a red box), Symptoms, and Knowledge. Below the navigation bar is a toolbar with an 'Expand All' button, a 'Scan Coverage' progress bar (partially filled with a green bar), and a 'Printable version' link. The main content area displays a list of expandable items under the heading 'General Information From a Scan of This Ticket'. The items listed are: Product Versions, JVM Versions, WebSphere Versions, OS Versions, iFix Information, Database Information, Server Names, Server Instances, Host Names, Trace Specifications, and Configuration Information. Each item has a small triangle icon to its left, indicating it can be expanded.

- ___ c. Expand any entry in the **Overview** tab to see more details.

4. Explore the information in the Symptoms tab.

a. Click the **Symptoms** tab.

Global Score	Type	Symptom	Symptom Occurrences	Knowledge Base Matches	First Occurrence Timestamp	Last Occurrence Timestamp	ID
	ErrorMsg	CWPKI0041W: One or more key stores are using the default password.	1	7	2010-06-08 14:54:53.156	2010-06-08 14:54:53.156	1
	ErrorMsg	DCSV1036W: DCS Stack DefaultCoreGroup at Member bullisCell02\bullisNode0:\server1: An unusual connectivity state occurred with member bullisCell02\bullisNode0:\server2, details: alarm(): Closing the connection because members did not manage to connect.	2	9	2010-06-08 14:58:22.171	2010-06-08 15:01:42.421	6

The **Symptoms** tab lists error messages that the scan found in the diagnostic data for the case. It also lists the number of occurrences of the symptom, the number of items in the Knowledge Base that the symptoms match, and other useful information.

5. Explore the information on the **Knowledge** tab.

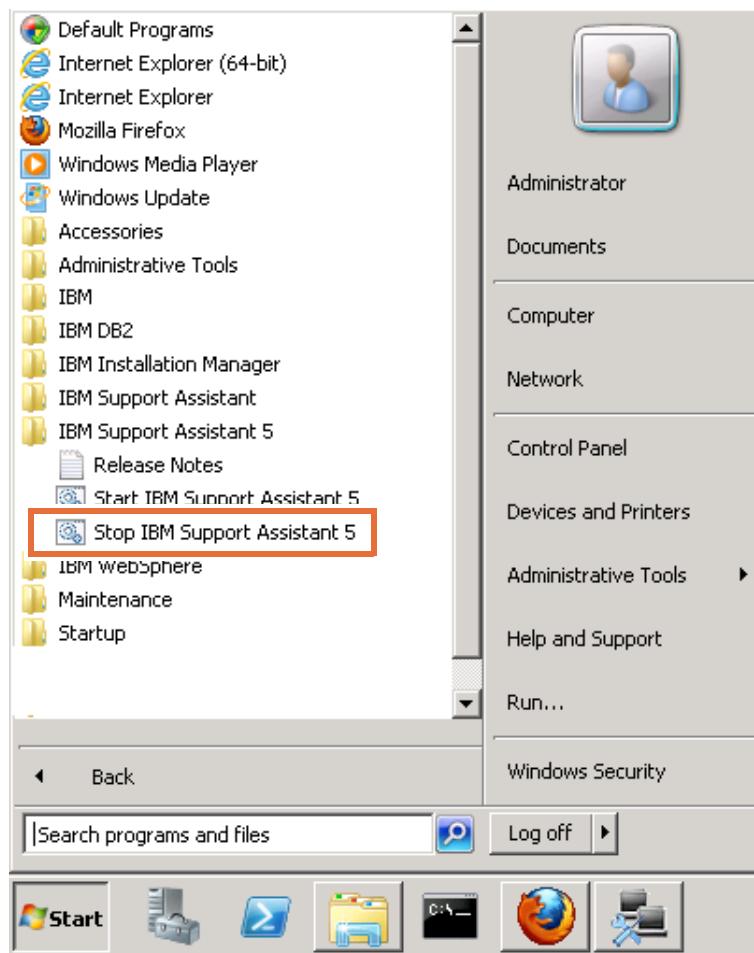
Global Score	Type	Knowledge Base Entry	Symptom	Tool	ID
	APAR	PK75700: DCS_UNICAST_ADDRESS PORT CONFLICT RESULTS IN HMGR0028E, DCSV1036W AND EVENTUALLY JAVA OUTOFGMEMORYERROR IN THE SERVER.	Multiple symptoms (2) matched by this entry	LocalKBSearch	11
	APAR	PK85685: THE ERROR MESSAGE SRVE0255E RETURNS TO A CLIENT BROWSER IF THE APPLICATION IS DOWN	SRVE0255E: A WebGroup/Virtual Host to handle /favicon.ico has not been defined	LocalKBSearch	41

Type: APAR
Found by Tool: LocalKBSearch
Global Score: 2714
Label: PK75700: DCS_UNICAST_ADDRESS PORT CONFLICT RESULTS IN HMGR0028E, DCSV1036W AND EVENTUALLY JAVA OUTOFGMEMORYERROR IN THE SERVER.
Match ID: 11
Symptom IDs associated with this Match: 3,6
[Description](#)

The **Knowledge** tab shows the correlation of the symptoms with Knowledge Base entries, which can be either an APAR or a technote.

6. Take time to explore each of the tabs in detail to see what type of problem determination the Automated Analysis provides.

- ___ 7. Stop IBM Support Assistant Team Server and close the tool in the web browser.
- ___ a. Go to **Start > All Programs > IBM Support Assistant 5 > Stop IBM Support Assistant 5.**



A command prompt window opens that displays status messages for stopping IBM Support Assistant Team Server. When IBM Support Assistant Team Server is stopped, the window closes.

- ___ b. Close the IBM Support Assistant Team Server web browser window.

Part 5: Running the IBM Support Assistant Data Collector tool

In this part of the exercise, you run the IBM Support Assistant Data Collector tool. The IBM Support Assistant Data Collector tool is included with the installation of IBM Business Process Manager V8.5.

Depending on what collection you run, the tool asks you for more information to complete the data collection activities. At each step, the choices are presented as numbered lists, and you input the number of your selection and press the Enter key. When input is required, you see prompts. You then enter your response and press the Enter key to move to the next step.

For example, the Data Collector tool prompts might ask you to provide:

- More configuration information

- Information about the sequence of events that lead up to the problem you are dealing with
- Your preferences about how it completes the collection.



Information

The IBM Support Assistant Data Collector tool is run from a script in the `isadc.bat` file, which can be found in the following directory:

`<Profile_root>/bin`

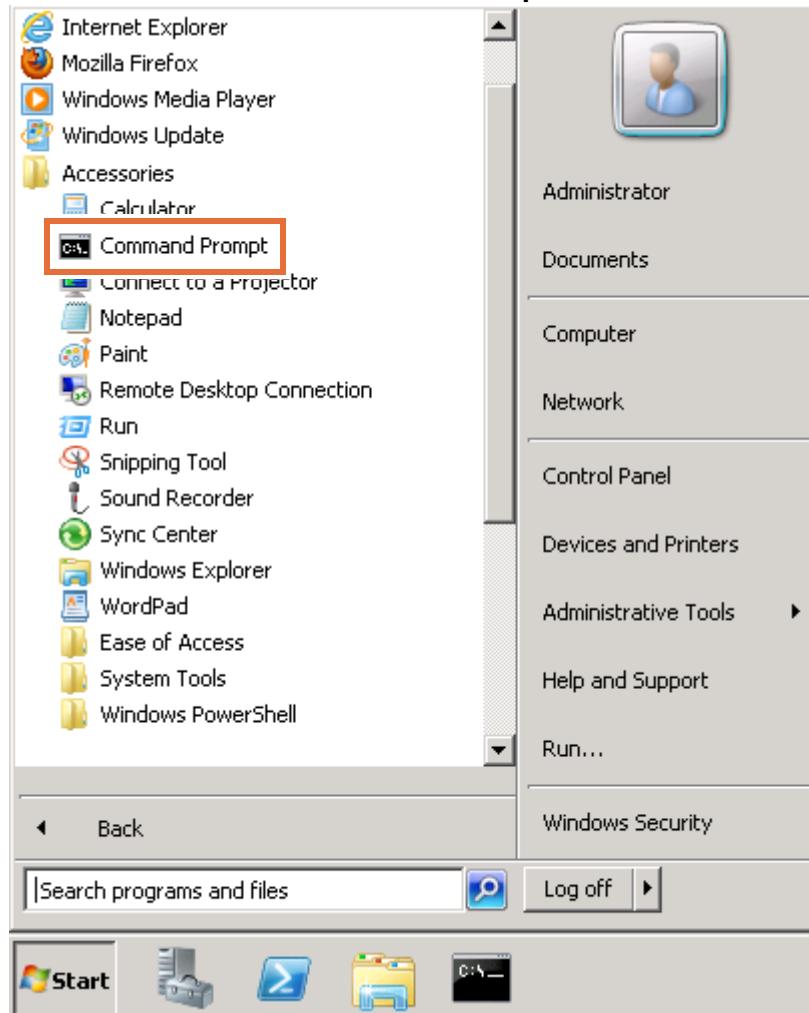
`<Profile_root>` is the base profile directory for the profile from which you want to get data. In this exercise, the base profile directory is:

`C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\bin`

1. Open a command prompt window, and change the directory to the base profile directory for the Process Center **DmgrProfile** profile.
 - a. Open a command prompt window by clicking the **command prompt** icon in the taskbar.



Alternatively, you can open a command prompt window by going to **Start > All Programs > Accessories > Command Prompt**.



- ___ b. Enter the following command, and press Enter.

```
cd C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\bin
```

 A screenshot of a Command Prompt window. The title bar says 'Administrator: Command Prompt'. The window shows the following text:


```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows>cd C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\bin

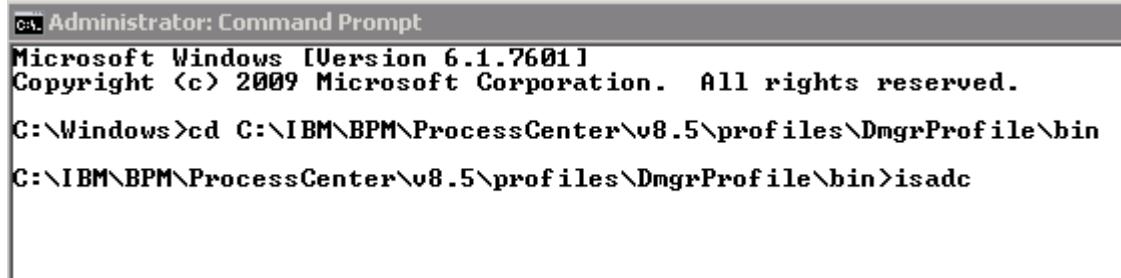
C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\bin>_
```

The directory changes, and is now the base profile directory for the Process Center DmgrProfile profile.

2. Start the IBM Support Assistant Data Collector tool.

a. Enter the following command, and press Enter.

isadc.bat



C:\ Administrator: Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Windows>cd C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\bin
C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\bin>isadc

A Software License Agreement window opens.

b. Click Accept.



After you accept the agreement, the Software License Agreement window closes and you return to the command prompt window. After the tool is started, you see the first screen, which asks about the location and name for the collection .zip file.

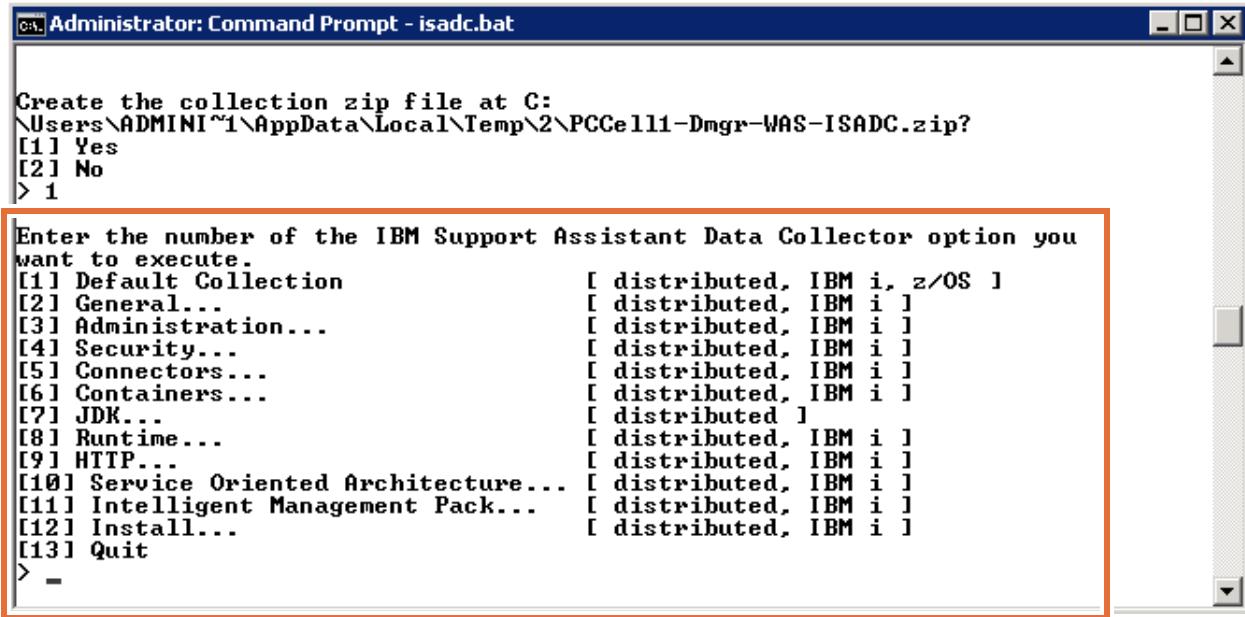
3. At the first screen, enter 1 to accept the default location for the collection file, and press Enter.

```
Starting IBM Support Assistant Data Collector in console mode...
Licensed Materials - Property of IBM Corporation Copyright, International
Business Machines, 2004, 2011. IBM is a trademark or registered
trademark of IBM Corporation in the United States, other countries, or
both.

ApplicationServer: was85.2.0.5.20130805
IBM Support Assistant Data
Collector: 2.0.1.GA20120316-1743
Common Inventory Sub Agent:
6.3.0.20120123

Create the collection zip file at C:
\Users\ADMINI~1\AppData\Local\Temp\2\PCCell1-Dmgr-WAS-ISADC.zip?
[1] Yes
[2] No
> 1
```

The next prompt shows you the available collection options.

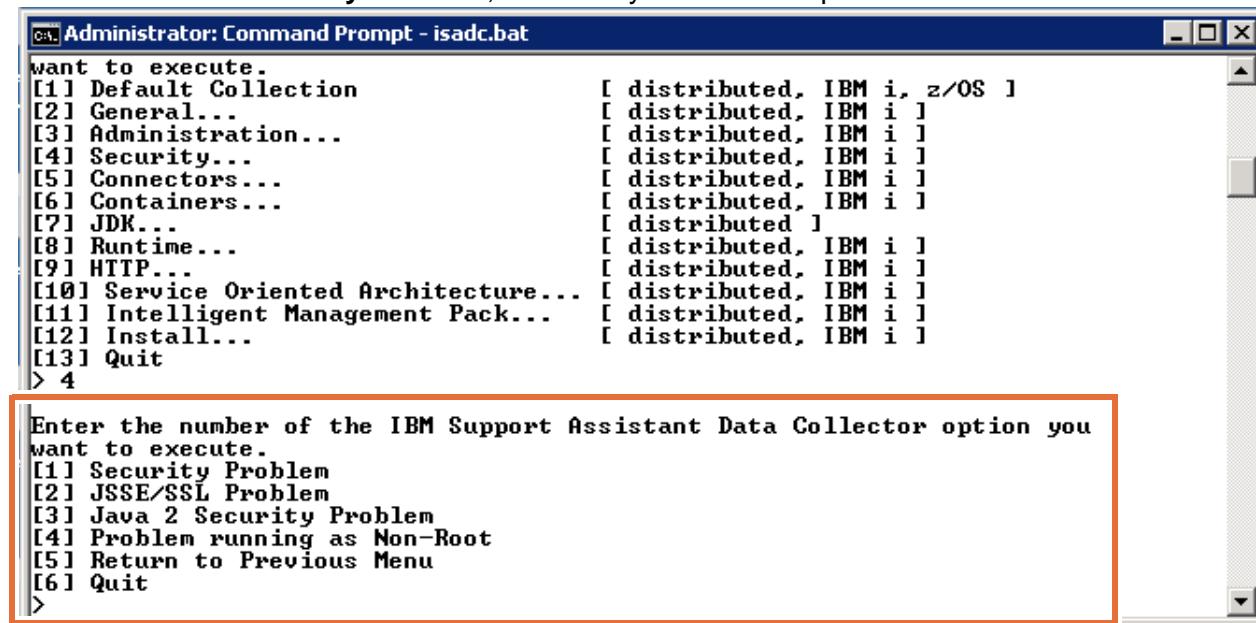


4. Decide what type of problem you need to collect data for, and enter the number of the type of collection that you want to run.

The options with an ellipsis (...) have subcollectors for different troubleshooting areas.

- a. Type 4 and press Enter for the Security option.

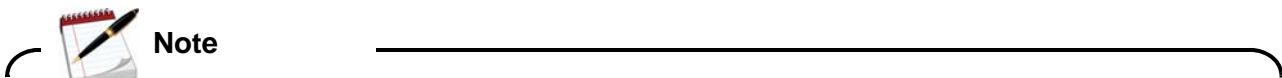
Notice that there are different security-related options, such as **JSSE/SSL Problem** and **Java 2 Security Problem**, for which you can run separate collectors.



```
want to execute.
[1] Default Collection           [ distributed, IBM i, z/OS ]
[2] General...                  [ distributed, IBM i ]
[3] Administration...           [ distributed, IBM i ]
[4] Security...                 [ distributed, IBM i ]
[5] Connectors...                [ distributed, IBM i ]
[6] Containers...                [ distributed, IBM i ]
[7] JDK...                      [ distributed ]
[8] Runtime...                   [ distributed, IBM i ]
[9] HTTP...                      [ distributed, IBM i ]
[10] Service Oriented Architecture... [ distributed, IBM i ]
[11] Intelligent Management Pack... [ distributed, IBM i ]
[12] Install...                   [ distributed, IBM i ]
[13] Quit
> 4

Enter the number of the IBM Support Assistant Data Collector option you
want to execute.
[1] Security Problem
[2] JSSE/SSL Problem
[3] Java 2 Security Problem
[4] Problem running as Non-Root
[5] Return to Previous Menu
[6] Quit
>
```

- b. Type 5 and press Enter to return to the previous menu.
- c. Try entering the number for other collectors that have an ellipsis to see the specific areas for which they provide collectors, such as:
 - 5 for **Connectors...**
 - 7 for **JDK...**
 - 9 for **HTTP...**
- d. When you are finished exploring the various subcollector options, return to the main menu by typing the number for the **Return to Previous Menu** option and pressing Enter.

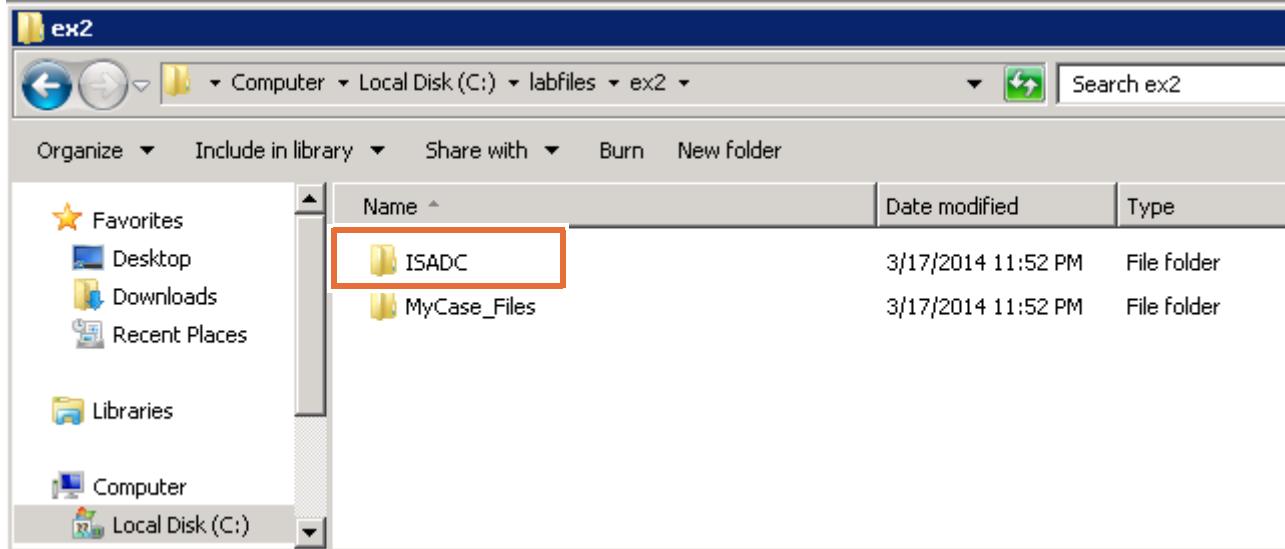


When you run a collector, you are prompted interactively to answer questions about your environment, provide profile and server names, administrator name, and password. You might also be asked if you want to restart a server and reproduce a problem. Finally, the collector gathers all the diagnostic data and archives it in a compressed file, and stores it in the location you chose when you started the IBM Support Assistant Data Collector.

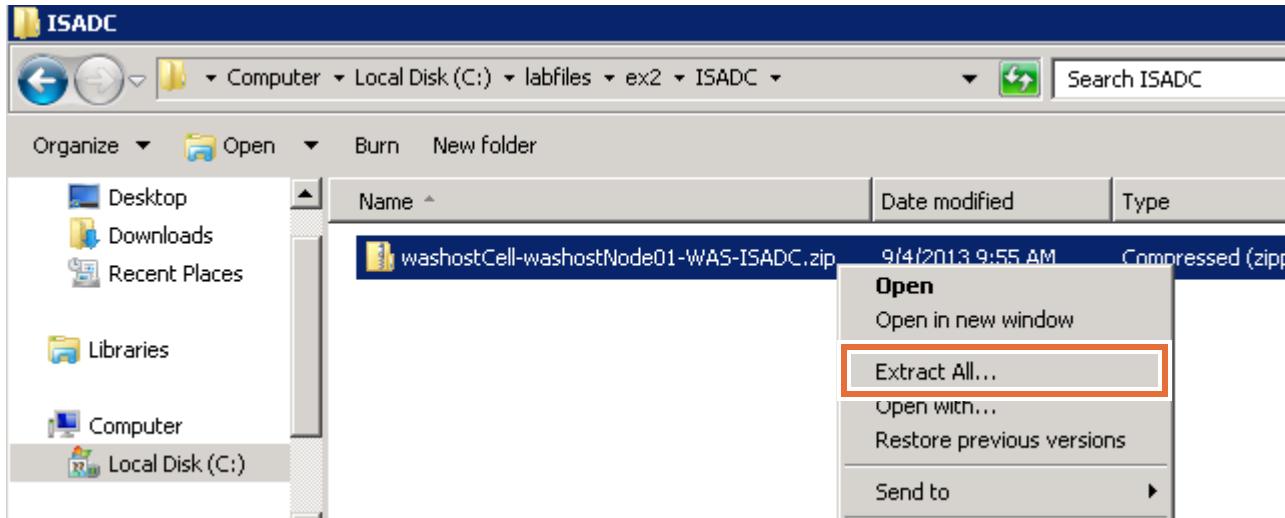
For this exercise, you do not run a collector, since it can take a long time. A previously run collection is available for you to examine.

5. Go to the lab files directory for this exercise, and extract the sample collection file.

a. Go to the C:\labfiles\ex2\ISADC directory.

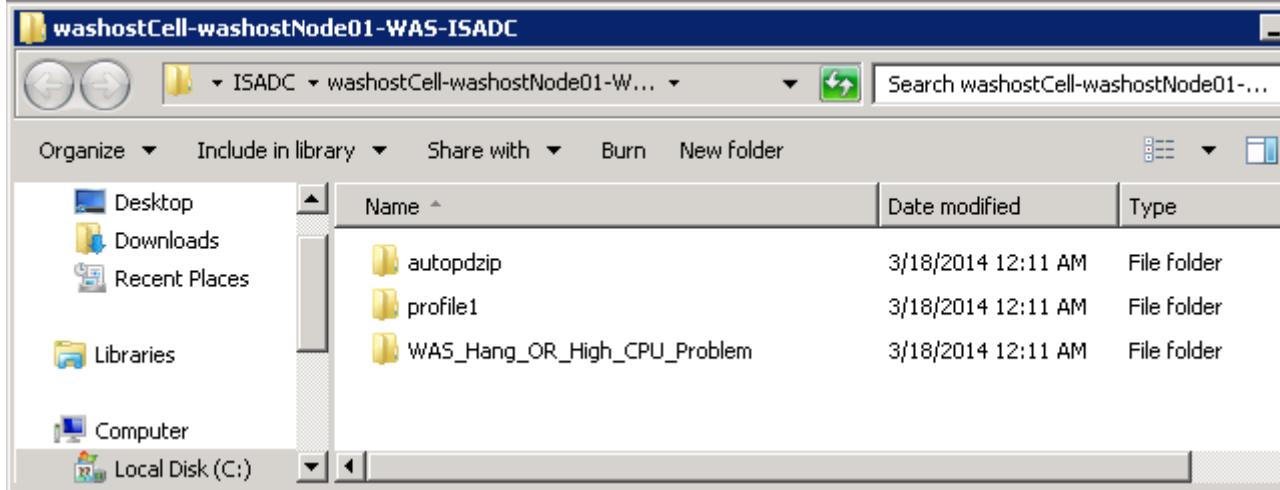


b. Right-click the washostCell-washostNode01-WAS-ISADC.zip file and select Extract All.



c. In the Extract Compressed (Zipped) Folders window, click Extract.

- ___ d. After the files are extracted, examine the data and logs in the sample collection file.



- ___ 6. Quit the IBM Support Assistant Data Collector.

- ___ a. Return to the main menu, and enter 13 to quit.

Keep the command prompt window open for the next part of this exercise.

Part 6: Using the Data Collector to automatically collect MustGather data

You can use the Data Collector tool to automatically gather some of the standard information (MustGather) that IBM support uses to troubleshoot IBM Business Process Manager issues. This feature can be helpful when you cannot resolve your issue on your own, and you need to contact IBM support to open a PMR (problem management record).

The automated script can gather either log file or configuration information, and it compresses the information into a .zip file. You can also configure the Data Collector to upload the .zip file to IBM for a problem management record (PMR).



Note

The term “MustGather” refers to the information that you must collect to help the Business Process Manager support team troubleshoot your problem. Having this data can help expedite the troubleshooting process. For more information about MustGather data, see:

<http://www.ibm.com/support/docview.wss?uid=swg21569731>



Information

For automated data collection, the Data Collector tool runs a script from the `bpmdc.bat` file. This file can be found in the following directory:

`<Profile_root>/bin`

<Profile_root> is the base profile directory for the profile from which you want to get data. In this exercise, the base profile directory is:

C:\IBM\BPM\v8.5\ProcessCenter\profiles\dmgrProfile\bin

With the automated `bpmdc.bat` file script, the tool runs immediately after you enter the command to start data collection. You can use the following parameters when you start the script.

- **PMR:** There is no default value. This parameter is the 11-digit PMR number to which the data is associated. Use one of the following forms for this value: 12345.678.901 or "12345,678,901". Comma characters can be an issue on the Microsoft Windows command line if you do not surround the value with the double quotation marks.
- **uploadToIBM:** There is no default value. This parameter specifies whether to upload the data to the IBM ECUREP site for a particular PMR. You can set this value to yes or no.
- **outputDirectory:** The default value is *<install_root>/BPM/isadc*. This parameter specifies the path to the directory where the output collection .zip file is stored.
- **type:** The default value is General. This parameter specifies which type of collection to run. The valid values are General or Install.
- **config:** There is no default value. With a general collection, when you set this parameter to yes, the config directory is included. You can set this value to yes or no.
- **help:** There are no values for this parameter. When you include this parameter with the command, a description of the command options is shown.



Important

In this exercise, you run the automated Data Collector tool and look at the collected files. However, some of the log and trace files might not have any data because there are no errors in the installation currently. The purpose of this part of the exercise is to learn how to run the tool and to introduce you to the kinds of information that the IBM Support Assistant Data Collector can collect automatically.

- 1. Make sure that the command prompt window is in the C:\IBM\BPM\v8.5\ProcessCenter\profiles\dmgrProfile\bin directory.
 - a. If needed, enter the following command:
cd C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\bin

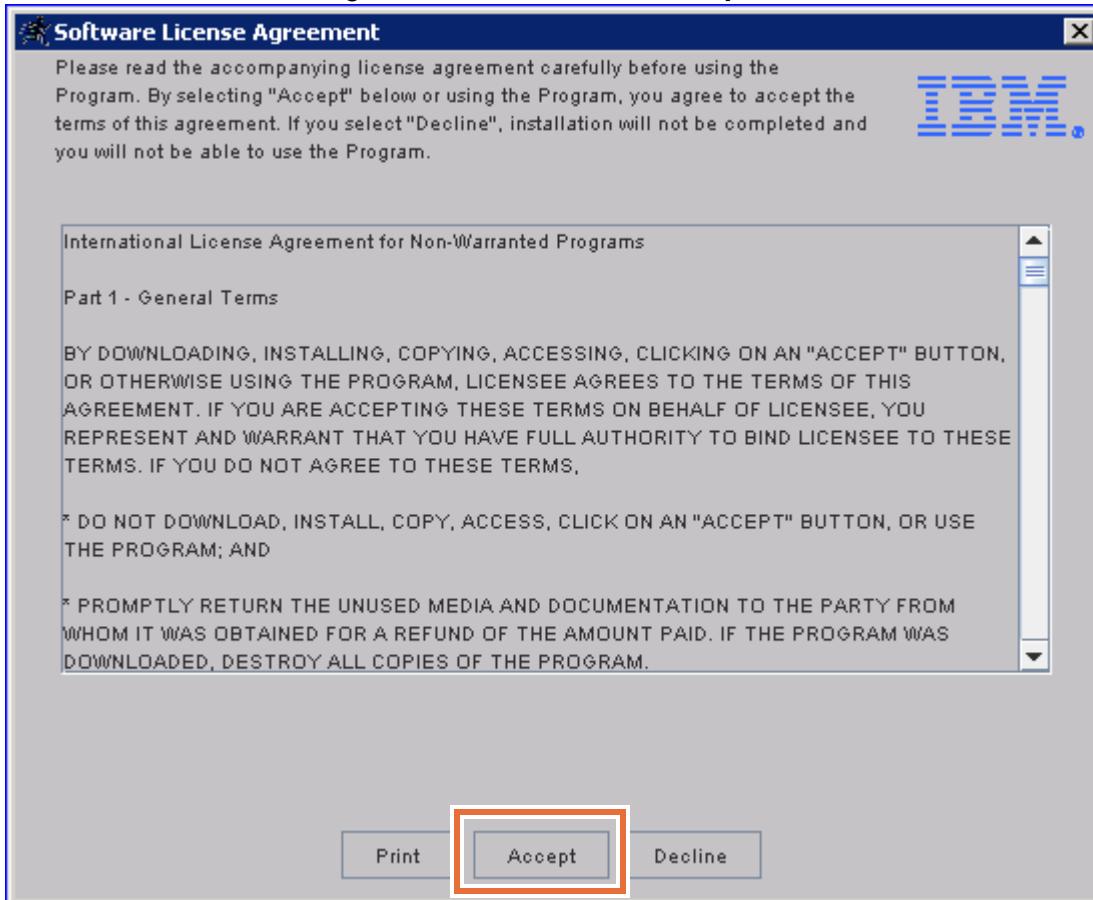
- __ 2. Start the IBM Support Assistant Data Collector tool, with the output directory configured for C:\labfiles\ex2\ISADC\MustGather.
- __ a. Enter the following command, and press Enter:

```
bpmdc.bat -outputDirectory=C:\labfiles\ex2\ISADC\MustGather
```

The screenshot shows an "Administrator: Command Prompt" window. The title bar says "Administrator: Command Prompt". The content of the window is:
The IBM Support Assistant Data Collector has completed.
C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\bin>bpmdc.bat -outputDirectory=C:\labfiles\ex2\ISADC\MustGather

The tool creates a folder that is called `MustGather` within the `C:\labfiles\ex2\ISADC` directory where the collection file is stored.

- __ 3. In the Software License Agreement window, click **Accept**.



After you accept the license agreement, the Software License Agreement window closes.

The command prompt window shows the parameters for the collection. Notice that the outputDirectory parameter is set to the directory that you specified.

```
C:\Administrator: Command Prompt
The IBM Support Assistant Data Collector has completed.
C:\IBM\BPM\ProcessCenter\v8.5\profiles\DomgrProfile\bin>hpndc.bat -outputDirectory=C:\labfiles\ex2\ISADC\MustGather
Running the Collector command with the following options
/
type=General
config=FALSE
uploadToIBM=FALSE
PMR=
outputDirectory=C:\labfiles\ex2\ISADC\MustGather

The collection is beginning and could take a few minutes depending on the size.
```

You also see the following message:

The collection is beginning and could take a few minutes depending on the size.

When the collection .zip file is created, the command prompt window shows the name and location of the collection file.

```
C:\Administrator: Command Prompt
The collection is beginning and could take a few minutes depending on the size.

Your collection file is located at :
C:\labfiles\ex2\ISADC\MustGather\General_Sun05-04-2014_17-06-40.77.zip

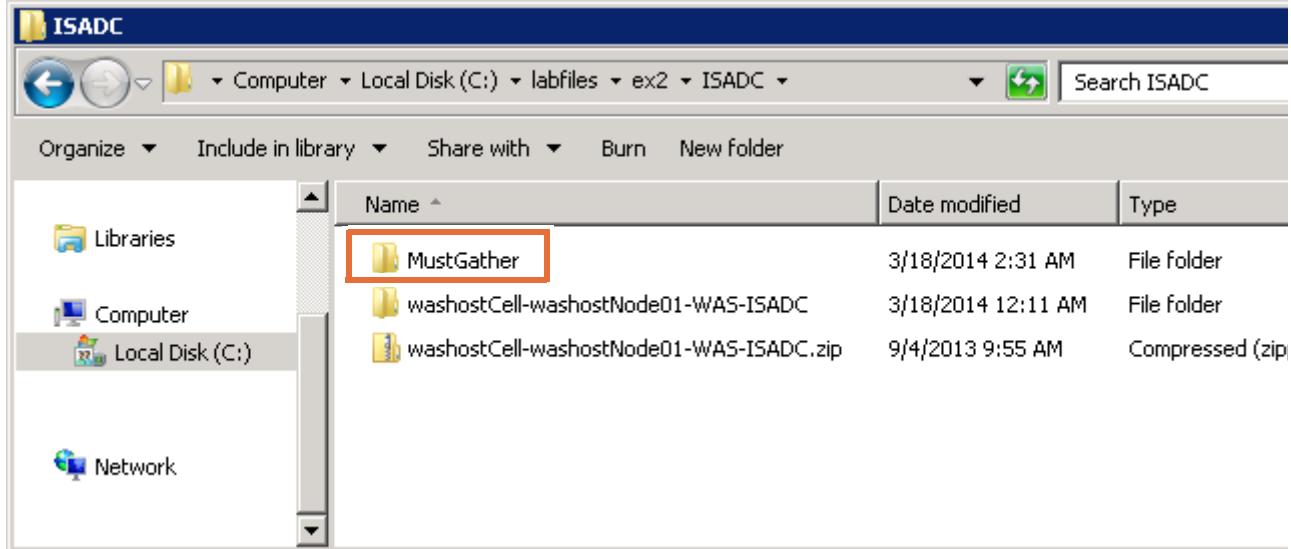
Collection is complete
C:\IBM\BPM\ProcessCenter\v8.5\profiles\DomgrProfile\bin>
```

You also see the following message:

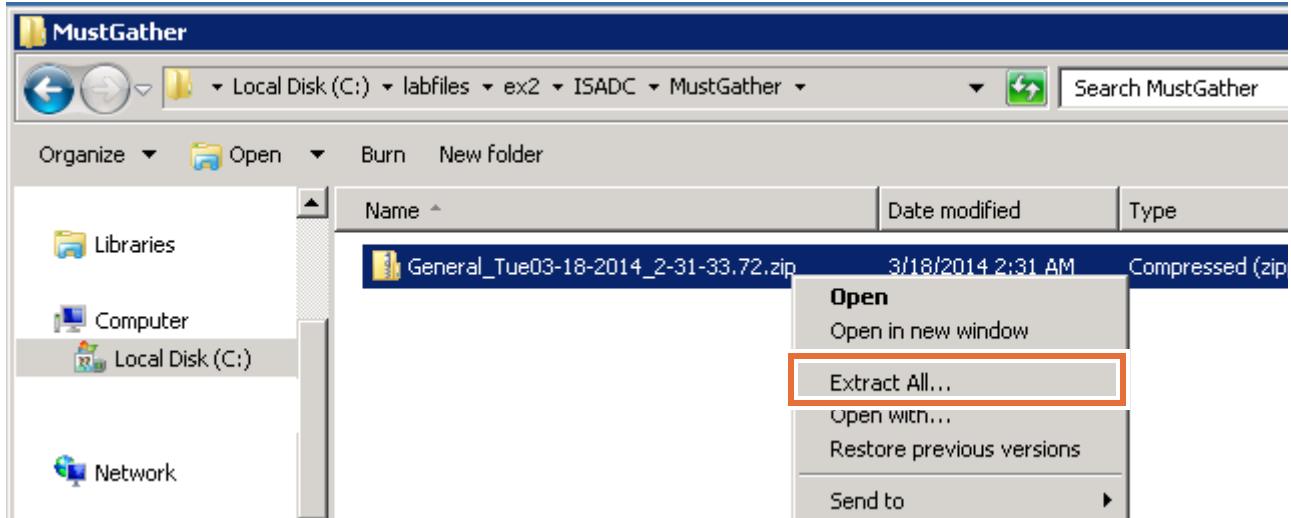
Collection is complete

___ 4. Examine the contents of the collection .zip file.

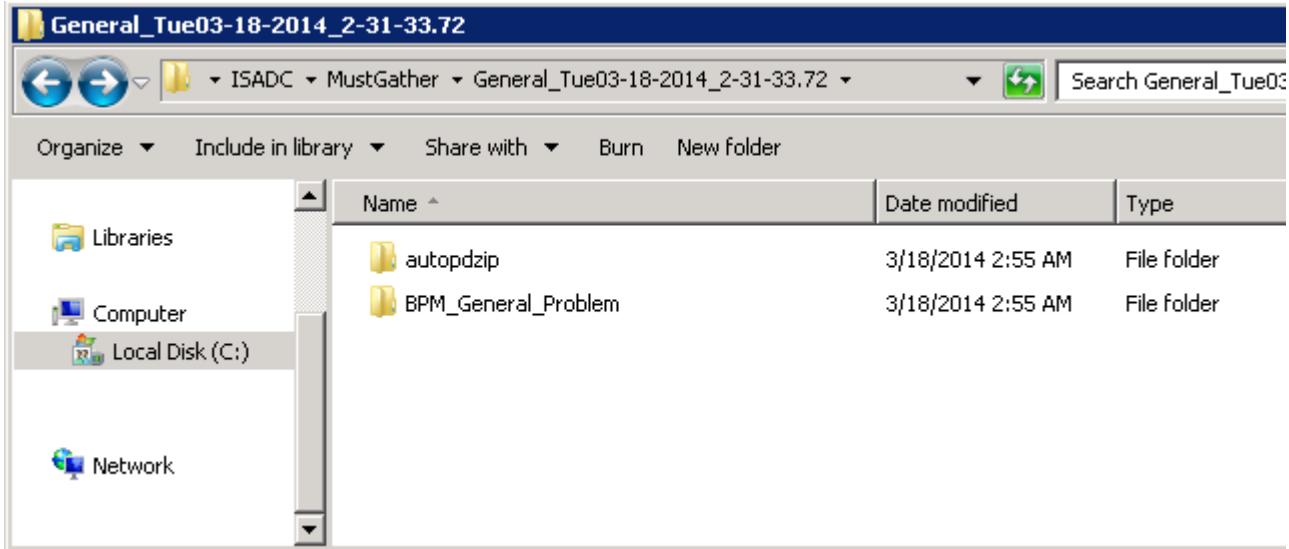
___ a. Go to C:\labfiles\ex2\ISADC\MustGather.



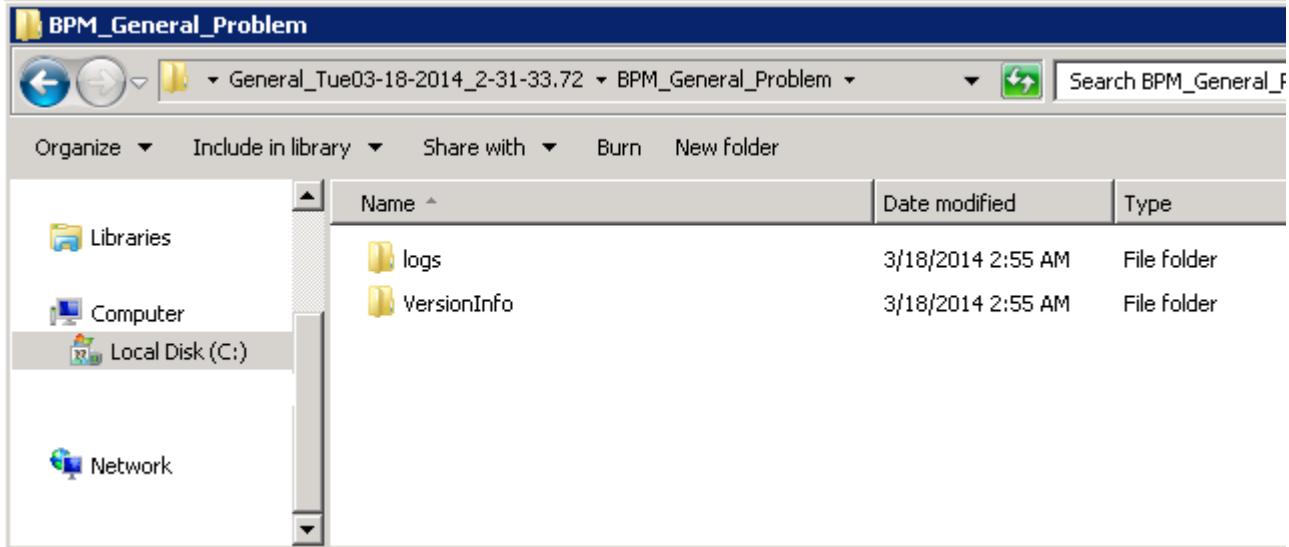
___ b. Right-click the collection .zip file, and click Extract All.



- ___ c. Click **Extract** in the Extract Compressed (Zipped) Files window, and wait for the extraction to complete.



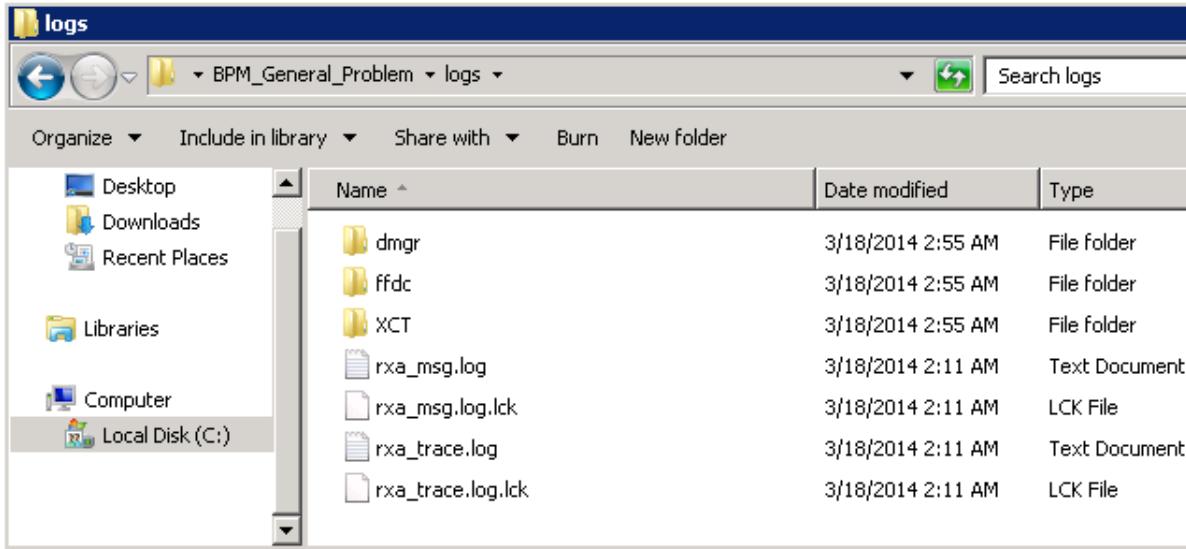
- ___ d. Explore the contents of the `BPM_General_Problem` folder as time permits.



You can examine the types of data that the IBM support team uses to troubleshoot a Business Process Manager runtime environment.

When you have a general collection file, you see the following information in the `BPM_General_Problem` folder.

- **Logs:** The logs folder contains all of the server log files and trace under the profile directory.



- **VersionInfo:** The VersionInfo folder contains the versionReport.txt file, which includes the results of the versionInfo -maintenancePackages command. It lists

installed WebSphere software packages, installed fix packs, and other product information.

```

versionReport.txt - Notepad
File Edit Format View Help

Report at date and time March 18, 2014 2:31:41 AM PDT

Installation
-----
Product Directory      C:\IBM\BPM\PCenter\v8.5
Version Directory      C:\IBM\BPM\PCenter\v8.5\properties\version
DTD Directory          C:\IBM\BPM\PCenter\v8.5\properties\version\dtd
Log Directory          C:\ProgramData\IBM\Installation Manager\logs

Product List
-----
BPMPC                 installed
ND                    installed

Installed Product
-----
Name                  IBM Business Process Manager Advanced
Version               8.5.0.1
ID                   BPMPC
Build Level           20131107-140634
Build Date            11/7/13
Package               com.ibm.bpm.ADV.v85_8.5.1.20131107_1830
Architecture          x86-64 (64 bit)
Installed Features    Business Process Manager Advanced Process Center
Optional Languages   Czech
                      German
                      Spanish
                      French
                      Hungarian
                      Italian
                      Japanese
                      Korean
                      Polish

```

- (Optional) **config**: This folder contains the profile config directory at <Profile_root>/config. This directory is collected only when you set the value for the -config parameter to yes.



Information

You can also use the automated Data Collector tool to collect installation information by setting the value of the -type parameter to Install.

The Install collection gathers the following information, which is also listed in the “Collect troubleshooting data for installation or upgrade problems with IBM Business Process Manager products” document (<http://www.ibm.com/support/docview.wss?uid=swg21506937>):

- Any temporary launchpad log files
- Installation Manager Data directory
- The results of the versionInfo -maintenancePackages command
- Installation logs directory

- Profile logs directory
- Database upgrade script log files
- Various configuration files that are related to the installation process

5. Close the command prompt window.

End of exercise

Exercise review and wrap-up

In this exercise, you learned how to start and stop the IBM Support Assistant Team Server. You logged in to the Administration for the IBM Support Assistant Team Server and examined the tools for installing, updating, and uninstalling problem determination tools. You also learned how to run report generator tools, examine the reports, use the Case Manager to create a case, and add diagnostic data. You used the **Tools** tab to run interactive desktop tools. You used Automated Analysis to scan a case and examine the results. Finally, you ran the IBM Support Assistant Data Collector tool, which is a tool that runs outside of the IBM Support Assistant to help gather diagnostic data. You also used the Data Collector tool to automatically collect MustGather troubleshooting data that the IBM Support team requires.

Exercise 3. Troubleshooting an online Process Server

What this exercise is about

This exercise covers how to troubleshoot an online Process Server that is connected to the Process Center. You take a systematic approach and use different tools and mechanisms to investigate the failing online connection status.

What you should be able to do

At the end of this exercise, you should be able to:

- Examine the online Process Server connection status in Process Center
- Review the system logs for errors
- Run wsadmin script commands for troubleshooting
- Verify the authentication alias that is used for Process Server and Process Center communication

Introduction

In this exercise, you work with a scenario where an online Process Server is no longer displaying the connected status in the Process Center. Your development team needs to deploy some snapshots to the online Process Server. However, the server is not connected, so you must diagnose, troubleshoot, and fix the problem.

Requirements

Completing the exercises for this course requires a lab that environment. This environment includes the exercise support files, IBM Process Designer, IBM Process Center, IBM Process Server, and IBM Integration Designer test environment.

This exercise is a prerequisite for Exercise 4.

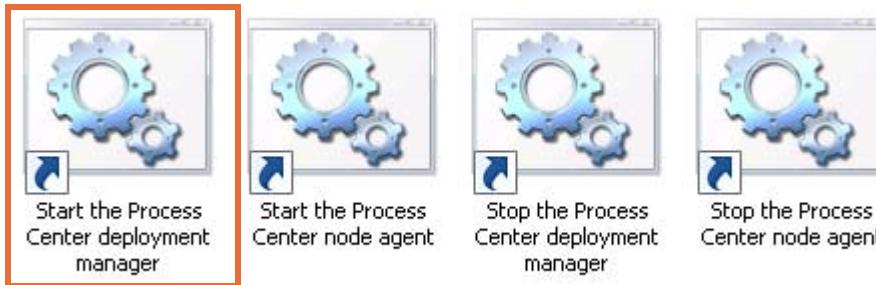
Exercise instructions

Part 1: Start the servers

- ___ 1. Start the Process Center environment.

If the Process Center environment is already running, then skip to step 2 to start Process Server.

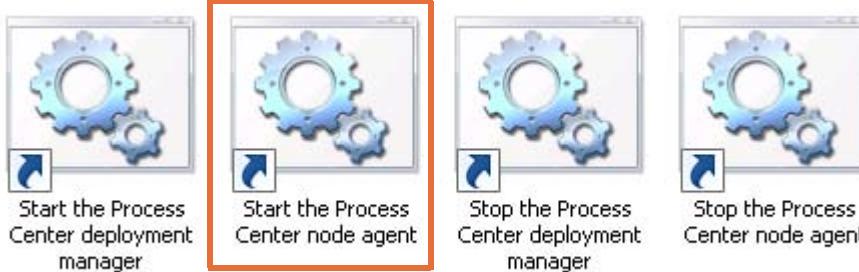
- ___ a. From the desktop, open the **Process Center** folder and double-click the **Start the Process Center Deployment Manager** shortcut icon to start the server. Leave the Process Center folder open, as you are going to use it again shortly.



- ___ b. Wait until the start command is successfully completed, and press any key to continue.

```
Start the Process Center deployment manager
ADMU0116I: Tool information is being logged in file
          C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\logs\dmgr\startServer.log
ADMU0128I: Starting tool with the DmgrProfile profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server dmgr open for e-business; process id is 4152
Press any key to continue . . . -
```

- ___ c. Double-click the **Start the Process Center node agent** shortcut icon.



- ___ d. Wait until the start command is successfully completed, and press any key to continue.

2. Start the administrative console for Process Center.
- ___ a. Double-click the **Firefox** icon from the desktop to open the web browser, and enter the following web address:
`http://localhost:9061/ibm/console`
 - ___ b. In the Untrusted Connection window, click **I Understand the Risks** to expand the option.



This Connection is Untrusted

You have asked Firefox to connect securely to **localhost:9044**, but we can't confirm that your connection is secure.

Normally, when you try to connect securely, sites will present trusted identification to prove that you are going to the right place. However, this site's identity can't be verified.

What Should I Do?

If you usually connect to this site without problems, this error could mean that someone is trying to impersonate the site, and you shouldn't continue.

[Get me out of here!](#)

- ▶ **Technical Details**
- ▶ **I Understand the Risks**

- ___ c. Click **Add Exception**.



This Connection is Untrusted

You have asked Firefox to connect securely to **localhost:9044**, but we can't confirm that your connection is secure.

Normally, when you try to connect securely, sites will present trusted identification to prove that you are going to the right place. However, this site's identity can't be verified.

What Should I Do?

If you usually connect to this site without problems, this error could mean that someone is trying to impersonate the site, and you shouldn't continue.

[Get me out of here!](#)

- ▶ **Technical Details**
- ▼ **I Understand the Risks**

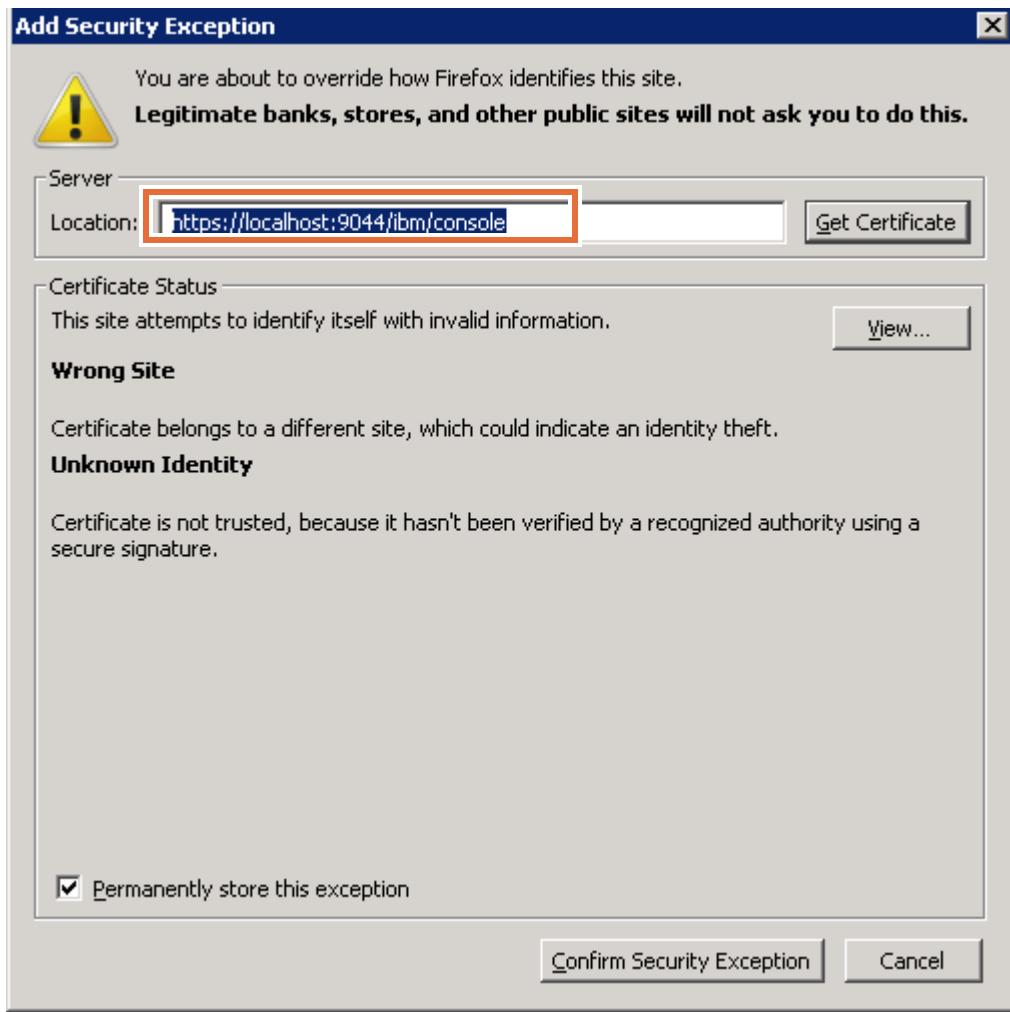
If you understand what's going on, you can tell Firefox to start trusting this site's identification. **Even if you trust the site, this error could mean that someone is tampering with your connection.**

Don't add an exception unless you know there's a good reason why this site doesn't use trusted identification.

[Add Exception...](#)

- __ d. On the Add Security Exception window, the location is the secure port for the deployment manager. Verify that the location is the following web address:

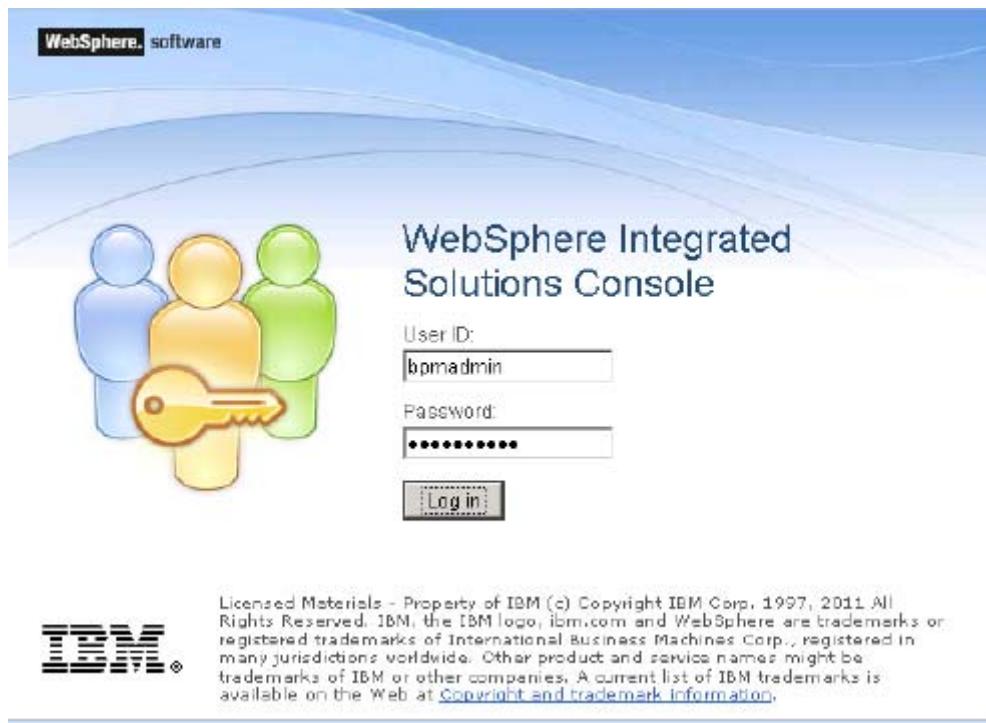
<https://localhost:9044/ibm/console>



- __ e. Click **Confirm Security Exception**. The administrative console login page is now visible.

___ f. Log in to the administrative console as:

- **User ID:** bpmadmin
- **Password:** web1sphere



___ g. In the administration console, expand **Servers > Server Types** and click **WebSphere application servers**.

___ h. Select the **SingleClusterMember1** check box.

___ i. Click **Start**.



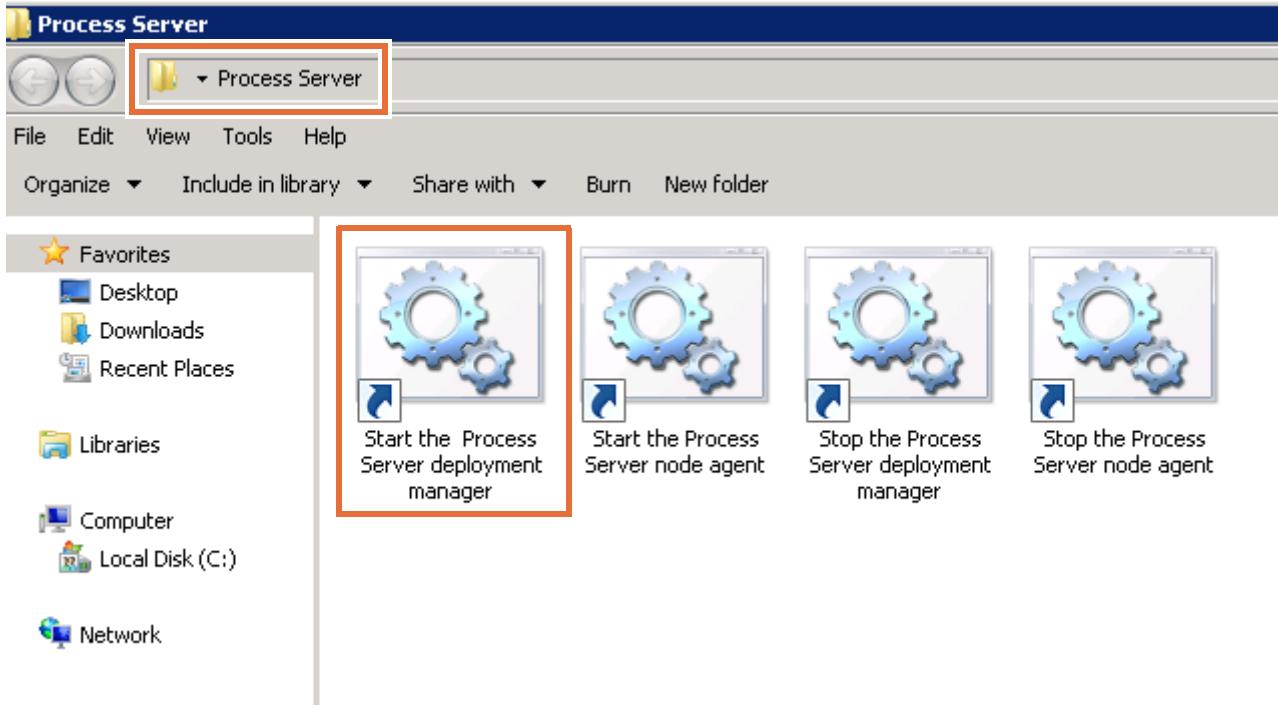
___ j. Wait until the start command is successfully completed, and the status becomes green.

Select	Name	Node	Host Name	Version	Cluster Name	Status
You can administer the following resources:						
<input type="checkbox"/>	SingleClusterMember1	Node1	ws2008r2x64.wetraining.com	ND 8.5.5.1 BPMAdv 8.5.0.1	SingleCluster	

___ 3. Start the Process Server environment.

If the Process Server Center environment is already running, then skip to the next step.

- __ a. From the desktop, open the **Process Server** folder and double-click the **Start the Process Server Deployment Manager** shortcut icon to start the server. Leave the Process Server folder open, as you are going to use it again shortly.



- __ b. Wait until the start command is successfully completed, and press any key to continue.

```
C:\Start the Process Server deployment manager
ADMU0116I: Tool information is being logged in file
          C:\IBM\BPM\ProcessServer\v8.5\profiles\dmgrProfile\logs\dmgr\startServer.log
ADMU0128I: Starting tool with the dmgrProfile profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server dmgr open for e-business; process id is 7044
Press any key to continue . . .
```

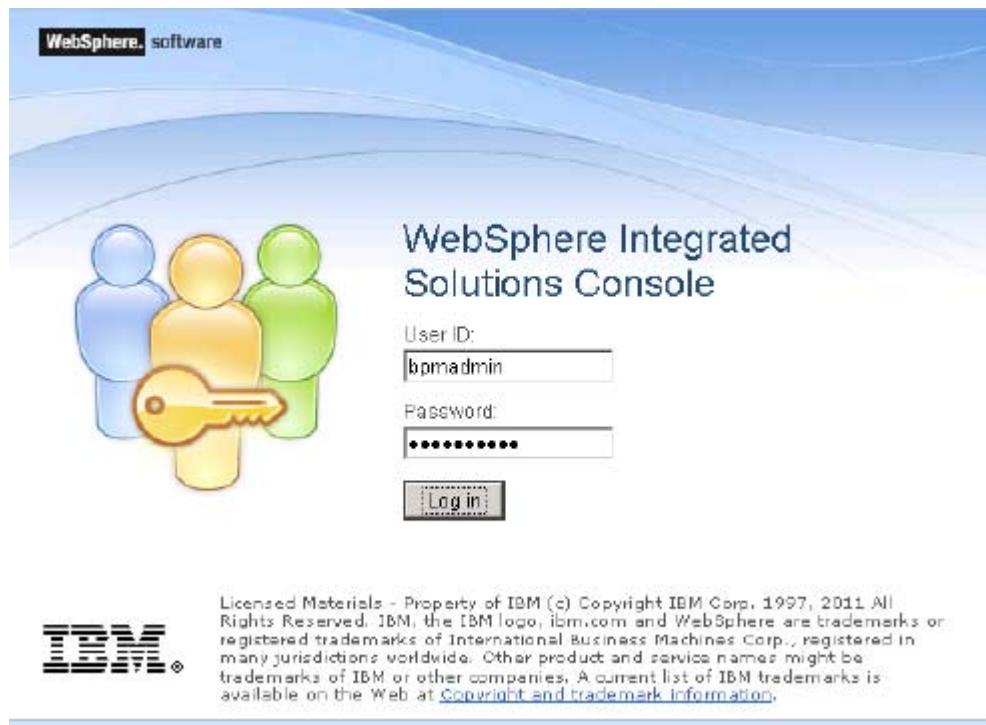
- ___ c. Double-click the **Start the Process Server node agent** shortcut icon.



- ___ d. Wait until the start command is successfully completed, and press any key to continue.
- ___ 4. Start the administrative console for Process Server.
- ___ a. Double-click the **Firefox** icon from the desktop to open the web browser, and enter the following web address:
`http://localhost:9063/ibm/console`
 - ___ b. In the Untrusted Connection window, click **I Understand the Risks** to expand the option.
 - ___ c. Click **Add Exception**.
 - ___ d. On the Add Security Exception window, the location is the secure port for the deployment manager.
 - ___ e. Click **Confirm Security Exception**. The administrative console login page is now visible.

__ f. Log in to the administrative console as:

- **User ID:** bpmadmin
- **Password:** websphere



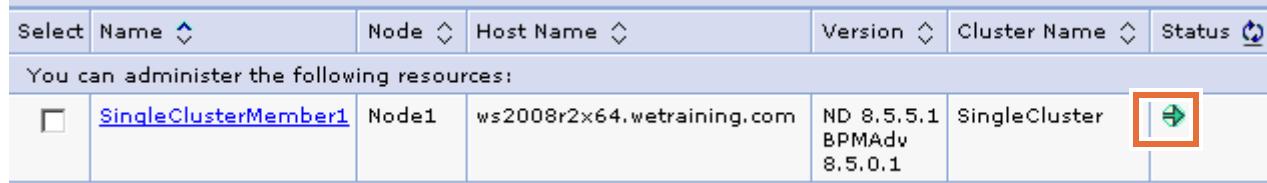
__ g. In the administration console, expand **Servers > Server Types** and click **WebSphere application servers**.

__ h. Select the **SingleClusterMember1** check box.

__ i. Click **Start**.



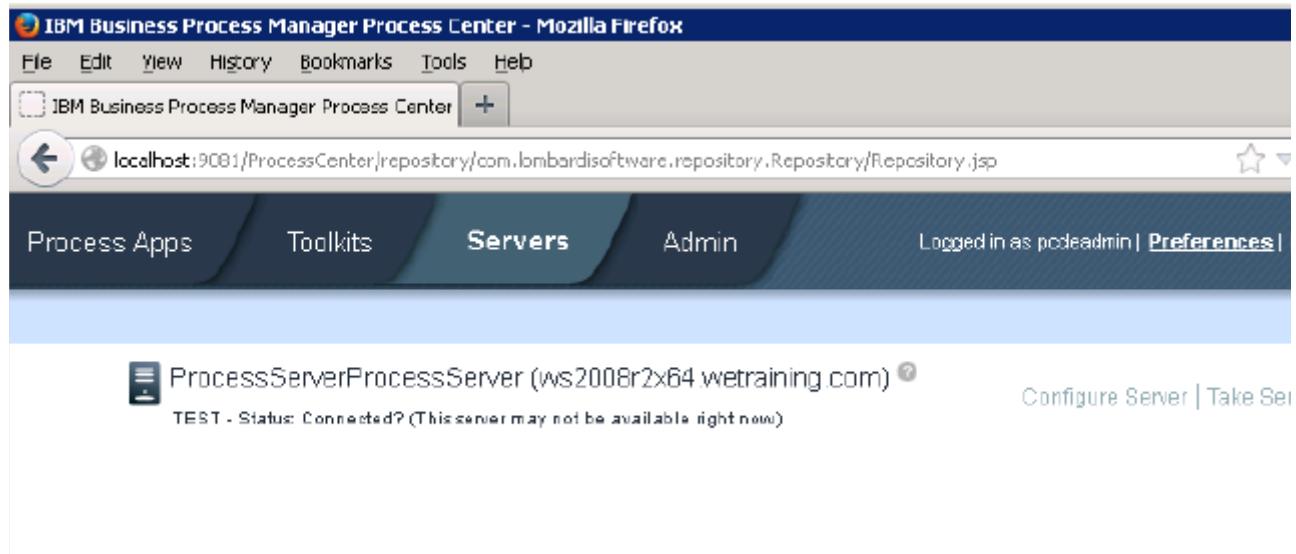
__ j. Wait until the start command is successfully completed, and the status becomes green.



Part 2: Verify the status of the online Process Server

In this section, you check whether the Process Server is online and connected to Process Center.

- 1. Start the Process Center console.
 - a. Double-click the **Internet Explorer** icon from the desktop to open the web browser, and enter the following web address:
`http://localhost:9081/ProcessCenter`
 Having two separate browsers makes sure that the session information is not shared among the two instances when you work with the administrative console and the Process Center console.
 - b. Log in to the Process Center console by entering `pcdeadmin` in the **User Name** field and `websphere` in the **Password** field.
 - c. Click **Login**.
 - d. Close the “Getting Started with IBM Process Center 8.5.0.1” window.
- 2. Check the status of the online Process Server.
 - a. Click the **Servers** tab.
 - b. Verify that the status of the online Process Server is not connected. Depending on the state of the image, the status is either Status Disconnected or Status Connected?.



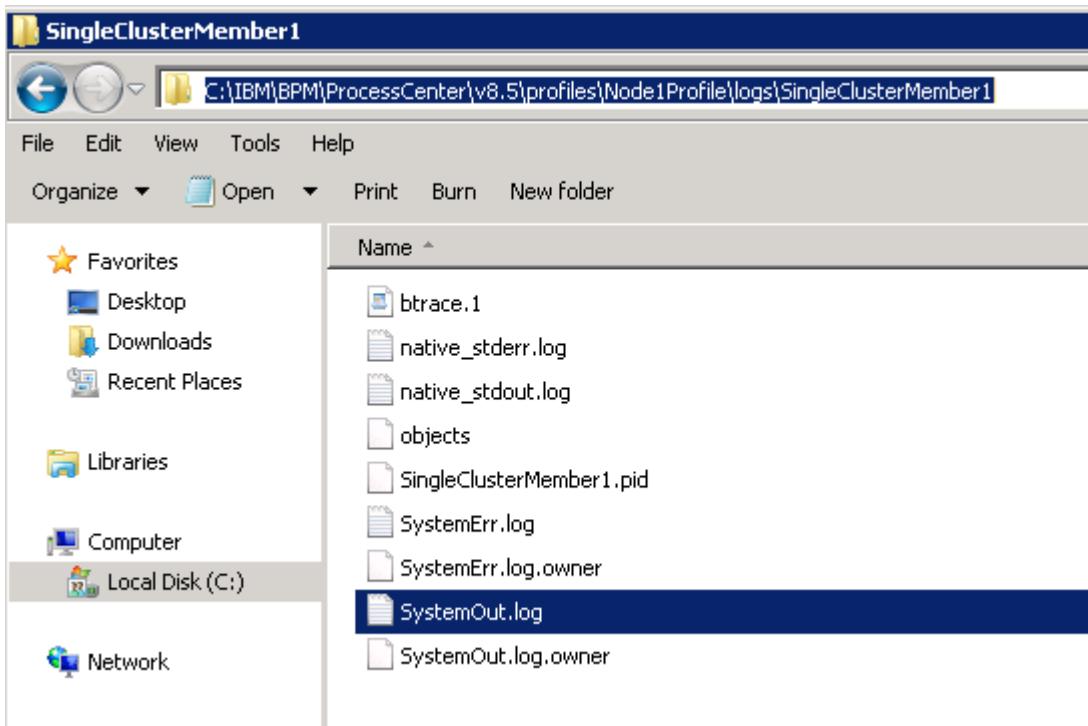
The Process Server must be in the `connected` state for you to install and deploy snapshots from the Process Center console. You know that the Process Center environment and the Process Server environment are running. However, the online Process Server is not in the `connected` state, so there is something wrong with the environment, which must be fixed. You need to troubleshoot this online Process Server and try to bring it back in the `connected` state so the development team can install and deploy process applications.

Part 3: Examine the Server logs

In this section, you check the `System.out` logs to help identify the connection problem with Process Server.

- 1. Review the Process Center logs.

- a. Go to `C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile\logs\SingleClusterMember1` and double-click **SystemOut.log**.

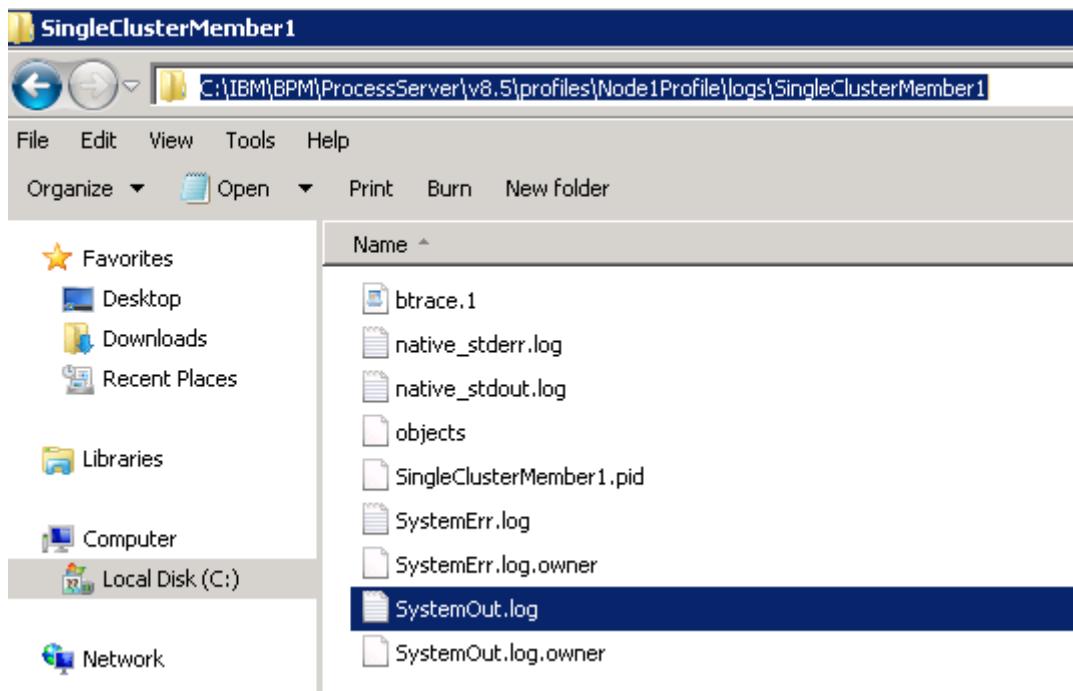


- b. The log file opens in Notepad, which is the default editor. Scroll to the bottom of the `SystemOut.log` file and review the contents.

A review of the log messages does not disclose any clear reason about why the Process Server is not connected online. There are other warning or error messages, but they might not be directly related to the issue at hand. When troubleshooting the Process Server connection problems, Process Center log does not really reveal any helpful information. The Process Server logs are a better source for help. You do that in the next section.

2. Review the Process Server logs.

- a. Go to C:\IBM\BPM\ProcessServer\v8.5\profiles\Node1Profile\logs\SingleClusterMember1 and double-click **SystemOut.log**.



- b. The log file opens in Notepad, which is the default editor. Scroll to the bottom of the SystemOut.log file and review the contents.
- c. Click **Format > Word Wrap** in Notepad to view the full text message without having to scroll all the way to the right.

- ___ d. Notice the following exception at the bottom of the log. Process Center console:

CWLLG0097E: An exception was received while trying to send heartbeat.
Error: java.lang.IllegalArgumentException: host parameter is null

stemOut.log - Notepad

Edit Format View Help

```
BPM_Teamworks_singleCluster#PALStartupBean.jar#FDSServiceMDB is activated.
0/14 13:12:21:872 PDT] 00000001 XDwsGroupMana I ODCFB010I: Peer layer setting up.
0/14 13:12:21:903 PDT] 00000001 P2PGroup I ODCFB020I: Peer layer starting;
ess=PSCell1\Node1\SingleClusterMember1; boot host=[ws2008r2x64.wetraining.com:11011,
08r2x64.wetraining.com:11014].
0/14 13:12:21:919 PDT] 00000001 SonP2PShimImpl I ODCFB030I: Peer layer started;
ess=PSCell1\Node1\SingleClusterMember1.
0/14 13:12:27:388 PDT] 00000001 WsServerImpl A WSVR0001I: server SingleClusterMember1
for e-business
0/14 13:12:27:403 PDT] 0000015a wle_repcore_E CWLLG0097E: An exception was received
while trying to send heartbeat. Error: java.lang.IllegalArgumentException: host parameter is
0/14 13:12:27:481 PDT] 0000021d P2PGroup I ODCFB040I: detected process
111\Node1\nodeagent started.
0/14 13:12:27:481 PDT] 0000021d P2PGroup I ODCFB040I: detected process
111\dmgr\dmgr started.
0/14 13:12:28:216 PDT] 00000222 InstanceManag W x.servlet.ServletContext is not supported!
0/14 13:12:28:903 PDT] 00000226 W5ChannelFram A CHFW0019I: The Transport Channel Service
started chain IPCCOutboundChainSecured.
0/14 13:12:29:044 PDT] 00000222 ControllerSer I WebDAV support is ENABLED
0/14 13:12:29:356 PDT] 00000222 WASPlatform I WASPlatform.getServerIdentifier:
compressed) PSCell1\Node1\SingleClusterMember1
0/14 13:12:29:356 PDT] 00000222 WASPlatform I WASPlatform.getServerIdentifier:
pressed) 95f761890c7af534d1ff31a1ee0a3d9e
0/14 13:12:29:356 PDT] 00000222 WASPlatform I WASPlatform.getServerIdentifier:
61890c7af534d1ff31a1ee0a3d9e
0/14 13:12:29:731 PDT] 0000022a DiscoveryMBea I ADMD0023I: The system discovered process
ie: nodeagent, type: NodeAgent, pid: 6280)
0/14 13:12:44:075 PDT] 0000015a wle_repcore_E CWLLG0097E: An exception was received
while trying to send heartbeat. Error: java.lang.IllegalArgumentException: host parameter is
0/14 13:12:54:684 PDT] 0000015a wle_repcore_E CWLLG0097E: An exception was received
while trying to send heartbeat. Error: java.lang.IllegalArgumentException: host parameter is
```

The heartbeat interval is the polling interval, in seconds, which the Process Server uses to communicate its location and characteristics to the Process Center. The exception indicates that a problem occurred most probably during this polling. You next check the database table for more information.

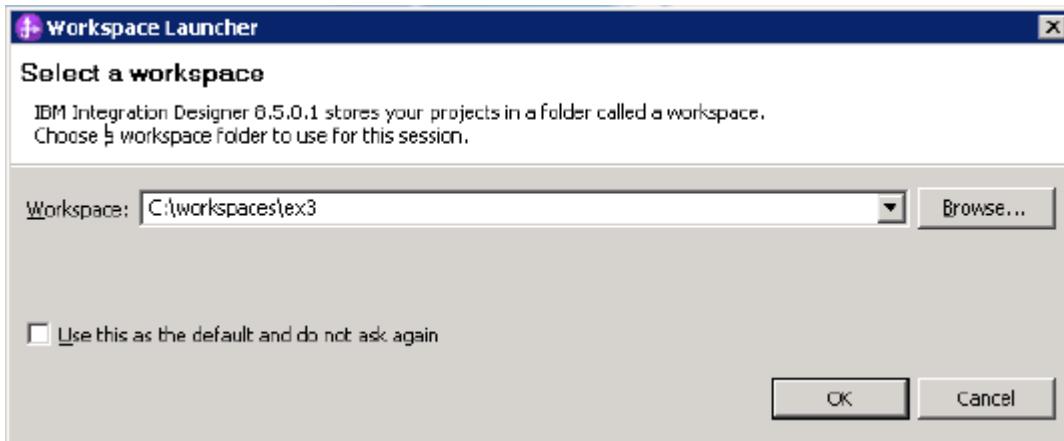
Part 4: Examine the database table.

In this section, you check the LSW_SERVER table to help identify the connection problem with Process Server.

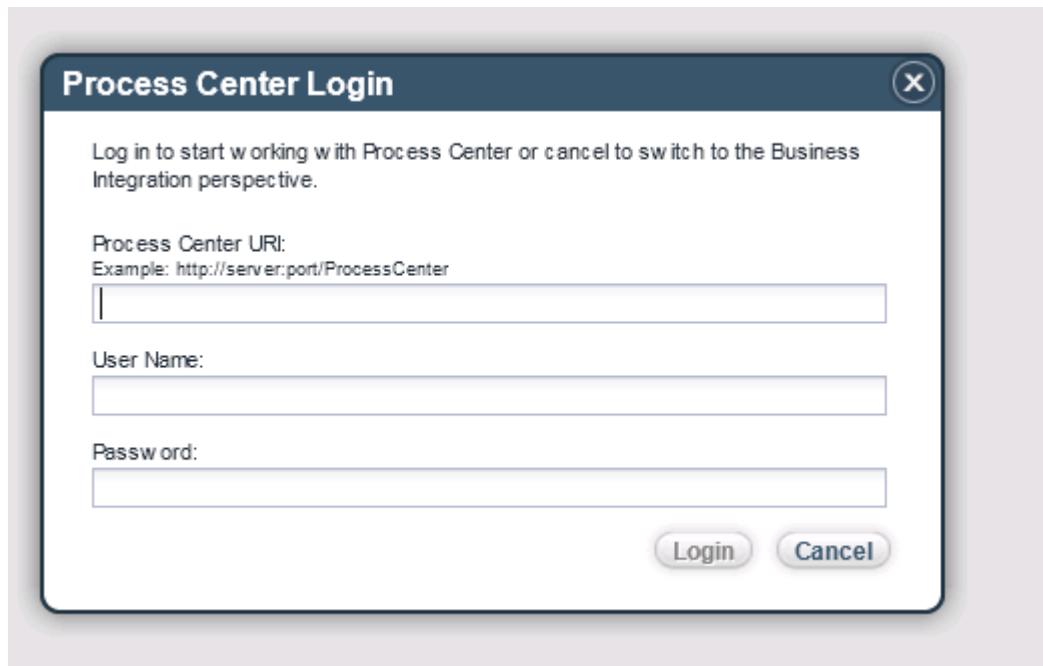
- ___ 1. Start IBM Integration Designer. Since there is no DB2 client available in the lab environment, you use the Data Explorer view in the IBM Integration Designer to connect and view the database tables.
- ___ a. Double-click the **IBM Integration Designer** icon from desktop.



- ___ b. In the Workspace Launcher window, enter C:\workspaces\ex3 and click **OK**.

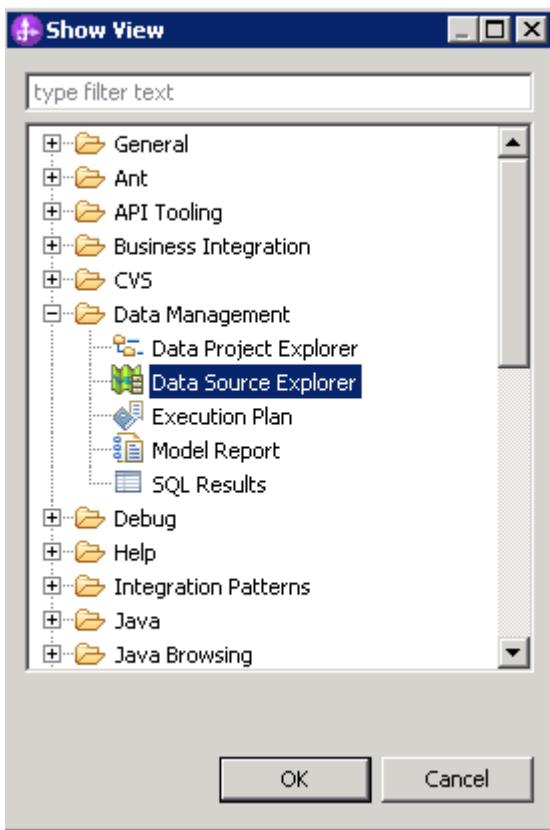


- ___ c. If the Process Center Login dialog appears, click **Cancel**.

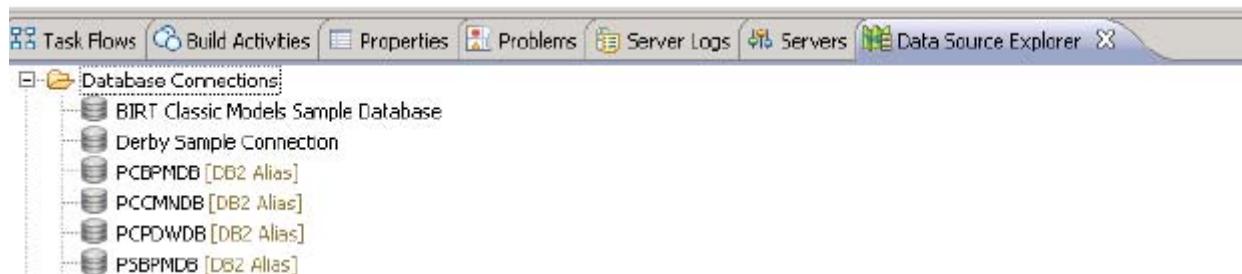


- ___ d. Close the **Getting Started - IBM Integration Designer** tab.
___ 2. Open the Data Source Explorer in your workspace.
___ a. Select **Window > Show View > Other**.

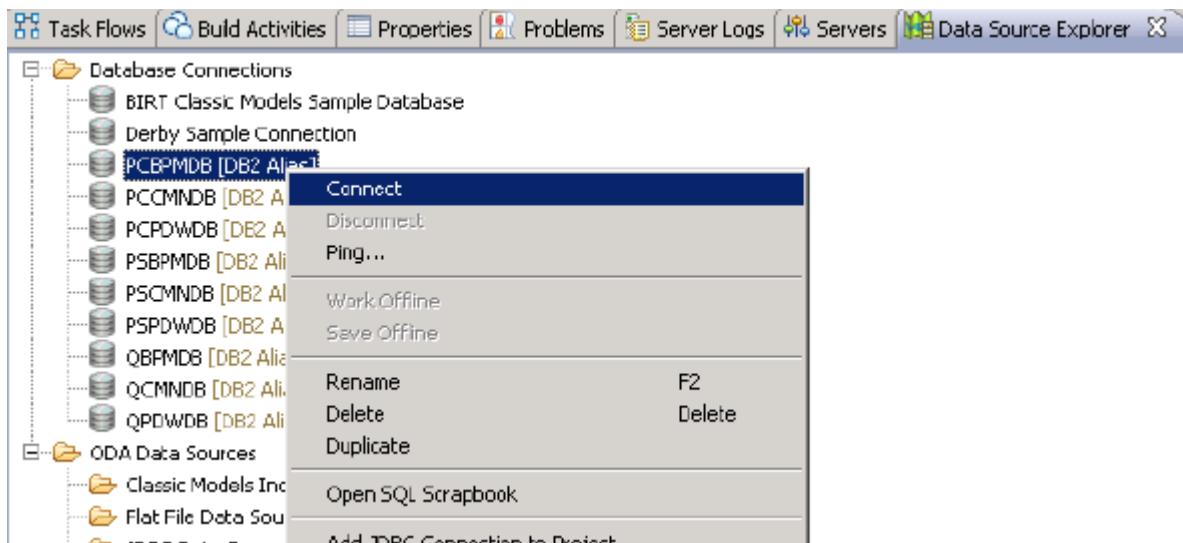
- __ b. Expand **Data Management** and select **Data Source Explorer**.



- __ c. Click **OK**. It might take a couple of minutes to open the Data Source Explorer view.



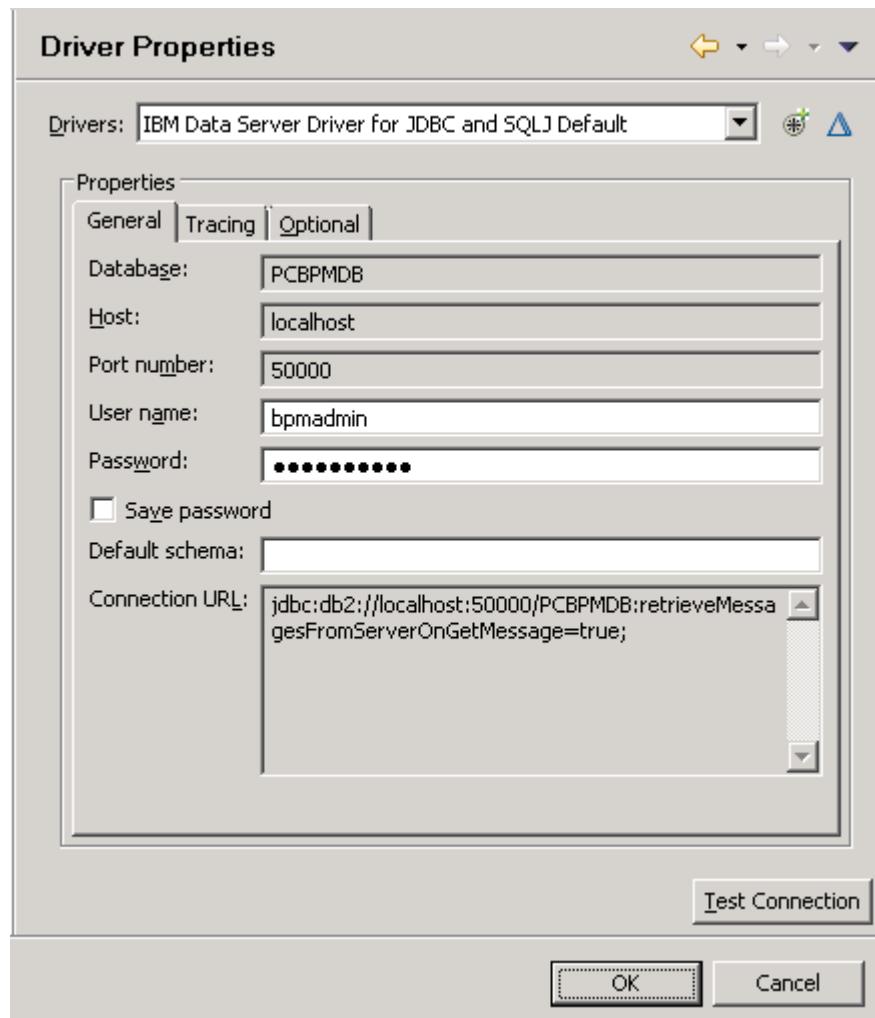
- __ d. In the Data Source Explorer view, expand **Database Connections**, right-click **PCBPMDB**, and select **Connect**.

**Hint**

Three sets of database tables are listed. The database with the prefix `PC` contains Process Center server tables. The database with the prefix `PS` contains information specific to Process Server. The databases that begin with `Q` are the Process Server test server databases.

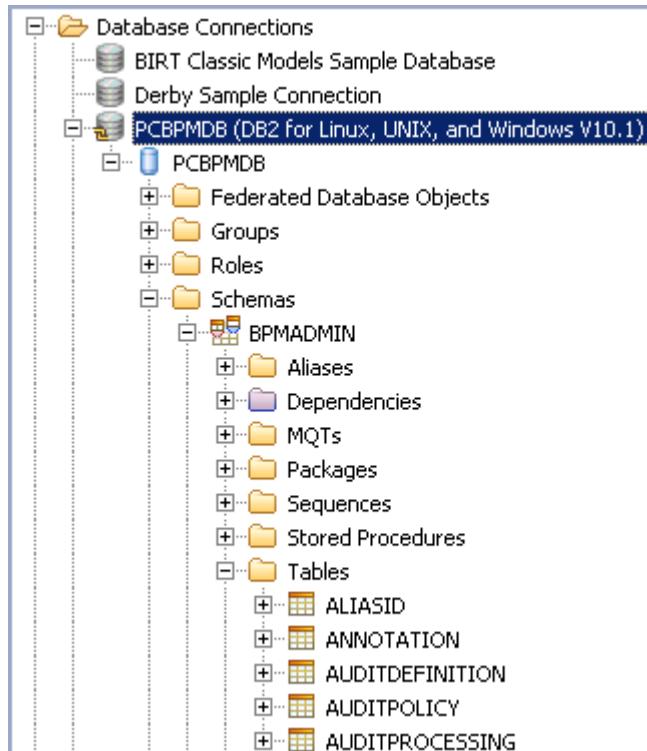
__ e. In the Driver Properties window, enter the following information:

- **User name:** bpmadmin
- **Password:** Web1Sphere [case sensitive]

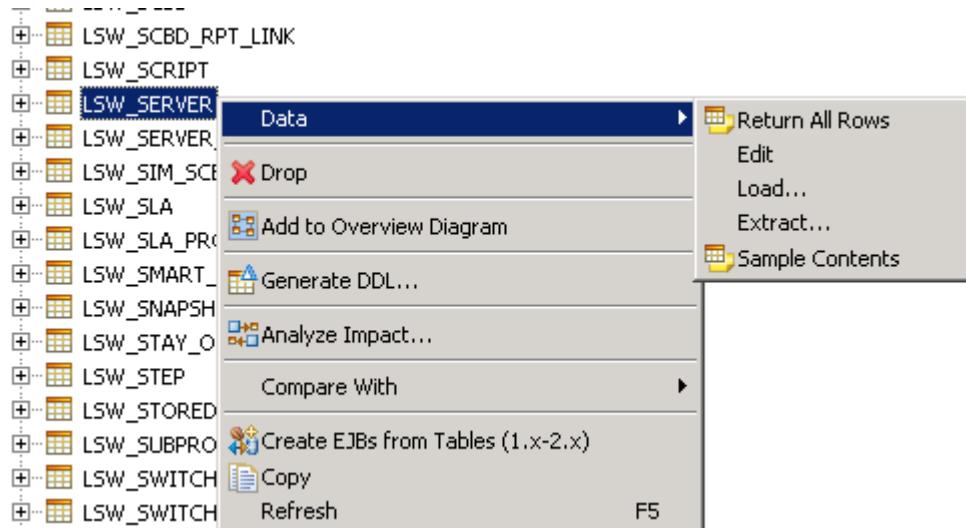


__ f. Click OK.

- __ g. Expand **PCBPMDB > PCBPMDB > Schemas > BPMADMIN > Tables.**



- __ h. Right-click **LSW_SERVER** and select **Data > Return All Rows**.



- __ i. The SQL Result view opens.

	CREATED_BY_USER_ID	CREATED_ON	LAST_MODIFIED	LAST_MODIFIED_BY_USER_ID
1	9	2014-05-0...	2014-05-09 1...	9

- __ j. Scroll to the right to view the **NAME**, **DESCRIPTION**, **ADDRESS**, and **PORT** columns in the results view.

NAME	DESCRIPTION	ADDRESS	PROVIDER_URL	PORT
ProcessServerProcessServer	A running process server	http://ws2008r2x64.wetraini...	corbaname:i...	9082

Notice that the **Name** is ProcessServerProcessServer, which is the name of the Process Server that is listed in the **Servers** tab in the Process Center Console. The description is of a running process server. The port 9082 is the port for the Process Server that is running.

- __ k. Scroll to the right to view the **IS_OFFLINE**, **LAST_HEARTBEAT**, **IS_AVAILABLE**, and **USER_NAME** columns in the results view.

PORT	IS_OFFLINE	LAST_HEARTBEAT	IS_AVAILABLE	TYPE	USER_NAME
9082	F	2014-05-09 13:...	T	1	psdeadmin

Notice that **IS_OFFLINE** is F, which indicates false. This information confirms that the server is not an offline server. The **LAST_HEARTBEAT** has a time stamp of an earlier date. This date is when the Process Server successfully connected to the Process Center. The **IS_AVAILABLE** value of T indicates that the Process Server is available. The Process-Center-to-Process-Server connection is using the **USER_NAME** of psdeadmin.

When you are done examining the row, close the **SQL Results** tab.

- __ l. Optionally, you can close IBM Integration Designer.

Part 5: Examine the connection properties

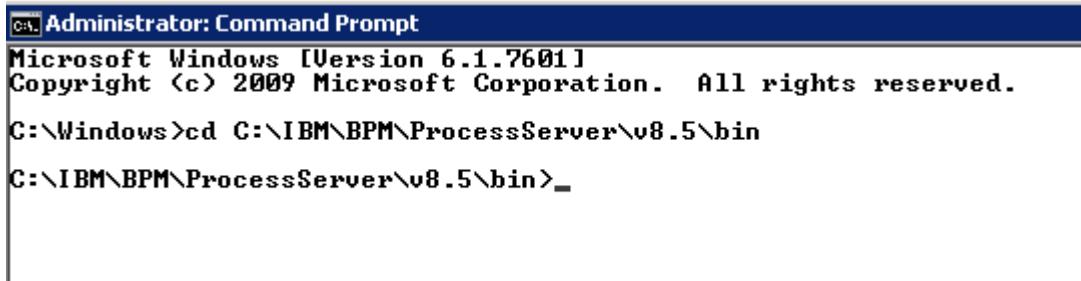
In this section, you use the wsadmin scripts to verify some of the key properties of the Process Server that are required for the connection.

1. Open a command-prompt window, and change the directory to C:\IBM\BPM\ProcessServer\v8.5\bin.
- a. Double-click the command prompt icon in the taskbar.



- ___ b. Enter the following command to change the directory to the Process Server deployment manager bin folder:

```
cd C:\IBM\BPM\ProcessServer\v8.5\bin
```

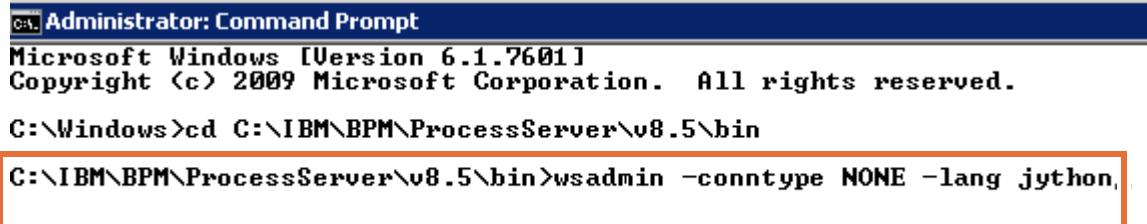


```
C:\ Administrator: Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows>cd C:\IBM\BPM\ProcessServer\v8.5\bin
C:\IBM\BPM\ProcessServer\v8.5\bin>_
```

- ___ 2. Start the wsadmin tool so it runs in local mode and is not connected to any running servers, and so it uses Jython commands.
- ___ a. Enter the following command and press the Enter key:

```
wsadmin -conntype NONE -lang jython
```

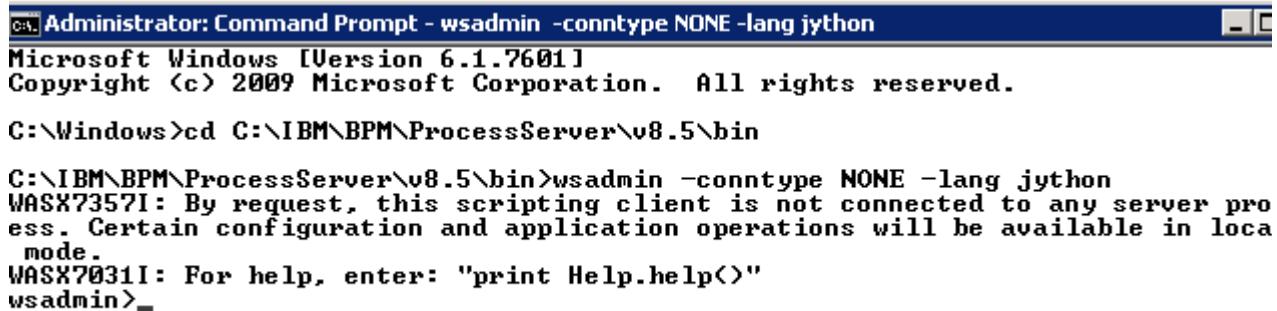


```
C:\ Administrator: Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows>cd C:\IBM\BPM\ProcessServer\v8.5\bin
C:\IBM\BPM\ProcessServer\v8.5\bin>wsadmin -conntype NONE -lang jython,
```

The wsadmin tool starts, and you see messages in the command prompt window.

- ___ b. Wait for the start process to complete and you see the wsadmin> prompt.



```
C:\ Administrator: Command Prompt - wsadmin -conntype NONE -lang jython
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows>cd C:\IBM\BPM\ProcessServer\v8.5\bin
C:\IBM\BPM\ProcessServer\v8.5\bin>wsadmin -conntype NONE -lang jython
WASX7357I: By request, this scripting client is not connected to any server pro
cess. Certain configuration and application operations will be available in loca
mode.
WASX7031I: For help, enter: "print Help.help()"
wsadmin>_
```



Note

You can also configure wsadmin so that it runs Java TCL (Jacl).

For more information about wsadmin, see the WebSphere Application Server V8.5 product documentation at

www.ibm.com/support/knowledgecenter/SSFPJS_8.5.0/ditamaps/ic-homepage-bpm.html and search for wsadmin.

3. Display the list of BPM server properties.

- a. Type the following command, and press Enter:

```
ps=AdminConfig.getId( "/BPMProcessServer:/")
```

```
C:\ Administrator: Command Prompt - wsadmin -conntype NONE -lang jython
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows>cd C:\IBM\BPM\ProcessServer\v8.5\bin

C:\IBM\BPM\ProcessServer\v8.5\bin>wsadmin -conntype NONE -lang jython
WASX7357I: By request, this scripting client is not connected to any session. Certain configuration and application operations will be available in mode.

wsadmin>ps=AdminConfig.getId("/BPMProcessServer:/")
```

- b. When you see the wsadmin > prompt, type the following command and press Enter:

```
print AdminConfig.show(ps)
```

```
C:\ Administrator: Command Prompt - wsadmin -conntype NONE -lang jython
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows>cd C:\IBM\BPM\ProcessServer\v8.5\bin

C:\IBM\BPM\ProcessServer\v8.5\bin>wsadmin -conntype NONE -lang jython
WASX7357I: By request, this scripting client is not connected to any session. Certain configuration and application operations will be available in mode.
WASX7031I: For help, enter: "print Help.help()"
wsadmin>print AdminConfig.show(ps).
```

- ___ c. Review the properties that are listed.

```
C:\ Administrator: Command Prompt - wsadmin -conntype NONE -lang jython
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Windows>cd C:\IBM\BPM\ProcessServer\v8.5\bin

C:\IBM\BPM\ProcessServer\v8.5\bin>wsadmin -conntype NONE -lang jython
WASX7357I: By request, this scripting client is not connected to any server process. Certain configuration and application operations will be available in local mode.
WASX7031I: For help, enter: "print Help.help()"
wsadmin>ps=AdminConfig.getId("/BPMProcessServer:/")
wsadmin>print AdminConfig.show(ps)
[authoringEnvironmentPortalPrefix portall
[baseUrl teamworks/webservices]
[clientLink teamworks]
[coachDesignerXslUrl teamworks/coachdesigner/transform/CoachDesigner.xsll
[commonPortalPrefix portall
[consoleSections [root(cells/PSCell1/clusters/SingleCluster!cluster-bpm.xml#BPMC
onsoleSection_1395637465101) console.lombardi.admin(cells/PSCell1/clusters/Singl
eCluster!cluster-bpm.xml#BPMConsoleSection_1395637465102) console.user.managemen
t(cells/PSCell1/clusters/SingleCluster!cluster-bpm.xml#BPMConsoleSection_1395637
465103) console.monitoring(cells/PSCell1/clusters/SingleCluster!cluster-bpm.xml#
BPMConsoleSection_1395637465104) console.event.manager(cells/PSCell1/clusters/Si
ngleCluster!cluster-bpm.xml#BPMConsoleSection_1395637465105) console.admin.tools
(cells/PSCell1/clusters/SingleCluster!cluster-bpm.xml#BPMConsoleSection_13956374
65106)11
[defaultNamespaceUri schema/]
[heartBeatInterval 10]
[httpProtocolOnly false]
[imagePrefix teamworks]
[processAdminPrefix ProcessAdmin]
[processCenterUrl http://localhost:9081/ProcessCenter]
[processHelpWikiUrlEdit processhelp/en/Special>Edit?topic=%TITLE%&teamworksTitle
=%TEAMWORKS_TITLE%]
[processHelpWikiUrlView processhelp/en/%TITLE%?teamworksTitle=%TEAMWORKS_TITLE%]

[repositoryPrefix ProcessCenter]
[security <cells/PSCell1/clusters/SingleCluster!cluster-bpm.xml#BPMServerSecurit
y_1395637465101>1
[servletPrefix teamworks]
[teamworksWebappPrefix teamworks]
[useHTTPSPrefixes false]
[virtualHost <cells/PSCell1/clusters/SingleCluster!cluster-bpm.xml#BPMVirtualHos
tInfo_1395637465101>1
[webapiPrefix webapi]
wsadmin>_
```



Troubleshooting

For a Process Server to be connected online, certain properties must be set. After reviewing the properties listed, can you identify any problem in any of the properties that are listed?

- __ d. Find the HeartbeatInterval property.

```
BPMConsoleSection_1395637465104> console.event.manager<ce
ngleCluster!cluster-bpm.xml#BPMConsoleSection_13956374651
(cells/PSCell1/clusters/SingleCluster!cluster-bpm.xml#BPM
65106>]
[def...l+<http://teamworks.com/schema/>]
[HeartBeatInterval 10]
[httpProtocolOnly false]
[imagePrefix teamworks]
[processAdminPrefix ProcessAdmin]
[processCenterUrl http://localhost:9081/ProcessCenter]
```

The HeartbeatInterval is listed at 10. This number is a valid heartbeat interval and not an error.

The CWLLG0097E: message is logged every 10 seconds in the SystemOut.log file. This value is the default heartbeat time that the Process Server uses to check for updates on the Process Center repository. However, the Process Center repository cannot be reached, in this case, and the exception is logged.



Questions

Recall the exception that you saw earlier in the SystemOut.log file for Process Server. It explained that when sending the heartbeat, an java.lang.IllegalArgumentException is received and that there is a null argument.

Can you identify any null parameter or missing argument in the properties listed?

- __ e. Scroll down further and find the processCenterUrl property.

```
processCenterInternalUrl 10
[httpProtocolOnly false]
[imagePrefix teamworks]
[processAdminPrefix ProcessAdmin]
processCenterUrl http://localhost:9081/ProcessCenter
[%TEAMWORKS_TITLE%]
[processHelpWikiUrlView processhelp/en/%TITLE%?teamwork:
[repositoryPrefix ProcessCenter]
[security <cells/PSCell1/clusters/SingleCluster!cluster-
```

For IBM BPM V8.5.0.1, you need to update the processCenterInternalUrl variable, which is the same as ProcessCenterUrl but with the literal string Internal appended at the end for the context root. Setting the value for ProcessCenterUrl does not set the correct variable in IBM BPM V8.5.0.1. As you can see, the processCenterInternalUrl variable is not set in this environment and must be set. You do that in the next step.

- ___ 4. Add the `ProcessCenterInternalUrl` property.

- ___ a. Type the following command, and press Enter:

```
AdminConfig.modify(ps, [['processCenterInternalUrl',
    'http://localhost:9081/ProcessCenterInternal']])
```

```
[processHelpWikiUrlEdit processhelp/cn/Special>Edit?topic=%TITLE%&teamworksTitle=%TEAMWORKS_TITLE%]
[processHelpWikiUrlView processhelp/en/%TITLE%?teamworksTitle=%TEAMWORKS_TITLE%]

[repositoryPrefix ProcessCenter]
[security <cells/PSCell1/clusters/SingleCluster!cluster-bpm.xml#BPMServerSecurity_1395637465101>]
[serverletPrefix teamworks]
[teamworksWebappPrefix teamworks]
[useHTTPSPrefixes false]
[virtualHost <cells/PSCell1/clusters/SingleCluster!cluster-bpm.xml#BPMVirtualHostInfo_1395637465101>]
[webapiPrefix webapi]
wsadmin>AdminConfig.modify(ps, [['processCenterInternalUrl','http://localhost:9081/ProcessCenterInternal']] )
```

- ___ b. When you see the `wsadmin >` prompt, type the following command and press Enter:

```
print AdminConfig.show(ps)
```

- ___ c. Verify that the `processCenterInternalUrl` property is added.

```
[imagePrefix teamworks]
[processAdminPrefix ProcessAdmin]
[processCenterInternalUrl http://localhost:9081/ProcessCenterInternal]
[processCenterUrl http://localhost:9081/ProcessCenter]
[processHelpWikiUrlEdit processhelp/en/Special>Edit?topic=%TITLE%&teamworksTitle=%TEAMWORKS_TITLE%]
[processHelpWikiUrlView processhelp/en/%TITLE%?teamworksTitle=%TEAMWORKS_TITLE%]

[repositoryPrefix ProcessCenter]
[security <cells/PSCell1/clusters/SingleCluster!cluster-bpm.xml#BPMServerSecurity_1395637465101>]
```

- ___ d. Type `AdminConfig.save()` and press Enter. Your changes are saved.

- ___ e. Exit wsadmin by entering the following command, and pressing Enter:

```
exit
```

- ___ f. Close the command prompt window.

- ___ 5. Stop the Process Server SingleClusterMember1 server.

- ___ a. Open a web browser window and go to the following website:

```
http://localhost:9063/ibm/console
```

- ___ b. In the WebSphere Integrated Solutions Console login window, enter the following credentials and click **Log in**.

- **User ID:** bpmadmin
- **Password:** websphere

- ___ c. Expand **Servers > Server types**, and click **WebSphere Application Servers**.

- ___ d. Select **SingleClusterMember1** and click **Stop**.

- ___ e. If prompted, click **OK** to stop.

It might take a couple of minutes for the SingleClusterMember1 server to stop. You also see a red icon in the Status column, which indicates that the server is running.

- ___ 6. Stop the Process Server node agent.

- ___ a. Double-click the **Stop the Process Server node agent** icon in the Process Server folder on the desktop.

A command prompt window opens with status messages on the progress of the node agent shutdown.

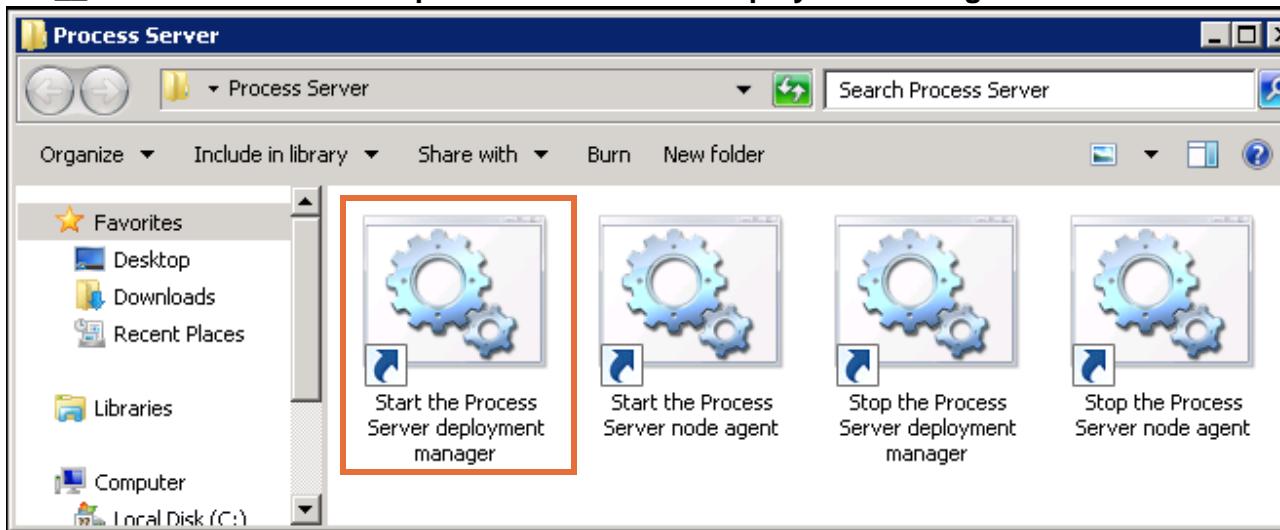
- ___ b. Enter the user ID of `bpmadmin` and password of `web1sphere` when prompted.

- ___ c. Wait until the node agent stops. Press any key to close the command prompt window.

- ___ 7. Stop the Process Server deployment manager.

- ___ a. Go back to the open Process Server folder window.

- ___ b. Double-click the **Stop the Process Server deployment manager** icon.



A command prompt window opens with status messages on the progress of the server shutdown.

- ___ c. Enter the user ID of `bpmadmin` and password of `web1sphere` when prompted.
 ___ d. Wait until the deployment manager stops, and then press any key to close the command prompt window.

- ___ 8. Start the Process Server environment.

If the Process Server Center environment is already running, then skip to the next step.

- ___ a. From the desktop, open the Process Server folder and double-click the **Start the Process Server Deployment Manager** shortcut icon to start the server. Leave the Process Server folder open as you are going to use it again shortly.
 ___ b. Wait until the start command is successfully completed, and press any key to continue.
 ___ c. Double-click the **Start the Process Server node agent** shortcut icon.

- ___ d. Wait until the start command is successfully completed, and press any key to continue.
- ___ 9. Start the administrative console for Process Server.
- ___ a. Double-click the **Firefox** icon from the desktop to open the web browser, and enter the following web address:
- http://localhost:9063/ibm/console
- ___ b. Log in to the administrative console as:
- User ID: bpmadmin
 - Password: websphere
- ___ c. In the administration console, expand **Servers > Server Types** and click **WebSphere application servers**.
- ___ d. Select the **SingleClusterMember1** check box.
- ___ e. Click **Start**.
- ___ f. Wait until the start command is successfully completed, and the status becomes green.

Select	Name	Node	Host Name	Version	Cluster Name	Status
You can administer the following resources:						
<input type="checkbox"/>	SingleClusterMember1	Node1	ws2008r2x64.wetraining.com	ND 8.5.5.1 BPMAdv 8.5.0.1	SingleCluster	

- ___ 10. Examine the Process Center console and verify the status of the online Process Server.
- ___ a. Double-click the **Internet Explorer** icon from the desktop to open the web browser, and enter the following web address:
- http://localhost:9081/ProcessCenter
- Having two separate browsers ensures that the session information is not shared among the two instances when working with the administrative console and the Process Center console.
- ___ b. Log in to the Process Center console by entering `pcdeadmin` in the **User Name** field and `websphere` in the **Password** field.
- ___ c. Click **Login**.
- ___ d. Click the **Servers** tab.

- ___ e. Notice that the status of the online Process Server is still the same as it was earlier.

The screenshot shows the IBM Business Process Manager Process Center interface in Mozilla Firefox. The title bar reads "IBM Business Process Manager Process Center - Mozilla Firefox". The menu bar includes File, Edit, View, History, Bookmarks, Tools, and Help. The toolbar has a "New Tab" button. The address bar shows "localhost:9081/ProcessCenter/repository/com.lombardisoftware.repository.Repository/Repository.jsp". The main navigation bar at the top has links for Process Apps, Toolkits, Servers, Admin, and Preferences. The user is logged in as "nodeadmin". The "Servers" tab is selected. A single server entry is displayed: "ProcessServerProcessServer (ws2008r2x64 wetraining.com)" with the status "Connected? (This server may not be available right now)". There are links to "Configure Server" and "Take Server Offline".

- ___ f. Since the status of the server did not change, you need to check the `SystemOut.log` file again to see whether the error that you had earlier still exists. It is possible that something else is going on with the environment.

11. Review the Process Server logs.

- ___ a. Go to `C:\IBM\BPM\ProcessServer\v8.5\profiles\Node1Profile\logs\SingleClusterMember1` and double-click **SystemOut.log**.

The screenshot shows a Windows File Explorer window. The title bar says "SingleClusterMember1". The address bar shows the path "C:\IBM\BPM\ProcessServer\v8.5\profiles\Node1Profile\logs\SingleClusterMember1". The menu bar includes File, Edit, View, Tools, Help. The toolbar includes Organize, Open, Print, Burn, and New folder. The left sidebar shows Favorites (Desktop, Downloads, Recent Places), Libraries, Computer (Local Disk (C:)), and Network. The right pane is a list view with columns for Name and Type. It contains several log files: btrace.1, native_stderr.log, native_stdout.log, objects, SingleClusterMember1.pid, SystemErr.log, SystemErr.log.owner, SystemOut.log, and SystemOut.log.owner. The "SystemOut.log" file is highlighted with a blue selection bar.

- ___ b. The log file opens in Notepad, which is the default editor. Scroll to the bottom of the `SystemOut.log` file and review the contents.

- ___ c. Notice the following exception at the bottom of the log:

```
org.apache.commons.httpclient.HttpMethodDirector processWWWAuthChallenge
Failure authenticating with BASIC
'ProcessCenterInternalRealm'@localhost:9081
CWLLG0095W: The repository contact failed with a status of: 401
```

```
failed with a status of: 401
[5/10/14 17:25:35:031 PDT] 0000016a AuthChallenge I
org.apache.commons.httpclient.auth.AuthChallengeProcessor selectAuthScheme basic
authentication scheme selected
[5/10/14 17:25:35:078 PDT] 0000016a HttpMethodDir I
org.apache.commons.httpclient.HttpMethodDirector processWWWAuthChallenge Failure
authenticating with BASIC 'ProcessCenterInternalRealm'@localhost:9081
[5/10/14 17:25:35:078 PDT] 0000016a wle_repopcore_W CWLLG0095W: The repository contact
failed with a status of: 401
[5/10/14 17:25:45:109 PDT] 0000016a AuthChallenge I
org.apache.commons.httpclient.auth.AuthChallengeProcessor selectAuthScheme basic
authentication scheme selected
[5/10/14 17:25:45:171 PDT] 0000016a HttpMethodDir I
org.apache.commons.httpclient.HttpMethodDirector processWWWAuthChallenge Failure
authenticating with BASIC 'Processcenterinternalrealm'@localhost:9081
[5/10/14 17:25:45:171 PDT] 0000016a wle_repopcore_W CWLLG0095W: The repository contact
failed with a status of: 401
[5/10/14 17:25:55:187 PDT] 0000016a Authchallenge I
org.apache.commons.httpclient.auth.AuthChallengeProcessor selectAuthScheme basic
authentication scheme selected
```

The error that you see in the list is a different error. The previous error is not listed anymore. The `processCenterUrl` entry that you defined earlier fixed that previous exception. But you still cannot see the Process Server that is connected to Process Center. Now that you see this new error, it is clear that there were multiple problems with this environment.

The `CWLLG0095W` message is logged every 10 seconds in the `SystemOut.log` file. This value is the default heartbeat time that the Process Server uses to check for updates on the Process Center repository. However, the Process Center repository cannot be reached in this case, and the warning message is logged.

The most common reason behind the listed error is an incorrect or missing authentication alias. The authentication alias is defined on the Process Server side for a user to connect to the Process Center repository. The error most likely refers to an alias that probably has incorrect credentials that are specified in either the Process Server or Process Center security configuration. The user and password set in the alias must be present in the Process Center configuration. You now verify that a correct alias exists.

Part 6: Examine the authentication alias that is defined in Process Server

- ___ 1. Log back in to the Process Server administrative console if you are not already logged in.
- ___ a. Open a web browser window and go to the following website:

<http://localhost:9063/ibm/console>

- ___ b. In the WebSphere Integrated Solutions Console login window, enter the following credentials and click **Log in**:
- **User ID:** bpmadmin
 - **Password:** web1sphere
- ___ c. In the administration console, expand **Security** and click **Global Security**.
- ___ d. In the Authentication section, expand **Java Authentication and Authorization Service**.

The screenshot shows the 'Authentication' configuration page. At the top, it says 'Authentication mechanisms and expiration'. There are two radio buttons: one selected for 'LTPA' and another for 'Kerberos and LTPA'. Below the radio buttons are several sections with links:

- LTPA
- Kerberos configuration
- Authentication cache settings
- Web and SIP security
- RMI/IOP security
- Java Authentication and Authorization Service
- Enable Java Authentication SPI (JASPI)
Providers
- Use realm-qualified user names

At the bottom of the page, there is a list of related topics:

- Security domains
- External authorization providers
- Programmatic session cookie configuration
- Custom properties

- ___ e. Click **J2c authentication data**.

- ___ f. Examine the list of the aliases defined. Notice the ProcessCenterUserAlias that is defined.

The screenshot shows the 'Global security' interface with the 'JAAS - J2C authentication data' tab selected. A checked checkbox at the top indicates the prefixing of alias names with the node name of the cell. Below this is an 'Apply' button. A 'Preferences' section includes 'New...' and 'Delete' buttons, and a toolbar with icons for adding, deleting, and sorting. A table lists four aliases:

Select	Alias	User ID
<input type="checkbox"/>	BPM_DB_ALIAS	bpmadmin
<input type="checkbox"/>	CellAdminAlias	bpmadmin
<input type="checkbox"/>	DeAdminAlias	psdeadmin
<input type="checkbox"/>	ProcessCenterUserAlias	pcdeadmin

Total 4

- ___ g. Click **ProcessCenterUserAlias**.
 ___ h. Examine the details of **ProcessCenterUserAlias**.

The screenshot shows the 'Global security' interface with the 'JAAS - J2C authentication data' tab selected, and the 'ProcessCenterUserAlias' alias selected. The 'General Properties' section displays the following details:

- Alias:** ProcessCenterUserAlias
- User ID:** pcdeadmin
- Password:** (redacted)
- Description:** (empty)

At the bottom are 'Apply', 'OK', 'Reset', and 'Cancel' buttons.

ProcessCenterUserAlias must use a valid user name and password from the Process Center environment. The user does not need any special authorization in Process Center. The user ID for this alias is listed as pcdeadmin, which is a valid user ID for the Process Center. A password is also listed.

**Warning**

Do not change any values.

Assuming that the password listed is correct, nothing seems unusual in this area.

- __ i. Click **Cancel**.
- __ j. Expand **Servers** and click **Deployment Environments**.
- __ k. Click the **ProcessServer** link.

The screenshot shows a software interface titled "Deployment Environments". At the top, there are three buttons: "Start", "Stop", and "New...". Below these are four small icons: a checkmark, a folder, a double arrow, and a gear. A toolbar below the icons includes "Select" and "Status" dropdown menus, and a "Deployment Environment Name" dropdown menu. A table lists one item: a checkbox next to a green arrow icon, followed by the text "ProcessServer". At the bottom left of the table, it says "Total 1".

- __ l. In the **Related Items** section, click **Authentication Aliases**.

- ___ m. Examine the roles and the aliases that are associated with them.

Deployment Environments

Deployment Environments > ProcessServer > Business Integration Security

Use this page to secure your application server and your business integration applications. The table below lists the authentication applications.

Authentication Alias

Role	Alias
BPCUser	DeAdminAlias
BPMAdminJobUser	DeAdminAlias
BPMAuthor	DeAdminAlias
BPMUser	DeAdminAlias
BPMWebserviceUser	DeAdminAlias
DeAdmin	DeAdminAlias
EmbeddedECMTechicalUser	DeAdminAlias
EventManagerUser	DeAdminAlias
PerformanceDWUser	DeAdminAlias
ProcessCenterUser	DeAdminAlias
ProcessServerUser	DeAdminAlias
SCAUser	DeAdminAlias
Total 12	

You can specify multiple aliases for role SystemLaneUser. Hold the CTRL key to select multiple items.

CellAdminAlias
DeAdminAlias
 ProcessCenterUserAlias
 BPM_DB_ALIAS

Apply **OK** **Reset** **Cancel**

- ___ n. Notice the alias for the `ProcessCenterUser` role. It is listed as `DeAdminAlias`.



Questions

Can you identify the problem here?

- ___ o. The `ProcessCenterUserAlias` that exists in the environment for access to the Process Center is not associated anywhere here with any role, specifically the `ProcessCenterUser` role. This circumstance might be why you saw the error message in the `Systemout.log`. You need to make that association.

- ___ 2. Associate the alias with the `ProcessCenterUser` role
- ___ a. Change the value of the **Alias** for `ProcessCenterUser` from `DeAdminAlias` to:
`ProcessCenterUserAlias`

	Alias
	DeAdminAlias ▾
	CellAdminAlias DeAdminAlias ProcessCenterUserAlias BPM_DB_ALIAS
	DeAdminAlias ▾

multiple items.

- ___ b. Verify that the modified value is listed for the alias. Click **OK**.

The screenshot shows a configuration table for 'Authentication Alias'. The columns are 'Role' and 'Alias'. Most roles have 'DeAdminAlias' selected in the dropdown, except for 'ProcessCenterUser' which has 'ProcessCenterUserAlias' selected. A tooltip at the bottom left says: 'You can specify multiple aliases for role SystemLaneUser. Hold the CTRL key to select multiple items.' Below the table is a dropdown menu showing 'CellAdminAlias', 'DeAdminAlias' (selected), 'ProcessCenterUserAlias', and 'BPM_DB_ALIAS'. At the bottom are 'Apply', 'OK', 'Reset', and 'Cancel' buttons.

Role	Alias
BPCUser	DeAdminAlias
BPMAdminJobUser	DeAdminAlias
BPMAuthor	DeAdminAlias
BPMUser	DeAdminAlias
BPMWebserviceUser	DeAdminAlias
DeAdmin	DeAdminAlias
EmbeddedECMTechicalUser	DeAdminAlias
EventManagerUser	DeAdminAlias
PerformanceDWUser	DeAdminAlias
ProcessCenterUser	ProcessCenterUserAlias
ProcessServerUser	DeAdminAlias
SCAUser	DeAdminAlias

Total 12

You can specify multiple aliases for role SystemLaneUser. Hold the CTRL key to select multiple items.

CellAdminAlias
DeAdminAlias
 ProcessCenterUserAlias
 BPM_DB_ALIAS

Apply **OK** **Reset** **Cancel**

- ___ c. Click **Save**.

The 'Messages' dialog box contains the following text:

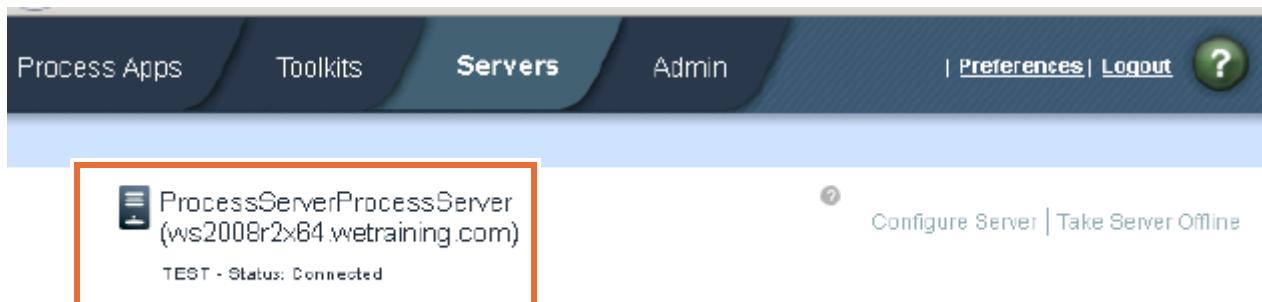
- Changes have been made to your local configuration. You can:
 - Save directly to the master configuration.
 - Review changes before saving or discarding.
- An option to synchronize the configuration across multiple nodes after saving can be enabled in [Preferences](#).
- The server may need to be restarted for these changes to take effect.

- ___ 3. Restart servers so that the new configuration is in effect.
 - ___ a. Select **Servers > Server Types > WebSphere application servers**, and select the **SingleClusterMember1**.
 - ___ b. Click **Stop**.
 - ___ c. Click **OK** to confirm. Wait until the node stops successfully.
 - ___ d. Click **OK**.
 - ___ e. Click **Logout**, and minimize the browser.
 - ___ f. Double-click the **Stop the Process Server node agent** shortcut icon in the **Process Server** folder on the desktop.
 - ___ g. If the **Login at the Target Server** dialog appears, enter `bpmadmin` for **User Identity** and `web1sphere` for **User Password**.
 - ___ h. Click **OK**.
 - ___ i. Wait until the stop command is successfully completed, and press any key to continue.
 - ___ j. Double-click the **Stop the Process Server deployment manager** shortcut icon.
 - ___ k. If you are prompted, enter `bpmadmin` for **User Identity** and `web1sphere` for **User Password**.
 - ___ l. Click **OK**.
 - ___ m. Wait until the stop command is successfully completed, and press any key to continue.
 - ___ n. Double-click the **Start the Process Server deployment manager** shortcut icon.
 - ___ o. Wait until the start command is successfully completed, and press any key to continue.
 - ___ p. Double-click the **Start the Process Server node agent** shortcut icon.
 - ___ q. Wait until the start command is successfully completed, and press any key to continue.
 - ___ r. Return to the **administrative console** on the Firefox browser that was minimized earlier, and enter `bpmadmin` in the **User ID** field and `web1sphere` in the **Password** field. If you shut down the browser, then you can start a new browser session by entering the web address for the Process Server administrative console, which is:
`http://localhost:9063/ibm/console`
 - ___ s. Click **Log in**.
 - ___ t. In the administration console, expand **Servers > Server Types** and click **WebSphere application servers**.
 - ___ u. Select the **SingleClusterMember1** check box.
 - ___ v. Click **Start**.
 - ___ w. Wait until the start command is successfully completed, and the status becomes started.

Part 7: Verify the status of the online Process Server

You now examine the status of the online server.

- 1. Examine the Process Center console and verify the status of the online Process Server.
- a. Double-click the **Internet Explorer** icon from the desktop to open the web browser, and enter the following web address: `http://localhost:9081/ProcessCenter`
Having two separate browsers ensures that the session information is not shared among the two instances when working with the administrative console and the Process Center console.
- b. Log in to the Process Center console by entering `pcdeadmin` in the **User Name** field and `websphere` in the **Password** field.
- c. Click **Login**.
- d. Click the **Servers** tab.
- e. Notice that the status of the online Process Server is now connected.



- 2. Optionally, examine the `SystemOut.log` file to verify that the error message is no longer listed.
 - a. Go to `C:\IBM\BPM\ProcessServer\v8.5\profiles\Node1Profile\logs\SingleClusterMember1` and double-click **SystemOut.log**.
 - b. The log file opens in Notepad, which is the default editor. Scroll to the bottom of the `SystemOut.log` file and review the contents. The errors that you saw earlier are no longer listed.
- 3. Close all open windows and browsers. You can leave Process Center running for the next lab.

End of exercise

Exercise review and wrap-up

In this exercise, you learned to troubleshoot Process Server communication with Process Center.

Exercise 4. Troubleshooting process application deployment

What this exercise is about

This exercise covers troubleshooting process application deployment issues. In this exercise, you assume the role of an application deployer user and the role of an administrative user.

As the application deployer, you use Process Center to install a process application snapshot to Process Server, but the installation fails. You then work as an administrative user to troubleshoot the failed installation by using several different methods: checking user permissions, reviewing log files, and searching for information in the product documentation.

After resolving the issue, you verify the successful process application installation by using Process Admin Console for Process Server.

What you should be able to do

At the end of this exercise, you should be able to:

- Create users in the Process Admin console
- Add users to groups in the Process Admin console
- Check server log files and identify issues
- Search the Business Process Manager product documentation for troubleshooting information

Introduction

The scenario for this exercise follows appdeployer, a process application user who deploys and installs process applications. The appdeployer user tries to install a process application snapshot to Process Server, but encounters an error message and cannot install the process application snapshot. The administrator, who uses both the pcdeadmin and bpmadmin user IDs, troubleshoots the error message to determine how to resolve the issue.

This exercise uses the following user IDs:

- appdeployer: An application deployment user ID
- bpmadmin: A Business Process Manager administrator user ID
- pcdeadmin: A Process Center administrator user ID

Requirements

Completing the exercises for this course requires a lab environment. This environment includes the exercise support files, IBM Process Designer, IBM Process Portal, IBM Process Center, IBM Process Server, and IBM Integration Designer test environment.

Before starting this exercise, you must successfully complete Exercise 3.

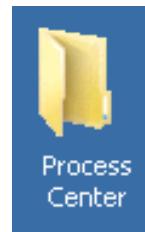
Exercise instructions

Part 1: Starting the Process Center servers

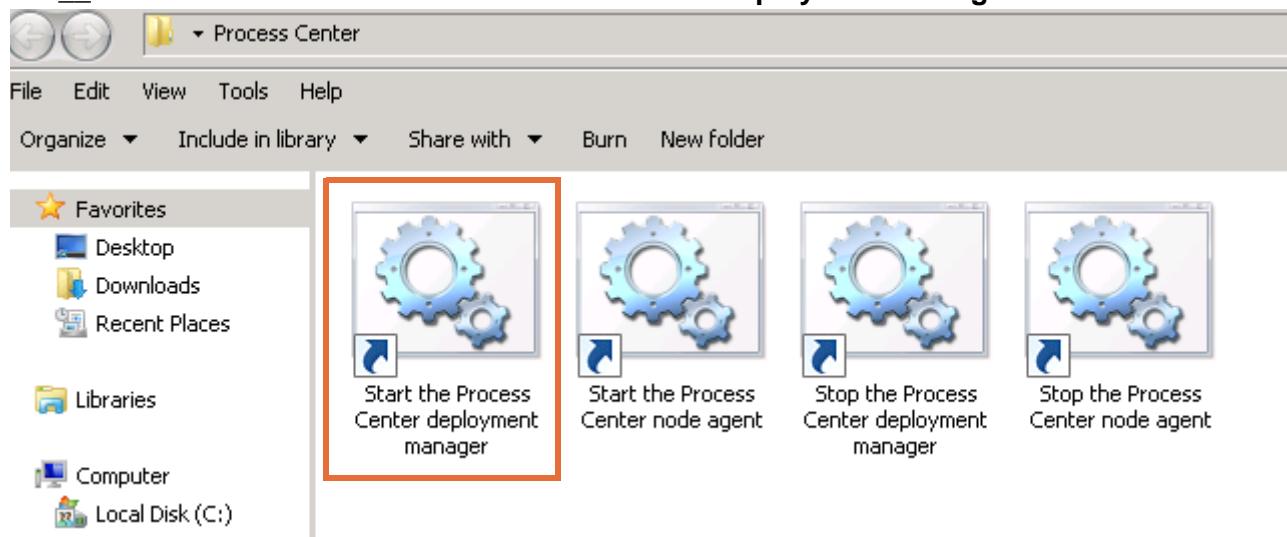
If needed, start the three Process Center servers.

If the Process Center servers are already started in your lab environment, go to **Part 2: Starting the Process Server servers**.

- 1. Start the Process Center deployment manager.
 - a. Double-click the **Process Center** folder on the desktop.



- b. Double-click the **Start the Process Center deployment manager** icon.



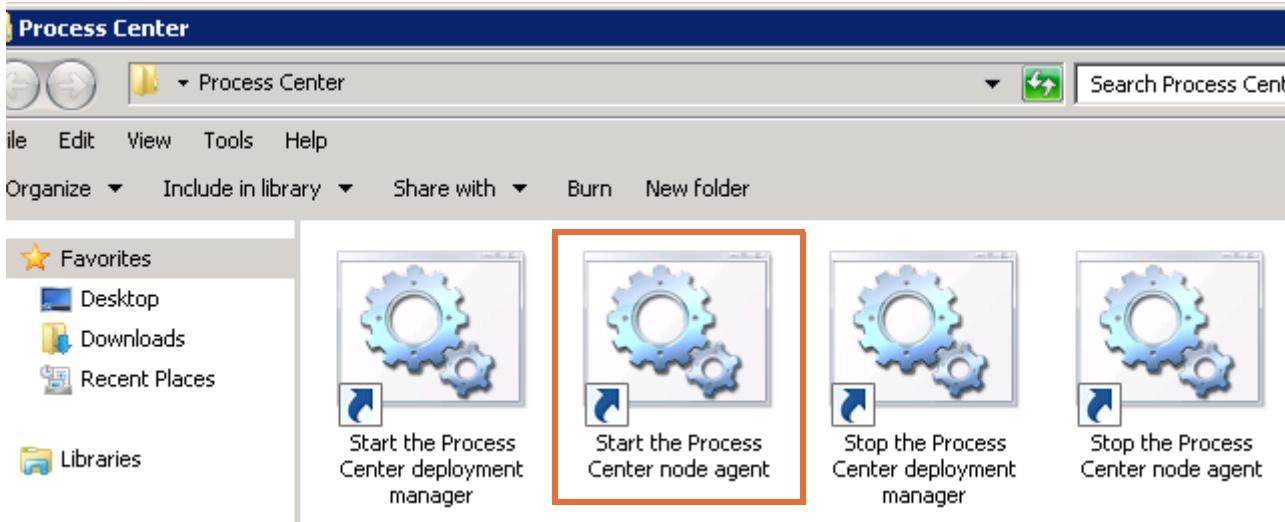
A command prompt window opens with status messages on the progress of the server initialization.

- c. Wait until you see the following message, which indicates that the server started successfully:

Server dmgr open for e-business

```
Start the Process Center deployment manager
ADMU0116I: Tool information is being logged in file
              C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\logs\dmgr\startSe
              rver.log
ADMU0128I: Starting tool with the DmgrProfile profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3000I: Server dmgr initialized for e-business; initialization status.
ADMU3000I: Server dmgr open for e-business; process id is 7872
Press any key to continue . . . =
```

- ___ d. Press any key to close the command prompt window.
- ___ 2. Start the Process Center node agent.
 - ___ a. Go back to the open **Process Center** folder window.
 - ___ b. Double-click the **Start the Process Center node agent** icon.



A command prompt window opens with status messages on the progress of the server initialization.

- ___ c. Wait until you see the following message, which indicates that the server started successfully:

Server nodeagent open for e-business

```
Start the Process Center node agent
ADMU0116I: Tool information is being logged in file
  C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile\logs\nodeagent\startServer.log
ADMU0128I: Starting tool with the Node1Profile profile
ADMU3100I: Reading configuration for server: nodeagent
ADMU3200I: Configuration for server nodeagent initialized.
ADMU3000I: Server nodeagent open for e-business; process id is 8520
Press any key to continue . . .
```

- ___ d. Press any key to close the command prompt window.
- ___ 3. Start the Process Center SingleClusterMember1 server.
 - ___ a. Open a web browser window and go to the following website:

<http://localhost:9061/ibm/console>

**Information**

After the page loads, the URL for the Process Center WebSphere Application Server administrative console is:

`https://localhost:9044/ibm/console/secure/securelogon.do`

Make sure that you see **9044** as the port number, which is the correct port number for the Process Center WebSphere Application Server administrative console.

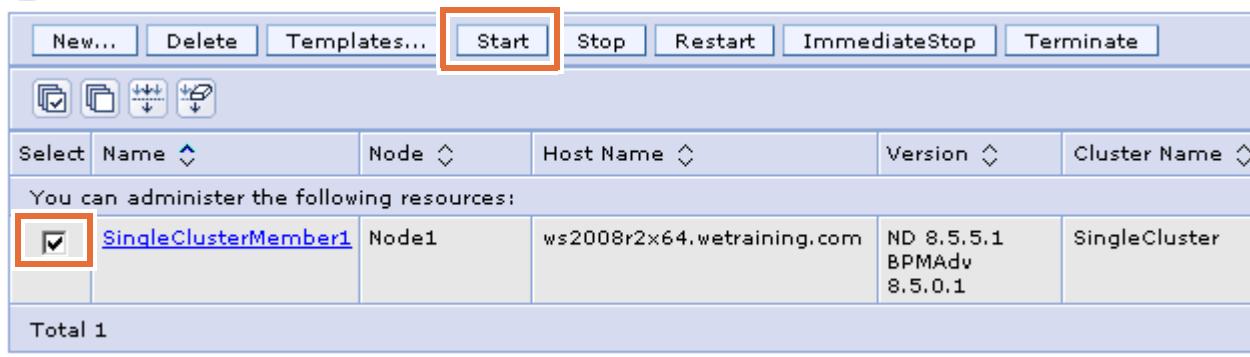
- ___ b. In the WebSphere Integrated Solutions Console login window, enter the following credentials and click **Log in**.

- **User ID:** bpmadmin
- **Password:** web1sphere



You see the main WebSphere Application Server administrative console page for Process Center.

- ___ c. Expand **Servers > Server types**, and click **WebSphere Application Servers**.
 ___ d. Select **SingleClusterMember1** and click **Start**.



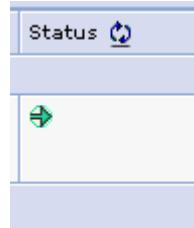
It might take several minutes for the SingleClusterMember1 server to start.

When the server is started, you see a message that says:

Server Node1/SingleClusterMember1 started successfully.

The screenshot shows a 'Messages' panel with a single item: 'Server Node1/SingleClusterMember1 started successfully. The collection may need to be refreshed to show the current server status. [View JVM logs](#) for further details.' A green arrow icon is present next to the message text.

You also see a green arrow in the Status column, which indicates that the server is running.



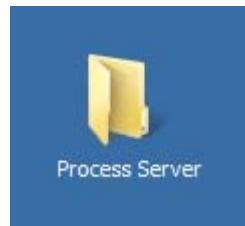
- ___ 4. Log out of the Process Center WebSphere Application Server console.

Part 2: Starting the Process Server servers

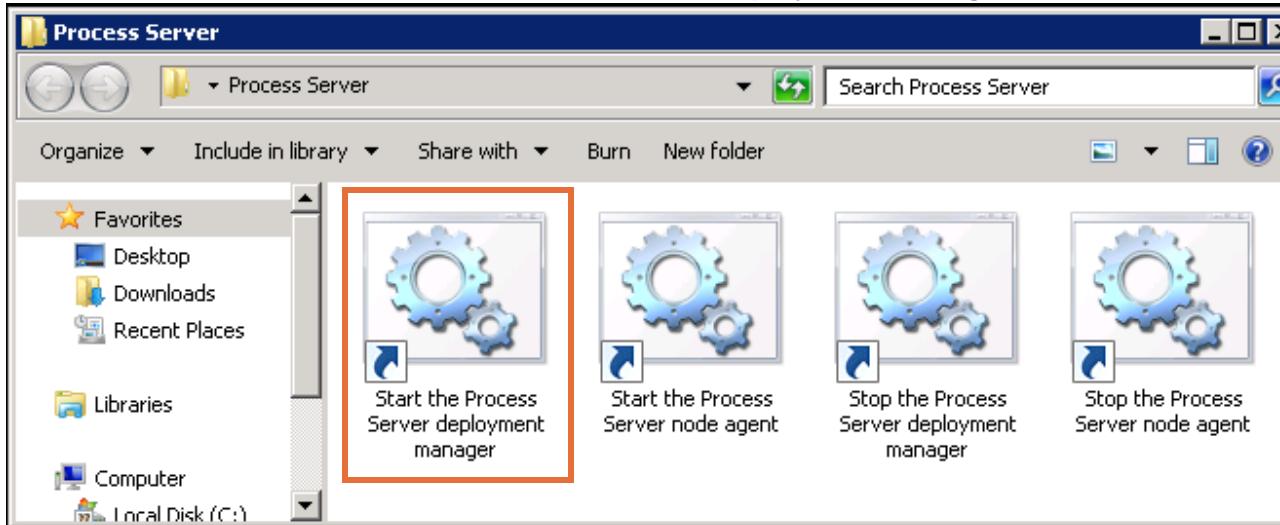
If needed, start the Process Server servers.

If the Process Server servers are already started in your lab environment, go to **Part 3: Trying to install a process application snapshot**.

- ___ 1. Start the Process Server deployment manager.
 - ___ a. Double-click the **Process Server** folder on the desktop.



- ___ b. Double-click the **Start the Process Server deployment manager** icon.



A command prompt window opens with status messages on the progress of the server initialization.

- c. Wait until you see the following message, which indicates that the server started successfully:

Server dmgr open for e-business

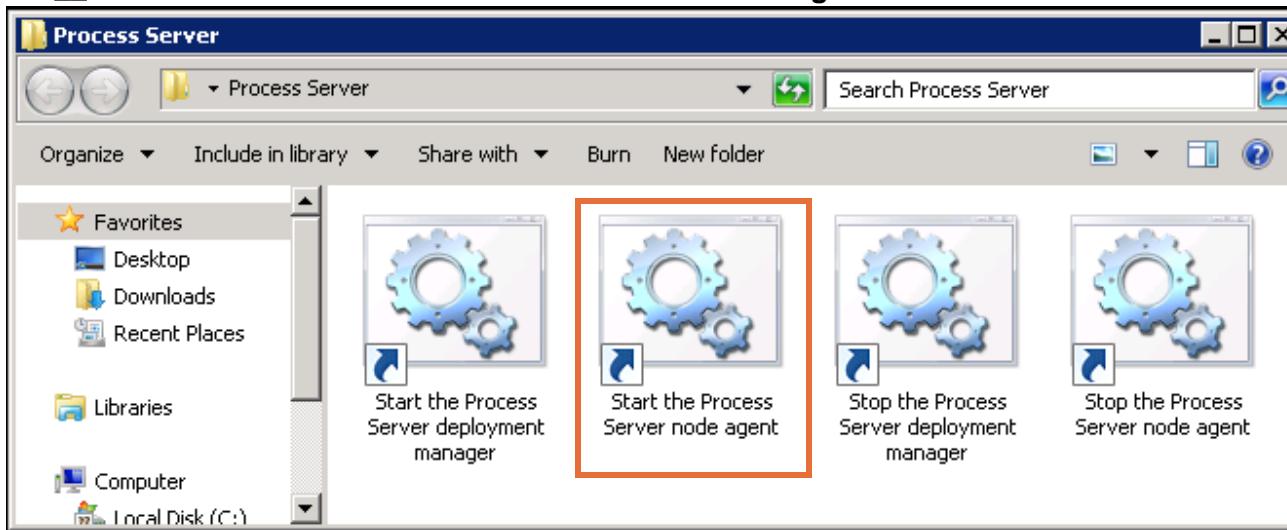
```

Start the Process Server deployment manager

ADMU0116I: Tool information is being logged in file
C:\IBM\BPM\ProcessServer\v8.5\profiles\dmgrProfile\logs\dmgr\startServer.log
ADMU0128I: Starting tool with the DmgrProfile profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3000I: Server dmgr open for e-business; process id is 4292
Press any key to continue . . .

```

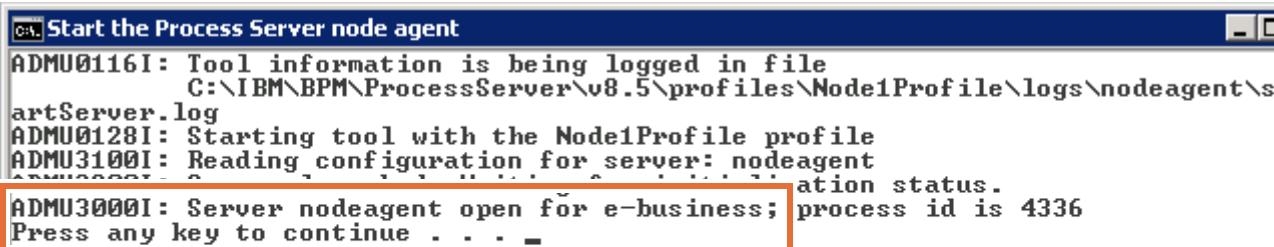
- d. Press any key to close the command prompt window.
2. Start the Process Server node agent.
 - a. Go back to the open Process Server folder window.
 - b. Double-click the **Start the Process Server node agent** icon.



A command prompt window opens with status messages on the progress of the server initialization.

- ___ c. Wait until you see the following message, which indicates that the server started successfully:

Server nodeagent open for e-business



```
Start the Process Server node agent
ADMU0116I: Tool information is being logged in file
C:\IBM\BPM\ProcessServer\v8.5\profiles\Node1Profile\logs\nodeagent\startServer.log
ADMU0128I: Starting tool with the Node1Profile profile
ADMU3100I: Reading configuration for server: nodeagent
ADMU3000I: Server nodeagent open for e-business; process id is 4336
Press any key to continue . . .
```

- ___ d. Press any key to close the command prompt window.

- ___ 3. Start the Process Center SingleClusterMember1 server.

- ___ a. Open a web browser window and go to the following website:

<http://localhost:9063/ibm/console>



Information

The URL for the Process Center WebSphere Application Server administrative console after the page loads is:

<https://localhost:9046/ibm/console/secure/securelogon.do>

Make sure that you see **9046** as the port number, which is the correct port number for the Process Server WebSphere Application Server administrative console.

- ___ b. In the WebSphere Integrated Solutions Console login window, enter the following credentials and click **Log in**.
- **User ID:** bpmadmin
 - **Password:** web1sphere



You see the main WebSphere Application Server administrative console page for Process Server.

- ___ c. Expand **Servers > Server types**, and click **WebSphere Application Servers**.
 ___ d. Select **SingleClusterMember1** and click **Start**.

Select	Name	Node	Host Name	Version	Cluster Name
<input checked="" type="checkbox"/>	SingleClusterMember1	Node1	ws2008r2x64.wetraining.com	ND 8.5.5.1 BPMAdv 8.5.0.1	SingleCluster

It might take a few minutes for the SingleClusterMember1 server to start.

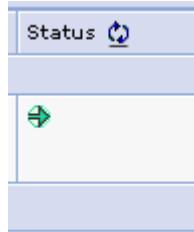
When the server is started, you see a message that says:

Server Node1/SingleClusterMember1 started successfully.

Messages

i Server Node1/SingleClusterMember1 started successfully. The collection may need to be refreshed to show the current server status. [View JVM logs](#) for further details.

You also see a green arrow in the Status column, which indicates that the server is running.



- ___ 4. Log out of the Process Server WebSphere Application Server administrative console.

Part 3: Trying to install a process application snapshot

In this part of the exercise, you work as the `appdeployer` process application user and try to install a process application snapshot.



Note

To make it easier to switch between tools during this exercise, use different web browsers for the following tools.

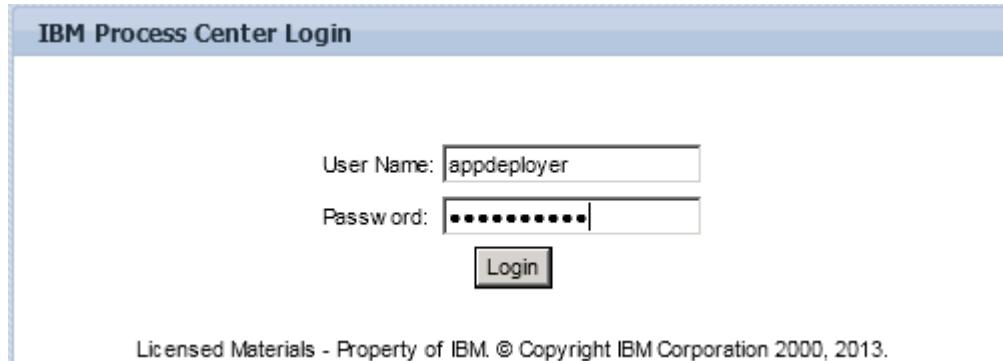
- Process Admin console: <http://localhost:9081/ProcessAdmin>
- Process Center console: <http://localhost:9081/ProcessCenter>

The reason for using two different browsers is that the session host for the Process Admin console and the Process Center console is the same. In a default installation of Business Process Manager Advanced, the session host for both is at <http://localhost:9081>. Thus, if you use only one web browser to use the Process Center console and the Process Admin console, you must log out of one tool to use the other. Using two different web browsers is one way to avoid this situation.

While these exercise instructions specify a browser, such as Firefox or Internet Explorer, you can use any two different web browsers of your choosing.

- ___ 1. Log in to Process Center as the `appdeployer` user.
___ a. Open an Internet Explorer web browser window and enter the following URL:
<http://localhost:9081/ProcessCenter>

- ___ b. In the IBM Process Center Login window, enter the following user name and password, and click **Login**:
- **User Name:** appdeployer
 - **Password:** web1sphere



- ___ 2. Close the Getting Started window.

The `appdeployer` user is a member of the `tw_authors` default IBM Business Process Manager group. As a member of the `tw_authors` group, `appdeployer` sees the Procurement Sample and Hiring Sample process applications.



Information

Process Center includes several default user groups, such as `tw_admins` and `tw_authors`, that have specific privileges that are associated with them. For example, `tw_admins` users can read, write, install; members of `tw_authors` have only read and write permissions. You can access the default user groups and their configurations through the Process Admin console.

The default groups make administering user privileges easier: you can easily add a user to a group, and the user automatically inherits the permissions that are granted to the group. Using groups eliminates individually configuring permissions on a user-by-user basis.

Process App	Last Updated	By
Procurement Sample (STPPS1)	3/23/14	pcdeadmin
Hiring Sample (HSS)	3/23/14	pcdeadmin

- ___ 3. Create a snapshot of the Procurement Sample process application.
- ___ a. Click **Procurement Sample (STPPS1)**.

The Procurement Sample main page opens. There is one process application snapshot: **Procurement Sample v85**.

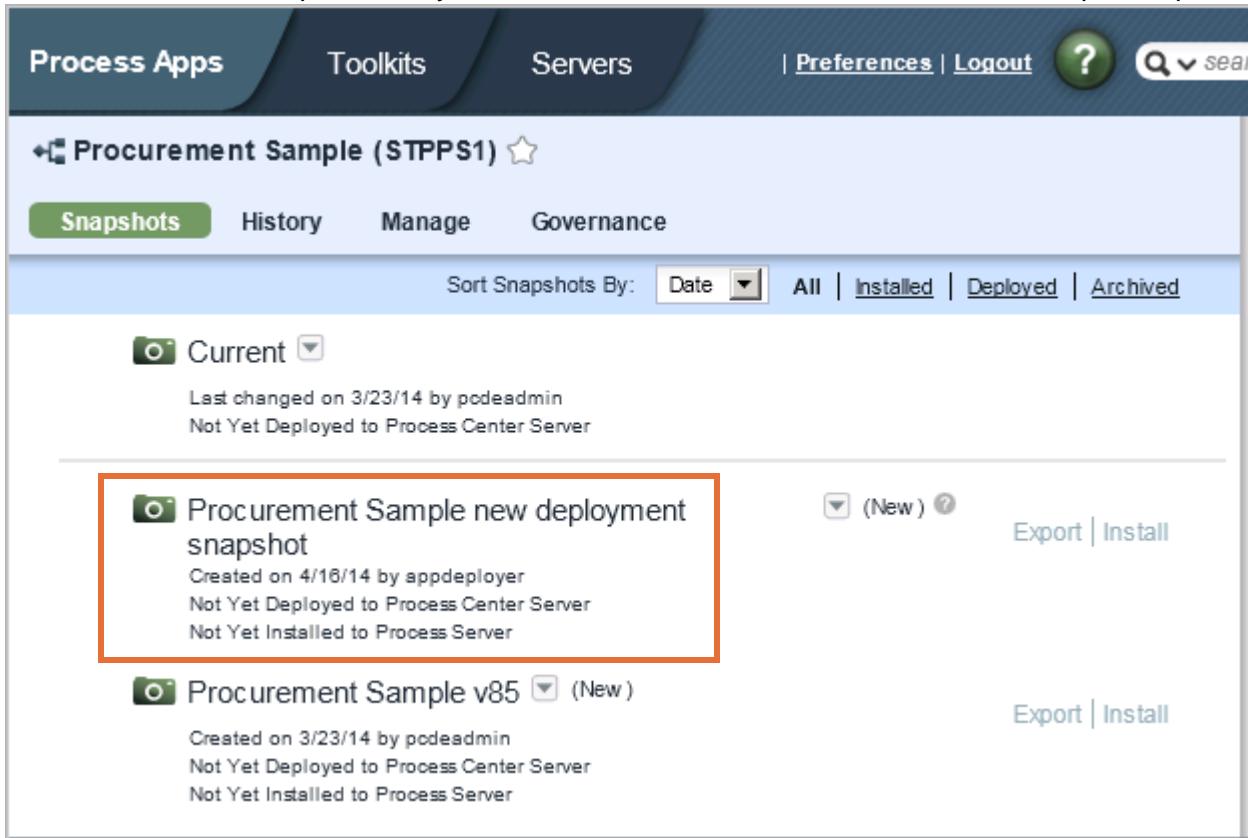
- ___ b. In the right pane, click **Create New Snapshot**. The Create New Snapshot window opens.



- ___ c. In the **Snapshot Name** field, enter a name for the snapshot, such as: Procurement Sample new deployment snapshot
___ d. In the **Documentation** field, enter a description of the new snapshot, such as: New process application snapshot for installation and deployment.
___ e. Click **Create**.

A screenshot of a modal dialog box titled 'Create New Snapshot'. The dialog has a dark blue header bar with a close button ('X') on the right. Inside, there are two input fields: 'Snapshot Name:' containing 'Procurement Sample new deployment snapshot' and 'Documentation:' containing 'New process application snapshot for installation and deployment.' Below the documentation field is a rich text editor toolbar with buttons for bold (B), italic (I), underline (U), font size (10pt), and alignment (left, center, right, justify). At the bottom right of the dialog is a 'Create' button, which is highlighted with a red rectangular box.

The new snapshot that you created is now in the list of Procurement Sample snapshots.

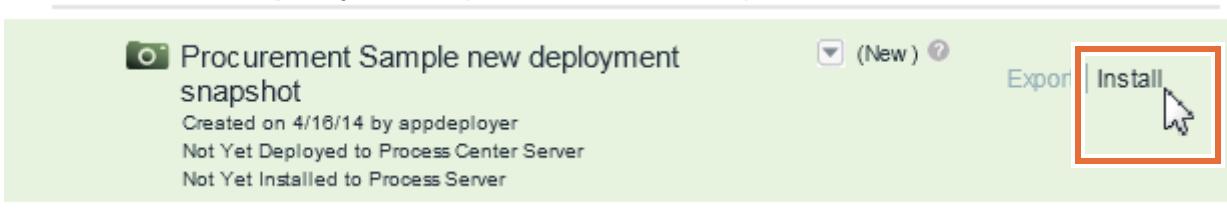


The screenshot shows the 'Process Apps' interface with the 'Solutions' tab selected. The 'Procurement Sample (STPPS1)' solution is open. In the 'Solutions' section, there are two entries:

- Procurement Sample new deployment snapshot**: This entry is highlighted with a red box. It was created on 4/16/14 by appdeployer and is not yet deployed or installed. It has a '(New)' status indicator and 'Export | Install' buttons.
- Procurement Sample v85**: This entry is not highlighted. It was created on 3/23/14 by pcodeadmin and is also not yet deployed or installed. It has a '(New)' status indicator and 'Export | Install' buttons.

4. Install the snapshot that you created.

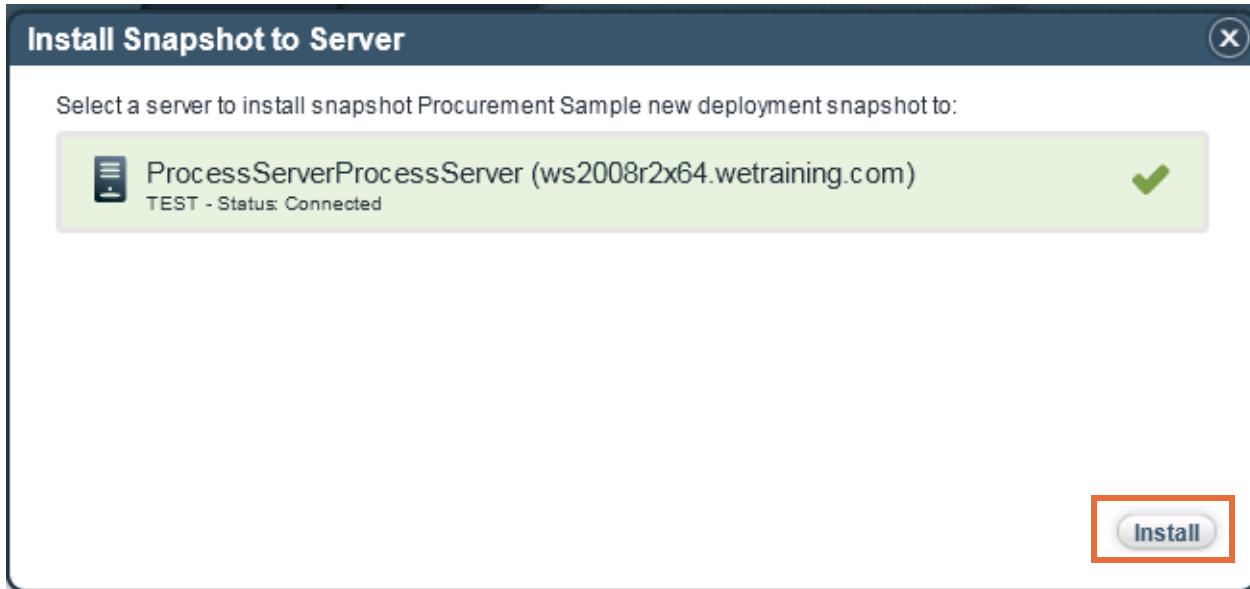
a. Find the **Export | Install** options next to the snapshot, and click **Install**.



This screenshot shows the details for the 'Procurement Sample new deployment snapshot'. The 'Install' button is highlighted with a red box and a cursor arrow pointing to it, indicating the step to click.

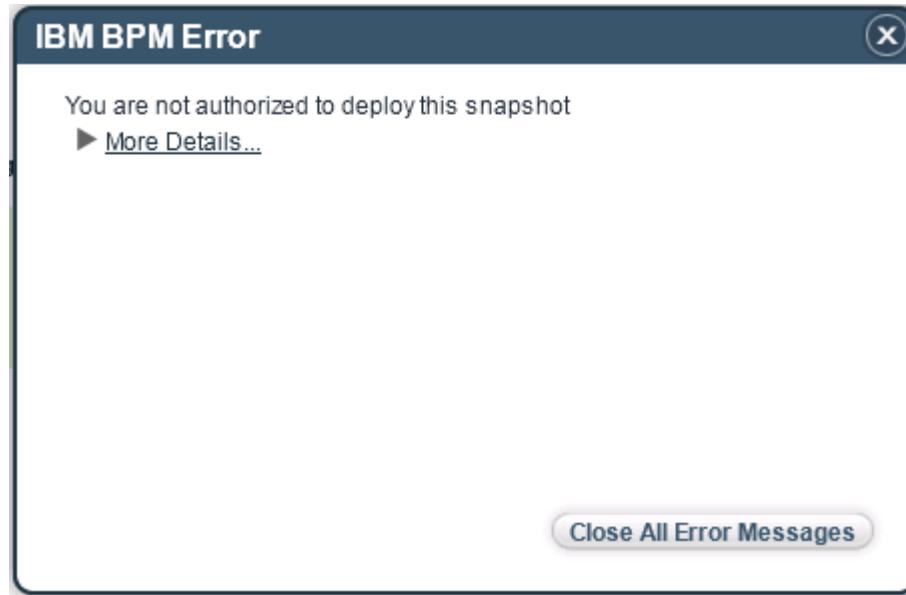
b. In the "Install Snapshot to Server," window, click the Process Server instance to select it.

- ___ c. Click **Install**.

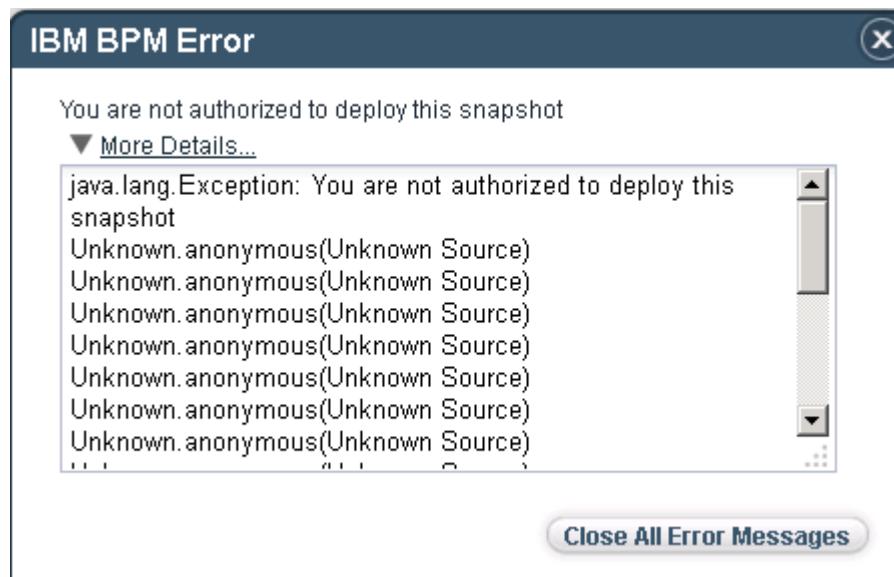


- ___ 5. An IBM BPM Error window opens with the following message:

You are not authorized to deploy this snapshot.



- ___ 6. Expand **More Details** and review the messages.



The messages do not give any information as to why you see the error message.

- ___ 7. Click **Close All Error Messages** to close the window.

Part 4: Checking administrative group membership

In the next parts of this exercise, you work mainly as an administrator who troubleshoots the process application deployment error that the appdeployer user sees. The appdeployer user notified you of the BPM error that prevents process application installation on Process Server.

For the troubleshooting steps, you use two different administrator user IDs.

- **pcdeadmin:** A Process Center administrative user. This user ID can perform various administrative functions within Process Center, including adding users and groups, assigning permissions, and other tasks.
- **bpmadmin:** A Business Process Manager administrative user. This user ID can perform various administrative functions within Business Process Manager and WebSphere Application Server, such as configuring troubleshooting settings in the WebSphere Application Server administrative console.

The first step in this troubleshooting process involves checking administrative group privileges in the Process Administration console. The error message, You are not authorized to deploy this snapshot, seems to indicate that there is an issue with the permissions of the appdeployer user.

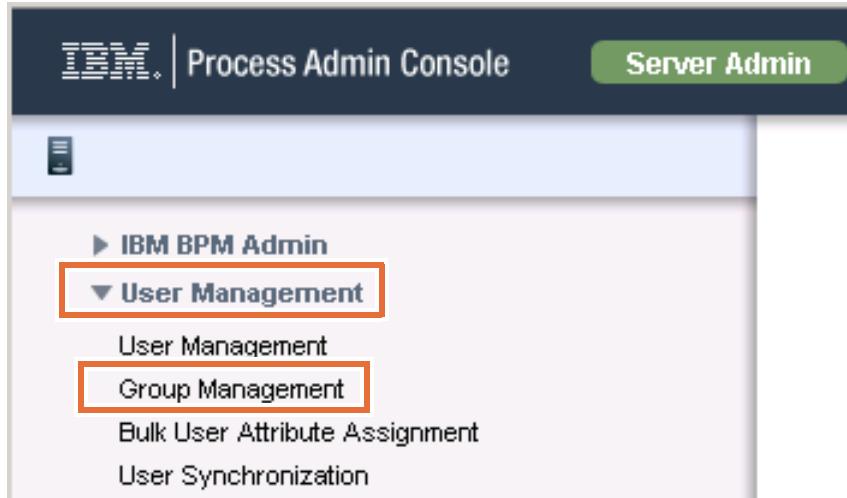
In this section, you start by checking which groups appdeployer belongs to. You also check to see whether appdeployer is a member of the `tw_admins` group, which has installation permissions.

- ___ 1. Open a Firefox window and log in to the Process Admin console as **pcdeadmin**.
 - ___ a. Start Firefox by double-clicking the Firefox icon in the taskbar or by going to **Start > All Programs > Mozilla Firefox**.
 - ___ b. Go to the following website: <http://localhost:9081/ProcessAdmin>

- ___ c. In the Process Admin Console Login window, enter the following credentials, and click **Login**.
- **User Name:** pcdeadmin
 - **Password:** web1sphere

The image shows the 'Process Admin Console Login' window. It has fields for 'User Name' (pcdeadmin) and 'Password' (redacted). A 'Login' button is below the fields. At the bottom, a note says 'Licensed Materials - Property of IBM. © Copyright IBM Corporation 2000, 2013.'

- ___ 2. Check the group membership of appdeployer.
- ___ a. In the Process Admin Console, go to **User Management > Group Management**.



- ___ b. Type %% in the **Select Group to Modify** field.

The image shows the 'User Management > Group Management' search field. The input field contains the value '% %'.

This value returns all available groups in the results list.

- ___ c. Select **tw_authors** to see the group details.

User Management > Group Management

Select Group to Modify: %%

New Group	Remove
Debug	
processappadmin	
tw_admins	
tw_allusers	
tw_allusers_managers	
tw_authors	
tw_managers	
tw_portal_admins	
tw_process_owners	
twem	

In the section on the right, you see a list of all of the users who are members of this group.

- ___ d. Notice that appdeployer is a member of the **tw_authors** group.

tw_authors

Team Manager Group (deprecated): No Team Manager Group

[Add Users](#) [Add Groups](#)

Add Users	Add Groups	Remove
appdeployer (appdeployer)		
bpmadmin (bpmadmin)		
pcdeadmin (pcdeadmin)		



Information

The **tw_authors** group has read and write permissions.

- ___ 3. Check the tw_admins member list.
___ a. Select **tw_admins** from the list of groups.

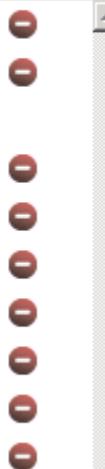
User Management > Group Management

Select Group to Modify: %%

New Group

Remove

- Debug**
- processappadmin**
- tw_admins**
- tw_allusers**
- tw_allusers_managers**
- tw_authors**
- tw_managers**
- tw_portal_admins**
- tw_process_owners**
- twem**



- ___ b. Notice that appdeployer is not a member of this group.

tw_admins

Team Manager Group (deprecated): No Team Manager Group

Add Users Add Groups

Remove

- bpmadmin (bpmadmin)
- pcdeadmin (pcdeadmin)



4. Add **appdeployer** to the `tw_admins` group to rule out whether not being a member of `tw_admins` is the cause of the issue.
- a. Click **Add Users**.

`tw_admins`

Team Manager Group (deprecated): No Team Manager Group

- b. Enter `app` in **Search For Name** field.

The WebSphere Admin console automatically searches for the search string, and returns the results.

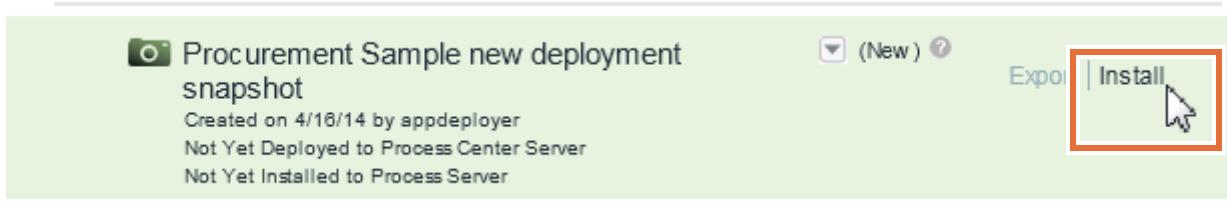
- c. Click **Add Selected** when **appdeployer** appears in results pane.

The `appdeployer` user is now a member of the `tw_admins` group, and now has installation permissions.

Part 5: Verifying group membership permissions as appdeployer

In this part of the exercise, you work as the appdeployer user to verify whether being added to the `tw_admins` group resolved the issue. As appdeployer, you use Process Center to see whether you can now install a process application.

- 1. Go back to the Internet Explorer Process Center window.
 - a. If you are not logged in to Process Center as appdeployer, log in with the following credentials:
 - User Name: appdeployer
 - Password: web1sphere
- 2. Install the **New deployment snapshot** that you created for the Procurement Sample process application.
 - a. Click **Procurement Sample**, and click **Install** next to **New deployment snapshot**.

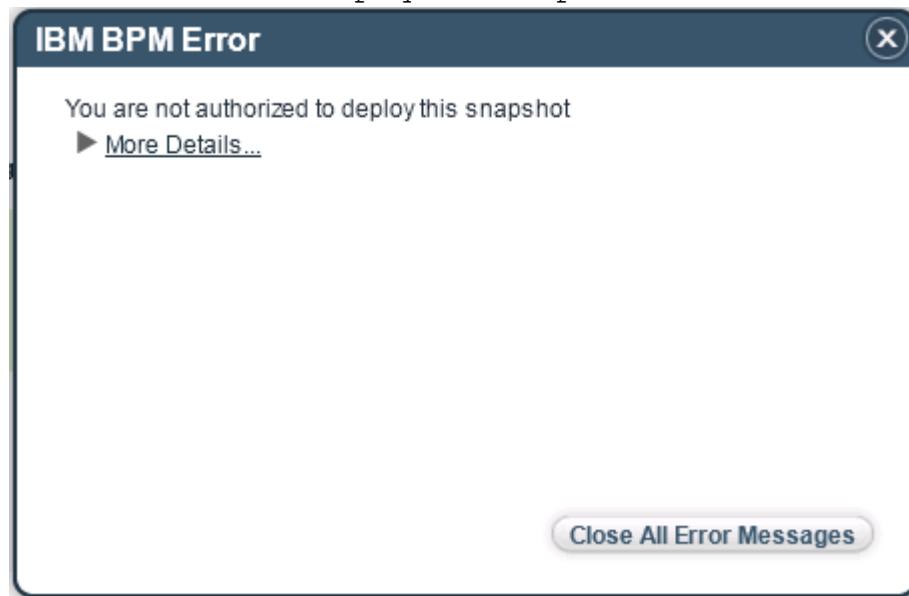


- b. Select the Process Server instance, and click **Install**.

A screenshot of the "Install Snapshot to Server" dialog box. It shows a list of servers: "ProcessServerProcessServer (ws2008r2x64.wetraining.com)" with a checked status. Below the list is a "Status: Connected" message. At the bottom right of the dialog is a large "Install" button, which is highlighted with a red box.

- ___ 3. You see the IBM BPM Error message:

You are not authorized to deploy this snapshot.



Because you see the error message, adding appdeployer to `tw_admins` did not resolve the issue. Further investigation is required.

- ___ 4. Close the error message window by clicking the X in the upper-right corner.
___ 5. Log out of Process Center as appdeployer.



Part 6: Checking `tw_admin` installation permissions

Because appdeployer is still unable to install a process application on Process Server, giving a user installation permissions through membership in `tw_admins` is not the solution to this issue. However, this scenario must be confirmed before you can eliminate it as a resolution to the issue.

In this part of the exercise, you work as the administrator to test the process application installation process by using two different user IDs. You create a test user in Process Center to verify that having installation permissions through membership in `tw_admins` is not enough for a user to install a process application on Process Server. You also test whether you can install a process application as an administrative user.

Creating a test user to check `tw_admins` group permissions

- ___ 1. Go to Process Center Admin console in Firefox and make sure that you are logged in as `pcdeadmin`.
- ___ a. If you need to log in to the Process Admin console, use the following credentials:
- **User Name:** `pcdeadmin`
 - **Password:** `websphere`

- __ 2. Create a user called testuser.
- __ a. Go to **User Management > User Management**.
- __ b. In the Internal IBM BPM User Details pane on the right, enter the following information and click **Add**:
- **User Name:** testuser
 - **Full Name:** testuser
 - **Password:** web1sphere
 - **Confirm Password:** web1sphere

Internal IBM BPM User Details

User Name	testuser
Full Name	testuser
Password	*****
Confirm Password	*****

Add **Update** **Clear**

- __ 3. Confirm that testuser exists by typing an asterisk (*) in the **Retrieve Profile** field and clicking **Retrieve**.

User Management > Maintain User Settings

Retrieve Profile

Retrieve

 **Information** _____

Entering an asterisk (*) in the **Retrieve Profile** field and clicking **Retrieve** returns a list of all users.

You see that `testuser` is in the results list.

Internal IBM BPM Users

appdeployer	
bpmadmin	
pcdeadmin	
testuser	

- ___ 4. Add `testuser` to the `tw_admins` group.
 - ___ a. Go to **User Management > Group Management**.
 - ___ b. Enter `%%` in the **Select Group to Modify** field to retrieve a list of all the groups.

User Management > Group Management

Select Group to Modify: `%%`

New Group	Remove
<code>Debug</code>	
<code>processappadmin</code>	
<code>tw_admins</code>	
<code>tw_allusers</code>	
<code>tw_allusers_managers</code>	
<code>tw_authors</code>	
<code>tw_managers</code>	
<code>tw_portal_admins</code>	
<code>tw_process_owners</code>	
<code>twem</code>	

- ___ c. Click `tw_admins` to see the group details.

`tw_admins`

Team Manager Group (deprecated): `No Team Manager Group`

Add Users	Add Groups	Remove
<code>appdeployer (appdeployer)</code>		
<code>bpmadmin (bpmadmin)</code>		
<code>pcdeadmin (pcdeadmin)</code>		

- __ d. Click **Add Users**.

tw_admins

Team Manager Group (deprecated): No Team Manager Group

The screenshot shows a list of users assigned to the 'tw_admins' group. The 'Add Users' tab is highlighted with a red border. Three users are listed: 'appdeployer (appdeployer)', 'bpmadmin (bpmadmin)', and 'pcdeadmin (pcdeadmin)'. Each user has a small profile icon and a red minus sign to its right, indicating they can be removed from the group. A vertical scroll bar is visible on the right side of the list.

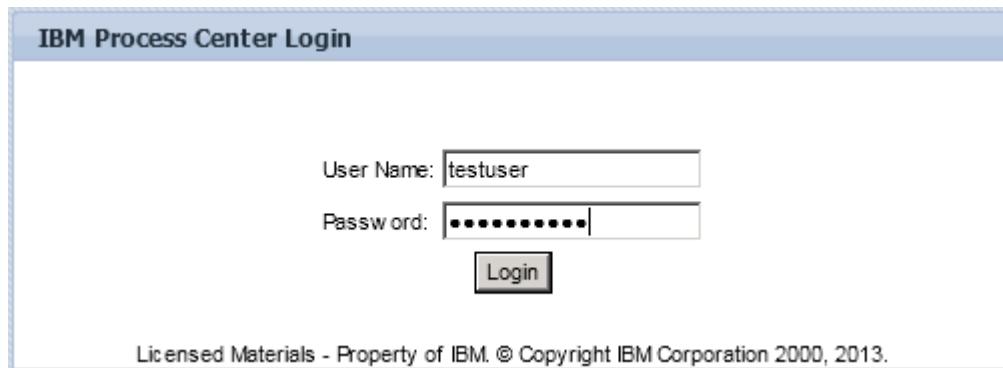
- __ e. Enter **te** in the **Search for Name** field.

The screenshot shows the 'Add Users' search interface. The search field contains 'te'. Below the search field, a message says 'Start typing to view matching results'. The interface has a dark blue header and a light gray body.

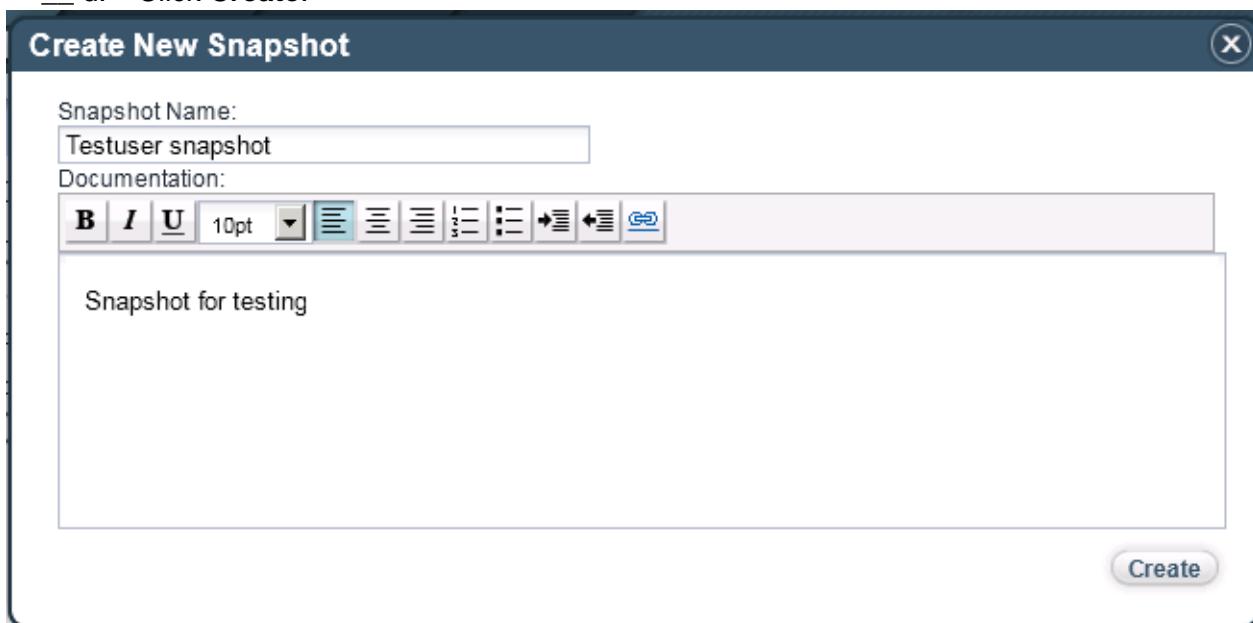
- __ f. Click **Add Selected** when you see **testuser** in the results pane.

The screenshot shows the 'Add Users' search results interface. The search field contains 'te'. The results pane shows one entry: 'testuser (testuser)' with a checked checkbox to its right. At the bottom of the results pane is a button labeled 'Add Selected'.

5. Install a process application snapshot with the **testuser** user.
- a. Go to the Process Center console window in Internet Explorer and log in with the following credentials.
- **User Name:** testuser
 - **Password:** web1sphere



6. Create a second Procurement Sample process application snapshot for testing purposes.
- a. Click **Procurement Sample**, and click **Create New Snapshot**.
- b. Enter a name for the new snapshot, such as: Testuser snapshot
- c. Enter a description for the snapshot, such as: Snapshot for testing
- d. Click **Create**.



7. Install the test process application snapshot that you created.
- a. Click **Install** next to **Testuser snapshot**.



- ___ b. Select the Process Server instance, and click **Install**.
- ___ 8. You see the IBM BPM Error window, with the following message:

You are not authorized to deploy this snapshot.

This error message confirms that membership in `tw_admins` alone is not sufficient to allow a user to install a process application snapshot.
- ___ 9. Close the error message window, and log out of Process Center as testuser.

Checking pcdeadmin user permissions

Both appdeployer and testuser were unable to install process application snapshots. You can test whether another user can install a process application snapshot. A successful snapshot installation can indicate that the inability to install process application snapshots does not apply to all users.

In this section, you use the pcdeadmin administrative user ID to test snapshot installation.

- ___ 1. Install a process application snapshot as **pcdeadmin**.
 - ___ a. Log in to Process Center with the following credentials:
 - **User Name:** pcdeadmin
 - **Password:** web1sphere
 - ___ b. Click **Procurement Sample**.
 - ___ c. Click **Install** next to **Testuser snapshot**.
 - ___ d. Select the Process Server instance, and click **Install**.

This time, you do not receive the IBM BPM Error window that both appdeployer and testuser saw. The installation process starts, and you see a message that states:

Installation in progress

The screenshot shows a Process Center interface. At the top, there's a header with a camera icon, the text 'Testuser snapshot', a dropdown menu, and a help icon. Below the header, it says 'Created on 4/16/14 by testuser' and 'Not Yet Deployed to Process Center Server'. At the bottom, there's a progress bar with the text 'Process ServerProcess Server(ws2008r2x64.wetraining.com) - Installation in progress'.

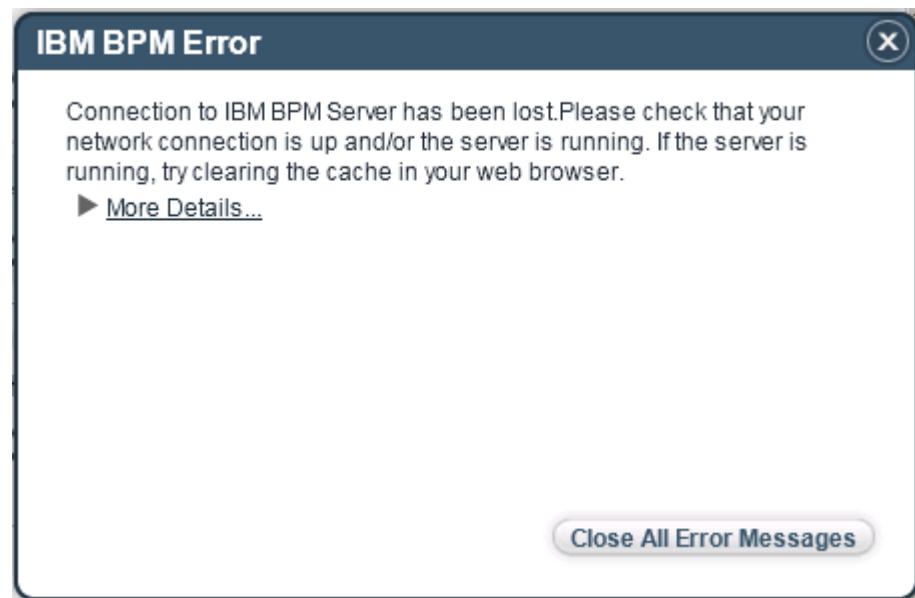
- ___ e. Wait until the installation completes.

The installation might take a few minutes to finish.

Note

If you see the following IBM BPM Error message during the process application snapshot installation process, you can ignore it:

Connection to IBM BPM Server has been lost. Please check that your network connection is up and/or the server is running. If the server is running, try clearing the cache in your web browser.



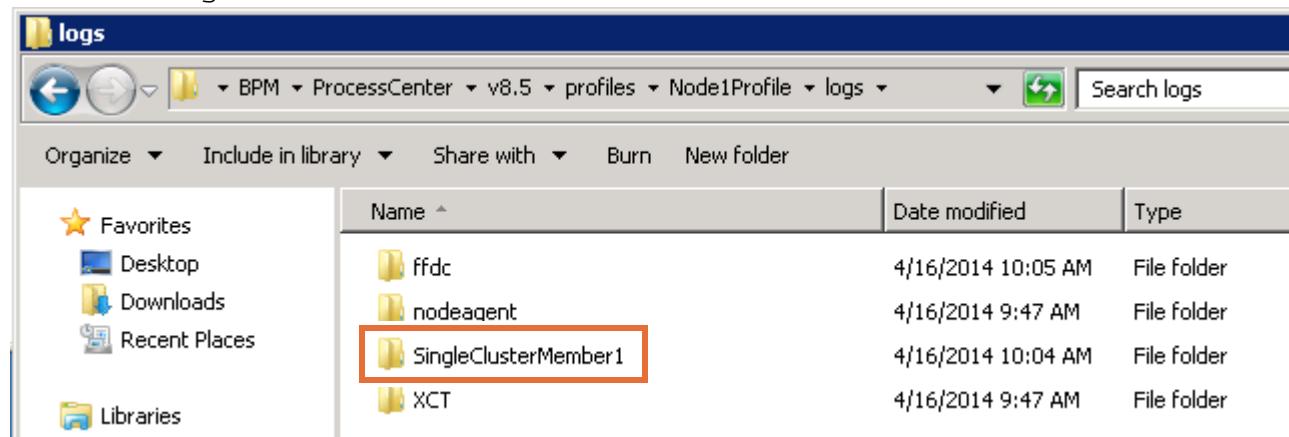
The process application snapshot installs successfully on Process Server.

- ___ 2. When the snapshot is installed, log out of Process Center as pcdeadmin.

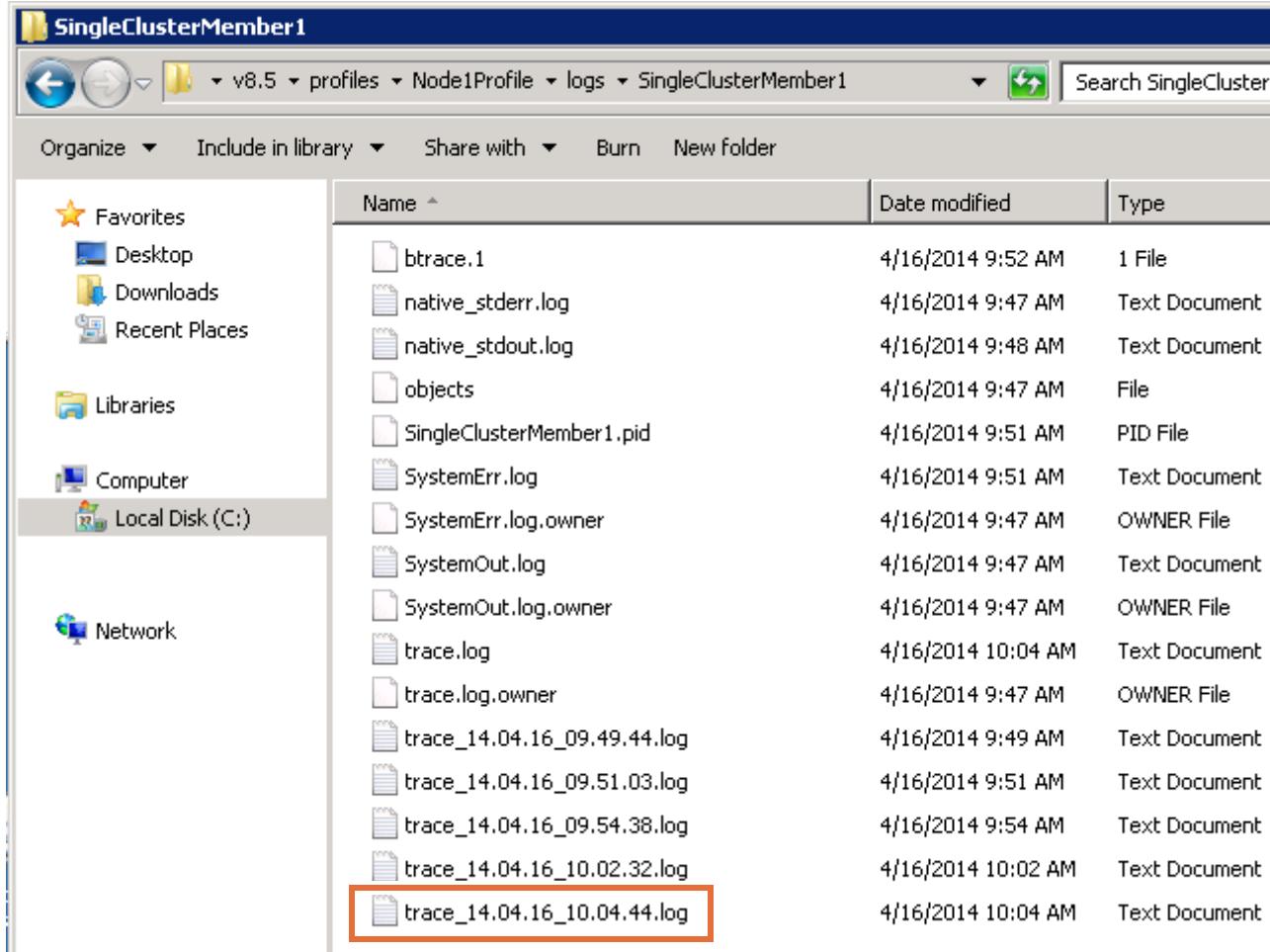
Part 7: Check the Process Center SingleClusterMember1 server logs

In this part of the exercise, you check the Process Center SingleClusterMember1 logs to see whether there is any information as to why appdeployer cannot install a process application.

- ___ 1. Check the logs for the Process Center SingleClusterMember1 profile for information about snapshot installation.
 - ___ a. Go to C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile\logs\SingleClusterMember1.



- __ b. Locate the most recent trace log file, and double-click the `trace_dd.mm.yy_hh.mm.ss.log` file.



Important

In lab exercise 1, you turned on the HPEL mode for the single cluster member server and the server wrote into the trace log. If you do not turn on the HPEL mode, then you check the `SystemOut.log` file.

The log file opens in Notepad.

```
File Edit Format View Help
***** Start Display Current Environment *****
websphere [BPMPC 8.5.0.1 20131107-140634]Platform 8.5.5.1 [ND 8.5.5.1 cf011341.
Host Operating System is Windows Server 2008 R2, version 6.1
Java version = 1.6.0, Java Compiler = j9jit26, Java VM name = IBM J9 VM
was.install.root = C:\IBM\BPM\ProcessCenter\v8.5
user.install.root = C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile
Java Home = C:\IBM\BPM\ProcessCenter\v8.5\java\jre
ws.ext.dirs = C:\IBM\BPM\ProcessCenter\v8.5\java\lib;C:\IBM\BPM\ProcessCenter\w
Classpath = C:\IBM\BPM\ProcessCenter\v8.5\profiles\Node1Profile\properties;C:\I
Java Library path = C:\IBM\BPM\ProcessCenter\v8.5\lib\native/win/x86_64/:C:\IBM
Orb Version = IBM Java ORB build orb626ifx-20130530.00 (SR6+IX90121+IX90123)
***** End Display Current Environment *****
[4/16/14 9:47:17:489 PDT] 00000001 ManagerAdmin I TRAS0017I: The startup tra
[4/16/14 9:47:17:489 PDT] 00000001 ManagerAdmin I TRAS0111I: The message IDs
[4/16/14 9:47:18:208 PDT] 00000001 ModelMgr I WSVR0801I: Initializing al
```

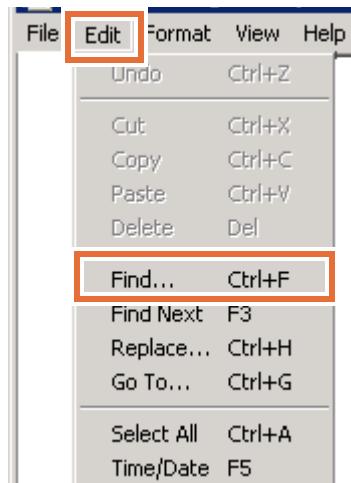


Information

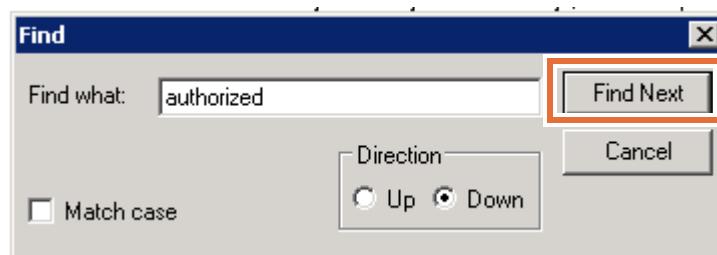
The SystemOut.log file records system events that occur.

2. Search for the term authorized in the log file.

a. Go to **Edit > Find**.



b. Enter authorized in the **Find what** field.



c. Click **Find Next** until you find the following line:

You are not authorized to deploy this snapshot.

**Note**

Depending on how large your log file is, you might need to click **Find Next** a few times before you reach the error message.

The search should find the following error message:

```
wle E CWLLG2229E: An exception occurred in an EJB call. Error: You are not
authorized to deploy this snapshot
com.lombardisoftware.client.security.AuthorizationDeniedException: You are not
authorized to deploy this snapshot
```

```
[4/16/14 10:04:57:712 PDT] 0000020e Instrumentati w user configuration is null
[4/16/14 10:05:01:099 PDT] 0000026a ServletWrapp I
com.ibm.ws.webcontainer.servlet.ServletWrapper init SRVE0242I:
[IBM_BPM_Repository_SingleCluster] [/ProcessCenter] [EscortServiceImpl]: Initialization
succesful
[4/16/14 10:05:02:802 PDT] 0000026a wle E CWLLG2229E: An exception occurred
in an EJB call. Error: You are not authorized to deploy this snapshot
com.lombardisoftware.client.security.AuthorizationDeniedException: You are not
authorized to deploy this snapshot
at com.lombardisoftware.client.security.AuthorizationUtils.get
(AuthorizationUtils.java:124)
at
com.lombardisoftware.client.security.LibraryAuthorizationImpl.assertDeploySnapshot
(LibraryAuthorizationImpl.java:98)
```

- __ d. Close the log file.

This error message confirms that the problem appdeployer experiences is an authorization issue. The authorization to install a process application snapshot is denied to appdeployer. However, there is not enough information in the log file to definitively determine why appdeployer cannot install a process application.

Because the inability to install a process application snapshot does not depend solely on having `tw_admins` installation permissions, further investigation is required. You were able to install the process application snapshot with the `pcdeadmin` user ID, so another setting is probably determining whether the installation can proceed.

Part 8: Checking the IBM Business Process Manager product documentation for process application installation information

Reviewing the log file provided some insight, but it did not produce a definitive answer. One good troubleshooting practice is to search support documentation, such as the product documentation, Technotes, developerWorks articles, and other IBM web pages for relevant information.

In this section, you search the IBM Business Process Manager V8.5 documentation to see whether there is documented information about process application snapshot installation that can help explain why appdeployer cannot install snapshots.

- 1. Go to the documentation for IBM Business Process Manager V8.5 in IBM Knowledge Center.
 - a. Open a web browser window and go to the following website:
www.ibm.com/support/knowledgecenter/SSFPJS_8.5.0/ditamaps/ic-homepage-bpm.html



Information

This information section provides an alternative way to open the IBM Business Process Manager V8.5 documentation.

You can also open the Business Process Manager V8.5 documentation by opening a web browser window and going to the following URL:

www.ibm.com/support/knowledgecenter

Under Products in the navigation pane, go to **WebSphere > Business Process Manager Family > Business Process Manager**.

The screenshot shows a vertical navigation pane titled "Table of Contents". The "Products" category is expanded, displaying a list of various IBM products. The "WebSphere" category is collapsed. The "IBM Business Process Manager family" category is expanded, showing its single member, "IBM Business Process Manager". The "IBM API Management" category is also present.

- ▶ Products
 - ▶ CICS
 - ▶ Clarity Systems
 - ▶ Cloud & Smarter Infrastructure
 - ▶ Cluster software
 - ▶ Cognos
 - ▶ Collaboration Solutions
 - ▶ Enterprise Content Management
 - ▶ Financial Operations
 - ▶ Information Management
 - ▶ OpenPages
 - ▶ Other Software
 - ▶ Platform Computing
 - ▶ Power Systems
 - ▶ PureSystems
 - ▶ Rational
 - ▶ Security Systems
 - ▶ Smarter Cities
 - ▶ SPSS
 - ▶ Sterling Commerce
 - ▶ System software
 - ▶ System Storage
 - ▶ System z
- ▼ WebSphere
- IBM API Management
- ▼ IBM Business Process Manager family
 - IBM Business Process Manager

In the IBM Business Process Manager section, click **IBM Business Process Manager 8.5.0** to load the V8.5 documentation.

The screenshot shows a 'Table of Contents' page from the IBM Knowledge Center. At the top, there's a blue header bar with a 'Table of Contents' icon and a 'Back to all products' link. Below the header, a list of IBM Business Process Manager versions is displayed: 8.5.0, 8.0.1, 8.0.0, 7.5.1, and 7.5.0. The 'IBM Business Process Manager 8.5.0' link is highlighted with a red rectangular box.

__ b. The IBM Business Process Manager V8.5 documentation main page opens.

The screenshot shows the main documentation page for IBM Business Process Manager V8.5. The left side features a navigation pane with a 'Table of Contents' section, which includes links to 'Back to all products', 'IBM Business Process Manager', and 'IBM Business Process Manager 8.5.0'. Under 'IBM Business Process Manager 8.5.0', there are sections for 'Welcome' (with links to 'IBM Business Process Manager, V8.5, All platforms', 'IBM Business Process Manager in a cloud environment', and 'IBM Business Monitor, V8.0.1') and 'My Collections' and 'Search Results'. The right side contains the main content area with a title 'IBM Business Process Manager V8.5 information center' and a sub-section 'Learn about the capabilities and features in IBM® Business Process Manager V8.5.' Below this, there are two columns: 'Getting started' (with links to 'Getting started', 'Release summary', 'What's new in IBM Business Process Manager', 'Getting started with IBM Business Process Manager', and 'Introductory concepts and') and 'Common tasks' (with links to 'Planning information', 'Planning for IBM Business Process Manager', 'Installing and migrating IBM Business Process Manager', 'Interactive Installation and Configuration Guide').

The documentation home page has two main areas: the navigation pane on the left and the main content area on the right.

- You can use the navigation pane to move between the Table of Contents, My Collections, and Search Results.

- You can expand the table of contents to display topics.
 - The main content area has different sections (**Getting started**, **Common tasks**, and **Troubleshooting and support**) with links to various kinds of information.
 - Specific topics from the table of contents or from search results are viewed in the main content area.
- ___ 2. Search for information about process application installation and restricted users.

- ___ a. Enter the following string in the **Search** field, and press Enter:

process application snapshot installation restrict users

process application snapshot installation restrict users

Search Filters: IBM Business Process Manager 8.5.0 Auto-select | Clear All | Add Products...

- ___ b. The documentation returns search results that are based on the string.

1 - 20 items

20 [Next 20 results >](#)

Restricting installation access to runtime servers - IBM

In order to **install a snapshot** on a **process** server (a runtime server), you must ... Use **process-center-install-group** to allow **users** to **install process applications** to ...

Date: October 2, 2013 | Found in: IBM Business Process Manager 8.5.0

Restricting installation access to runtime servers - IBM

In order to **install a snapshot** on a **process** server (a runtime server), you must ... Use **process-center-install-group** to allow **users** to **install process applications** to ...

Date: October 2, 2013 | Found in: IBM Business Process Manager 8.5.0

Restricting installation access to runtime servers - IBM

In order to **install a snapshot** on a **process** server (a runtime server), you must ... Use **process-center-install-group** to allow **users** to **install process applications** to ...

Date: October 2, 2013 | Found in: IBM Business Process Manager 8.5.0

Restricting installation access to runtime servers - IBM

In order to **install a snapshot** on a **process** server (a runtime server), you must ... Use **process-center-**

- ___ 3. View the first search result, "Restricting installation access to runtime servers."

- ___ a. Click the first **Restricting installation access to runtime servers** in the Search Results.

- ___ b. The topic opens in the main content area.

The screenshot shows a web browser window with the following details:

- Page Title:** IBM Business Process Manager 8.5.0 > IBM Business Process Manager, V8.5, All platforms > Installing, deploying, and undeploying applications in the runtime environment > Installing process application snapshots > Restricting installation access to runtime servers
- Header:** Print | Share | Save to Collection | Like | Dislike
- Section Header:** **Restricting installation access to runtime servers**
- Text:** In order to install a snapshot on a process server (a runtime server), you must have the appropriate access to the process application. Access requirements vary depending on whether the runtime server is in a non-production environment or in a production environment or is an online or offline server.
- Section Header:** **Before you begin**
- Text:** You must log in to the Process Admin Console.
- Section Header:** **About this task**
- Text:** By default, the following access to the process application is required for each type of environment:
- List:**
 - Administrative access to install to Process Servers in production environments
 - Write access to install to any non-production Process Server
 - Read access to install to Process Servers in development environments.
- Text:** By default, anyone in the `tw_admins` group can install a process application on either an online or offline Process Server. Two subgroups within the `tw_admins` group allow you to further control who can install process applications. Use `process-center-install-group` to allow users to install process applications to online Process Servers. Use `process-server-install-group` to allow users to install process applications to offline Process Servers. If you restrict access as described in the following procedure, a user must be a member of `process-center-install-group` or `process-server-install-group` in addition to having administrative permission (membership in the `tw_admins` group). For example, to install to a Process Server in a staging environment, a user must have administrative access to the process application that is being installed and must also be a member of `process-center-install-group`.

In the “About this task” section, note the following facts:

- A user must have administrative access to install to Process Servers in production environments, write access to install to any non-production Process Server, and read access to install to Process Servers in development environments.
- By default, anyone in the `tw_admins` group can install a process application on either an online or an offline Process Server.
- You can use two other subgroups within the `tw_admins` group to further control who can install process applications: `processCenterInstall` and `offlineInstall`.
 - If there is a `processCenterInstall` group, only allowed users can install process applications to online Process Servers.
 - If there is an `offlineInstall` group, only allowed users can install process applications to offline Process Servers.
- If you restrict access by using `processCenterInstall` or `offlineInstall`, a user must be a member of the subgroup in addition to being a member of the `tw_admins` group.

Since you added `appdeployer` to the `tw_admins` group, you know that `appdeployer` should have administrative access to process applications. Also, the Process Server servers are not offline, so you can eliminate `offlineInstall` group membership.

However, it is possible that the `processCenterInstall` subgroup was defined. If this situation is the case, and `appdeployer` is not a member of this `processCenterInstall` group, then `appdeployer` cannot install a process application.

- 5. Review the “Procedure” section of the topic, and notice that the `processCenterInstall` group is defined by using the `wsadmin` scripting tool.

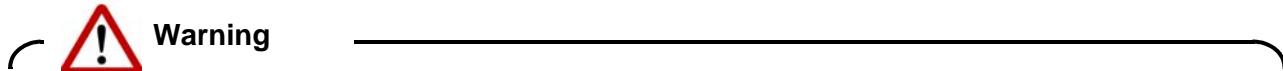
In the next section, you use `wsadmin` and check to see whether `processCenterInstall` was defined.

Part 9: Checking the `processCenterInstall` definition by using `wsadmin`

As noted in the product documentation, process application installation can be limited by running the `wsadmin` tool to define the `processCenterInstall` administrative subgroup.

You can also use `wsadmin` to perform administrative tasks on WebSphere Application Server cells, such as application deployment or configuration.

In this section, you start `wsadmin` and check to see whether the `processCenterInstall` group was defined on the Process Server deployment manager (`dmgr`) server.



When you enter `wsadmin` commands, make sure that you type the commands into the command prompt window instead of copying and pasting.

The `wsadmin` tool might not recognize the single quotation mark (') unless it is typed into the window manually. The issue is that `wsadmin` does not recognize straight quotation marks as a single quotation mark, only closing single quotation marks. When you type commands manually into the `wsadmin` tool, the single quotation mark appears as a closing single quotation mark.

For example, in the product documentation, the single quotation mark (') appears as a single straight quotation mark in the following command.

```
wsadmin> groups =  
AdminConfig.list('BPMServerSecurityGroups')  
wsadmin> print AdminConfig.show(groups)
```

However, if you cut and paste the text as-is from the documentation, wsadmin does not recognize the single straight quotation mark as a valid symbol.

For the purposes of this exercise, it is easier to manually type in the command so that you get closing single quotation marks, which wsadmin recognizes as valid.

- 1. Open a command prompt window, and change the directory to C:\IBM\BPM\ProcessServer\v8.5\profiles\dmgrProfile\bin.
 - a. Double-click the command prompt icon in the taskbar.

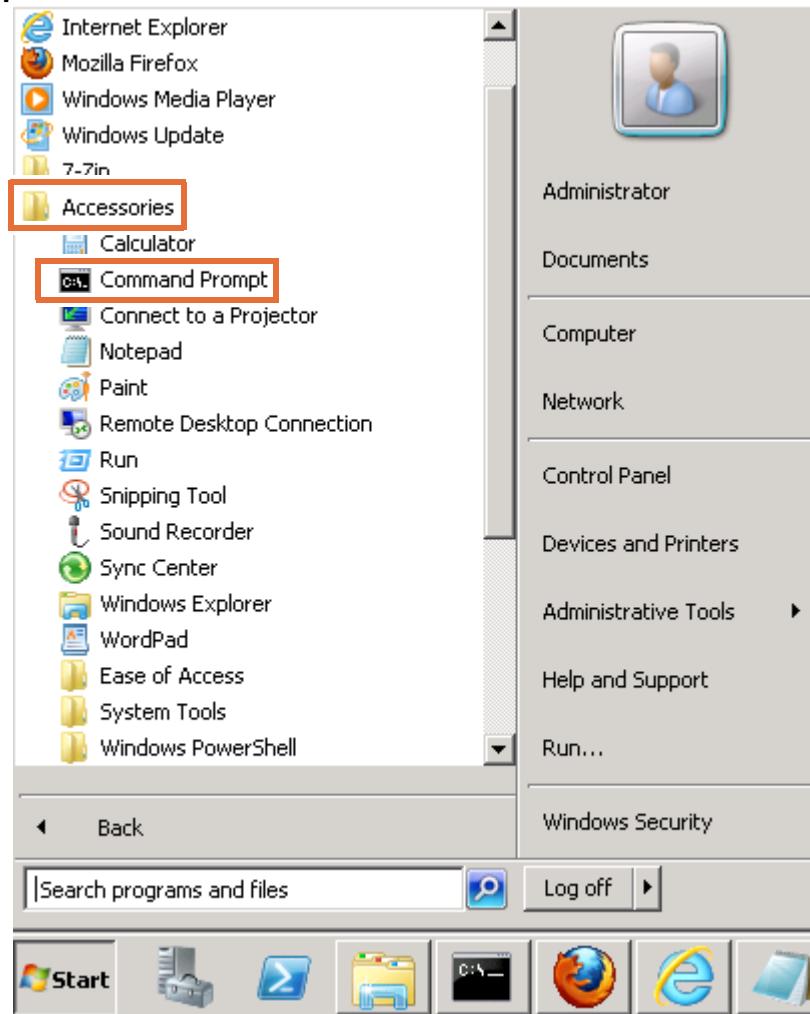




Information

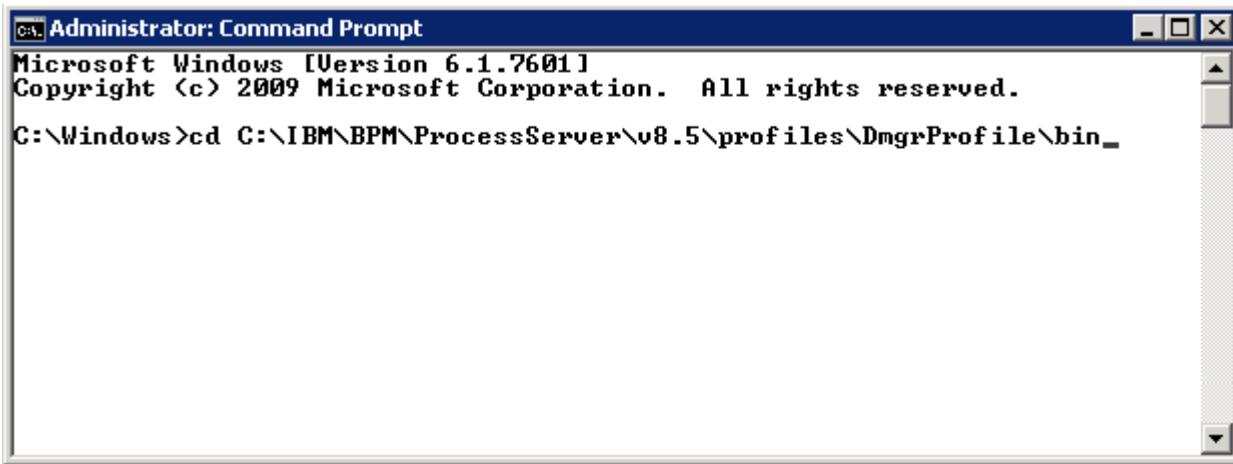
This information section provides an alternative way to open a command prompt window.

You can also open a command prompt window by going to **Start > All Programs > Accessories > Command Prompt**.



- ___ b. Enter the following command to change the directory to the Process Server deployment manager bin folder:

```
cd C:\IBM\BPM\ProcessServer\v8.5\profiles\dmgrProfile\bin
```

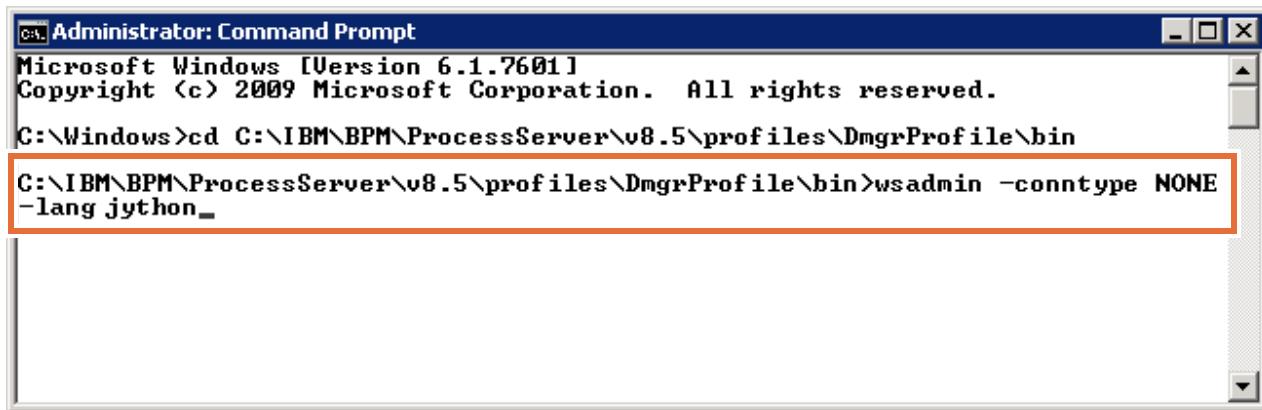


The screenshot shows a Windows Command Prompt window titled "Administrator: Command Prompt". The title bar includes the text "Microsoft Windows [Version 6.1.7601]" and "Copyright (c) 2009 Microsoft Corporation. All rights reserved.". The command line shows the user has typed "cd C:\IBM\BPM\ProcessServer\v8.5\profiles\dmgrProfile\bin" and is awaiting further input.

- ___ 2. Start the wsadmin tool so it runs in local mode and is not connected to any running servers, and so that it uses Jython commands.

- ___ a. Enter the following command:

```
wsadmin -conntype NONE -lang jython
```



The screenshot shows a Windows Command Prompt window titled "Administrator: Command Prompt". The title bar includes the text "Microsoft Windows [Version 6.1.7601]" and "Copyright (c) 2009 Microsoft Corporation. All rights reserved.". The command line shows the user has typed "wsadmin -conntype NONE -lang jython" and is awaiting further input. The entire command line is highlighted with a red box.

The wsadmin tool starts, and you see messages in the command prompt window.

Wait for the start process to complete and you see the wsadmin> prompt.



Note

You can also configure wsadmin so that it runs Java TCL (Jacl).

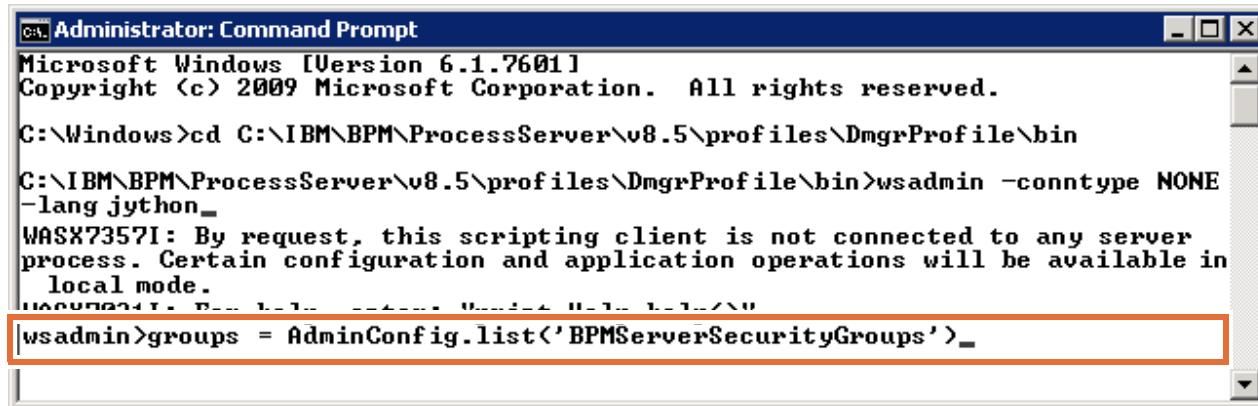
For more information about wsadmin, see the WebSphere Application Server V8.5 product documentation at

www.ibm.com/support/knowledgecenter/SSFPJS_8.5.0/ditamaps/ic-homepage-bpm.html and search for wsadmin.

___ 3. Display the list of BPM server security groups.

___ a. Type the following command, and press Enter:

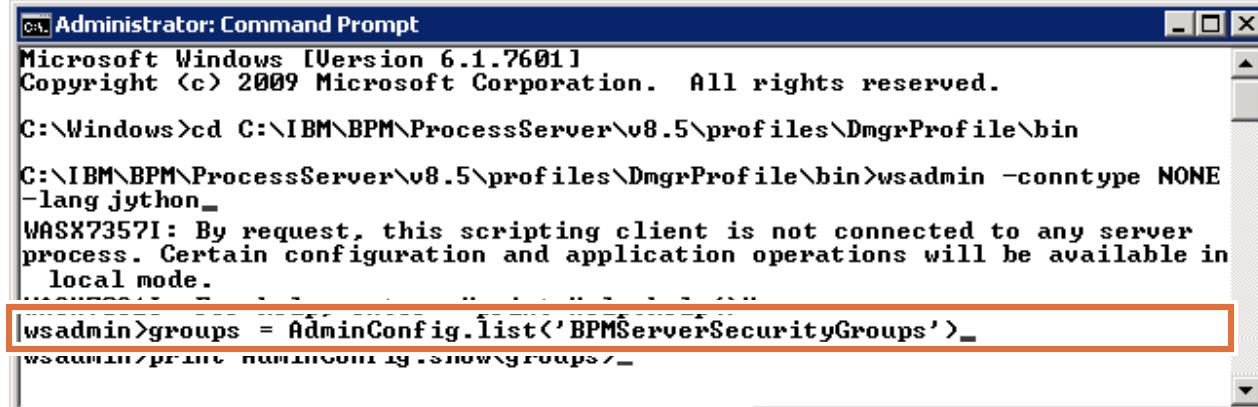
```
groups = AdminConfig.list('BPMServerSecurityGroups')
```



Administrator: Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Windows>cd C:\IBM\BPM\ProcessServer\v8.5\profiles\dmgrProfile\bin
C:\IBM\BPM\ProcessServer\v8.5\profiles\dmgrProfile\bin>wsadmin -conntype NONE
-lang jython
WASX7357I: By request, this scripting client is not connected to any server
process. Certain configuration and application operations will be available in
local mode.
wsadmin>groups = AdminConfig.list('BPMServerSecurityGroups')_

___ b. When you see the wsadmin > prompt, type the following command and press Enter:

```
print AdminConfig.show(groups)
```



Administrator: Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Windows>cd C:\IBM\BPM\ProcessServer\v8.5\profiles\dmgrProfile\bin
C:\IBM\BPM\ProcessServer\v8.5\profiles\dmgrProfile\bin>wsadmin -conntype NONE
-lang jython
WASX7357I: By request, this scripting client is not connected to any server
process. Certain configuration and application operations will be available in
local mode.
wsadmin>groups = AdminConfig.list('BPMServerSecurityGroups')_
wsadmin>print AdminConfig.show(groups)_

- ___ c. Look for the `processCenterInstall` property.

```

Administrator: Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright <c> 2009 Microsoft Corporation. All rights reserved.

C:\Windows>cd C:\IBM\BPM\ProcessServer\v8.5\profiles\dmgrProfile\bin
C:\IBM\BPM\ProcessServer\v8.5\profiles\dmgrProfile\bin>wsadmin -conntype NONE
-lang jython_
WASX7357I: By request, this scripting client is not connected to any server
process. Certain configuration and application operations will be available in
local mode.
WASX7031I: For help, enter: "print Help.help()"
wsadmin>groups = AdminConfig.list('BPMServerSecurityGroups')
wsadmin>print AdminConfig.show(groups)
[bpmAdminGroup tw_admins]
[bpmAllUsersGroup tw_allusers]
[bpmAllUsersManagersGroup tw_allusers_managers]
[bpmAuthorGroup tw_authors]
[bpmEventManagerGroup tw_eventmanager]
[bpmManagerGroup tw_managers]
[bpmPortalAdminGroup tw_portal_admins]
[bpmProcessOwnerGroup tw_process_owners]
[collaborationAdmin tw_admins]
[debug Debug] ...
[processCenterInstall processappadmin]
[showXmlMetadata Debug]
wsadmin>_

```

- ___ d. Confirm that `processCenterInstall` is set to `processappadmin`.

The name of the `processCenterInstall` installation subgroup is `processappadmin`. Thus, users must be a member of the `processappadmin` group to install a process application.

- ___ e. Exit wsadmin by entering the following command, and pressing Enter:

`exit`

- ___ f. Close the command prompt window.

Part 10: Adding appdeployer to the processappadmin installation group

The next step is to check whether appdeployer is a member of the `processappadmin` group.

- ___ 1. In Firefox, go to the Process Admin console.

- ___ a. If you do not have the Process Admin console open, go to the following website:

<http://localhost:9081/ProcessAdmin>

- ___ b. Log in with the following credentials:

- **User Name:** pcdeadmin
- **Password:** websphere

- ___ 2. Go to **User Management > Group Management**.

- ___ 3. View the `processappadmin` group.

- ___ a. Enter `%` in the **Select Group to Modify** field to list all available groups.

- __ b. Select the **processappadmin** group to see the group details.

User Management > Group Management

Select Group to Modify: %%

New Group	Remove
Debug	-
processappadmin	-
tw_admins	-
tw_allusers	-
tw_allusers_managers	-
tw_authors	-
tw_managers	-
tw_portal_admins	-
tw_process_owners	-
twem	-

- __ c. Notice that appdeployer is not a member of the **processappadmin** group.

processappadmin

Team Manager
Group No Team Manager Group
(deprecated):

Add Users Add Groups Remove

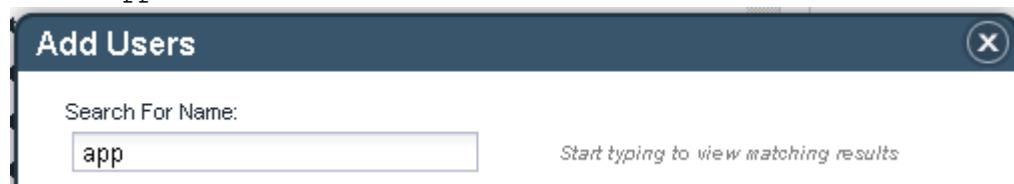
pcdeadmin (pcdeadmin)	-
-----------------------	---

- ___ 4. Add **appdeployer** to the `processappadmin` group.

- ___ a. Click **Add Users**.

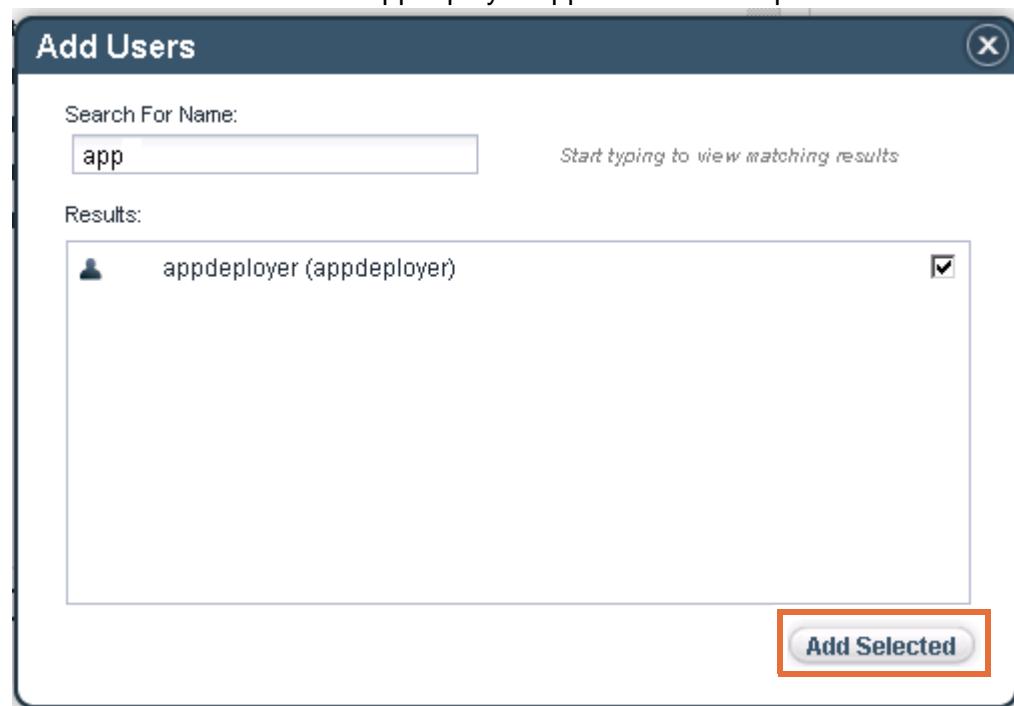


- ___ b. Enter `app` in the **Search For Name** field.



The WebSphere Admin console automatically searches for the search string, and returns the results.

- ___ c. Click **Add Selected** when `appdeployer` appears in results pane.



The appdeployer user is now a member of the `processappadmin` group, and now has installation permissions.

- ___ 5. Log out of the Process Admin Console as pcdeadmin.

Part 11: Verifying the fix and process application snapshot installation

In this part of the exercise, you verify that appdeployer can now install process application snapshots after being added to the `processappadmin` group. You also verify that the snapshot was successfully installed on Process Server.

- ___ 1. Log in to Process Center as appdeployer.
 - ___ a. If needed, open an Internet Explorer window and enter the following URL:
`http://localhost:9081/ProcessCenter`
 - ___ b. Use the following credentials to log in.
 - **User Name:** appdeployer
 - **Password:** web1sphere
- ___ 2. Install the Procurement Sample New deployment snapshot.
 - ___ a. Click **Procurement Sample (STPPS1)**.
 - ___ b. Click **Install** next to **Procurement Sample new deployment snapshot**.
 - ___ c. Select the Process Server instance, and click **Install**.

The process application now installs on the Process Server without any errors.

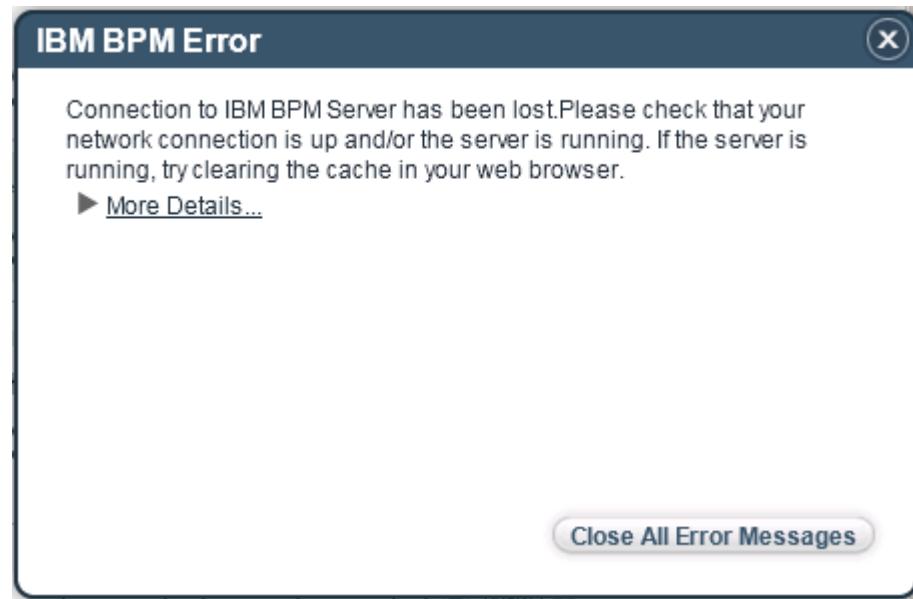
- ___ d. Wait for the installation to complete.

The installation might take a few minutes to finish.

**Note**

If you see the following IBM BPM Error message during the process application snapshot installation process, you can ignore it:

Connection to IBM BPM Server has been lost. Please check that your network connection is up and/or the server is running. If the server is running, try clearing the cache in your web browser.



The process application snapshot installs successfully on Process Server.

___ 3. Log in to the Process Admin console for Process Server as **bpmadmin**.

___ a. Open a Firefox window and go to the following website:

<http://localhost:9082/ProcessAdmin>

**Note**

Make sure that the port is **9082**, which is the port value for the Process Admin console for *Process Server*.

___ b. Enter the following credentials in the Process Admin Console Login window, and click **Login**.

- **User Name:** bpmadmin

- **Password:** web1phere

Process Admin Console Login

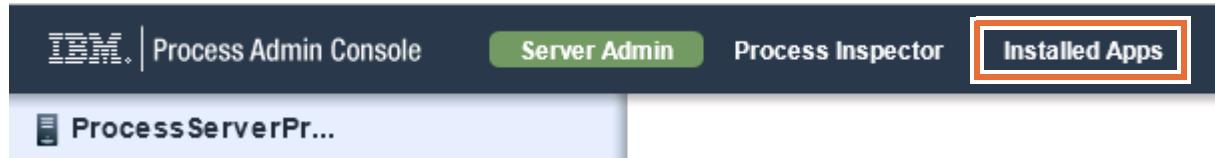
User Name: bpmadmin

Password: [REDACTED]

Login

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4. Verify that appdeployer successfully installed **Procurement Sample new deployment snapshot**.
 - a. In the main Process Admin page for Process Server, click **Installed Apps**.



5. Click **All** next to the **Sort Snapshots** menu.
6. You should see the Procurement Sample new deployment snapshot in the **Installed Apps** list.

Process Admin Console Server Admin Process Inspector **Installed Apps** Logged in as bpmadmin

Sort Snapshots By: Application Name **All** Active Default

Process Portal (TWP) - 8.5.0	Inactive
Process Portal (TWP) - 8.5.0.1	Active, Default
Procurement Sample (STPPS1) - Procurement Sample new deployment snapshot	Active
ReplenishmentBPD' - '0 instances	
Procurement Sample (STPPS1) - Testuser snapshot	Active, Default
ReplenishmentBPD' - '0 instances	
Saved Search Admin (SSA) - 8.5.0	Inactive

Note

If you do not see the active status, make sure that the port is **9082**, which is the port value for the Process Admin console for the online *Process Server*.

Part 12: Cleaning up the environment

- 1. Log out of the Process Admin console for Process Server.
- 2. Log out of the Process Admin console for Process Center.
- 3. Log out of the WebSphere Application Server administrative consoles for Process Center.
- 4. Close all web browser windows.
- 5. Optionally, shut down the Process Server environment. Leave the Process Center environment running.

End of exercise

Exercise review and wrap-up

In this exercise, you used several troubleshooting techniques to investigate and resolve a failed process application installation. After resolving the issue, you verify that the process application installed successfully on the Process Server by using the Process Admin console for Process Server.

Exercise 5. Troubleshooting Business Process Manager Standard runtime problems

What this exercise is about

This exercise covers how to take advantage of the REST APIs to move a token in a failed activity of a BPD to complete the process. You also troubleshoot two different kinds of infinite loops.

What you should be able to do

At the end of this exercise, you should be able to:

- Examine a failed instance in Process Inspector
- Restart a failed instance and complete the process
- Explore REST APIs by using the REST API Tester
- Troubleshoot infinite loops
- Examine Process Monitor metrics to identify problem services

Introduction

In this exercise, you work with two different scenarios.

In the first portion of the exercise, you work with a BPD that is in production and some of the instances are succeeding while some are failing. The business unit wants to target some of those failed instances to move the token on the process and inform your development team about this issue. The development team can fix this problem, but it takes them couple of weeks before they can put the fix into production. You get another call from the business manager that one of the failed instances in production is critical; they need this instance to pass beyond the failed step and are seeking your help. You do not have the luxury of time to wait for an implementation so you must get this token pass this step now. In a normal development cycle, you would go through testing, and would also have some governance to understand what is happening with all your processes before you implement a change in production. However, since it is a business emergency, you need to move the token and get the process beyond that failed activity. You solve this problem of moving the token by using an external implementation of REST API. You can use a similar solution with a mobile offering of IBM Worklight when working with a mobile coach.

In the second portion of this exercise, you troubleshoot infinite loops in the Process Center environment.

Requirements

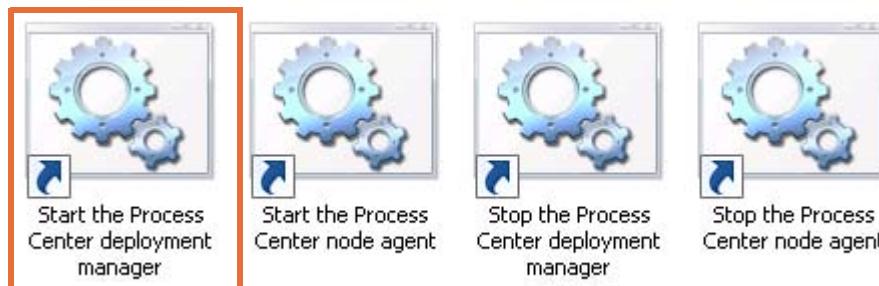
Completing the exercises for this course requires a lab environment. This environment includes the exercise support files, IBM Process Designer, IBM Process Center, IBM Process Server, and IBM Integration Designer test environment.

Exercise instructions

Part 1: Start the Process Center environment

If the Process Center environment is already running, then skip to step 2 to start Process Server.

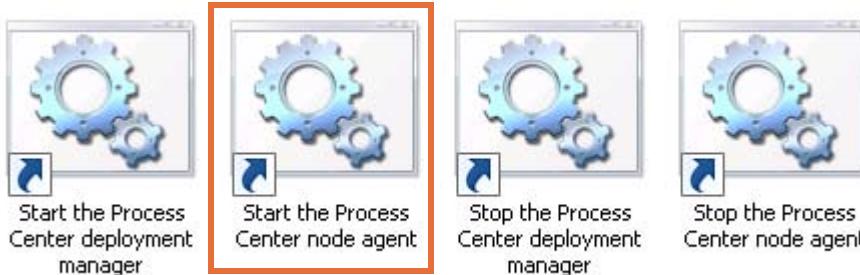
- ___ 1. Start the Process Center deployment manager and node agent.
 - ___ a. From the desktop, open the **Process Center** folder and double-click the **Start the Process Center deployment manager** shortcut icon to start the server. Leave the Process Center folder open, as you are going to use it again shortly.



- ___ b. Wait until the start command is successfully completed, and press any key to continue.

```
CA: Start the Process Center deployment manager
ADMU0116I: Tool information is being logged in file
C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\logs\dmgr\startServer.log
ADMU0128I: Starting tool with the dmgrProfile profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server dmgr open for e-business; process id is 4152
Press any key to continue . . . -
```

- ___ c. Double-click the **Start the Process Center node agent** shortcut icon.



- ___ d. Wait until the start command is successfully completed, and press any key to continue.

- __ 2. Start the administrative console for Process Center.
- __ a. Double-click the **Firefox** icon from the desktop to open the web browser, and go to the following web address:
- `http://localhost:9061/ibm/console`
- __ b. If the Untrusted Connection window is displayed, click **I Understand the Risks** to expand the option; otherwise, go to step f to log in.



This Connection is Untrusted

You have asked Firefox to connect securely to **localhost:9044**, but we can't confirm that your connection is secure.

Normally, when you try to connect securely, sites will present trusted identification to prove that you are going to the right place. However, this site's identity can't be verified.

What Should I Do?

If you usually connect to this site without problems, this error could mean that someone is trying to impersonate the site, and you shouldn't continue.

Get me out of here!

- ▶ **Technical Details**
- ▶ **I Understand the Risks**

- __ c. Click **Add Exception**.



This Connection is Untrusted

You have asked Firefox to connect securely to **localhost:9044**, but we can't confirm that your connection is secure.

Normally, when you try to connect securely, sites will present trusted identification to prove that you are going to the right place. However, this site's identity can't be verified.

What Should I Do?

If you usually connect to this site without problems, this error could mean that someone is trying to impersonate the site, and you shouldn't continue.

Get me out of here!

- ▶ **Technical Details**
- ▼ **I Understand the Risks**

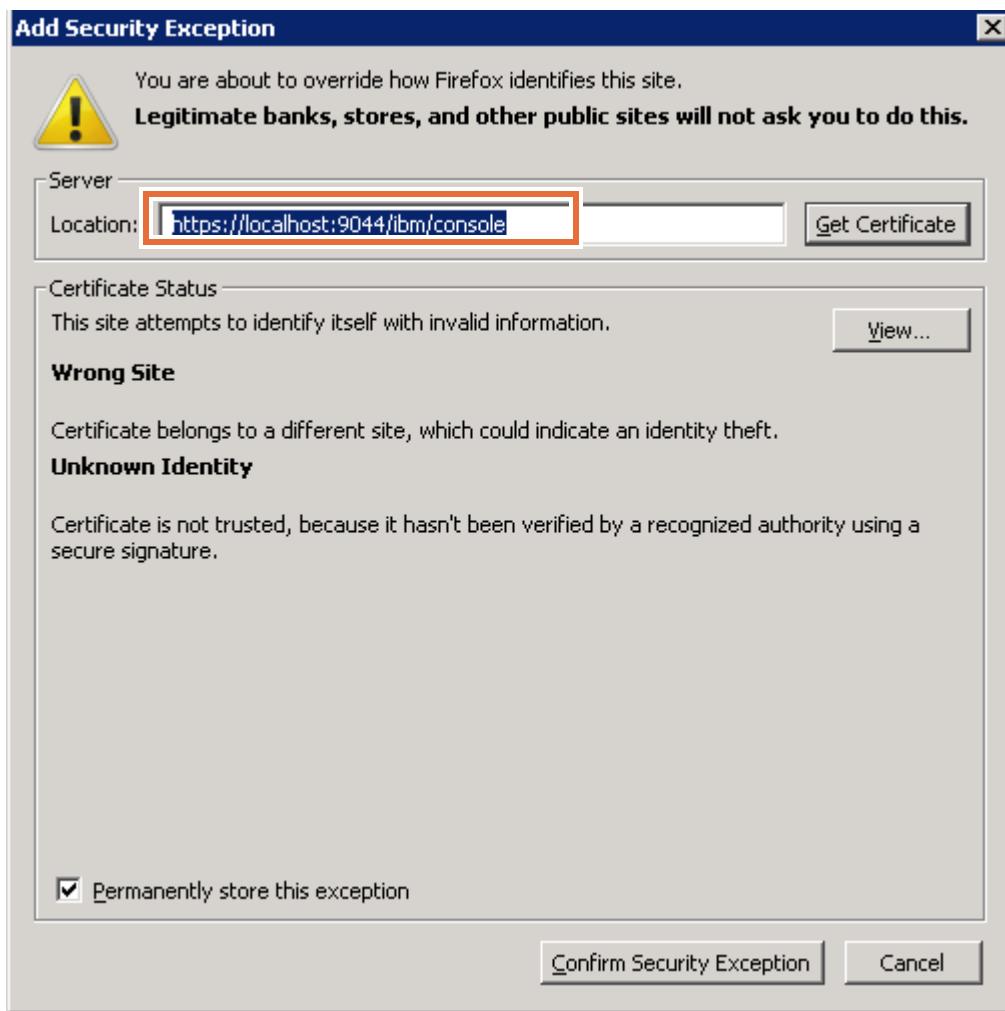
If you understand what's going on, you can tell Firefox to start trusting this site's identification. **Even if you trust the site, this error could mean that someone is tampering with your connection.**

Don't add an exception unless you know there's a good reason why this site doesn't use trusted identification.

Add Exception...

- ___ d. On the Add Security Exception window, the location is the secure port for the deployment manager. Verify that the location is the following web address:

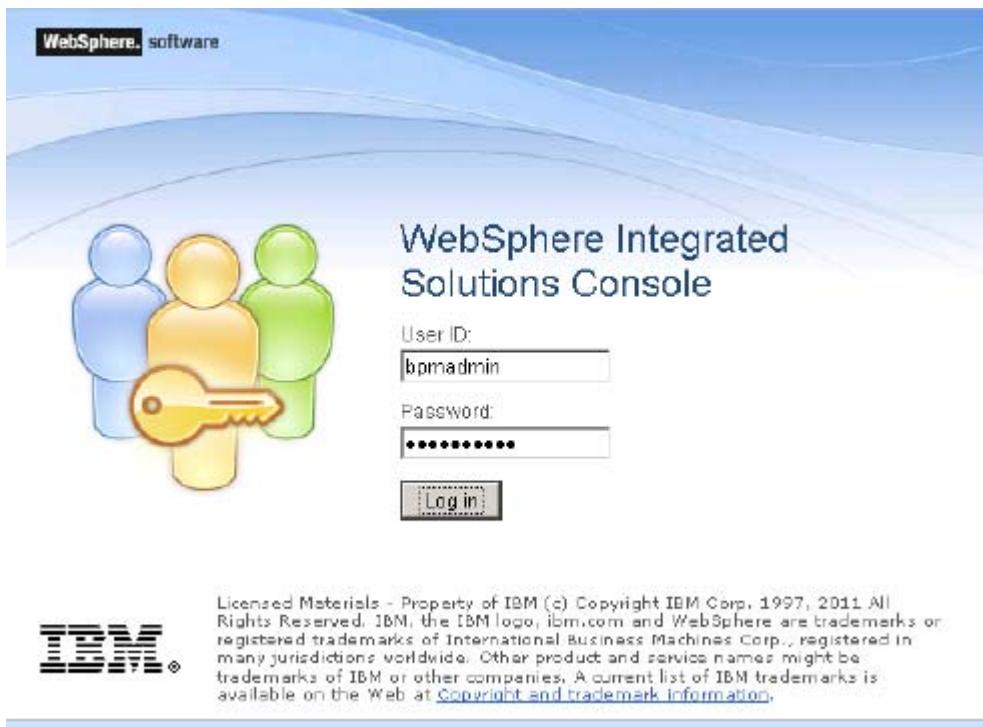
<https://localhost:9044/ibm/console>



- ___ e. Click **Confirm Security Exception**. The administrative console's login page is now visible.

___ f. Log in to the administrative console by using:

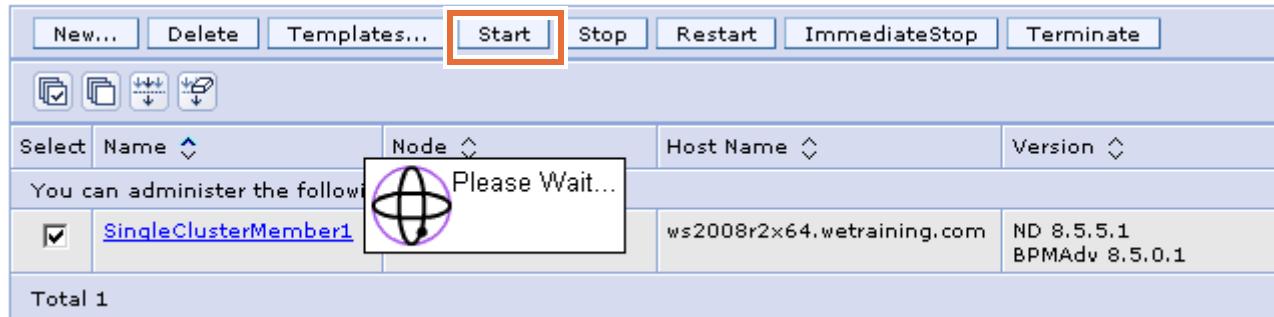
- **User ID:** bpmadmin
- **Password:** websphere



___ g. In the administration console, expand **Servers > Server Types** and click **WebSphere application servers**.

___ h. Select the **SingleClusterMember1** check box.

___ i. Click **Start**.



___ j. Wait until the start command is successfully completed, and the status becomes green.

Select	Name	Node	Host Name	Version	Cluster Name	Status
You can administer the following resources:						
<input type="checkbox"/>	SingleClusterMember1	Node1	ws2008r2x64.wetraining.com	ND 8.5.5.1 BPMAdv 8.5.0.1	SingleCluster	

Part 2: Explore the process and run the instance

- __ 1. Import the process application in IBM Process Designer.
 - __ a. Double-click the **IBM Process Designer** shortcut on the desktop.



- __ b. When prompted, enter `pcdeadmin` in the **User Name** field and `websphere` in the **Password** field, and click **Login**.



IBM Process Designer

8.5.0.1

User Name

Password

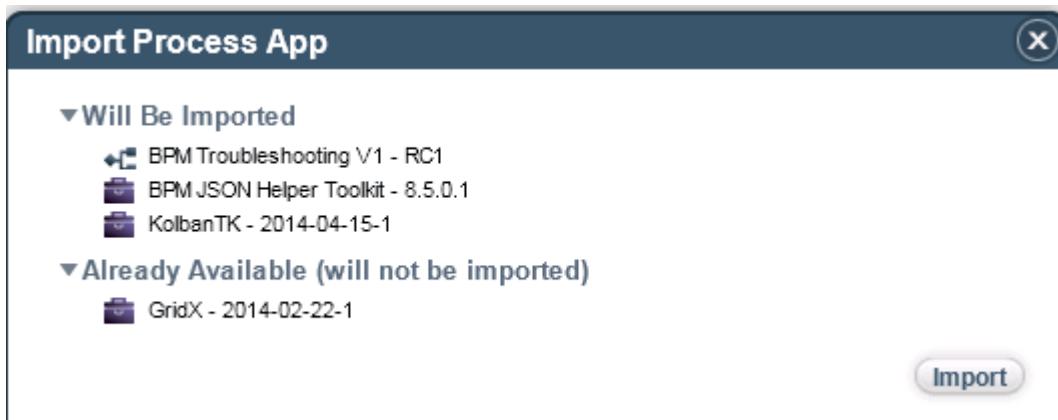
Login

Cancel

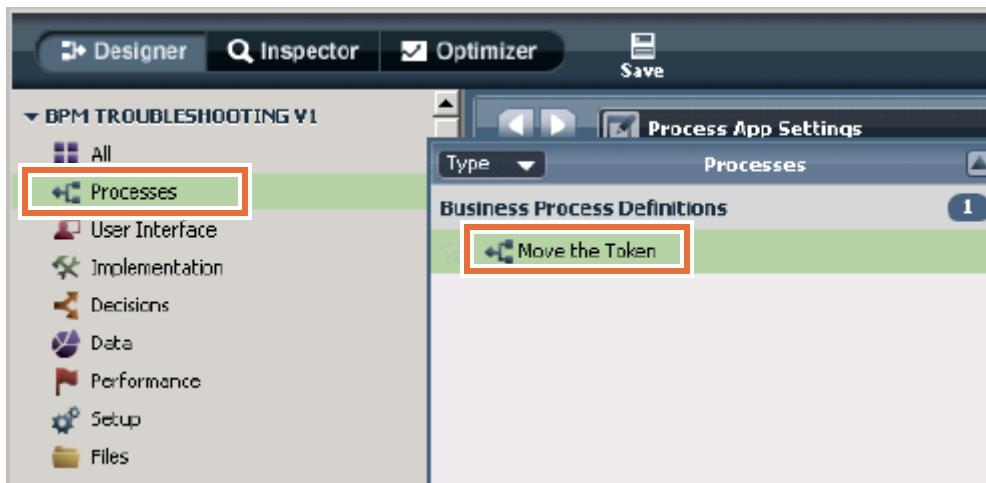
8.5.0.1

- __ c. If prompted, close the **Getting Started with IBM Process Designer 8.5.0.1** by clicking **X** in the upper right corner.
- __ d. Click Import Process App.
- __ e. In the Import Process App window click **Browse**.
- __ f. Go to `C:\labfiles\ex5`, select `BPM_Troubleshooting_V1-RC1.twx`, and click **Open**.
- __ g. Click **OK**.

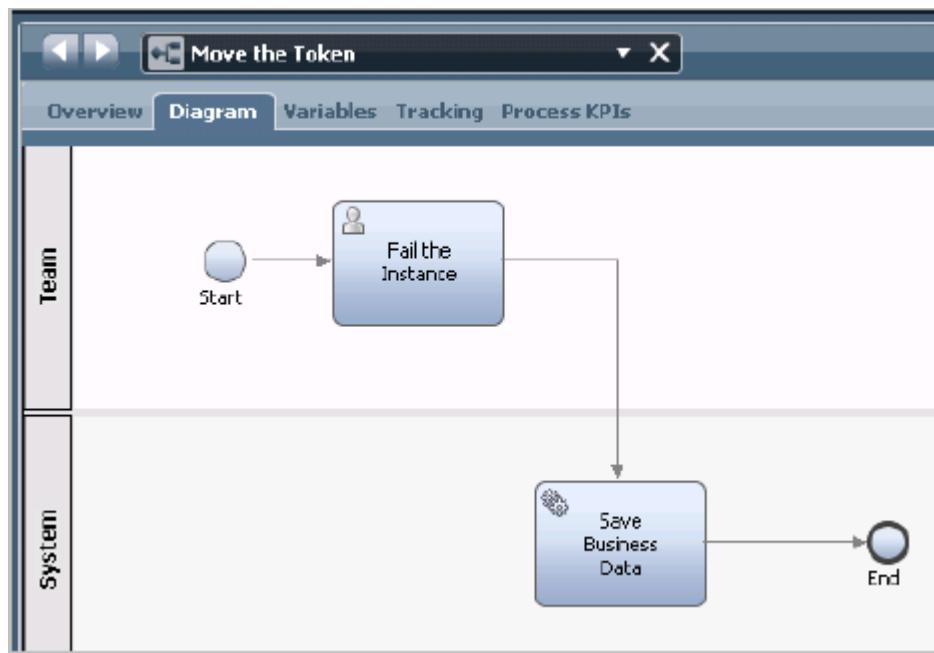
- __ h. Click **Import**.



- __ i. Wait for the import to complete. When it is complete, the newly imported application is listed in the Process Apps tab.
- __ 2. Explore the **Move the Token** User Interface
- __ a. Click **Open in Designer** next to BPM Troubleshooting V1(IBMMC).
- __ b. Select **Processes** and then double-click **Move the Token**.

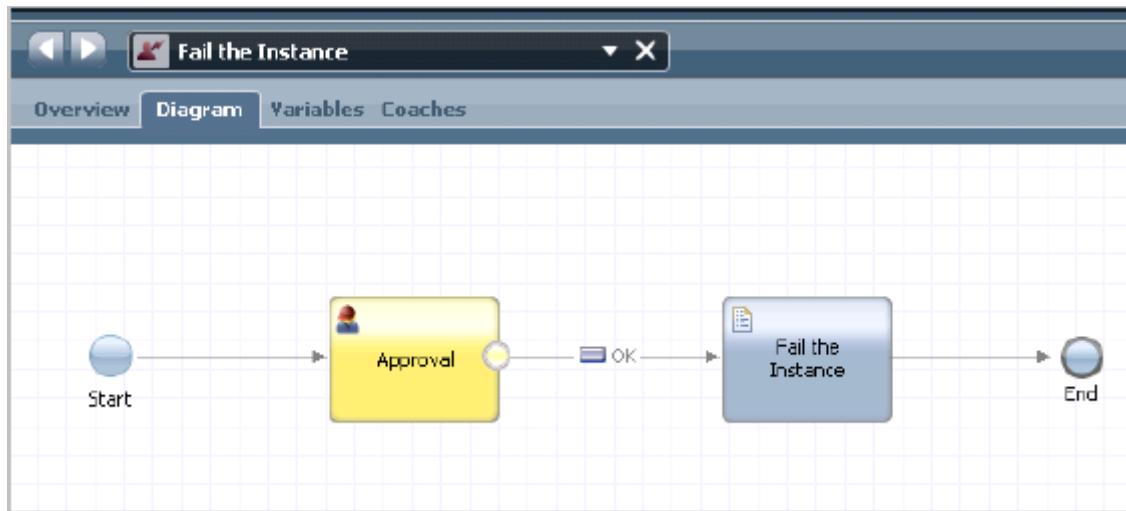


- ___ c. The **Move the Token** process is displayed in the Diagram tab. Examine the process.



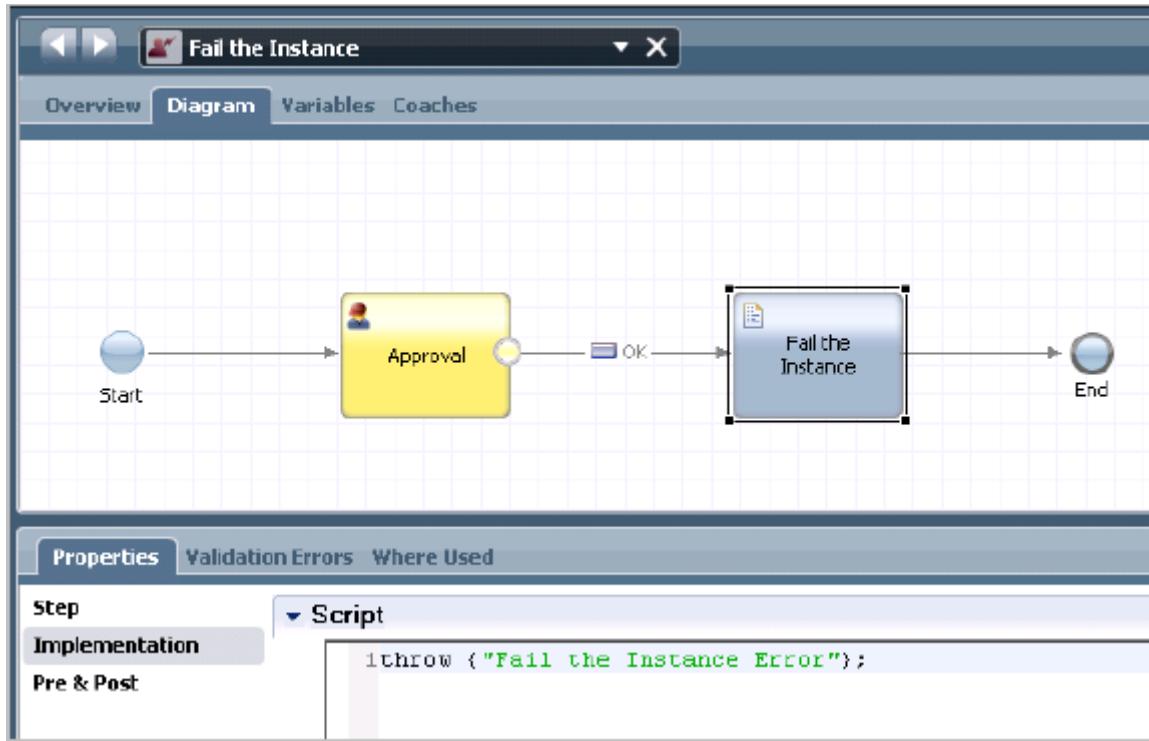
The **Move the Token** process is a simple process that is having problems at run time. The **Fail the Instance** activity is failing for several process instances, and you are required to get past this activity for some specific failed instances.

- ___ d. Double-click **Fail the Instance**.
 ___ e. The **Fail the Instance** service is displayed in the Diagram tab. Examine this service.



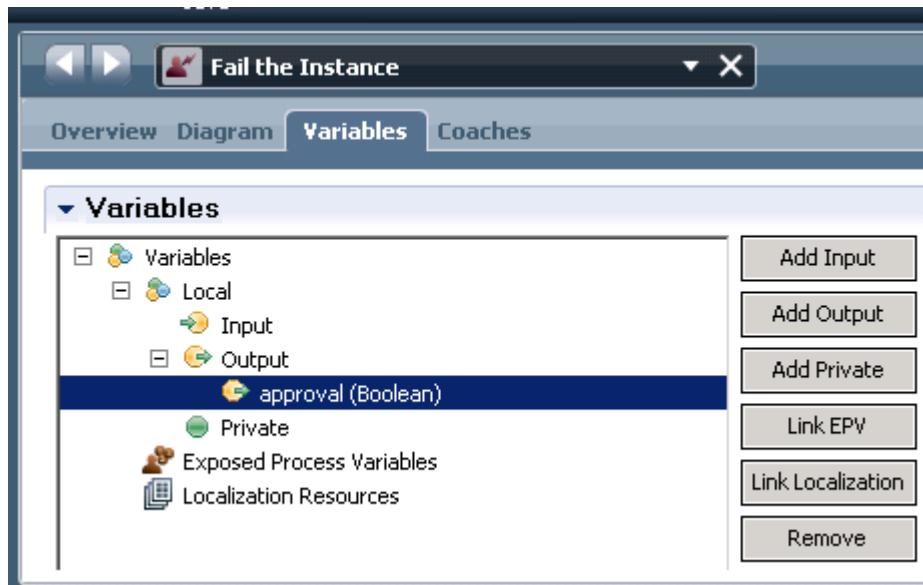
When the approval step completes, the service goes through some persistence. However, the service fails because either the database or the network is down and the **Fail the Instance** step throws an error.

- __ f. Select the **Fail the Instance** step, click the **Properties** tab, and then click **Implementation**.



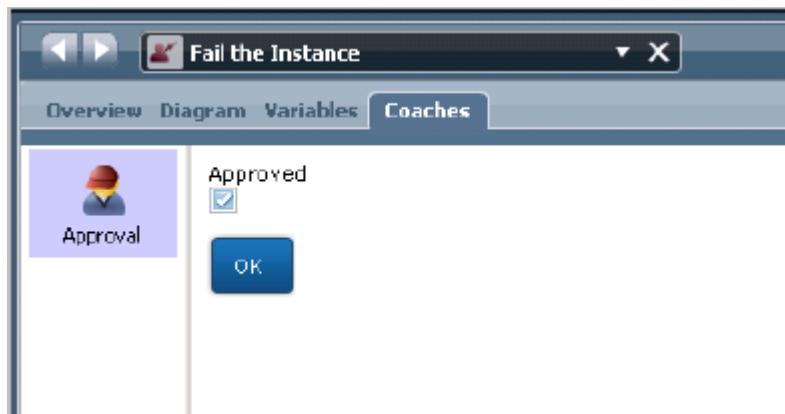
The error that is thrown is "Fail the Instance Error".

- __ g. Click the **Variables** tab. Notice that the output variable `approval` of type Boolean is defined.

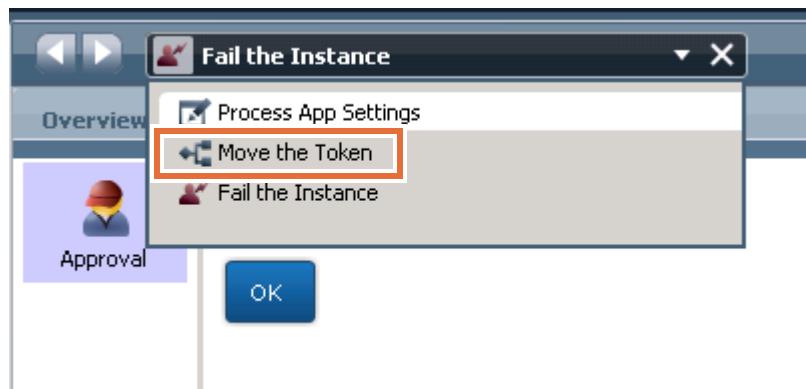


When the process runs, it does not matter whether the Boolean is true or false: the instance fails.

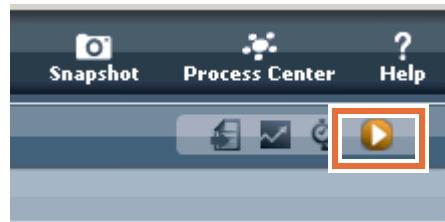
- ___ h. Click the **Coaches** tab. There is one check box available for selecting approved status. You might have to click the Approval icon to see the check box.



- ___ i. Go back to the process by clicking the twistie and selecting **Move the Token**.

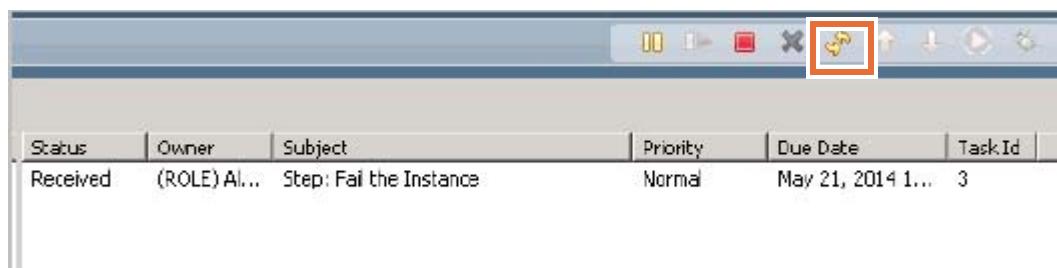


- ___ j. Click the **Run Process** icon in the upper right corner.

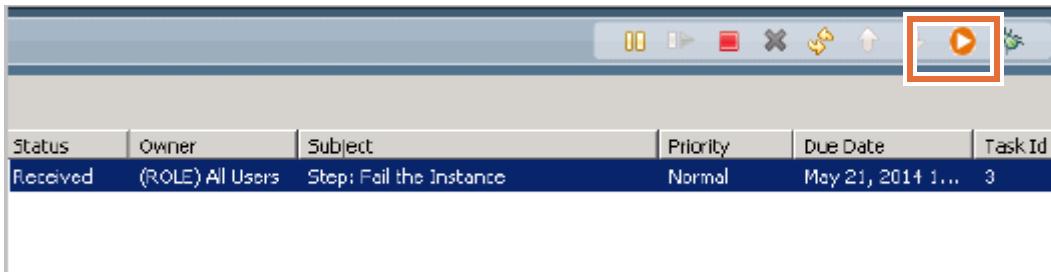


- ___ k. Click **Yes** when prompted to switch to the Inspector view.

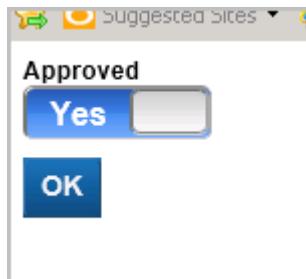
- ___ l. Click the refresh icon.



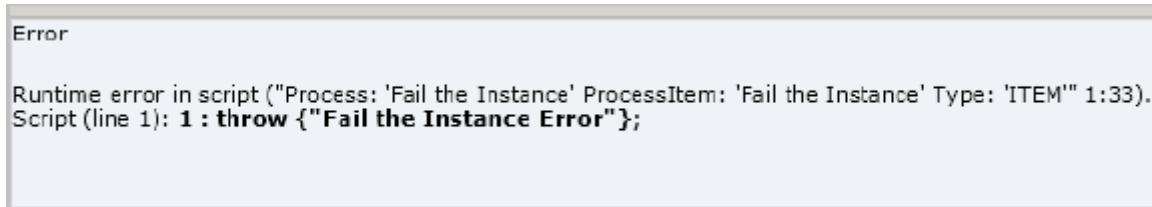
- __ m. Select the **Fail the Instance** activity and click the “Run the selected task” icon.



- __ n. When prompted to select a user, select **pcdeadmin** and click **OK**.
__ o. When the coach is displayed, select **Yes** to approve and click **OK**.



- __ p. Verify that a runtime error is thrown.

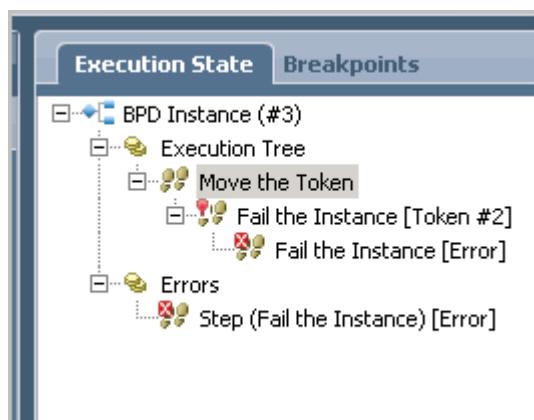


- __ q. Close the browser and return to Process Designer.

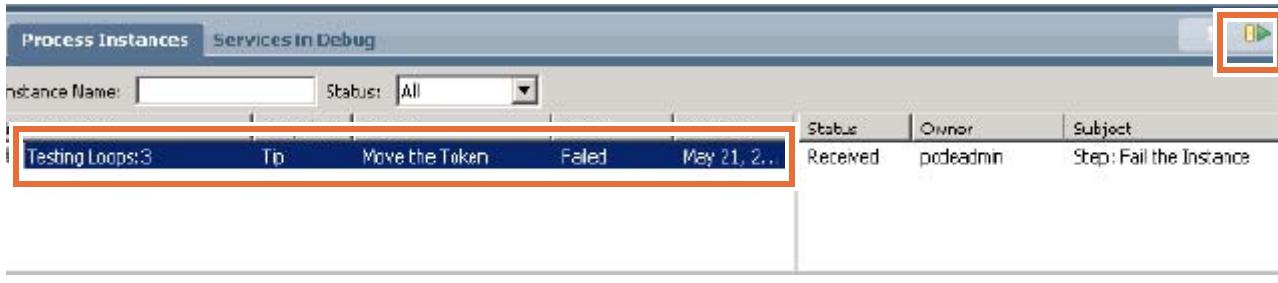
- ___ r. Click the refresh icon. Notice that the instance Status is now **Failed**.

The screenshot shows two overlapping windows. The top window is titled "Process Instances" and displays a table of process instances. One instance, "Testing Loops:3", has its status highlighted with a red box and is listed as "Failed". The bottom window is titled "Move the Token" and shows a BPMN diagram. The diagram starts with a "Start" node, followed by a gateway labeled "Fail the Instance" which is highlighted with a yellow border and a red "Error" icon above it. This leads to a "Save Business Data" activity and finally an "End" node. On the left side of the diagram, there are two vertical panels: "Team" on top and "System" on the bottom.

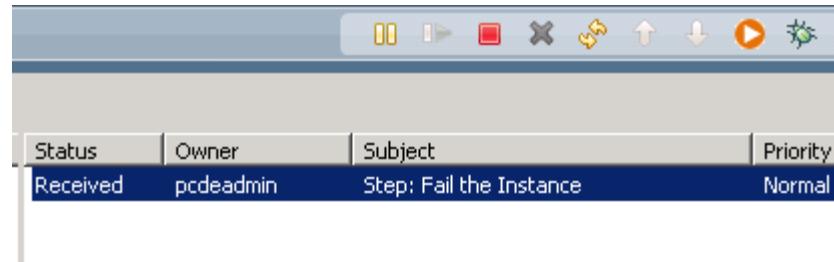
- ___ s. Notice the error in the **Execution State** tab.



- ___ 3. Try to restart the instance and see whether you can get past this error.
- ___ a. Select the instance in the left pane and click the **Resumes the selected BPD instances** icon.



- ___ b. Notice the instance status in the left pane changes from Failed to Active.
- ___ c. Select the activity in the right pane and click the **Run the selected task** icon.



- ___ d. Verify that the error is thrown.

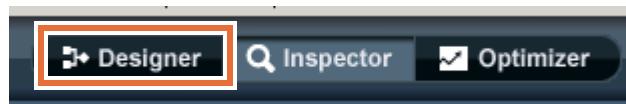
It is the same error that you saw earlier. Notice that this time when you ran, you did not see the coach for approval. It just went straight to the error. The process remembers the step where you were when the service failed. Suppose that a database call was made in that service, and you turned the instance active and ran it again. It would go directly to the step after the coach, attempt to make that database call each time, and eventually fail. The token is at the service failed step. Each time that you try to restart that failed instance, it starts from that failed step; and you do not see the coach anymore. The system tries to resume the service from the point it failed. It does not start from the starting point of the process, nor does it restart the entire service.

The user pcdeadmin is associated with that failed task. If this task is in failed state for few days, then it might reflect badly upon pcdeadmin as far as IBM BPM metrics are concerned. Something that should take 5 minutes, is now taking five days and is still not complete.

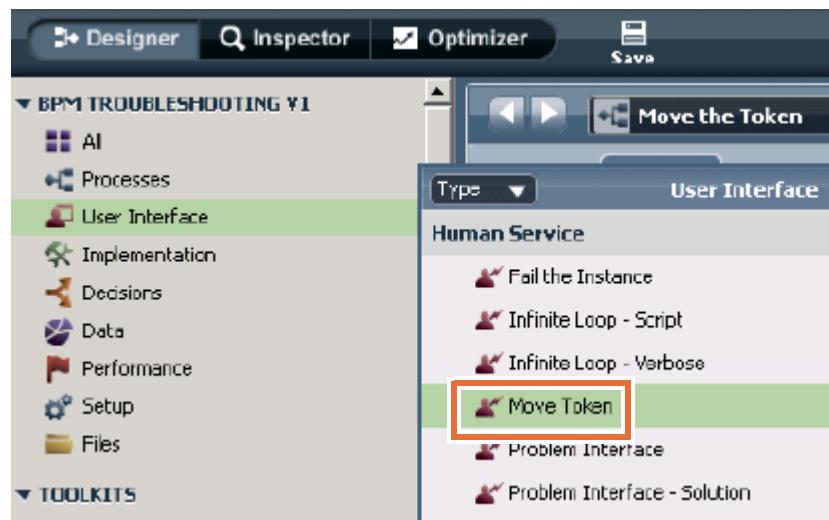
- ___ e. Close the browser.

Part 3: Explore the Move Token service implementation

- ___ 1. Explore the **Move Token** service.
 - ___ a. Make sure that you are in the Designer view and not in the Inspector view. If unsure, then click **Designer**.

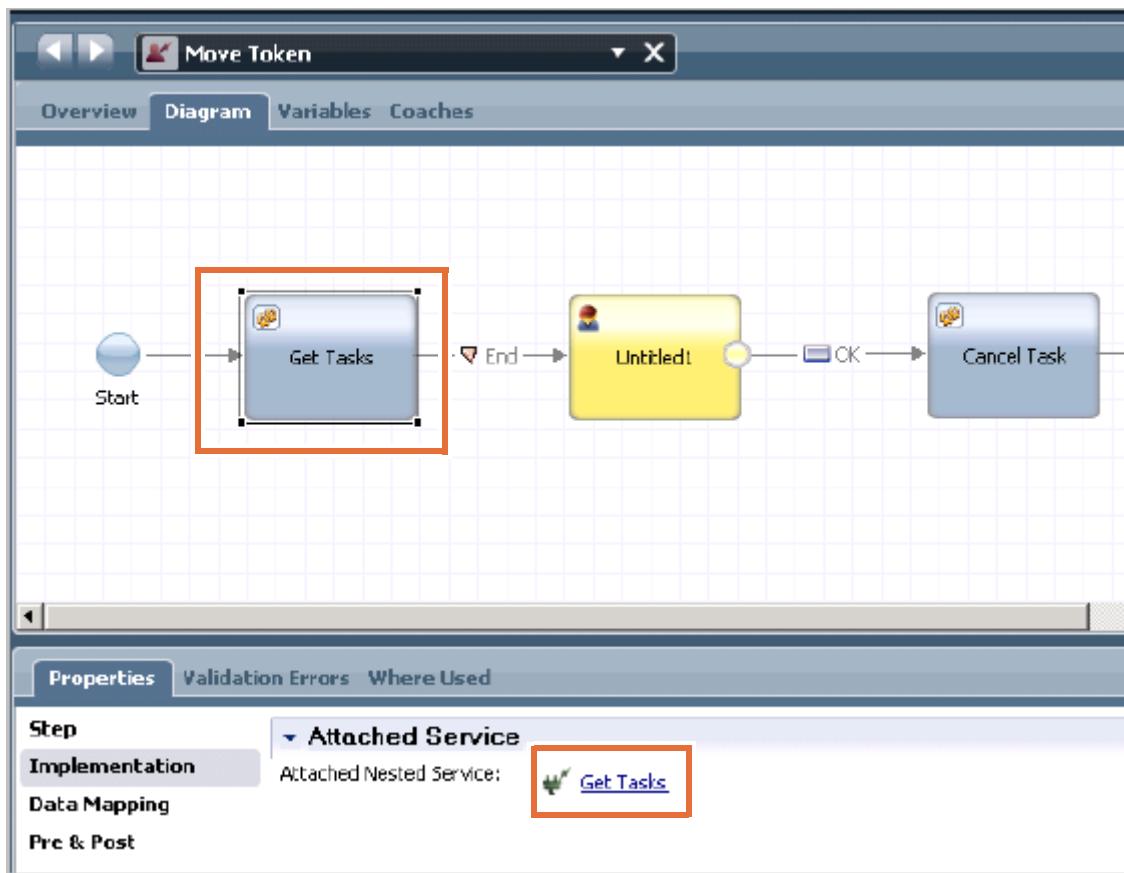


- ___ b. Select **User Interface** and then double-click **Move Token**.

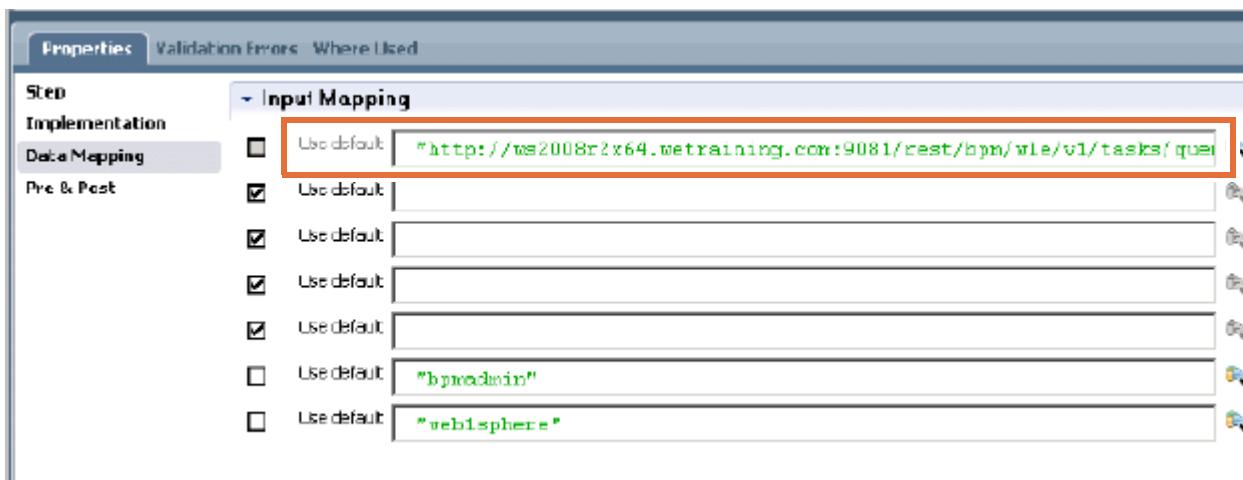


- ___ c. Select **Get Tasks**.

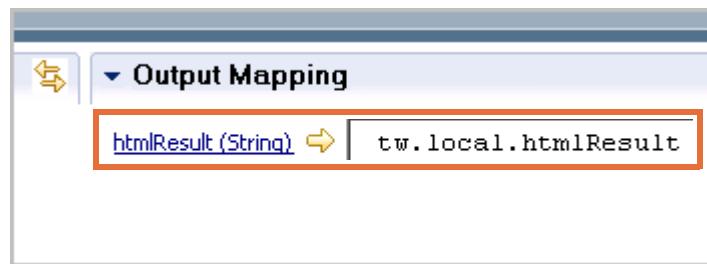
- ___ d. Click the **Properties** tab and then click **Implementation**.



- ___ e. Notice that the service calls Get Tasks, which provides all the tasks in the system.
 ___ f. Double-click **Get Tasks** and then select **Read from HTTP**.
 ___ g. In the Properties tab, click **Data Mapping**.
 ___ h. Examine the Input Mapping section. The URL on the left side is a REST API call to the system.

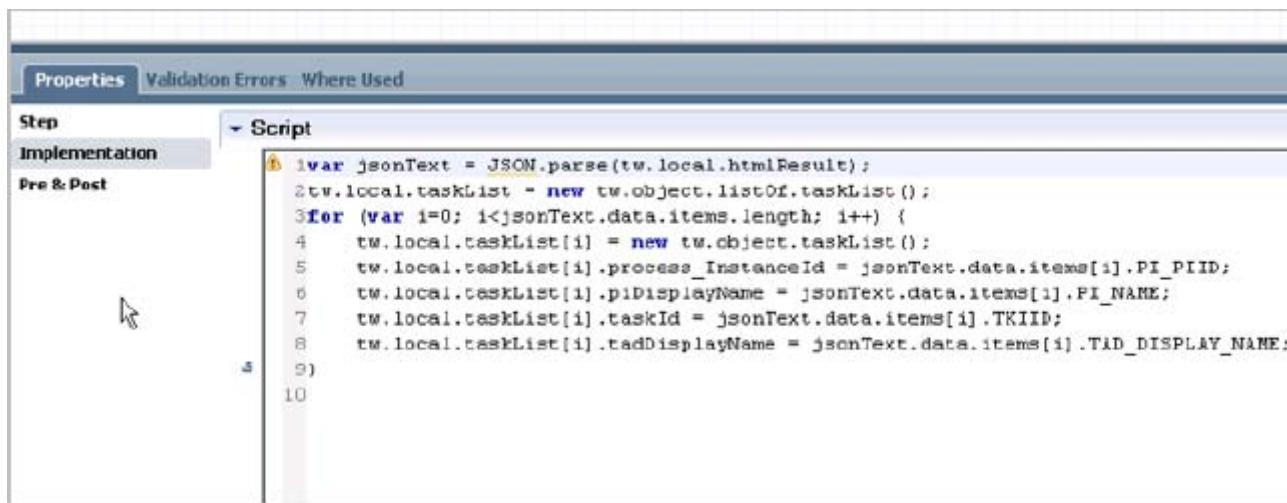


- ___ i. Examine the Output Mapping section.



The REST API call returns a JSON representation of an object that is then turned into a string, `tw.local.htmlResult`.

- ___ j. Select the **Parse JSON** step and click **Implementation** in the **Properties** tab. Examine the script. The return result set is dumped into the task list object.



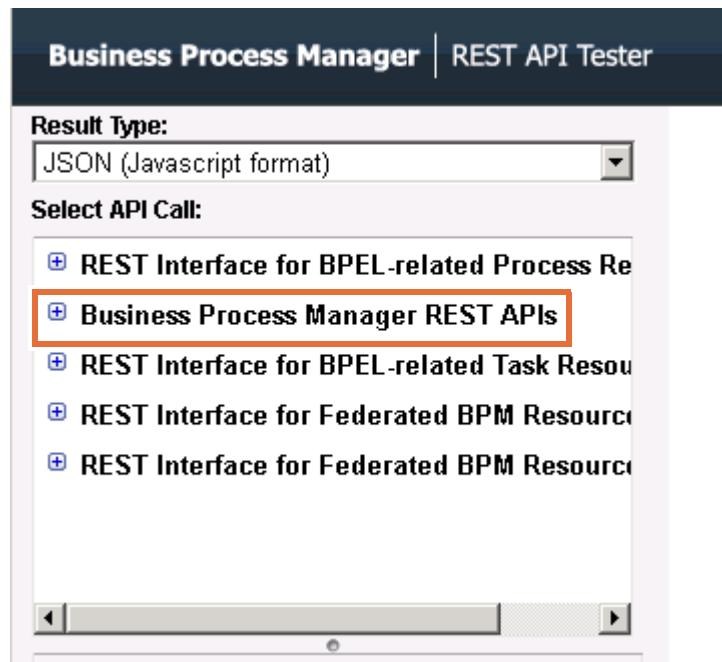
- ___ 2. Explore REST API Tester.

- ___ a. Start Firefox and go to the following web address:

<http://localhost:9081/bpmrest-ui/BPMRestAPITester/index.jsp>

- ___ b. Log in to the API Tester by entering `pcdeadmin` in the **User Name** field and `websphere` in the **Password** field. If you are already logged in, then you can skip this step.

- ___ c. Expand Business Process Manager REST APIs.



- ___ d. Expand Task API and click **Task Query Entity List**.

Result Type:
JSON (Javascript format)

Select API Call:

- + Process API
- + Service API
- Task API

- Task Details
- GetData
- SetData
- Bulk Task Details
- Start Task
- Assign Task To User
- Assign Task To Group
- Assign Task To Me
- Assign Task Back
- Update Due Date
- Update Priority
- Finish Task
- Cancel Task
- Task Client Settings
- Task Actions
- Task Queries
- Task Query Attributes
- Task Query Entity List
- Task Query Entity List Count
- Invite a user for Task Collaboration

- __ e. In the Query Name field, enter IBM.DEFAULTALLTASKSLIST_75 and click **Execute Call**.

The screenshot shows a configuration dialog box for a task query. At the top, it says "Task Query Entity List" with a description: "Retrieves a list of task instance entities obtained via a query." Below this are several input fields:

- Method:** GET
- Query Name:** IBM.DEFAULTALLTASKSLIST_75 (This field is highlighted with a red border.)
- Selected Attributes:** (A placeholder text area: "Comma-separated list of attributes, in upp...")
- Interaction Filter:** (A placeholder text area: "A query table condition language express...")
- Query Filter:** (A placeholder text area: "A query table condition language express...")
- Search Filter:** (A placeholder text area: "A search expression used as input to the t...")
- Execute Call** (A large button at the bottom right)

- ___ f. Examine the request in the right pane.

Request: `http://localhost:9081/rest/bpm/wle/v1/tasks/query/IBM.DEFAULTALLTASKSLIST_75`

Method: GET

Status: 200 - OK

Header:

```
X-Powered-By - Servlet/3.0
BPM_GENERIC_HEADER - SERVED
Cache-Control - no-cache, no-store, max-age=0
Content-Type - application/json
Content-Encoding - gzip
Content-Language - en-US
Transfer-Encoding - chunked
Date - Wed, 21 May 2014 21:41:34 GMT
```

Result:

```
{
  status: "200",
  data: [
    {
      identifier: "TASK.TKIID",
      query: "IBM.DEFAULTALLTASKSLIST_75",
      entityTypeName: "TASK",
      attributeInfo: [
        {
          name: "IS_AT_RISK",
          type: "BOOLEAN",
          content: "TASK.IS_AT_RISK"
        }
      ]
    }
  ]
}
```

Status 200 means that the call was successful. The result lists all the tasks in the current environment. The result is a JSON object that is being parsed to get all the ids for every task whether it is closed, stopped, or deleted in the system.

Recall that the REST API call is made in the data mapping section of the **Move Token** service that you explored earlier. The request is:

```
http://ws2008r2x64.wetraining.com:9081/rest/bpm/wle/v1/tasks/query/
IBM.DEFAULTALLTASKSLIST_75?queryFilter=STATE%3C%3E5%20AND%20STATE%3C%3E3
```

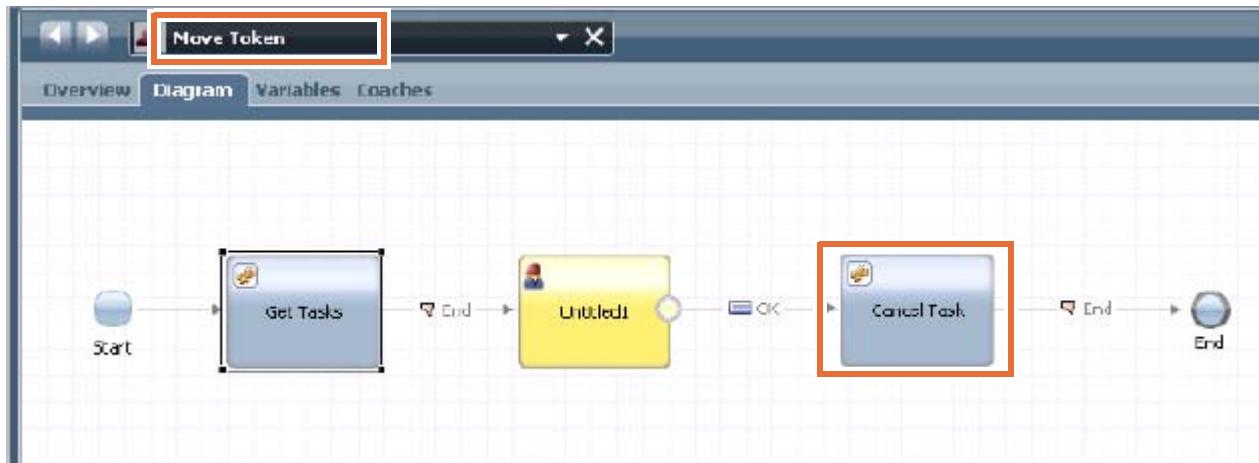
Compare that request with the one you see in the right pane:

```
http://localhost:9081/rest/bpm/wle/v1/tasks/query/
IBM.DEFAULTALLTASKSLIST_75
```

You can refine and filter the results set depending on your requirements. For this exercise, this request is modified so any task that is not active is not included in the result. Similarly, deleted tasks are not listed either. Feel free to examine the remaining contents of the result.

- ___ g. When you are done examining the REST APIs, close the browser.

- __ h. Go back to the Process Designer, switch to the **Move Token** service, and then double-click **Cancel Task**.



- __ i. Select **Set URL** and then click **Implementation** in the **Properties** tab.

```

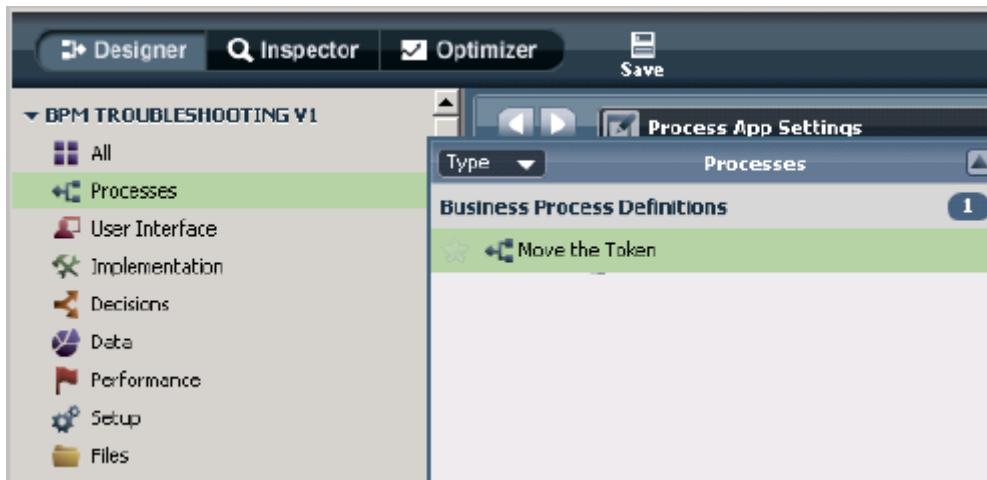
var param = {"approval":tw.local.taskList.approved};
tw.local.url =
"http://localhost:9081/rest/bpm/wle/v1/task/" + tw.local.taskList.taskId +
action=finish&params=" + JSON.stringify(param);

```

This request passes the JSON object back to the REST API along with the approval.

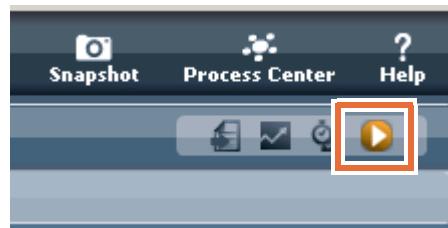
Part 4: Use the Move Token service to close the failed activity and complete the process

- __ 1. Create failed instances. Now that you explored the process and the service, you create several failed instances so you can close the ones that you want.
- __ a. Select **Processes** and then double-click **Move the Token**.

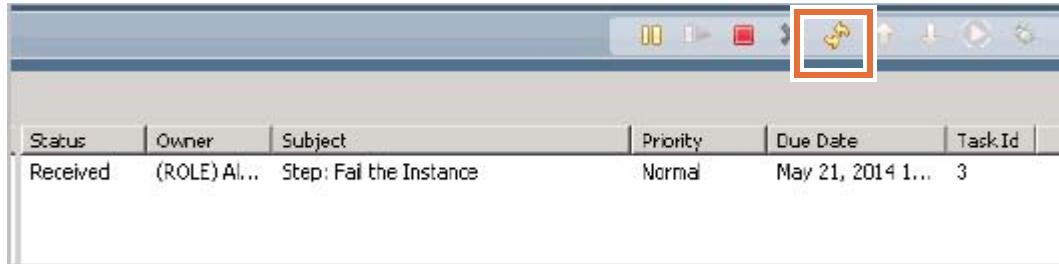


- __ b. The **Move the Token** process is displayed in the Diagram tab.

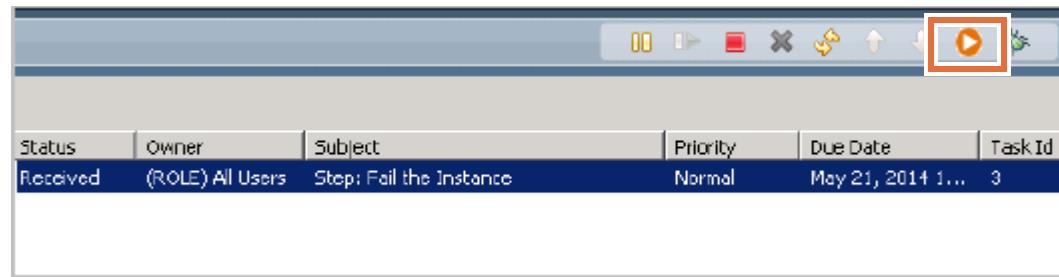
- ___ c. Click the **Run Process** icon in the upper right corner.



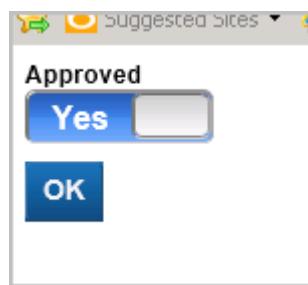
- ___ d. Click **Yes** when prompted to switch to the Inspector view.
___ e. Click the refresh icon.



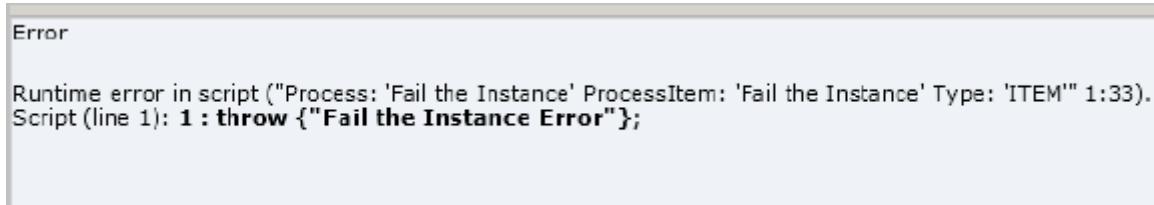
- ___ f. Select the **Failed the Instance** activity and click the “Run selected task” icon.



- ___ g. When prompted to select a user, select `pcdeadmin` and click **OK**.
___ h. When the coach is displayed, select **Yes** to approve and click **OK**.



- ___ i. Verify that a runtime error is thrown.



- __ j. Close the browser and return to Process Designer.
- __ k. Click the refresh icon. Notice that the instance status is now **Failed**.
- __ l. Click **Designer** to go back to the designer view.

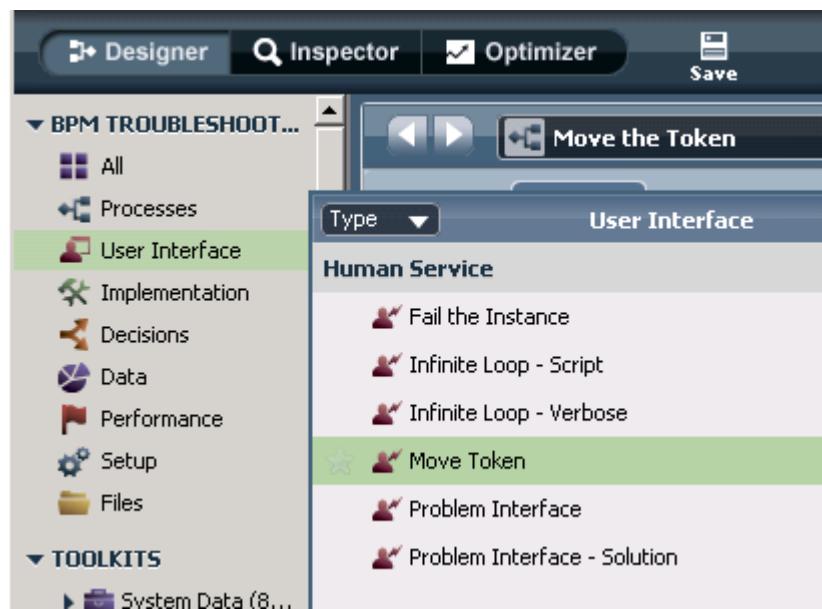


- __ m. Repeat the steps to create two more failed instances. When you are done, several failed instances are listed in the Inspector view. Depending on your environment and the number of instances run, the exact number of failed instances might not match, and that is OK.

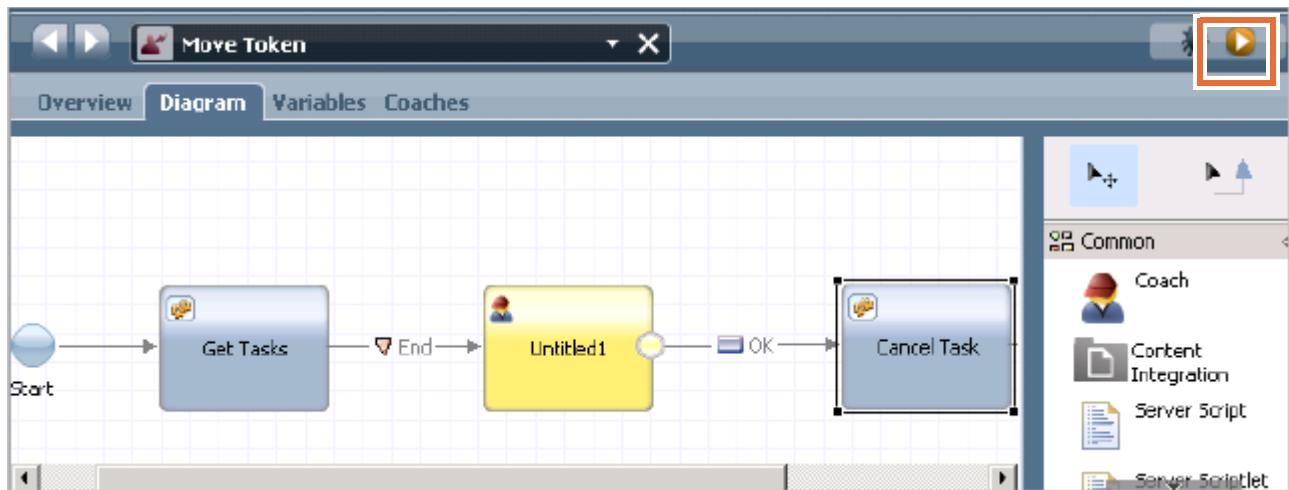
Process Instances Services in Debug						
Instance Name:	Snapshot	Process	Status	Due Date	Instance Id	
Testing Loops:14	Tip	Move the Token	Failed	May 22, 2...	14	
Testing Loops:13	Tip	Move the Token	Failed	May 22, 2...	13	
Testing Loops:12	Tip	Move the Token	Failed	May 22, 2...	12	
Testing Loops:11	Tip	Move the Token	Failed	May 22, 2...	11	

- __ 2. Try to restart an instance.
 - __ a. Select an instance in the left window and note the instance id here:
Instance id: _____
 - __ b. Click the **Resumes the selected BPD instances** icon.
 - __ c. Click the refresh icon.
 - __ d. Select the activity in the right pane and click the “Run the selected task” icon.
 - __ e. Verify that the error is thrown and the coach is not displayed.
- __ 3. Move the token of a failed instance.
 - __ a. Go to the Designer view by clicking **Designer**.

- __ b. Select **User Interface** and then double-click **Move Token**.



- __ c. Click the **Run Service** icon.



- ___ d. The new coach opens in the browser. Notice the difference in the coach from the one you saw earlier in the exercise. The coach lists several failed instances with their instance id and task id details. The instance id and task id might not match with your lab environment.

Process_instance_id	Pi display name	Task id	Tad display name	Approved
11	Testing Loops:11	26	Step: Fail the Instance	<input type="radio"/> No
12	Testing Loops:12	28	Step: Fail the Instance	<input type="radio"/> No
13	Testing Loops:13	30	Step: Fail the Instance	<input type="radio"/> No
14	Testing Loops:14	32	Step: Fail the Instance	<input type="radio"/> No

OK

The only data that is not coming from the database is the value for the Approved variable. The remaining contents are pulled from the database by using the REST API call.

- ___ e. Find the instance id that you noted earlier. It is the failed instance that you tried to restart, but it still failed. Select the radio button for that instance on the left and change the Approved Status to **Yes** by clicking to the left of No; and click **OK**.

Process_instance_id	Pi display name	Task id	Tad display name	Approved
11	Testing Loops:11	26	Step: Fail the Instance	<input type="radio"/> No
12	Testing Loops:12	28	Step: Fail the Instance	<input checked="" type="radio"/> Yes <input type="radio"/> No
13	Testing Loops:13	30	Step: Fail the Instance	<input type="radio"/> No
14	Testing Loops:14	32	Step: Fail the Instance	<input type="radio"/> No

OK

Notice that in this exercise, instance id 12 is selected and is used as a reference for the remainder of the exercise. In your lab, make sure to keep a note of the instance id you selected.

The service finishes successfully without any errors.

- ___ f. Switch to the Inspector view.

- ___ g. Click the refresh icon.
- ___ h. Select the instance that you approved.

Process Instances Services in Debug					
Instance Name	Snapshot	Process	Status	Due Date	Instance Id
Testing Loops:14	Tip	Move the Token	Failed	May 22, 2014	14
Testing Loops:13	Tip	Move the Token	Failed	May 22, 2014	13
Testing Loops:12	Tip	Move the Token	Failed	May 22, 2014	12
Testing Loops:11	Tip	Move the Token	Failed	May 22, 2014	11

- ___ i. Notice the status of the step **Fail the Instance** in the right pane. It is now closed.

Status	Owner	Subject	Priority
Closed	pcdeadmin	Step: Fail the Instance	Normal

- ___ j. Make sure that the task instance is selected in the left pane and click the “Resumes the selected BPD” icon.

Process Instances Services In Debug					
Instance Name	Snapshot	Process	Status	Due Date	Status
Testing Loops:14	Tip	Move the Token	Failed	May 22, 2014	Closed
Testing Loops:13	Tip	Move the Token	Failed	May 22, 2014	Closed
Testing Loops:12	Tip	Move the Token	Failed	May 22, 2014	Closed
Testing Loops:11	Tip	Move the Token	Failed	May 22, 2014	Closed

- ___ k. Click the refresh icon.
- ___ l. Notice that the task is now completed. It is not in the failed state anymore.

Process Instances Services In Debug					
Instance Name	Snapshot	Process	Status	Due Date	Status
Testing Loops:14	Tip	Move the Token	Failed	May 22, 2014	Completed
Testing Loops:13	Tip	Move the Token	Failed	May 22, 2014	Completed
Testing Loops:12	Tip	Move the Token	Completed	May 22, 2014	Completed
Testing Loops:11	Tip	Move the Token	Failed	May 22, 2014	Completed

- ___ m. The step Save Business Data is now also closed.

Status	Owner	Subject
Closed	pcdeadmin	Step: Fail the Instance
Closed	pcdeadmin	Step: Save Business Data

You successfully moved the token without having to submit a new version of the process into production. To maintain this instance and complete the activity in a failed or inactive process, you can use the REST API calls to complete that task. You can complete any task in the system instance (failed or active), if a task is not closed.

Part 5: Explore the Infinite Loop - Verbose service

In this part, you explore and troubleshoot infinite loops.

- 1. Explore the **Infinite Loop - Verbose** service.
 - a. Switch to the Designer view, if you are not already there.
 - b. Select User Interface and then double-click **Infinite Loop-Verbose**.



- ___ c. Select the decision gateway and then click **Implementation** in the **Properties** tab.

The screenshot shows a Business Process Diagram (BPMN) with the following steps:

- Start** leads to **Test Page**.
- Test Page** leads to **OK**.
- OK** leads to a **Decision Gateway** (labeled **Untitled1**).
- From the Decision Gateway, one path leads to **Counting**, which then leads to **Success Page**.
- Another path from the Decision Gateway loops back to **Counting**.
- Success Page** leads to **OK**.
- OK** leads to **End**.

The **Properties** tab is open for the **Decision** step. The **Implementation** section shows:

```
tw.local.count < 1000
```

The condition `tw.local.count < 1000` is highlighted with a red box.

This verbose loop has a decision gateway and a count. It is going to loop while `tw.local.count < 1000` and go towards the **Counting** Server Script. When `tw.local.count >= 1000`, then it goes to the secondary flow of **Success Page**.

- ___ d. Select **Counting** and then click **Implementation** in the **Properties** tab.

The screenshot shows a Business Process Diagram (BPMN) with the following steps:

- Start** leads to **Test Page**.
- Test Page** leads to **OK**.
- OK** leads to a **Decision Gateway** (labeled **Untitled1**).
- From the Decision Gateway, one path leads to a **Script Task** (labeled **Counting**), which then leads to **Success Page**.
- Another path from the Decision Gateway loops back to the **Script Task**.
- Success Page** leads to **OK**.
- OK** leads to **End**.

The **Properties** tab is open for the **Script** step. The **Implementation** section shows:

```
1//whoops, I forgot to increment!!  
2/tw.local.count++;
```

The script code `1//whoops, I forgot to increment!!
2/tw.local.count++;` is highlighted with a red box.

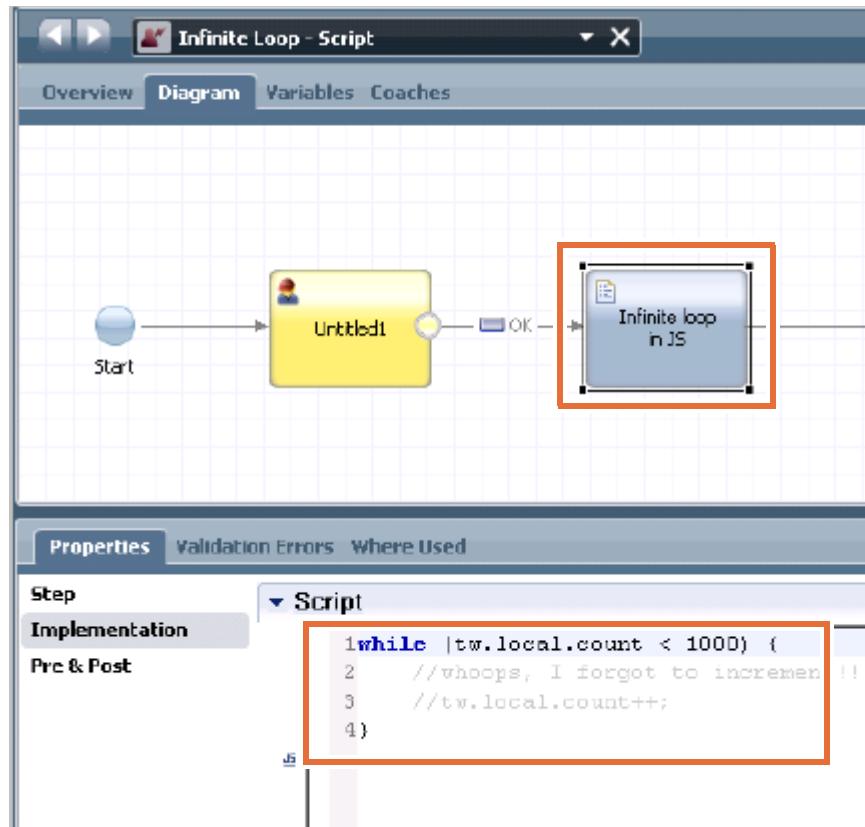
Question: Can you detect a problem with the **Counting** Server Script implementation?

Notice that there is no increment of the count within the **Counting** Server Script. The developer forgot to increment the counter, which is going to cause an infinite loop.

- __ 2. Explore the **Infinite Loop - Script** service.
 - __ a. Select **User Interface** and then double-click **Infinite Loop-Script**.



- __ b. Select **Infinite Loop in JS** and then click **Implementation** in the **Properties** tab.





Q

Can you detect a problem with the **Infinite Loop in JS** Server Script implementation?

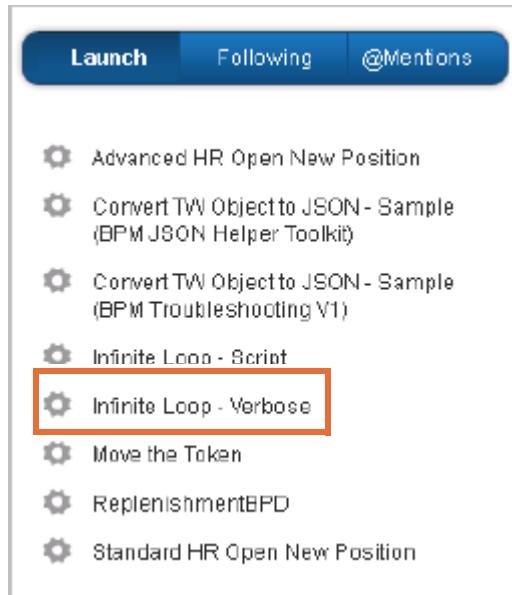
A while loop is created in the script. It is going to loop while `tw.local.count < 1000`. Notice that the developer forgot to increment the counter within the **Infinite Loop in JS** Server Script so the counter never gets above 1000 and always remains in this loop. This missing increment is going to cause an infinite loop.

Part 6: Test the Infinite Loop - Verbose loop

- 1. Run the **Infinite Loop - Verbose** loop in Process Portal.
 - a. Start Process Portal by starting Firefox and going to the following web address:
`http://localhost:9081/ProcessPortal`
 - b. In the Untrusted Connection window, click **I Understand the Risks** to expand the option.
 - c. Click **Add Exception**.
 - d. On the Add Security Exception window, the location is the secure port for the deployment manager. Click **Confirm Security Exception**. The login page is now visible.
 - e. In the Process Portal login window, enter `pcdeadmin` in the **User ID** field and `web1sphere` in the **Password** field. Click **Login**.

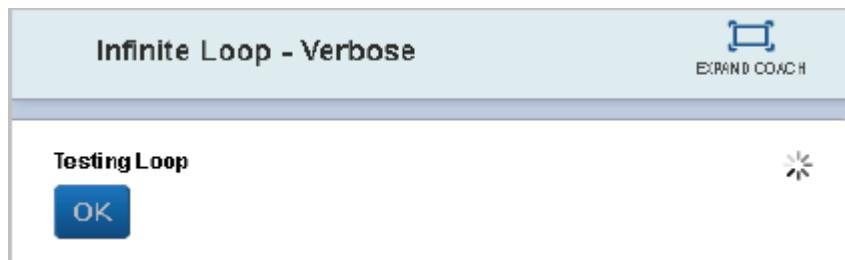
The screenshot shows a login interface for the IBM BPM | Process Portal. At the top, there's a dark header bar with the IBM logo on the left and 'BPM | Process Portal' on the right. Below this is a white login form. The form has two text input fields: 'User ID' with the value 'pcdeadmin' and 'Password' with the value '*****' (represented by five asterisks). At the bottom right of the form is a blue rectangular button labeled 'Login'.

- __ f. In the right pane, click **Infinite Loop - Verbose**.



- __ g. Click **OK**.

- __ h. Notice that the page seems locked and continues to spin and nothing happens. You can wait for few seconds or even minutes, but nothing is going to happen as you will never get past this page to the next step. You are in a continuous loop, and the only way to stop it on the page is to close out the page.



- __ i. Close this page, by closing this browser. You start Process Portal again.

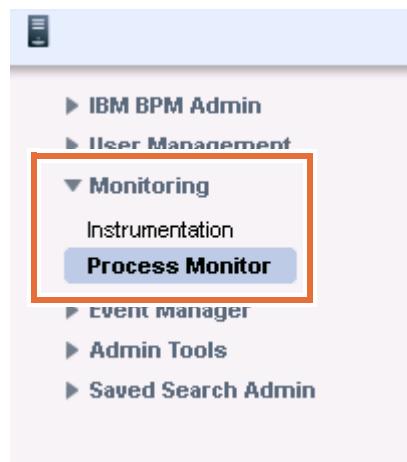
- __ 2. View Process Monitor metrics.

- __ a. Start Process Admin Console by opening Firefox and entering the following web address: <http://localhost:9081/ProcessAdmin>

- ___ b. Log in to the Process Admin Console by entering `pcdeadmin` in the **User Name** field and `websphere` in the **Password** field. Click **Login**.

The image shows the 'Process Admin Console Login' window. It has fields for 'User Name' containing 'pcdeadmin' and 'Password' containing '*****'. A 'Login' button is at the bottom. Below the window is a copyright notice: 'Licensed Materials - Property of IBM. © Copyright IBM Corporation 2000, 2013.'

- ___ c. Expand **Monitoring** and click **Process Monitor**.



Notice that the performance of your lab environment for the rest of this exercise might be sluggish because of the infinite loop.

- ___ d. The Summary view of the Process Monitor is displayed.

Process App	Service Name	Total Time	Total Steps
BPM Troubleshooting V1 (tip)	Fail the Instance	0:00:18.171	4
BPM Troubleshooting V1 (tip)	Move Token	0:00:06.107	22
Coaches (8.6.0.1)	Coaches Localized Messages Loader	0:00:01.005	2

Process App	Process Name	Total Time	Total Steps
BPM Troubleshooting V1 (tip)	Move the Token	0:00:01.078	5

Process App	Service Name	Sub-Service Name	Step Name	Total Time	Total Instances
BPM Troubleshooting V1 (RC1)	Infinite Loop - Verbose		Counting	0:17:52.181	22,601,784
BPM Troubleshooting V1 (RC1)	Infinite Loop - Verbose		Untitled41	0:17:22.389	22,601,784
BPM Troubleshooting V1 (tip)	Fail the Instance		Approval	0:00:10.040	2
KelbanTK (201404-15-1)	Move Token	RESTRequest	call doRest	0:00:04.301	1
Coaches (8.6.0.1)	Coaches Localized Messages Loader		Initialize Localized Messages	0:00:01.022	1
System Data	Move Token	Data from UTTO	Data with XHR	0:00:00.040	4

- ___ e. Examine the middle of the table in the Most Expensive Service Steps section. Notice that Counting is listed as one of the most expensive steps, and it takes a total time of 17 minutes and 62 seconds and runs over 22 million instances of that step in the service. The numbers in your lab environment are different.
- Process Monitor is a good place to come to when troubleshooting some of your services as it immediately informs you where some problems might exist. It also helps to identify services in your environment that need optimization.
- ___ f. Examine the top of the table. The Active Services Currently Executing is listed at 1. In your lab environment, you might suspect that an infinite loop is running right now.
- ___ g. Click the **Services** tab.

- ___ h. Examine the metrics for Active Services Currently Executing at the top. The active service name is Infinite Loop-Verbose. The service started running more than 3 hours ago, and over 228 million steps are traversed inside the service, which is a huge indicator that something is wrong.

Process App	Service Name	Enter Time	Duration	Total Steps
BPM Troubleshooting V1 (RC1)	Infinite Loop - Verbose	May 21, 2014 8:35:45 PM	3:13:35.390	228,159,589

You can compare the duration of the active service with the rest of the ones that are listed in the active services not currently executing. Notice that most of them take less than 1 second to execute. When you see long durations and a high number of steps, then that is a good indicator that an infinite loop is the culprit.

- ___ i. Click **Infinite Loop-Verbose** under Service Name.
___ j. Click **Halt Service** to stop this infinite loop.

Service Name	Infinite Loop - Verbose
Name	BPM Troubleshooting V1 (RC1)
Instance ID	guid:4e070cfe4d1d2d7a-3ff769de:1480b6e0235:-42b1
Enter Time	May 21, 2014 8:35:45 PM
Duration	3:26:26.517
State	Active Currently Executing
Total Steps Completed	243,436,262

Halt Service

- ___ k. The right pane might take sometime to refresh. Click **Process Monitor** on the left to refresh the page.

- __ I. Verify that Active Services Currently Executing is now zero. **Infinite Loop-Verbose** claimed one of the top spots for the most expensive services and the most expensive service steps.

The screenshot shows the Process Admin Console interface with several tables of data:

- Summary:** Shows Active Processes Currently Executing (0) and Active Services Currently Executing (0).
- Most Expensive Services:** A table showing the most expensive services across different process applications. The data includes:

Process App	Service Name	Total Time	Total Steps
BPM Troubleshooting V1 (RC1)	Infinite Loop - Verbose	8:30:05.736	247,778,905
BPM Troubleshooting V1 (lp)	Fail the Instance	0:00:18.171	4
BPM Troubleshooting V1 (lp)	Move Token	0:00:00.187	22
Coaches (8.5.0.1)	Coaches Localized Messages Loader	0:00:01.985	2
- Most Expensive Processes:** A table showing the most expensive processes across different process applications. The data includes:

Process App	Process Name	Total Time	Total Steps
BPM Troubleshooting V1 (lp)	Move the Token	0:00:01.079	5
- Most Expensive Service Steps:** A table showing the most expensive service steps across different process applications. The data includes:

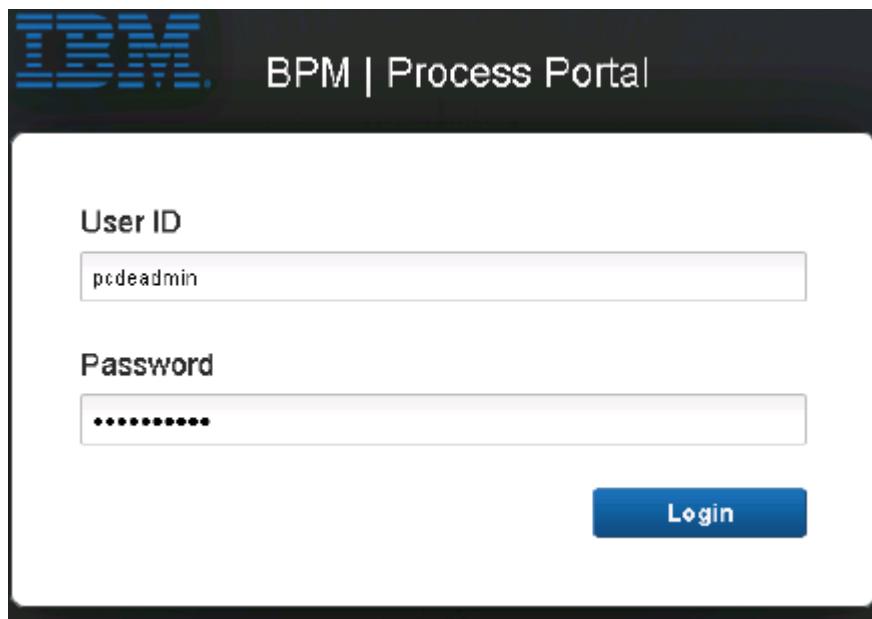
Process App	Service Name	Sub-Service Name	Step Name	Total Time	Total Instances
BPM Troubleshooting V1 (RC1)	Infinite Loop - Verbose		Counting	1:32:45.436	123,888,451
BPM Troubleshooting V1 (RC1)	Infinite Loop - Verbose		Untitled1	1:30:47.035	123,888,462
BPM Troubleshooting V1 (lp)	Fail the Instance		Approval	0:00:16.640	2
Kolban TK (2014-04-15-1)	Move Token	RESTRequest	call doRest	0:00:04.391	1

- __ m. Minimize Process Admin Console. You are going to use it again later.

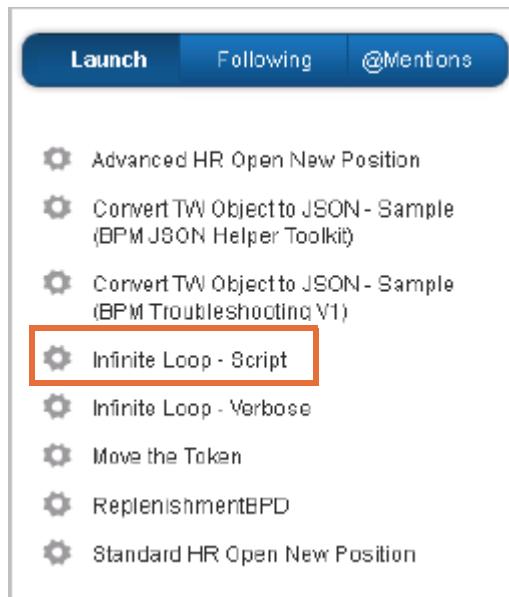
Part 7: Test the Infinite Loop - Script loop

- __ 1. Run **Infinite Loop - Script** in Process Portal.
 __ a. Start Process Portal by starting Firefox and entering the following web address:
<http://localhost:9081/ProcessPortal>

- __ b. If prompted, enter `pcdeadmin` in the **User ID** field and `websphere` in the **Password** field. Click **Login**.

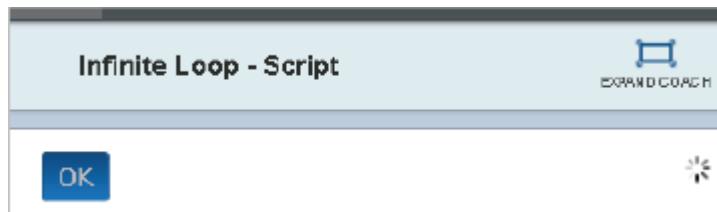


- __ c. In the right pane, click **Infinite Loop - Script**.

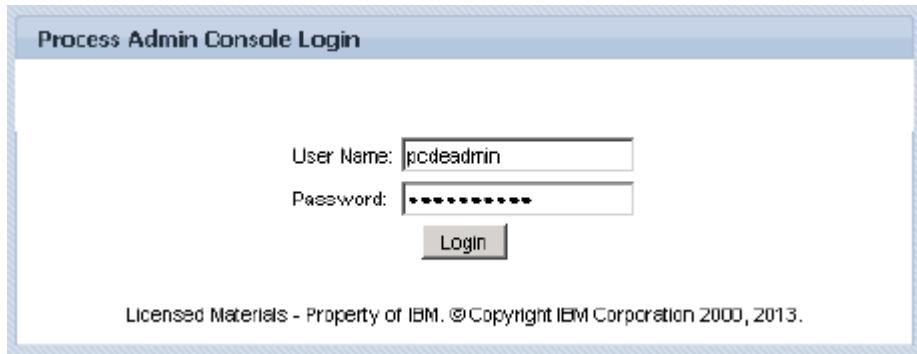


- __ d. Click **OK**.

- ___ e. Notice that the page seems locked and continues to spin and nothing happens. You are in a continuous loop again, and the only way to stop it on this page is to close out the page.



- ___ f. Close this page, by closing this browser.
- ___ 2. Explore Process Monitor metrics.
- ___ a. Maximize the Process Admin Console browser instance that you minimized earlier. If you closed it, then start Process Admin Console by opening Firefox and entering the following web address: <http://localhost:9081/ProcessAdmin>
- ___ b. If needed, log in to the Process Admin Console by entering `pcdeadmin` in the **User Name** field and `web1sphere` in the **Password** field. Click **Login**.



- ___ c. Expand **Monitoring** and click **Process Monitor**.



- ___ d. The Summary view of the Process Monitor is displayed.

The screenshot shows the Process Monitor interface with the 'Summary' tab selected. At the top, there are three tabs: 'Summary' (selected), 'Processes', and 'Services'. A 'Refresh' button is located in the top right corner. Below the tabs, there are two summary boxes:

Active Processes Currently Executing	0
Active Services Currently Executing	1

Below these boxes is a section titled 'Most Expensive Services' containing a table:

Process App	Service Name	Total Time	Total Steps
BPM Troubleshooting V1 (RC1)	Infinite Loop - Verbose	3:30:00.730	247,770,800
BPM Troubleshooting V1 (tip)	Fail the Instance	0:00:18.171	4
BPM Troubleshooting V1 (tip)	Move Token	0:00:06.197	22
Coaches (0.5.0.1)	Coaches Localized Messages Loader	0:00:01.095	2

Below this is a section titled 'Most Expensive Processes' containing a table:

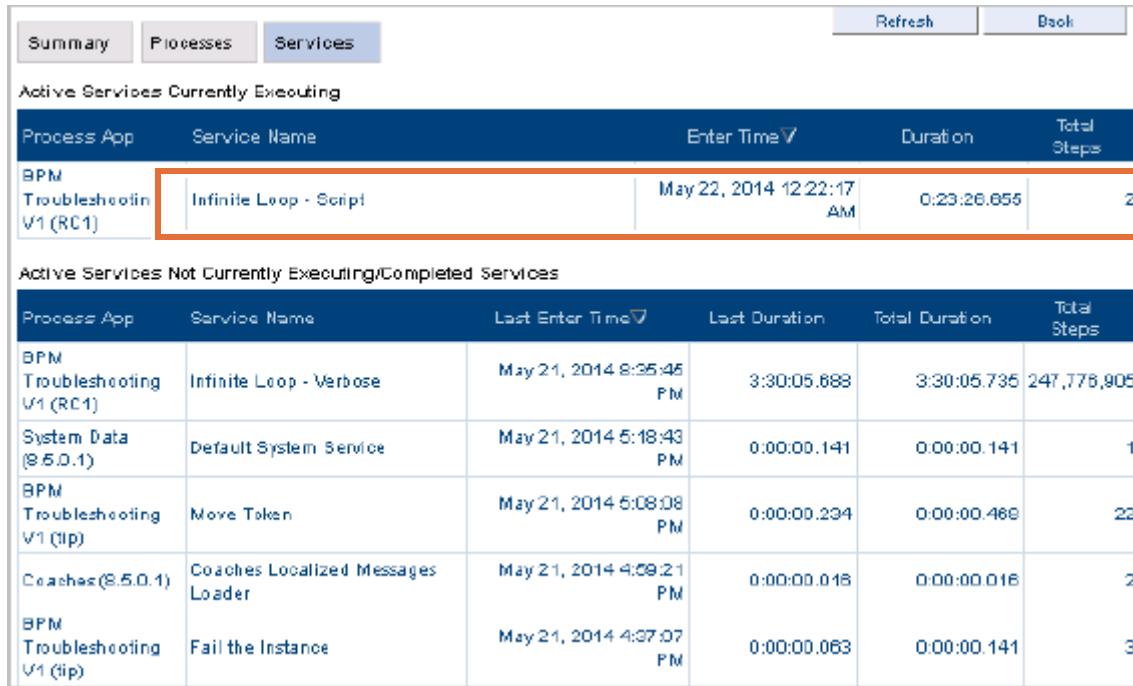
Process App	Process Name	Total Time	Total Steps
BPM Troubleshooting V1 (tip)	Move the Token	0:00:01.078	5

Finally, there is a section titled 'Most Expensive Service Steps' containing a table:

Process App	Service Name	Sub-Service Name	Step Name	Total Time	Total Instances
BPM Troubleshooting V1 (RC1)	Infinite Loop - Verbose		Counting	1:32:46.436	123,888,461
BPM Troubleshooting V1 (RC1)	Infinite Loop - Verbose		Untitled1	1:30:47.036	123,888,462
BPM Troubleshooting V1 (tip)	Fail the Instance		Approval	0:00:16.640	2
KolbanTK (201404-15-1)	Move Token	RESTRequest	call doRest	0:00:04.391	1

- ___ e. Examine the top of the table. The Active Services Currently Executing is listed at 1. It is the Infinite Loop - Script service that is running. However, unlike the Infinite Loop - Verbose service, you do not see the Infinite Loop - Script service as listed under the Most Expensive Services section or the Most Expensive Service Steps section. It is not listed because that one single service step of the loop is not completed. The verbose loop was completing the step so it was able to report that it is taking a long time. But the Infinite Loop Script is not reporting any service-specific details.
- ___ f. Click the **Services** tab.

- ___ g. Examine the metrics for the Active Services Currently Executing at the top. The active service name is Infinite Loop-Script. The service started running more than 23 minutes ago, and there are only two steps. The second step is the one that is running and did not stop yet.



The screenshot shows a table titled "Active Services Currently Executing". The columns are: Process App, Service Name, Enter Time, Duration, and Total Steps. One row is highlighted with a red border, corresponding to the entry in the "Active Services Not Currently Executing/Completed Services" table below it. The highlighted row contains: BPM Troubleshooting V1 (RC1), Infinite Loop - Script, May 22, 2014 12:22:17 AM, 0:23:26.655, and 2.

Process App	Service Name	Enter Time	Duration	Total Steps
BPM Troubleshooting V1 (RC1)	Infinite Loop - Script	May 22, 2014 12:22:17 AM	0:23:26.655	2

Process App	Service Name	Last Enter Time	Last Duration	Total Duration	Total Steps
BPM Troubleshooting V1 (RC1)	Infinite Loop - Verbose	May 21, 2014 8:35:45 PM	3:30:05.688	3:30:05.735	247,778,905
System Data (8.5.0.1)	Default System Service	May 21, 2014 5:18:43 PM	0:00:00.141	0:00:00.141	1
BPM Troubleshooting V1 (ip)	Move Token	May 21, 2014 6:08:08 PM	0:00:00.294	0:00:00.469	22
Coaches (8.5.0.1)	Coaches Localized Messages Loader	May 21, 2014 4:59:21 PM	0:00:00.018	0:00:00.018	2
BPM Troubleshooting V1 (ip)	Fail the Instance	May 21, 2014 4:37:07 PM	0:00:00.063	0:00:00.141	3

- ___ h. Click Infinite Loop - Script.

- __ i. Examine the **Services** details.

The screenshot shows the 'Service "Infinite Loop - Script" Details' page. At the top, there are tabs for Summary, Processes, and Services (which is selected). Below the tabs, there's a section for 'Service "Infinite Loop - Script" Details' with the following data:

Service Name	Infinite Loop - Script
Name	BPM Troubleshooting V1 (RC1)
Instance ID	guid:4e0700fc4d1d2d7a:3ff780de:1480b6e0295-3f1a
Enter Time	May 22, 2014 12:22:17 AM
Duration	0:29:08.152
State	Active Currently Executing
Total Steps Completed	2

Below this is a button labeled 'Halt Service'. The next section is 'Active Step' with one entry:

Process App	Sub-Service Name	Step Name	Enter Time	Duration
BPM Troubleshooting V1 (RC1)		Infinite loop in JS	May 22, 2014 12:22:17 AM	0:20:08.162

The final section is 'Completed Steps' with two entries:

Process App	Sub-Service Name	Step Name	Last Enter Time	Total Duration	Total Instances
BPM Troubleshooting V1 (RC1)		Untitled1	May 22, 2014 12:22:17 AM	0:00:00.031	2
BPM Troubleshooting V1 (RC1)		Infinite loop in JS	May 22, 2014 12:22:17 AM	0:00:00.000	0

The Infinite Loop - Script is still an active step. Duration is not complete.

Click **Halt Service** to stop this infinite loop. Notice that this infinite loop cannot be halted this way when it exists inside a script. To avoid infinite loops, make sure to include an exit criteria when working with loops. In this scenario, you need to restart the environment to get out of the infinite loop.

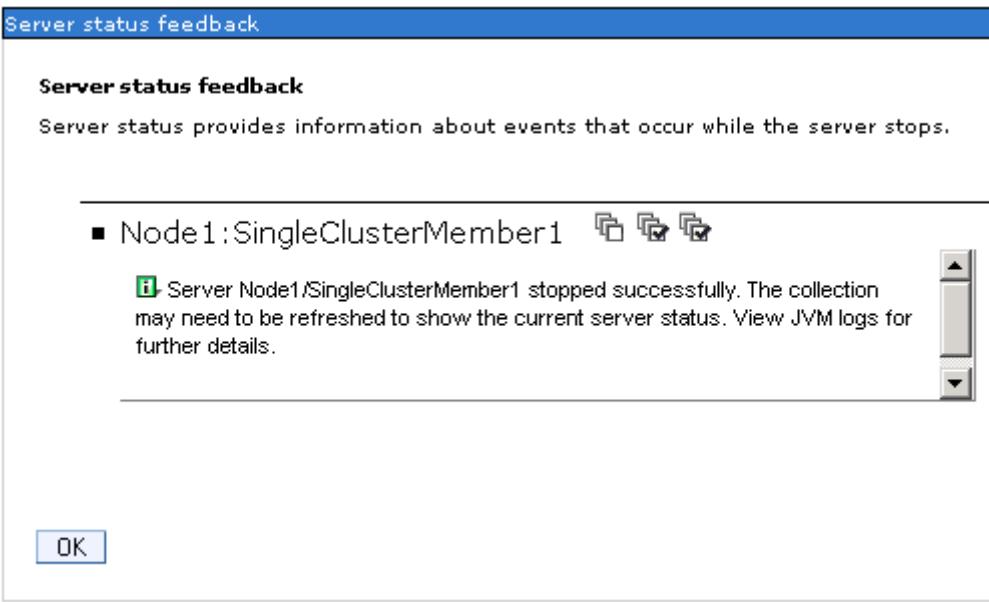
- __ 3. Stop the Process Center environment.

- __ a. Select **Servers > Server Types > WebSphere application servers**, and select the **SingleClusterMember1**.
- __ b. Click **Stop**.

- ___ c. Click **OK** to confirm. Wait until the server stops successfully.



- ___ d. Wait until the server stops successfully, and then click **OK**.



- ___ e. Click **Logout**, and minimize the browser.
___ f. Double-click the **Stop the Process Center node agent** shortcut icon in the **Process Center** folder on the desktop.
___ g. If the “Login at the Target Server” window appears, enter `bpmadmin` in the **User Identity** field and `websphere` in the **User Password** field.
___ h. Click **OK**.
___ i. Wait until the stop command is successfully completed, and press any key to continue.
___ j. Double-click the **Stop the Process Center deployment manager** shortcut icon in the **Process Center** folder on the desktop.
___ k. If you are prompted, enter `bpmadmin` in the **User Identity** field and `websphere` in the **User Password** field.

- __ l. Click **OK**.

Wait until the stop command is successfully completed, and press any key to continue.
The Process Center environment is now stopped.

- __ m. Close the web browser and any other open windows.

End of exercise

Exercise review and wrap-up

In this exercise, you used techniques to troubleshoot failed instances and infinite loops.

Exercise 6. Troubleshooting the user interface

What this exercise is about

This exercise covers how to take advantage of lazy loading of data in coaches to improve the page performance.

What you should be able to do

At the end of this exercise, you should be able to:

- Use Firefox Firebug for troubleshooting a web page
- Create a tabbed coach
- Run several instances of a coach and compare their performance

Introduction

In this exercise, you work with a scenario where an online Process Server is no longer displaying the connected status in the Process Center. Your development team needs to deploy some snapshots to the online Process Server. However, the server is not connected so you must diagnose, troubleshoot, and fix the problem.

Requirements

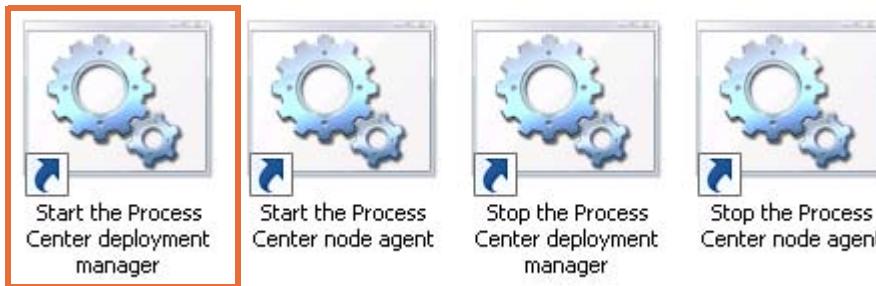
Completing the exercises for this course requires a lab environment. This environment includes the exercise support files, IBM Process Designer, IBM Process Center, IBM Process Server, and IBM Integration Designer test environment.

Exercise instructions

Part 1: Start the Process Center environment

If the Process Center environment is already running, then skip to step 2.

- ___ 1. Start the Process Center deployment manager and node agent.
 - ___ a. From the desktop, open the **Process Center** folder and double-click the **Start the Process Center deployment manager** shortcut icon to start the server. Leave the Process Center folder open, as you are going to use it again shortly.

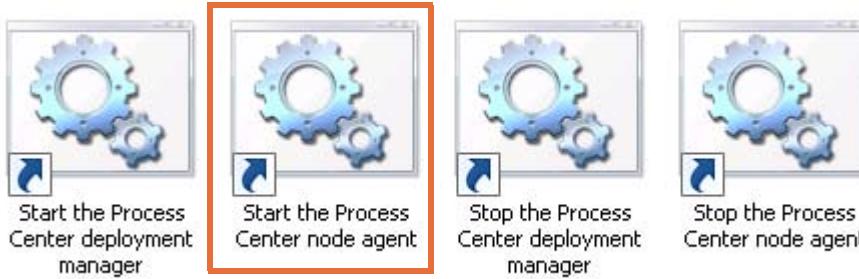


- ___ b. Wait until the start command is successfully completed, and press any key to continue.

A screenshot of a terminal window titled "Start the Process Center deployment manager". The window displays the following log output:

```
ADMU0116I: Tool information is being logged in file C:\IBM\BPM\ProcessCenter\v8.5\profiles\dmgrProfile\logs\dmgr\startServer.log
ADMU0128I: Starting tool with the dmgrProfile profile
ADMU3100I: Reading configuration for server: dmgr
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server dmgr open for e-business; process id is 4152
Press any key to continue . . .
```

- ___ c. Double-click the **Start the Process Center node agent** shortcut icon.



- ___ d. Wait until the start command is successfully completed, and press any key to continue.

2. Start the administrative console for Process Center.
- Double-click the **Firefox** icon from the desktop to open the web browser, and enter the following web address:
<http://localhost:9061/ibm/console>
 - If the Untrusted Connection window is displayed, click **I Understand the Risks** to expand the option. Otherwise, go to step f to log in.



This Connection is Untrusted

You have asked Firefox to connect securely to **localhost:9044**, but we can't confirm that your connection is secure.

Normally, when you try to connect securely, sites will present trusted identification to prove that you are going to the right place. However, this site's identity can't be verified.

What Should I Do?

If you usually connect to this site without problems, this error could mean that someone is trying to impersonate the site, and you shouldn't continue.

[Get me out of here!](#)

- ▶ **Technical Details**
- ▶ **I Understand the Risks**

- c. Click **Add Exception**.



This Connection is Untrusted

You have asked Firefox to connect securely to **localhost:9044**, but we can't confirm that your connection is secure.

Normally, when you try to connect securely, sites will present trusted identification to prove that you are going to the right place. However, this site's identity can't be verified.

What Should I Do?

If you usually connect to this site without problems, this error could mean that someone is trying to impersonate the site, and you shouldn't continue.

[Get me out of here!](#)

- ▶ **Technical Details**
- ▼ **I Understand the Risks**

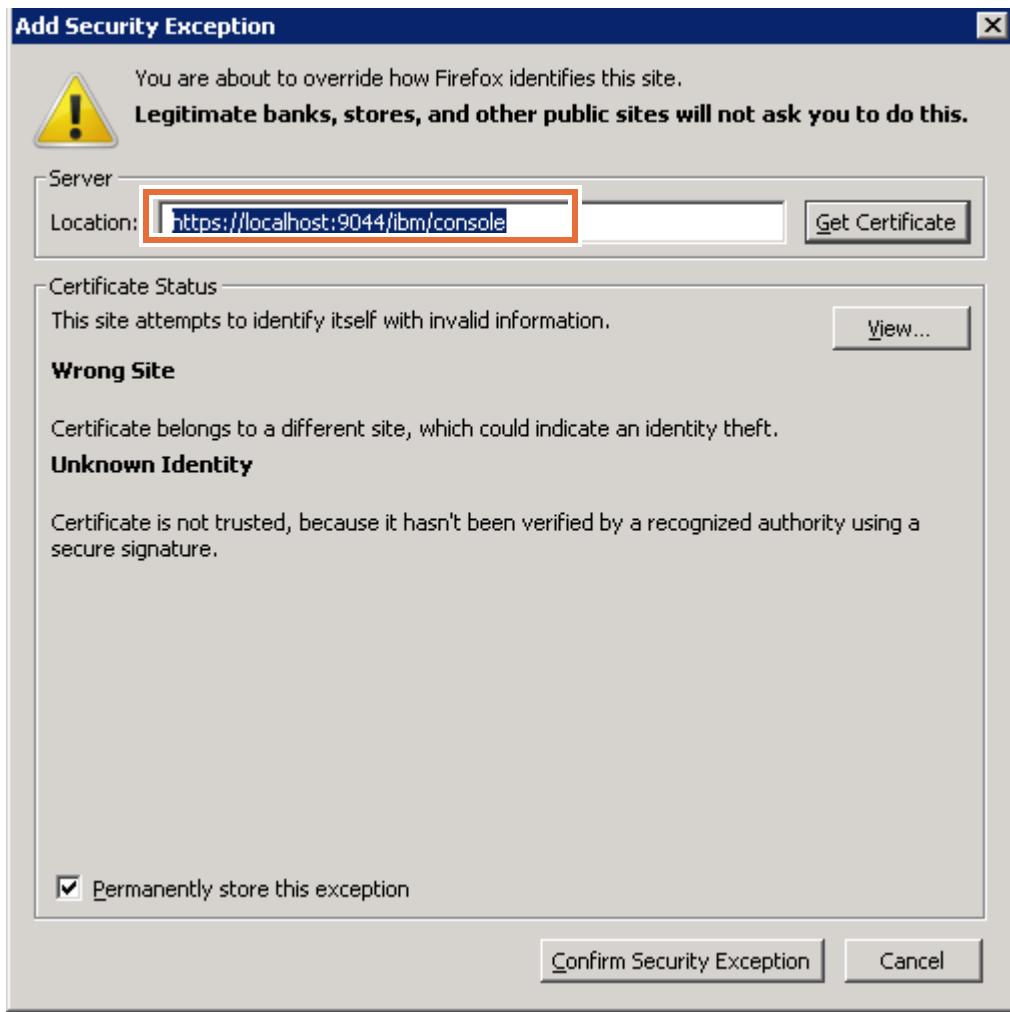
If you understand what's going on, you can tell Firefox to start trusting this site's identification. **Even if you trust the site, this error could mean that someone is tampering with your connection.**

Don't add an exception unless you know there's a good reason why this site doesn't use trusted identification.

[Add Exception...](#)

- __ d. On the Add Security Exception window, the location is the secure port for the deployment manager. Verify that the location is the following web address:

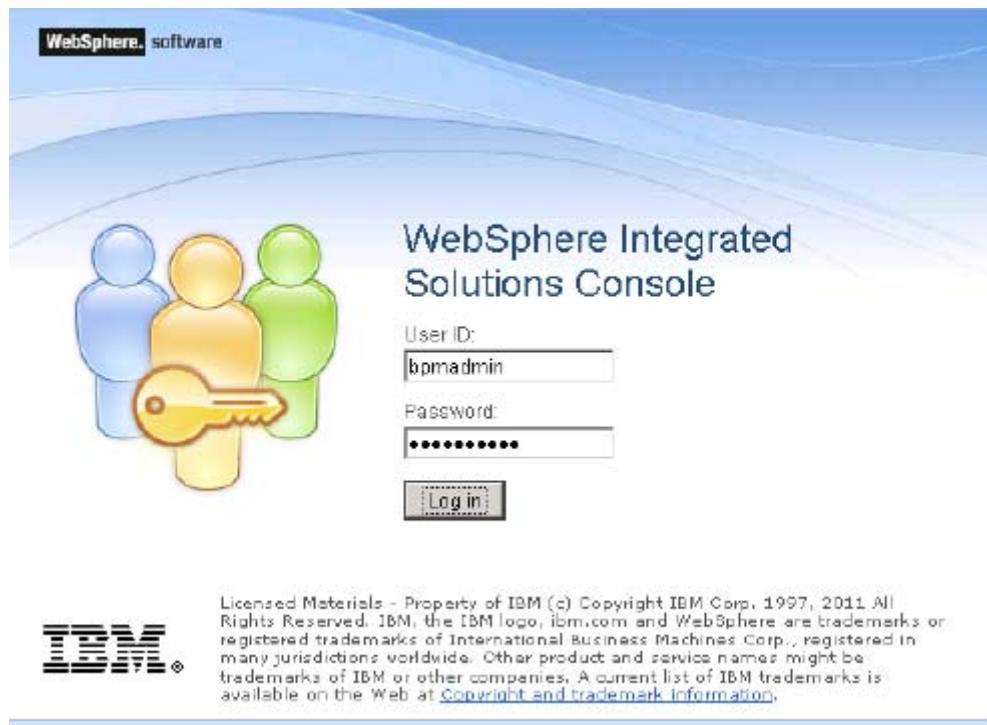
<https://localhost:9044/ibm/console>



- __ e. Click **Confirm Security Exception**. The administrative console login page is now visible.

___ f. Log in to the administrative console as:

- **User ID:** bpmadmin
- **Password:** websphere



___ g. In the administration console, expand **Servers > Server Types** and click **WebSphere application servers**.

___ h. Select the **SingleClusterMember1** check box.

___ i. Click **Start**.



___ j. Wait until the start command is successfully completed, and the status becomes green.

Select	Name	Node	Host Name	Version	Cluster Name	Status
You can administer the following resources:						
<input type="checkbox"/>	SingleClusterMember1	Node1	ws2008r2x64.wetraining.com	ND 8.5.5.1 BPMAdv 8.5.0.1	SingleCluster	

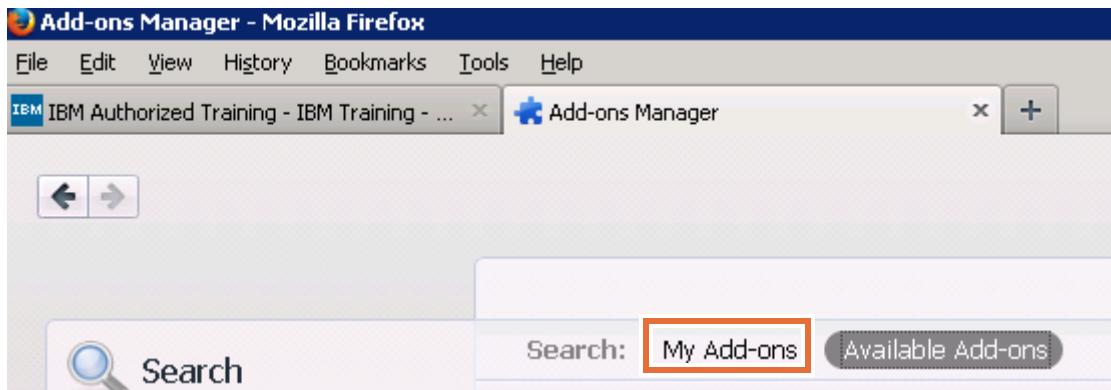
Part 2: Configure Firefox

In this section, you explore the Firebug add-on. This add-on is already installed. Firebug is a web development tool that can be used to inspect HTML and modify style and layout in real time. It includes a JavaScript debugger and can also be used to analyze network usage and performance.

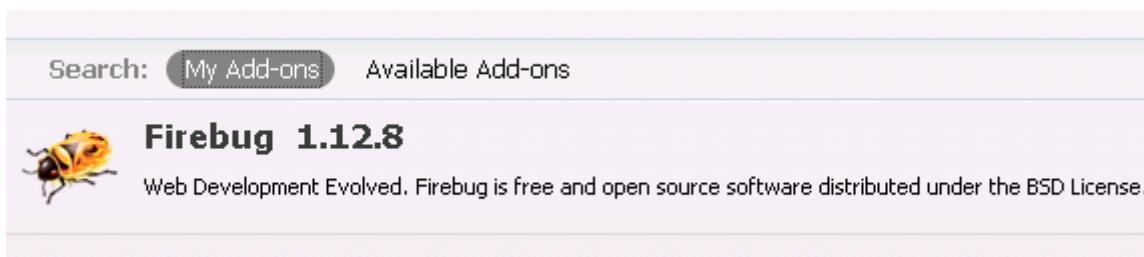
You also make Firefox the default browser so you can debug a running process in the web browser.

__ 1. Verify that the Firebug add-on is installed.

- __ a. Double-click the **Firefox** icon from the desktop to open the web browser,
- __ b. Click **Tools > Add-ons**.
- __ c. In the Search field, enter `Firebug` and click Enter.
- __ d. Click **My Add-ons**.

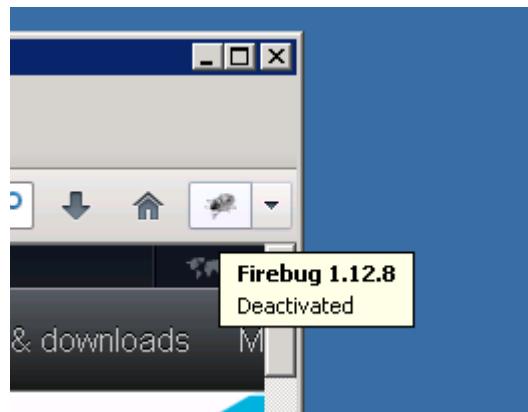


- __ e. Verify that Firebug 1.12.8 is listed as **My Add-ons**.

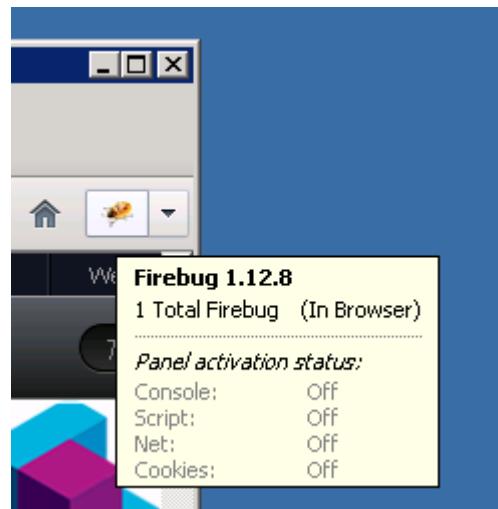


- __ f. Close the **Add-ons Manager** tab.

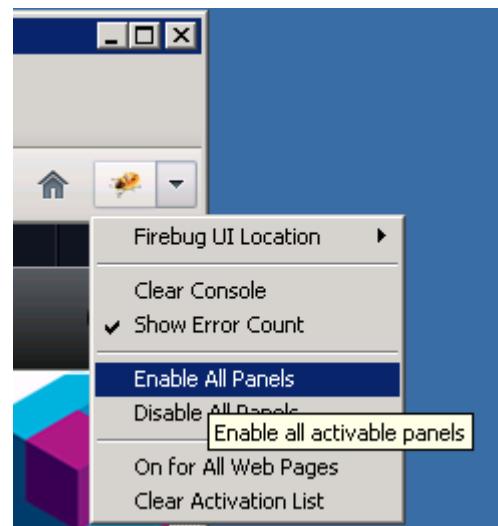
- ___ g. Verify that the Firebug 1.12.8 icon is displayed at the upper right corner of the browser. Hover (do not click) over that icon to verify. The status of Firebug is Deactivated.



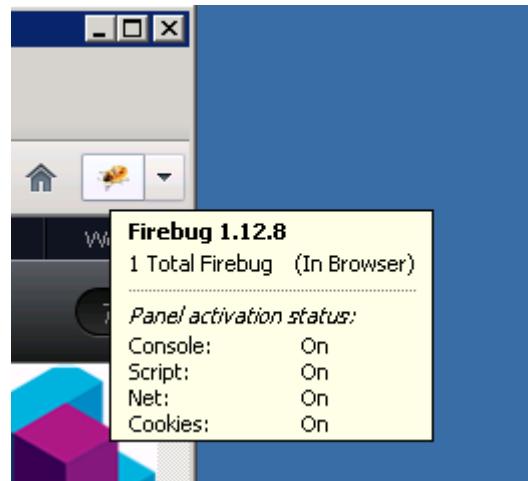
- ___ h. Click the firebug icon and then hover over the icon to see the status. Notice the status of the panel activation. It is in off status.



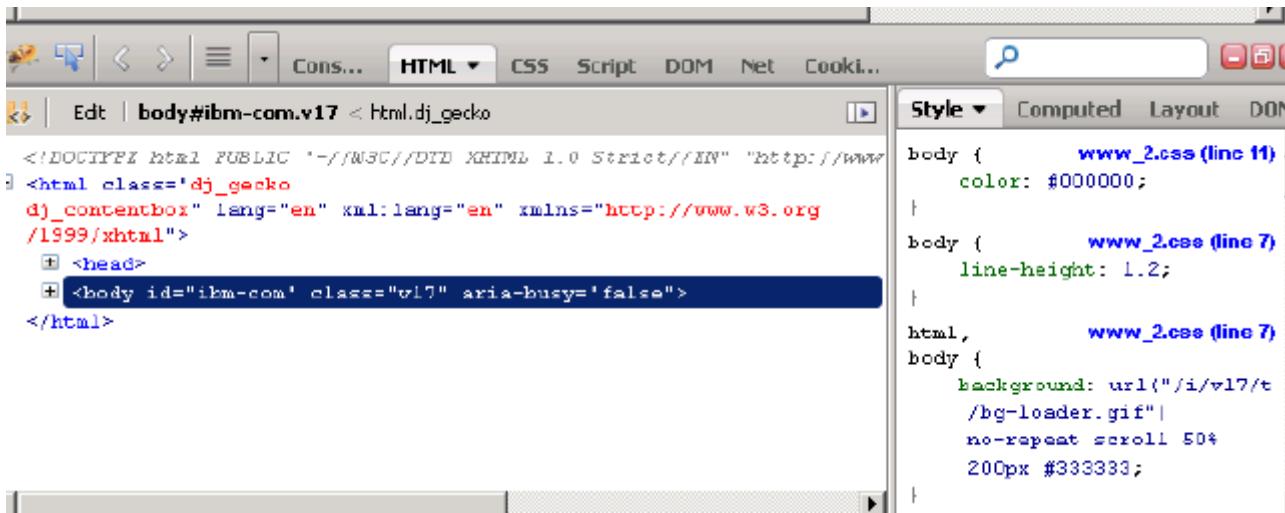
- ___ i. Click the twistie to the right of the icon and click **Enable All Panels**.



- __ j. Hover over that icon and notice that the “Panel activation status” changes to On.



- __ k. Click the Firebug icon to verify that the Firebug opens at the bottom of the browser.

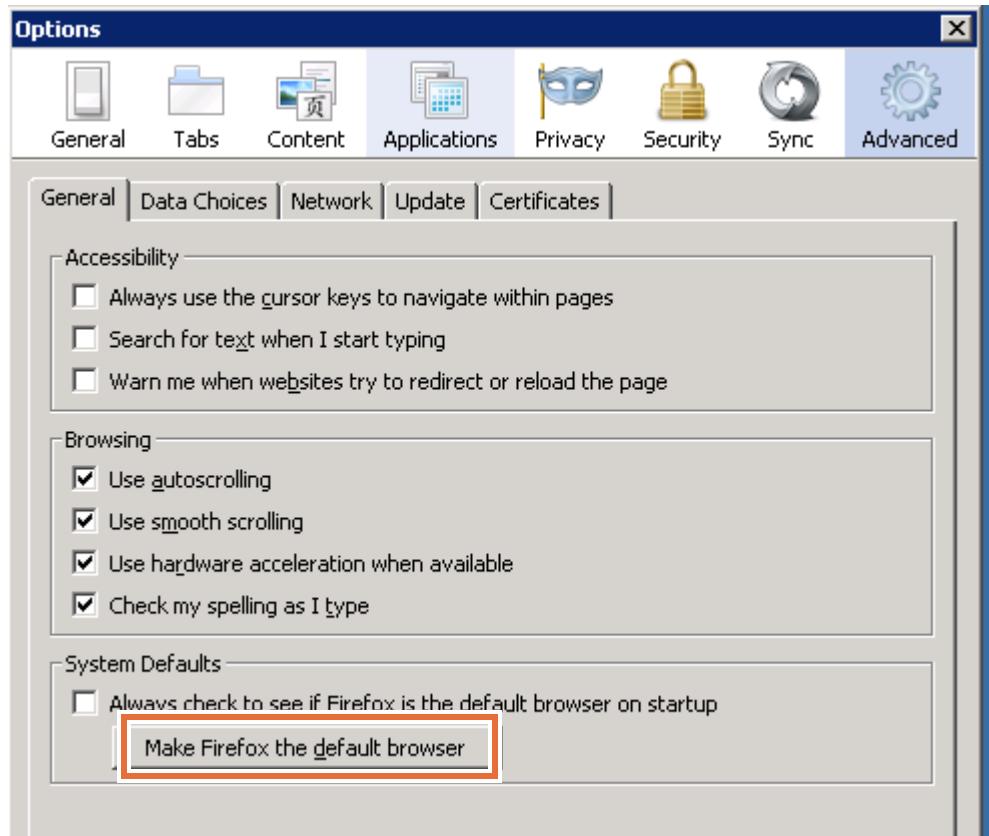


- __ 2. Make Firefox the default browser.

Currently, Internet Explorer is the default browser. You need to make Firefox the default browser to view a page detail in Firebug.

- __ a. In Firefox, click **Tool > Options**.

- ___ b. Click **Advanced**. In the General tab, click **Make Firefox the default browser**.



- ___ c. Click **OK**.
___ d. Close Firefox.

Part 3: Explore the Problem UI interface

- ___ 1. Import the process application in IBM Process Designer.
___ a. Double-click the **IBM Process Designer** shortcut on the desktop.



- ___ b. When prompted, enter `pcdeadmin` in the **User Name** field and `websphere` in the **Password** field. Click **Login**.



IBM Process Designer

8.5.0.1

User Name

pcdeadmin

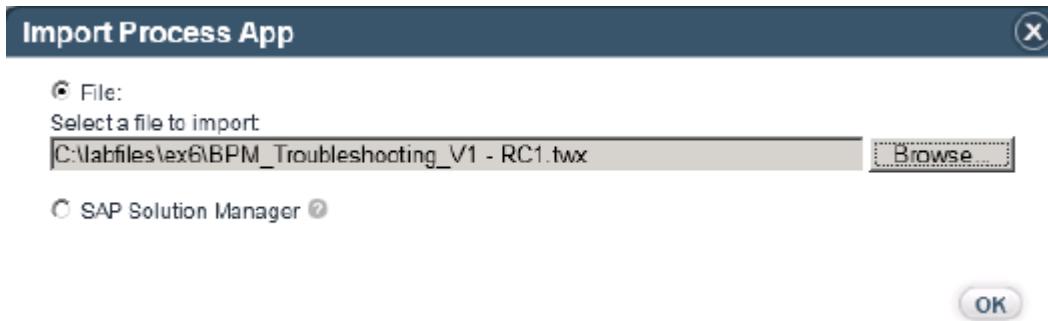
Password

Login

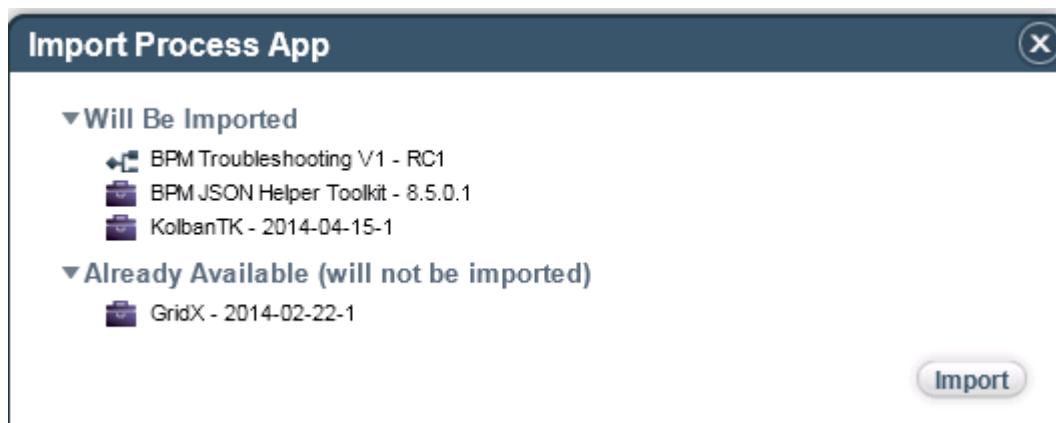
Cancel

8.5.0.1

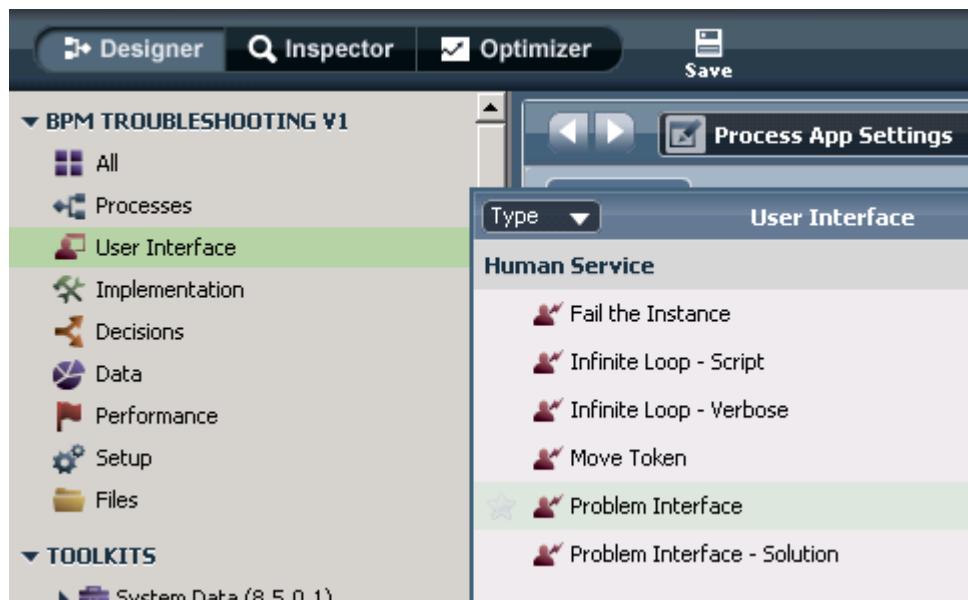
- ___ c. If prompted, close **Getting Started with IBM Process Designer 8.5.0.1** by clicking X in the upper right corner.
- ___ d. If you already completed exercise 5, then you imported the process application into the Process Center server, in which case you can skip and go to step 2: “Explore the **Problem Interface User Interface**.” If you did not do exercise 5, then click **Import Process App**.
- ___ e. In the Import Process App window, click **Browse**.
- ___ f. Go to `C:\labfiles\ex6`, select `BPM_Troubleshooting_V1-RC1.twx`, and click **Open**.
- ___ g. Click **OK**.



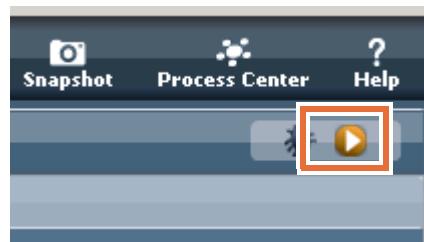
- ___ h. Click **Import**.



- ___ i. Wait for the import to complete. When it is complete, the newly imported application is listed in the Process Apps tab.
- ___ 2. Explore the **Problem Interface** User Interface
- ___ a. If you are already in the Designer view, go to the next step. Otherwise click "Open in Designer" next to BPM Troubleshooting V1(IBMMC).
- ___ b. Select **User Interface** and then double-click **Problem Interface**.

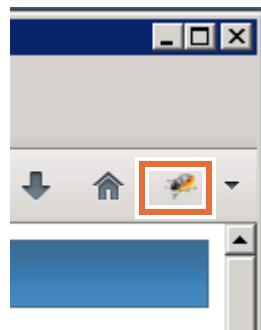


- ___ c. Click the Run Service icon.



- ___ d. The **Problem UI** coach opens in Firefox.

- ___ e. If the Firebug browser is already open at the bottom of the browser, then skip to the next step. Otherwise, click the Firebug icon at the upper right corner.



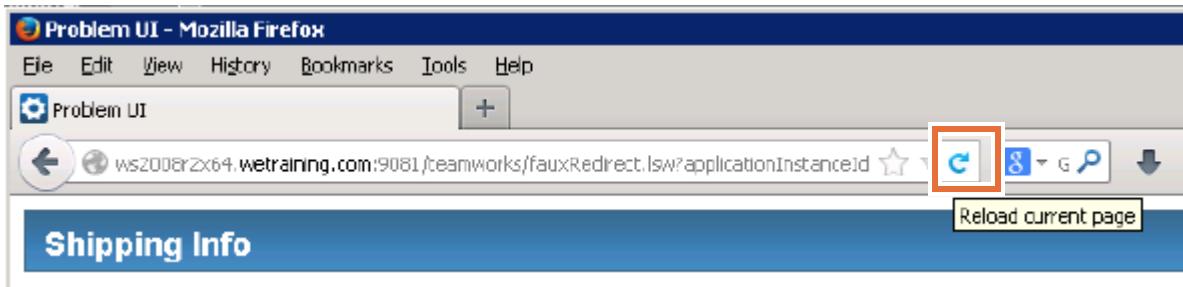
Firebug opens at the bottom of the browser.

- ___ f. Click the **Net** tab in Firebug.

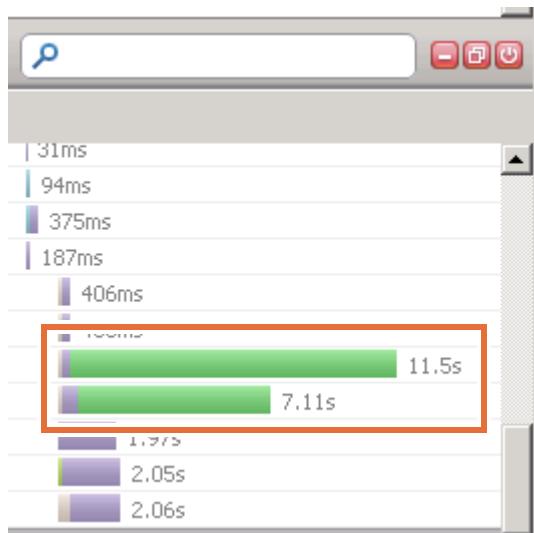


- ___ g. Maximize the web browser so that you can better view the details in Firebug.

- ___ h. Press the Shift key and the refresh icon in the browser at the same time.



- __ i. Examine the two green horizontal bars in Firebug. They grow for few seconds as the two images in the Coach load.



- __ j. Note the time in seconds next to the green horizontal bars. It takes about 11.5 seconds for one of the images to render in the browser. The time in your lab environment is slightly different.
 __ k. Hover over the `4631558377_4b5e08fe63_o.jpg` image, which is to the extreme left of the longest green horizontal bar. The image is displayed.

The screenshot shows the Firebug Network tab with a list of requests. One request, `GET 4631558377_4b5e08fe63_o.jpg`, is highlighted with a red box. The requests are listed as follows:

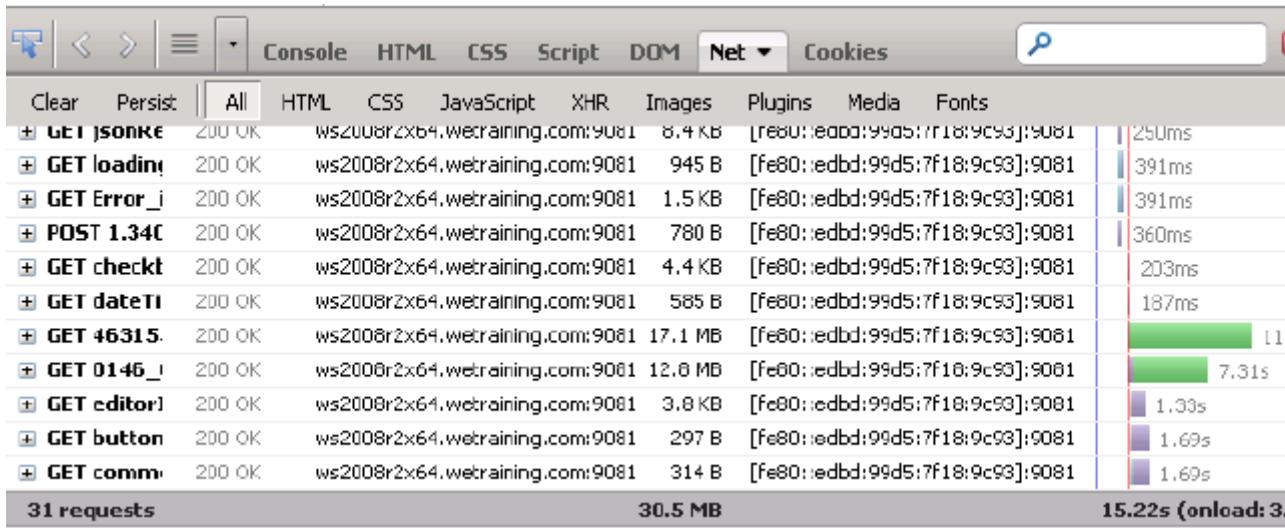
- Clear Persist || All HTML CSS JavaScript XHR
- + GET JSONResourceLoader?bundle=JQueryResources
- + GET loading.gif
- + GET Error_icon_24x24.png
- + POST 1.3402b466-ea01-464c-bc00-317677d58a67
- + GET checkbox_sprite.png
- + GET datePicker_calendar.png
- + GET 4631558377_4b5e08fe63_o.jpg (highlighted)
- + GET 0146_6836.jpg
- + GET editorIconsEnabled.png
- + GET buttonArrows.png
- + GET commonFormArrows.png

The screenshot shows the Firebug Network tab with a list of requests. The image `4631558377_4b5e08fe63_o.jpg` is highlighted with a red box. On the right side, its thumbnail and dimensions are displayed: `11006 x 5241`.

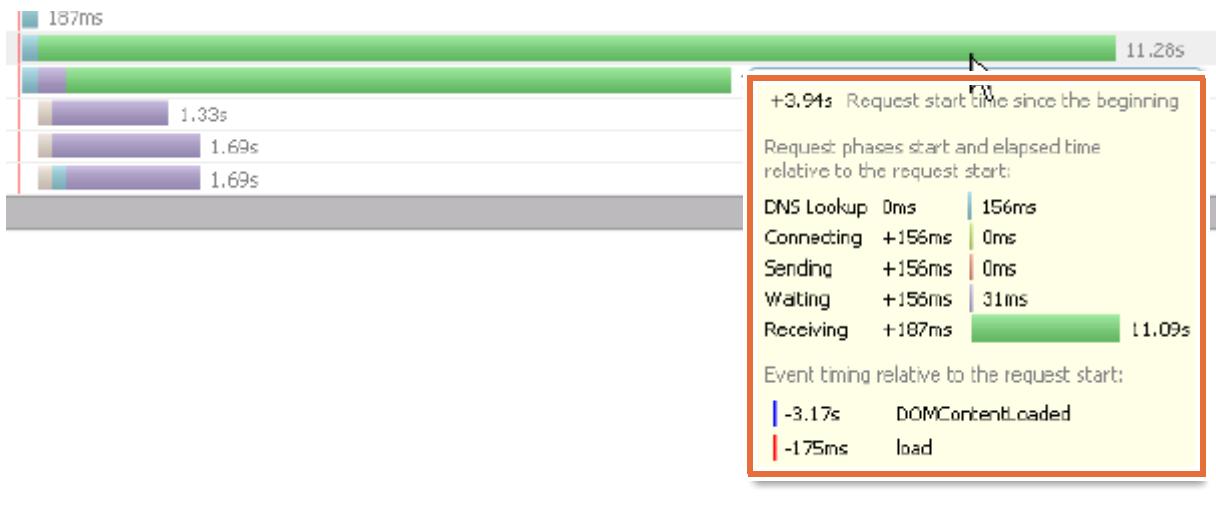
The requests listed are:

- + GET loading.gif
- + GET Error_icon_24x24.png
- + POST 1.3402b466-ea01-464c-bc00-317677d58a67
- + GET checkbox_sprite.png
- + GET datePicker_calendar.png
- + <http://ws2008r2x64.wetraining.com:9081/teamwork>
- + GET 0146_6836.jpg
- + GET editorIconsEnabled.png
- + GET buttonArrows.png
- GET commonFormArrows.png

- __ l. The 4631558377_4b5e08fe63_o.jpg image took 11.5 seconds to load. The time in your lab is different.
- __ m. Since the image size is huge, it takes a while for the browser to render the image.
- __ n. Press the Shift key and the refresh icon in the browser at the same time. Again, the browser clears the cache and the page refreshes. Notice the timing again. It is similar to the previous load times.
- __ o. Examine the details at the bottom of the Firebug window taskbar.



- __ p. Hover over the green horizontal bar for the first image and view its tooltip values.



The image request started 3.94 seconds after the start of the first request.

There are two numbers for each request phase (five phases). The first number on the left (closer to the phase label) says when the phase started within the request. The second number on the right says the time that is needed to complete each phase. In this case, the first phase of DNS Lookup took 156 milliseconds. DNS Lookup is the DNS resolution time.

The next two phases of Connecting and Sending took zero time. Connecting is the elapsed time that is required to create a TCP connection. Sending is the time that is needed to send request data to the server.

The Waiting phase needed 31 ms to complete. Waiting is the waiting time for the response of the first byte received from the server. The Receiving phase started in 187 milliseconds of the request and needed 11.09 seconds to complete. Receiving is the time that is needed to download the response body.

The **DOMContentLoaded** event was fired before the request started, since the value is negative.

The **load** event was fired before the request started, since the value is negative.

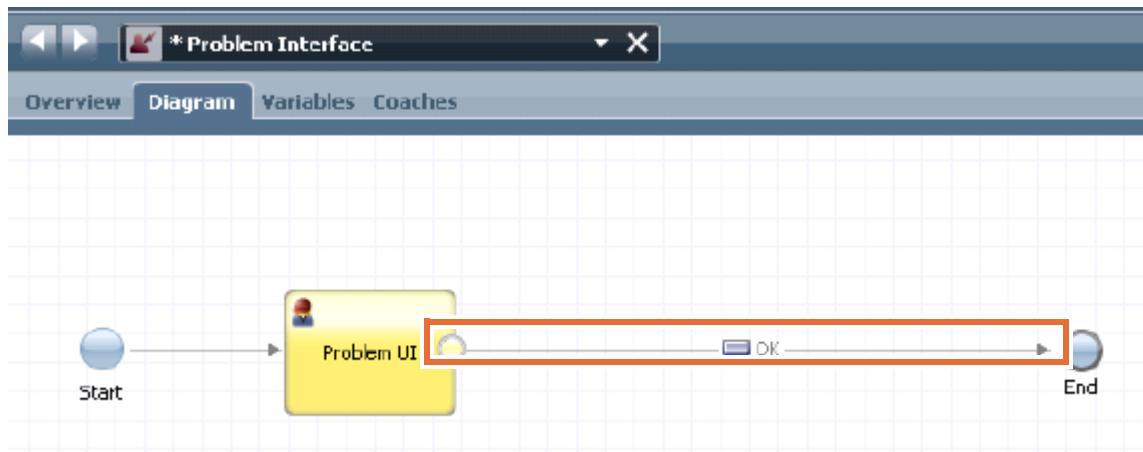
Notice that these numbers are different in your lab environment.

- ___ q. Scroll to the bottom of the coach and click **OK**. The service finishes.

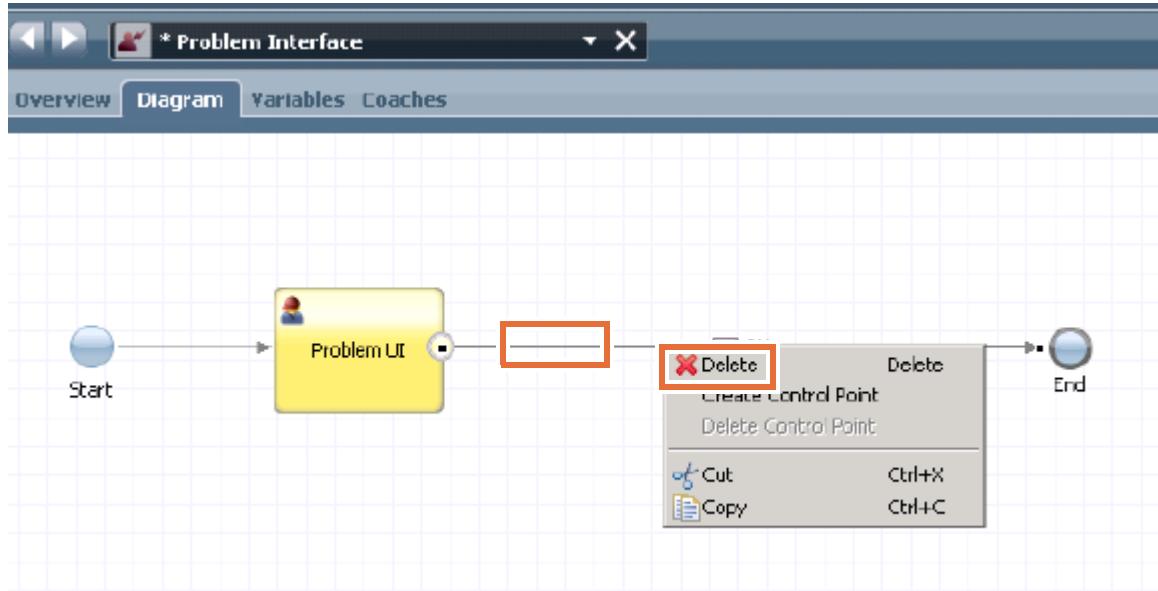
Part 4: Modify and test the Problem UI interface for improved performance.

You can take advantage of lazy loading to modify the coach and create a better user experience that supports increased performance.

- ___ 1. Create another version of the Problem UI interface.
 - ___ a. Go back to Process Designer.
 - ___ b. Verify that the Diagram tab is the active tab. If not, then click **User Interface** and double-click **Problem Interface**.
 - ___ c. Click the sequence flow between **Problem UI** and **End**.

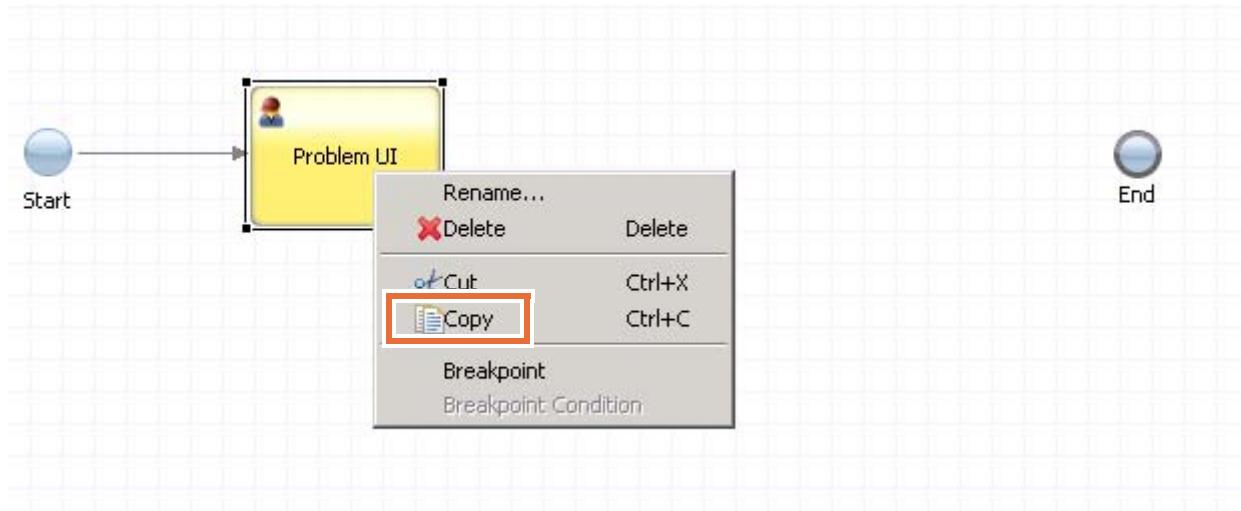


- __ d. While selected, right-click the sequence flow and click **Delete**.

**Note**

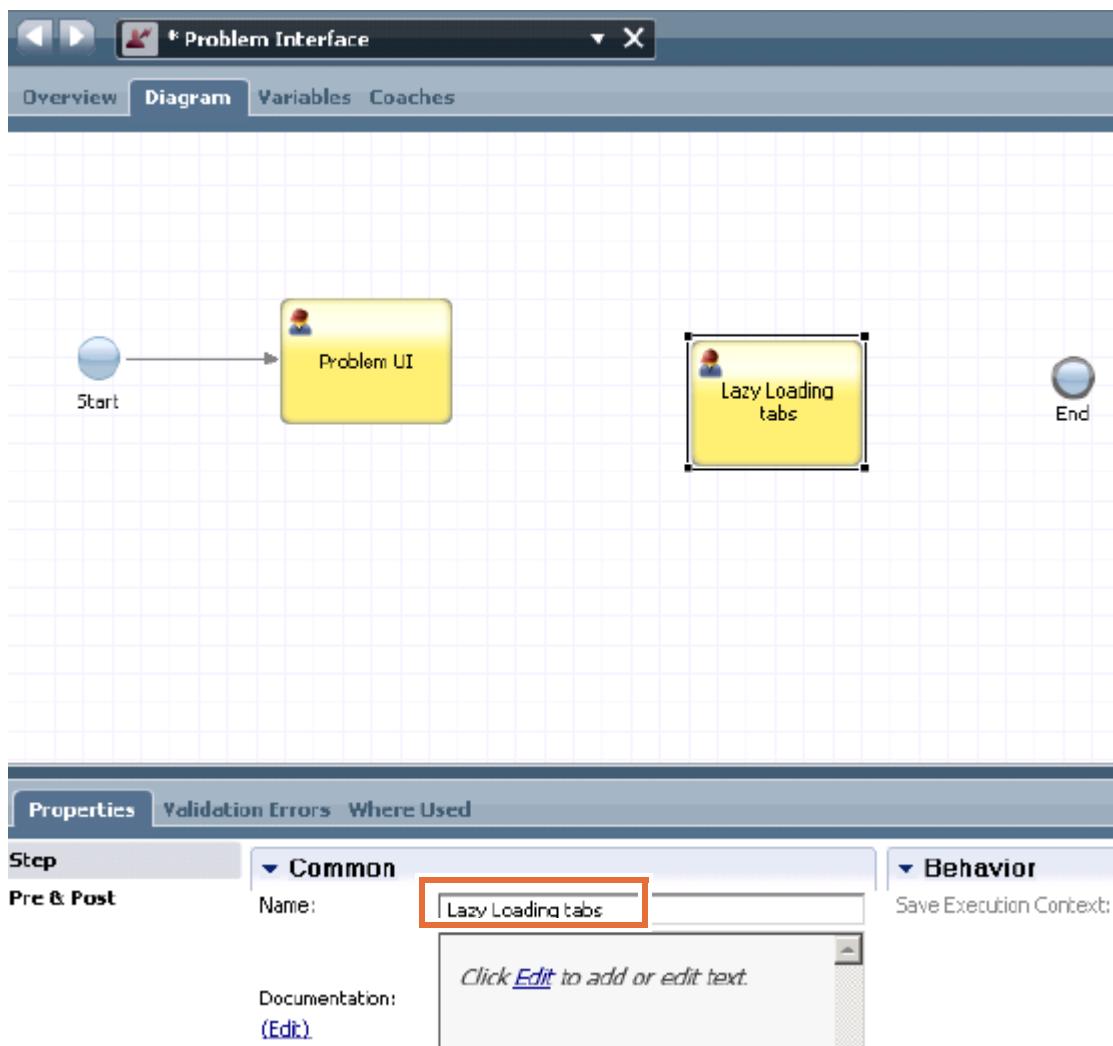
While selected, you can also delete the sequence flow by pressing the Delete key.

- __ e. Right-click **Problem UI** and click **Copy**.



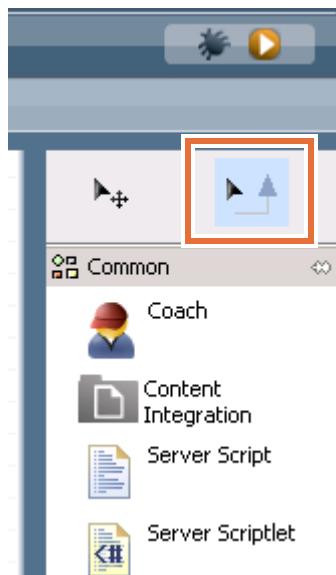
- __ f. Click anywhere in an empty space in the diagram; then right-click, and click **Paste**.
__ g. Select "Copy of Problem UI" and click the **Properties** tab.

- __ h. Enter Lazy Loading tabs in the Name field.

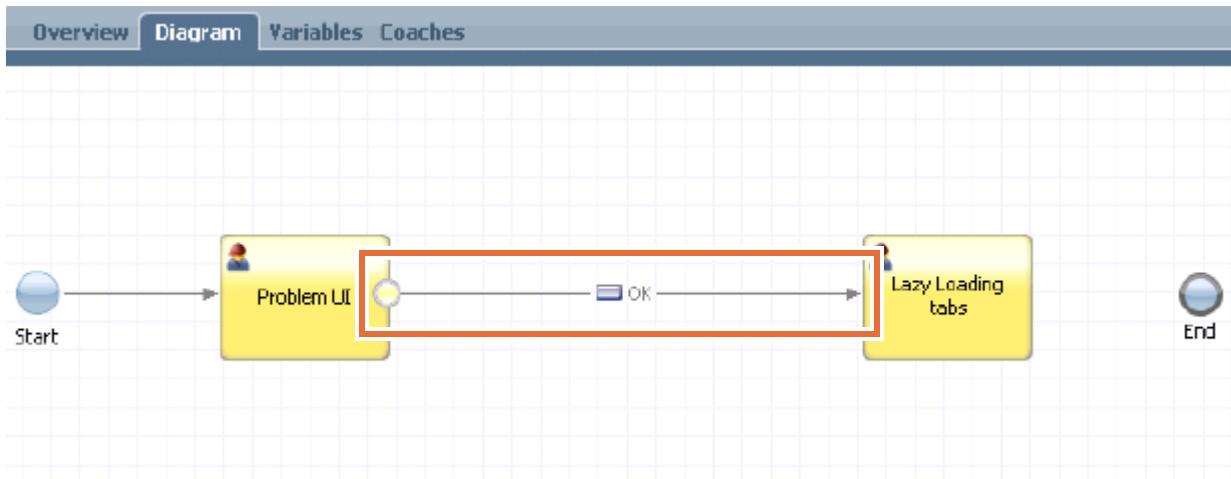


___ 2. Connect the flow line.

___ a. Select the Sequence Flow icon from the palette to the right of the diagram.

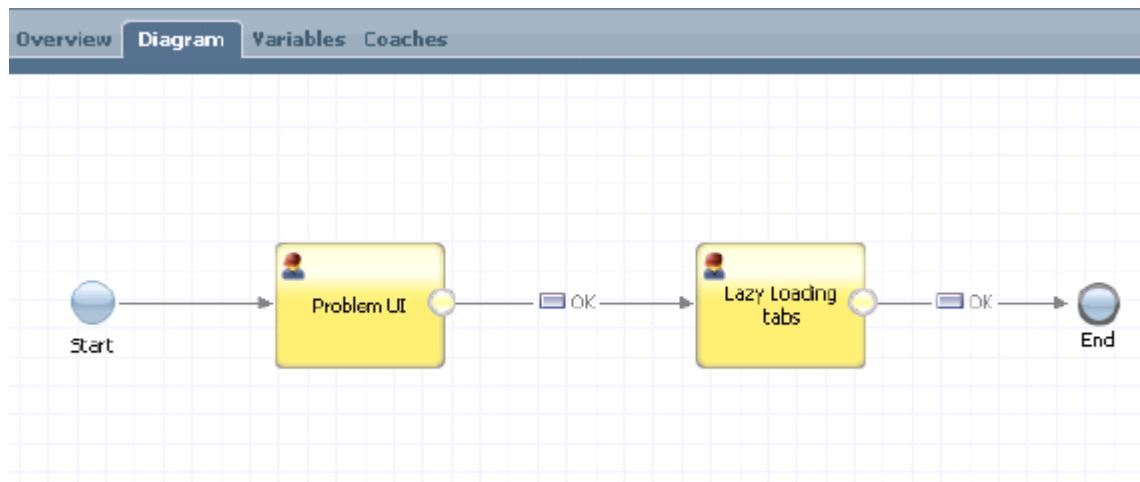


- ___ b. Roll the cursor over the right of the **Problem UI** coach; when a tick mark is displayed, drag the cursor to anchor the flow line.
- ___ c. Drag the mouse cursor to the left of the **Lazy Loading tabs** coach and when a tick mark is displayed, release the mouse cursor to connect the flow line.



- ___ d. Roll the cursor over the right of the **Lazy Loading tabs** coach; when a tick mark is displayed, drag the cursor to anchor the flow line.
- ___ e. Drag the mouse cursor to the left of the **End** event and when a tick mark is displayed, release the mouse cursor to connect the flow line.
- ___ f. Click the **Selection Tool** icon from the palette to the right of the diagram and rearrange the flow to tidy it up.

- __ g. Click in an empty space in the diagram, right-click, and click **Tidy Layout**.



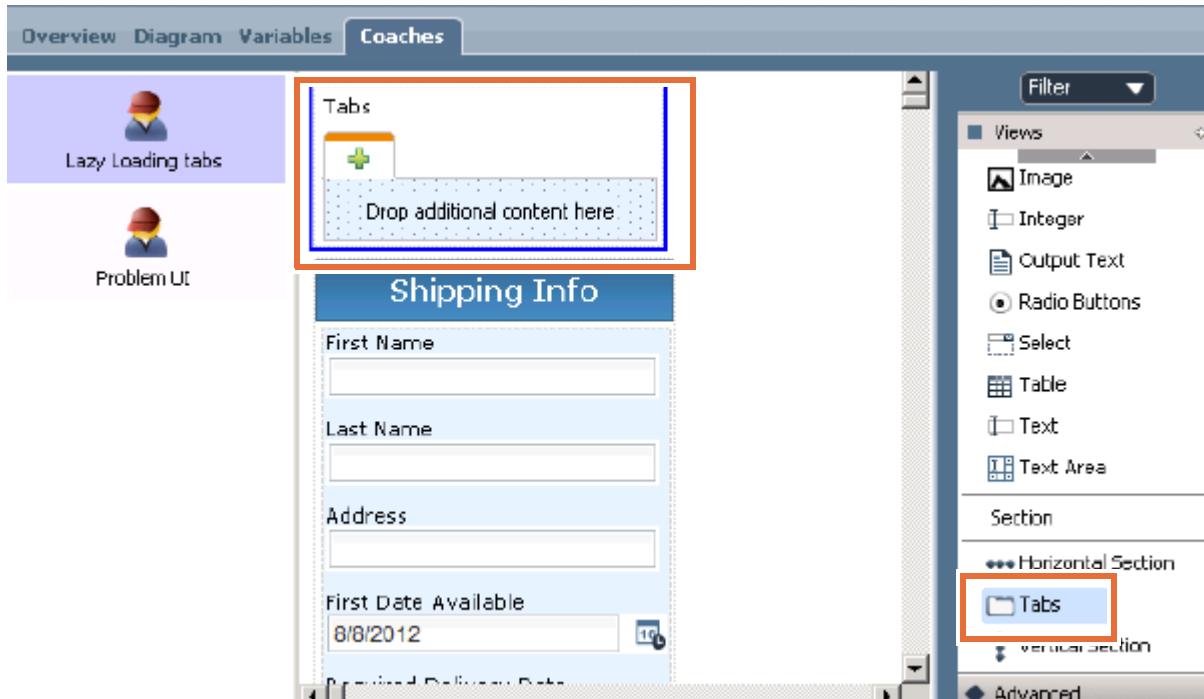
- __ h. Click **Save**.
- __ 3. Modify the coach.
- __ a. Double-click **Lazy Loading tabs**. The coach is displayed in the designer.
- __ b. Double-click the **Coaches** tab to maximize the view.



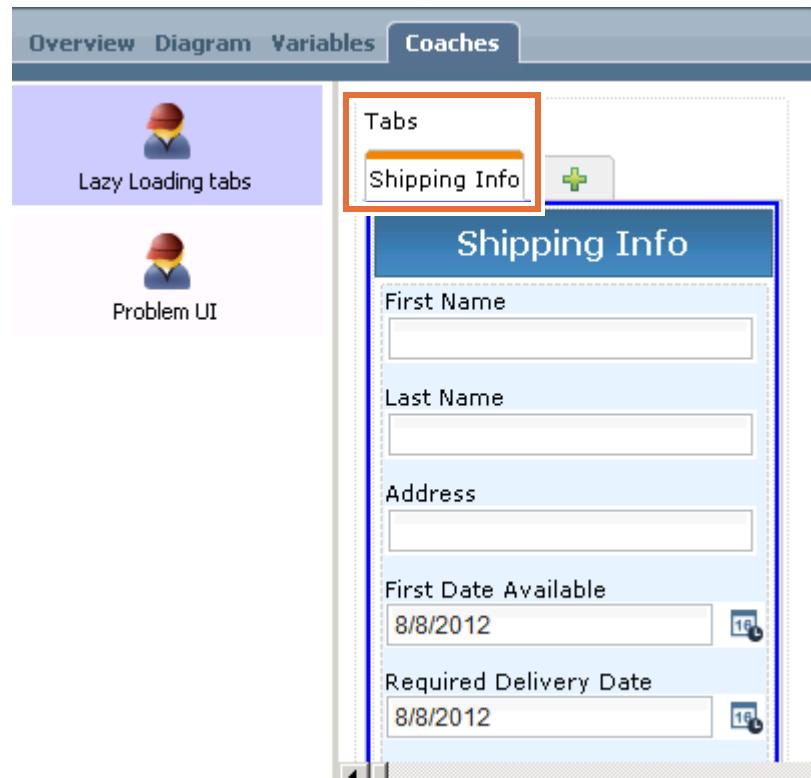
- __ c. Feel free to examine the coach by scrolling down. Notice the different sections in the coach. There are the Shipping Info and Optional Fields sections and a date area that is associated with two images.

The two images are large and take time to load on the page. The business requirement is such that the image information is not needed until the arrival date is explicitly defined. 90% of the users do not use the arrival date. For those 90% of users, the image that loads upfront does not offer any value since it is not needed but instead slows the rendering of the page. It would be best to use lazy loading tabs in this scenario, in which case the images load only when the arrival dates are defined for the remaining 10% of users. In this way, the web page loads much faster for most of the users. You now create those tabs.

- ___ d. Select the **Tabs** icon from the palette to the right of the diagram and drag the cursor inside the Lazy Loading tabs coach at the top.



- ___ e. Select **Shipping Info** and drag it inside the tab control. Verify that Shipping Info is now listed inside the first tabbed page.



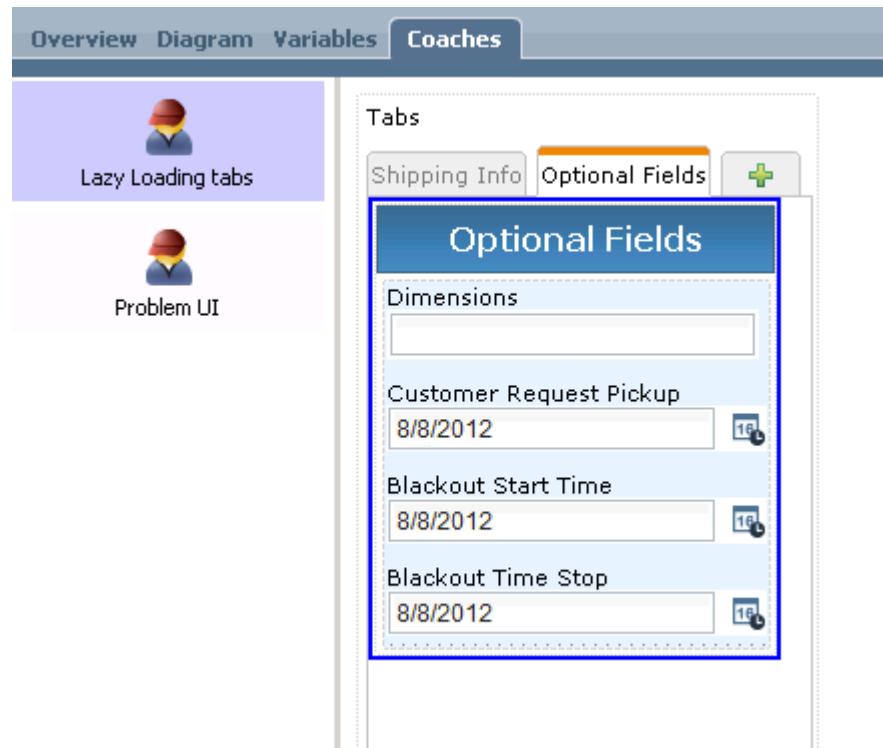
- ___ f. Verify that an empty tabbed page is created to the right of the Shipping Info tabbed page.



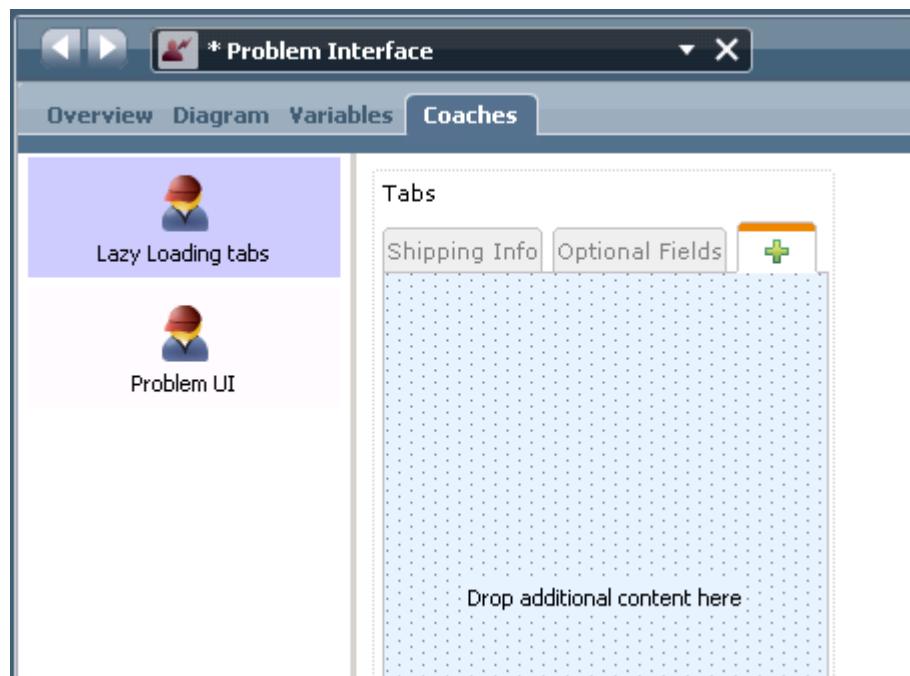
- ___ g. Click the + icon in the second tabbed page. Currently, it is empty.



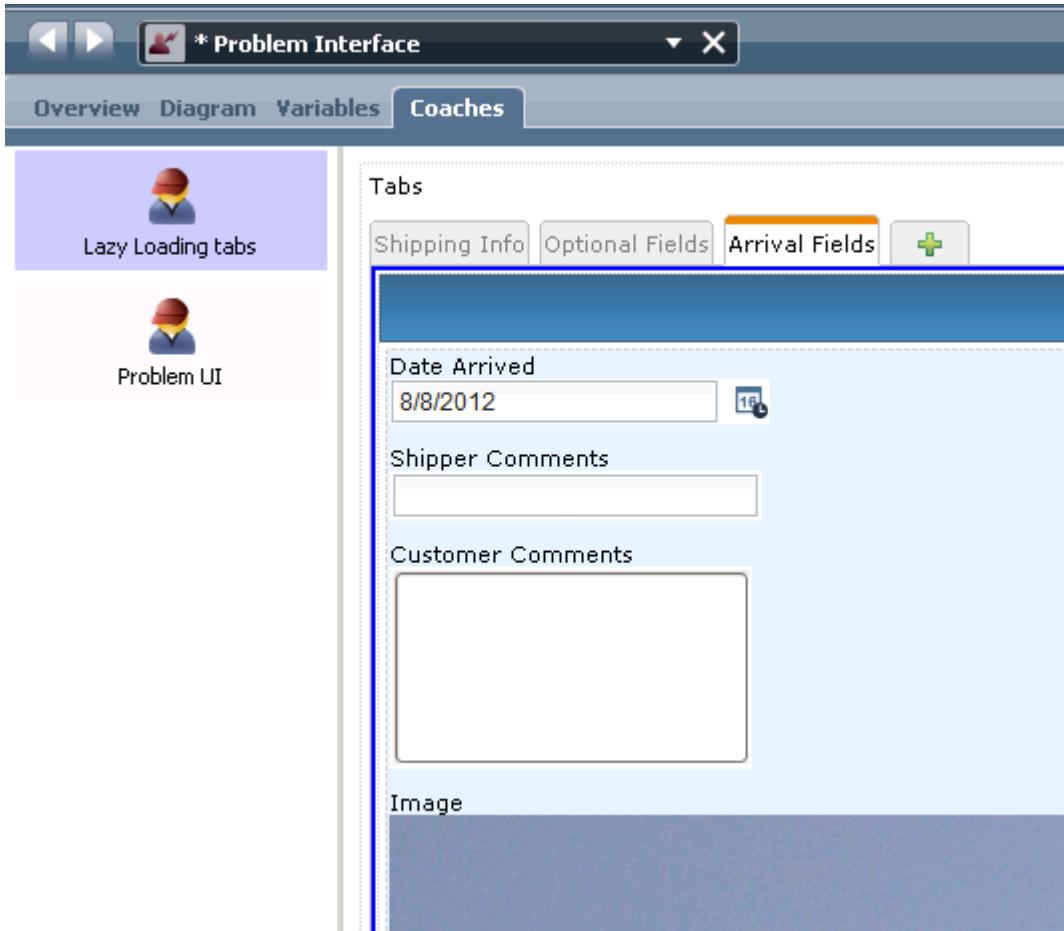
- __ h. Select **Optional Fields** and drag it inside the empty tabbed page. Verify that Optional Fields is now listed inside the second tabbed page.



- __ i. Click the + icon in the third tabbed page. Currently, it is empty.



- __ j. Select **Arrival Fields** at the header and drag it inside the empty tabbed page. Verify that Arrival Fields is now listed inside the third tabbed page.

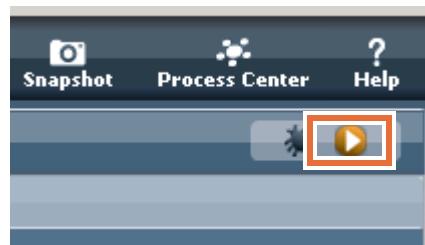


- __ k. Notice that the two images are now part of the third tabbed page also. You can scroll down to view them.
 __ l. Click **Save**.

Part 5: Run the Lazy Loading tabs coach

You can take advantage of lazy loading to modify the coach and create a better user experience that supports increased performance.

- __ 1. Run the Problem Interface service.
 __ a. In the Process Designer, make sure that Problem Interface is open. Click **Run Service**.



- __ b. The **Problem UI** coach opens in Firefox.

- ___ c. Click the Firebug icon at the upper right corner.

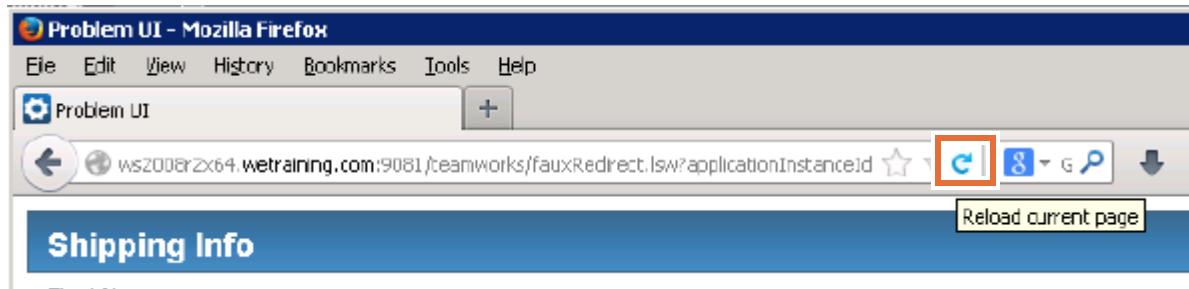


Firebug opens at the bottom of the browser.

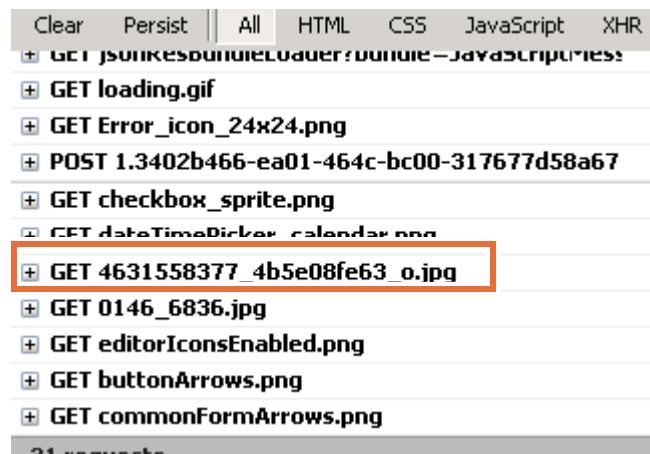
- ___ d. Make sure that **Net** is the active tab in Firebug.



- ___ e. Maximize the web browser so that you can better view the details in Firebug.
___ f. In the web browser, press Shift and the refresh icon at the same time.



- ___ g. Examine the two green horizontal bars in Firebug. It grows for few seconds as the two images in the coach load. Notice the time in seconds next to the green horizontal bars. The time is similar to the one you had when you ran the coach in the earlier section.
___ h. Hover over the image. The image is displayed.





- __ i. The 4631558377_4b5e08fe63_o.jpg image took 11.5 seconds to load. The time in your lab might be different.
- __ j. Since the image size is large, it takes a while for the browser to render the image.
- __ k. In the web browser, click Shift and the refresh icon at the same time. Again, the browser clears the cache and the page refreshes. Notice the timing again. It is similar to the previous load times.
- __ l. Examine the details at the bottom of the Firebug window toolbar. They are similar to the previous run. You can expect slight variations in the timings, but the overall rendering time is similar.
- __ m. Scroll down the page, and you can see the two images. Click OK at the bottom of the page.

Notice that the total number of requests that are made on the page is still the same at 31 requests. The total size of the requests is also the same at 30.5 MB. The time that is elapsed since the start of the first request until the end of the last request can vary slightly.

- __ n. Scroll down the page and you can see the two images. Click **OK** at the bottom of the page. The newly created Lazy Loading tab is rendered in the browser.

2. Explore the Lazy Loading tab coach.

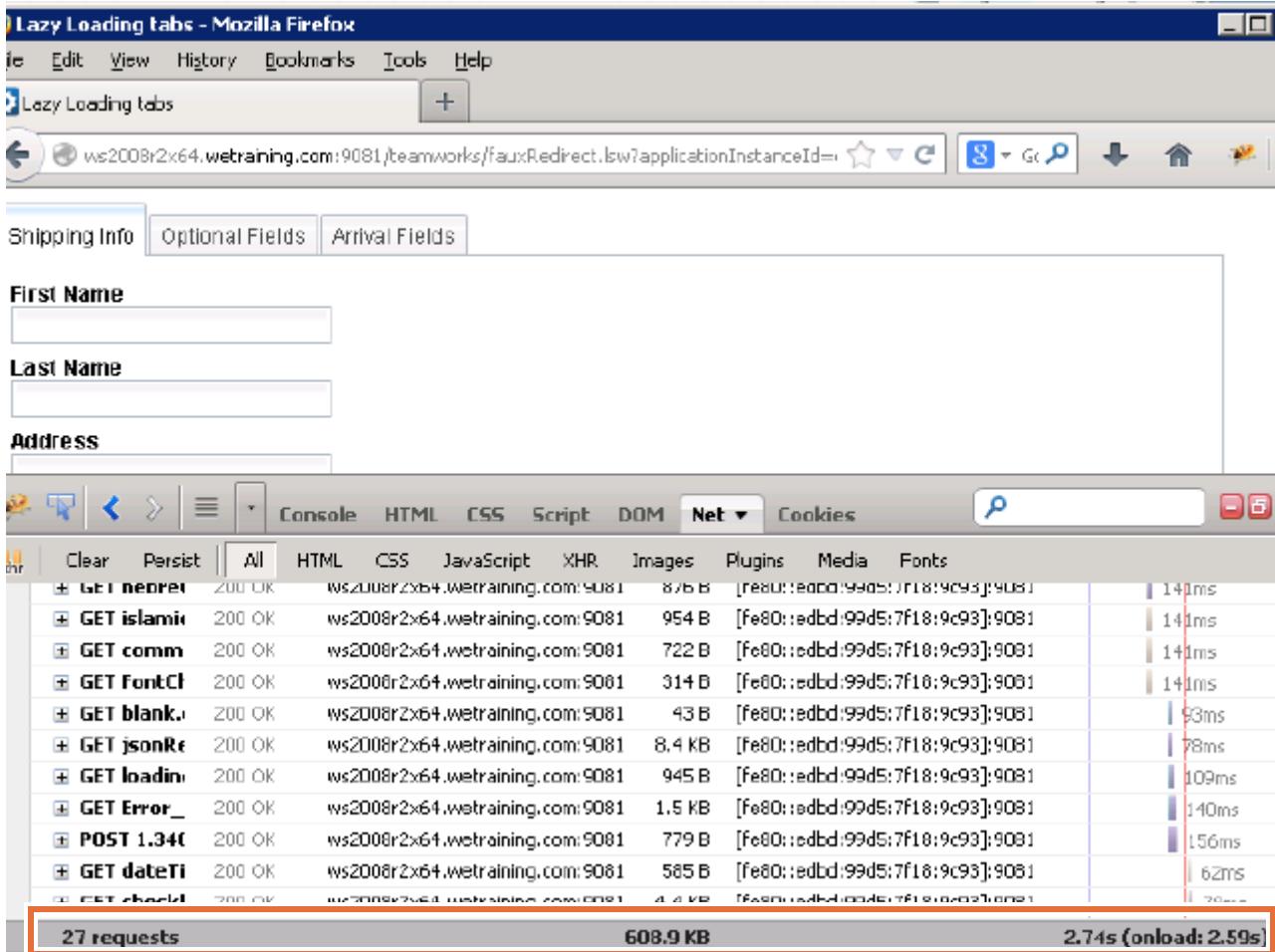
a. Examine the details at the bottom of the Firebug window toolbar.

URL	Status	Domain	Size	Remote IP	Timeline
GET FauxRi	200 OK	ws2008r2x64.websphere.com:9081	164.0 KB	[fe80::ecbd:99d5:7f18:9c93]:9081	359ms
GET comm	200 OK	ws2008r2x64.websphere.com:9081	187 B	[fe80::ecbd:99d5:7f18:9c93]:9081	47ms
GET jsonRe	200 OK	ws2008r2x64.websphere.com:9081	8.4 KB	[fe80::ecbd:99d5:7f18:9c93]:9081	94ms

4 requests 173.4 KB 875ms (onload: 4.39)

Notice that the total number of requests that are made on the page is now only three requests. The total size of the requests is around only 170 KB. Remember the total size from previous runs at over 30 MB. The time that is elapsed since the start of the first request until the end of the last request is now only 2.49 seconds. There is a huge reduction in the number of requests and the total size of the page.

- ___ b. Since you want to compare the two coaches, it is best to clear the browser cache for this coach to see some comparable numbers. In the web browser, click Shift and the refresh icon at the same time. Again, the browser clears the cache and the page refreshes. Notice the timings this time.



Notice that the total number of requests that are made on the page is now 27 requests. The total size of the requests is around 600 KB. Remember the total size from first run at over 30 MB. The time that is elapsed since the start of the first request until the end of the last request is now only 2.7 seconds. As you can see, while the number of requests is 27, the total size of the page is reduced to around 600 KB from 30 MB.

Also, notice that the two images are not yet downloaded on the page. The reason is that they are on the last tab and are available only when the third tab is active for the limited number of users.

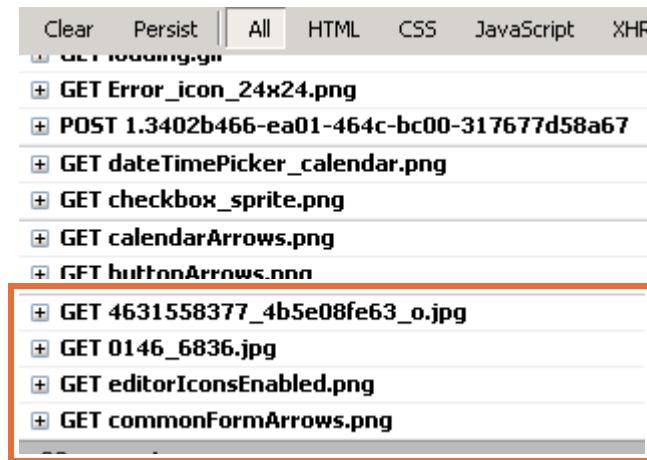
- ___ c. Click inside the **First Date Available** field. Notice that the number of requests increases to 29 requests.
- ___ d. Select a future date in the calendar.
- ___ e. Click the Arrival Fields tabbed page and examine the details at the bottom of the Firebug window toolbar.

Notice that the total number of requests that are made on the page now increases to 33 requests. Four new requests were made on the third tabbed page. The total size of the

requests is now back to 30.5 MB, which is the same as the first run. The time that is elapsed since the start of the first request until the end of the last request is around 16 seconds.

Also, notice that both the images are now loaded on the page. Using this lazy loading mechanism, you deferred the rendering of these large images to only when the arrival date is defined and the third tabbed page clicked. These images load only when they are needed as opposed to loading every time that the page is called.

- ___ f. Review the URL that is displayed in the left column. The bottom four entries are for the URLs that were rendered when this tabbed page was clicked.



Note

The number of requests, page size, and request times can vary depending on your lab environment and the number of clicks you do on the web browser. As such, your results might vary with the lab, but the overall trend and the performance advantage with the lazy loading are similar.

- ___ g. Close the web browser and any other open windows.

End of exercise

Exercise review and wrap-up

In this exercise, you improve coach performance with lazy loading tabs.

Exercise 7. Troubleshooting an SCA application with runtime errors

What this exercise is about

IBM Business Process Manager offers various tools and features to troubleshoot a runtime problem. IBM Integration Designer also provides features to trace and isolate runtime errors.

In this exercise, an SOA solution is provided. You import the solution into your workspace, deploy it onto Business Process Manager, and test it. The test fails and produces some exceptions. The purpose of this exercise is to demonstrate the different runtime tools for monitoring failed events and tracing them back to the source of the problem.

What you should be able to do

At the end of this exercise, you should be able to:

- View server console log messages in IBM Integration Designer
- Deploy SCA applications onto Business Process Manager
- Use the cross-component trace to follow the call sequences between SCA applications
- Query failed events through the Failed Event Manager and resubmit the events after the problem is resolved

Introduction

In the first part of the exercise, you import the provided SOA solution. After examining the end-to-end solution, sample data gets sent through a JSP application. The test fails, and your task is to troubleshoot this runtime error.

You then explore the cross-component trace feature in IBM Integration Designer. The exercise demonstrates how to trace an issue back to the point of failure in the assembly diagram.

In the second part of the exercise, you explore some of the runtime applications, including the Failed Event Manager and Business Process Choreographer Explorer. You learn how to deploy an SCA application to resolve the issue.

After the problem is resolved, the failed event must be resubmitted through the Failed Event Manager. You then confirm that the resubmitted event is processed successfully.

In the final part of the exercise, you clean up the server environment and view the first-failure data capture (FFDC) log files.

Requirements

Completing the exercises for this course requires a lab environment. This environment includes the exercise support files, IBM Process Designer, IBM Process Portal, IBM Process Center, IBM Process Server, and IBM Integration Designer test environment.

Exercise instructions

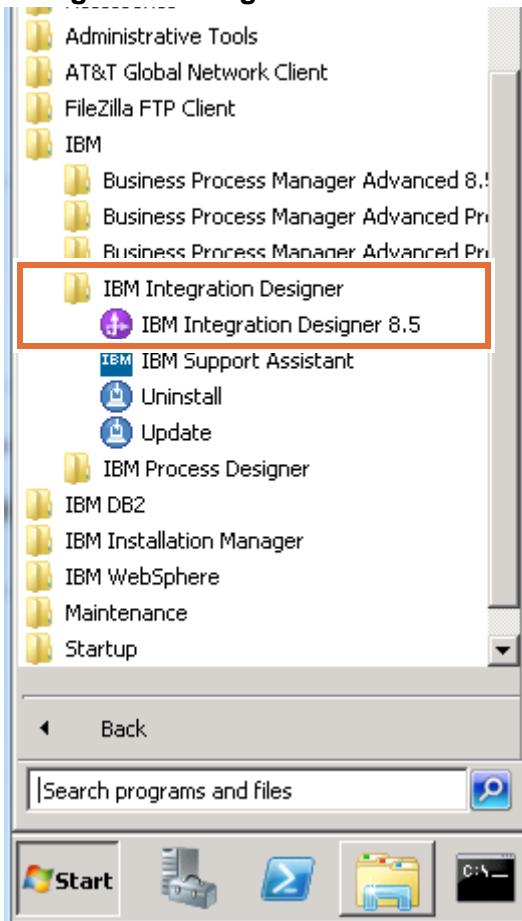
Part 1: Start IBM Integration Designer

- 1. Start IBM Integration Designer and create a workspace that is called: `workspaces\ex7`
 - a. Double-click the IBM Integration Designer icon on the desktop.



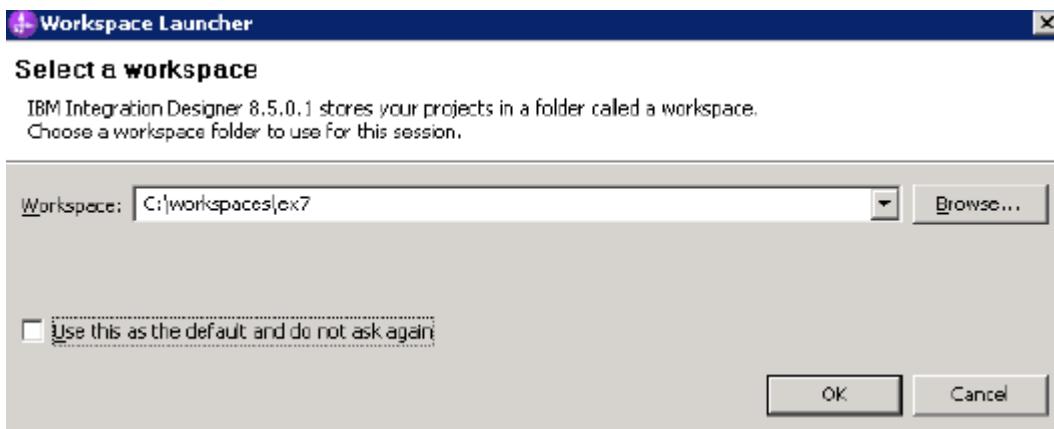
Note

You can also start IBM Integration Designer by going to **Start > All Programs > IBM > IBM Integration Designer > IBM Integration Designer 8.5**.

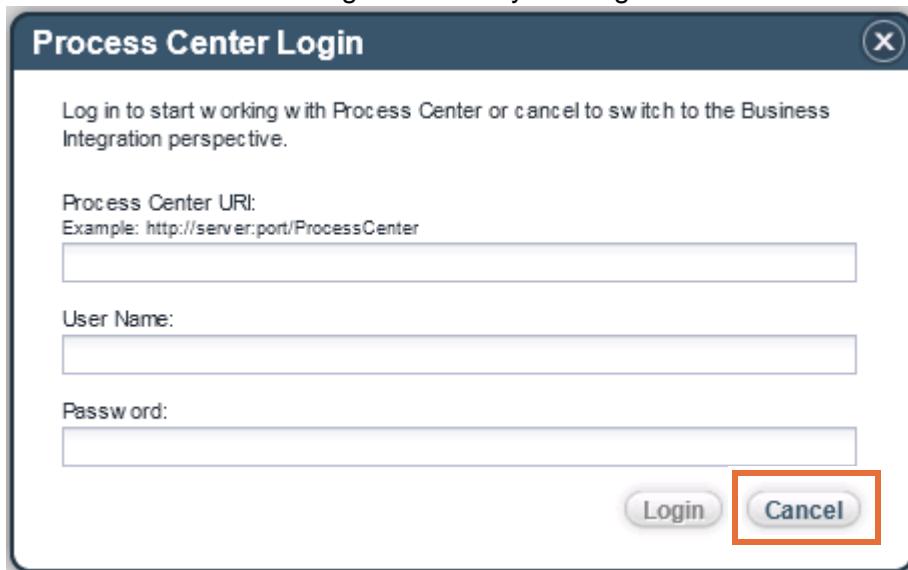


- __ b. In the Workspace Launcher window, enter the following path in the **Workspace** field, and click **OK**.

C:\workspaces\ex7



- __ c. Close the Process Center Login window by clicking **Cancel**.



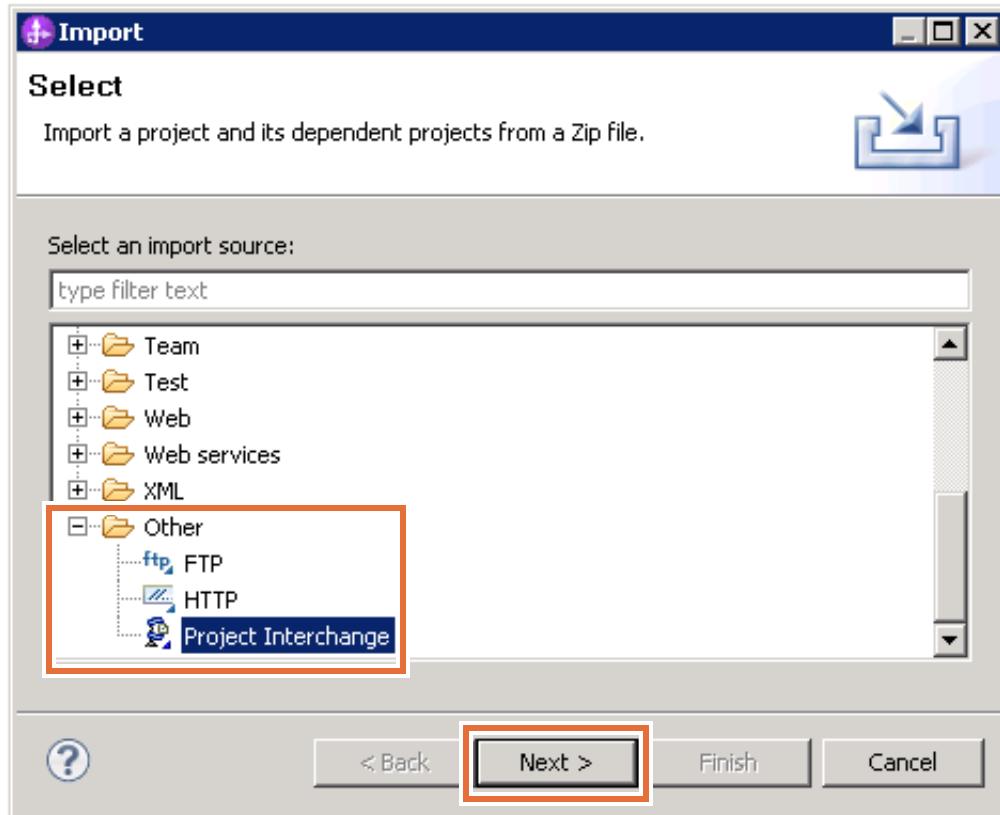
- __ d. Close the Getting Started pane by clicking the X in the **Getting Started - IBM Integration Designer** tab.



- __ 2. Import a project interchange file, C:/labfiles/Ex7/Ex7_start.zip, into your workspace.

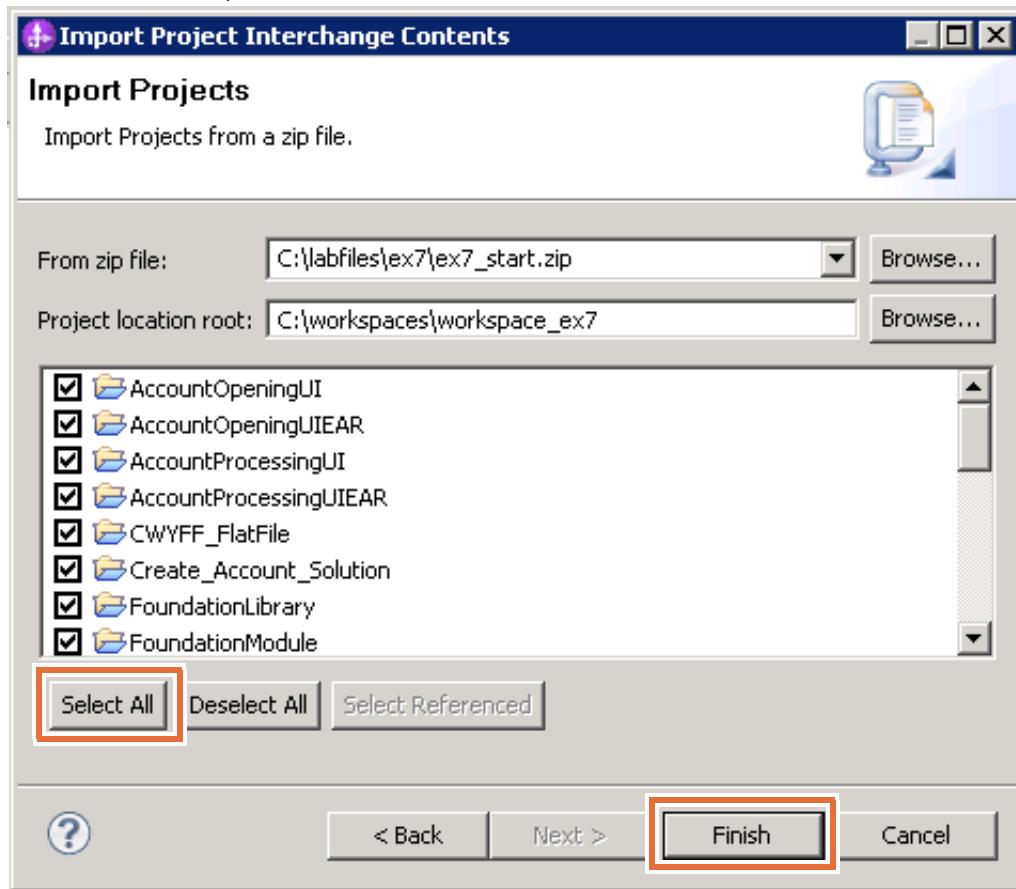
- __ a. Select **File > Import**.

- __ b. Select **Other > Project Interchange** as the import source type, and click **Next**.

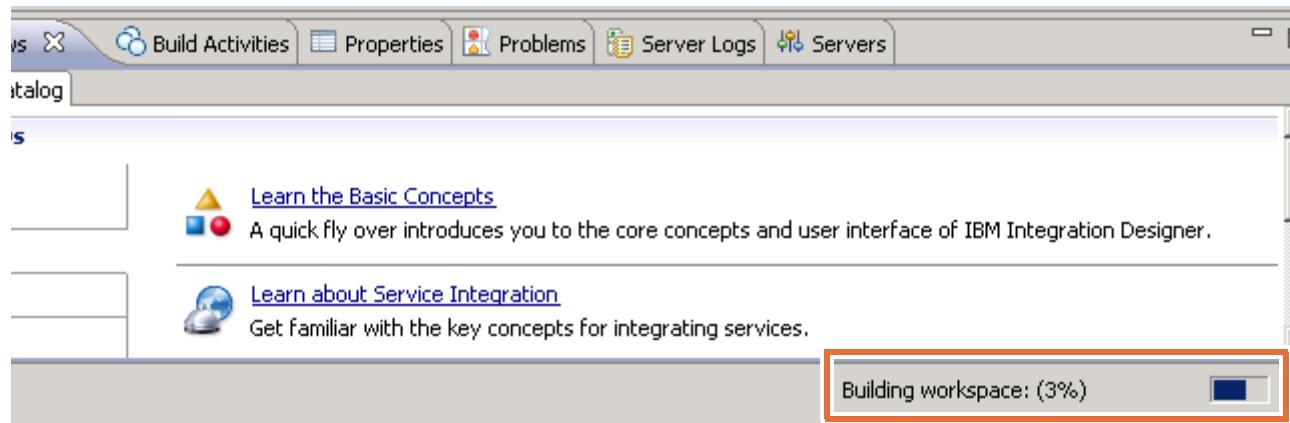


- __ c. Click the **Browse** button for the **From zip file** field.
__ d. Go to `C:/labfiles/ex7/ex7_start.zip`.
__ e. Click **Open**.

__ f. Click **Select All**, and then click **Finish**.

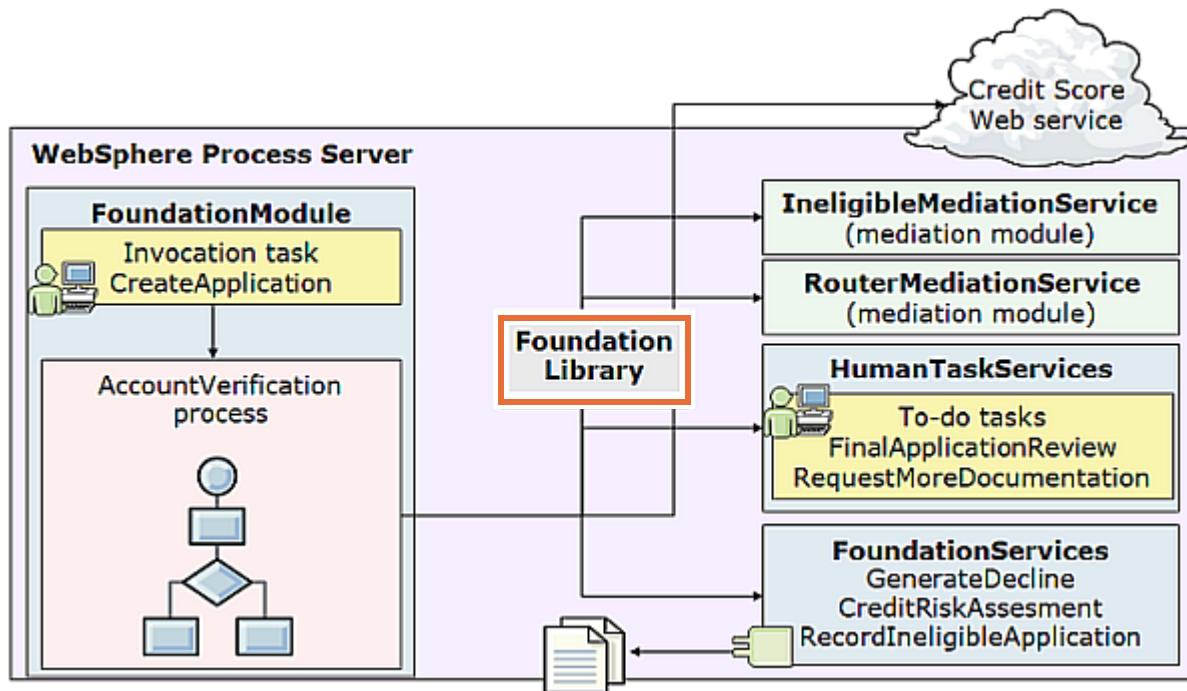


The import might take a few minutes to complete. You can see the status of the import and workspace build in the lower-right corner of the IBM Integration Designer window.



End-to-end scenario overview

This end-to-end scenario demonstrates a fictional retail company's SOA implementation to centralize a customer account creation process.



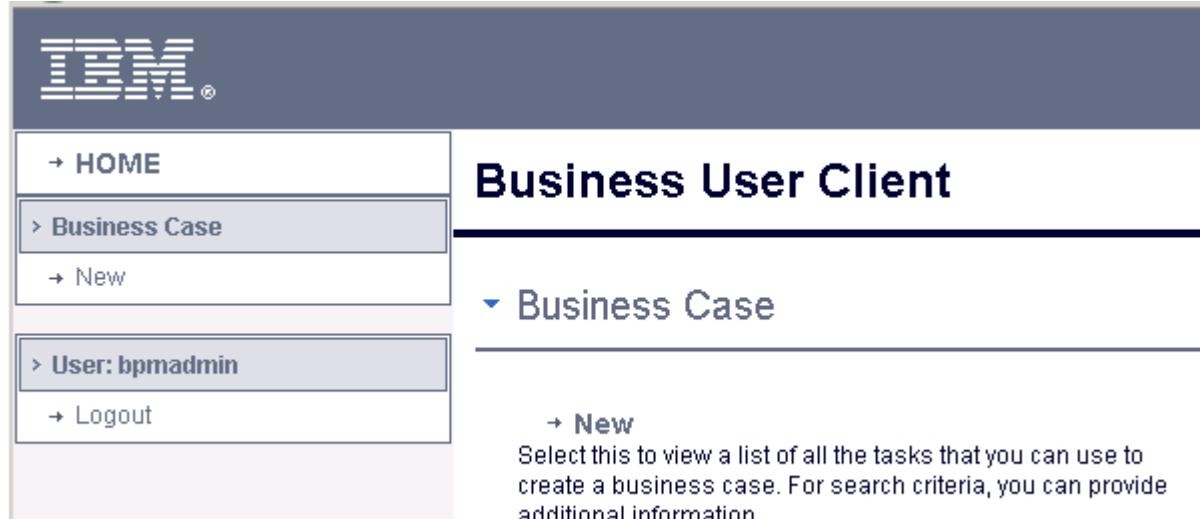
Two mediation modules mediate the incoming events and execute some data manipulation logic.

The service module is named `FoundationModule`, and it contains the main business logic, `AccountVerification` BPEL, to process an account creation logic.

The `FoundationServices` module contains services to help the `FoundationModule` to complete customer account verification tasks.

Since human interaction becomes necessary to approve a customer request, the `HumanTaskServices` module contains the human task components.

First, a sales person enters customer information through a web application, which triggers an instance of the AccountVerification business process to be created.



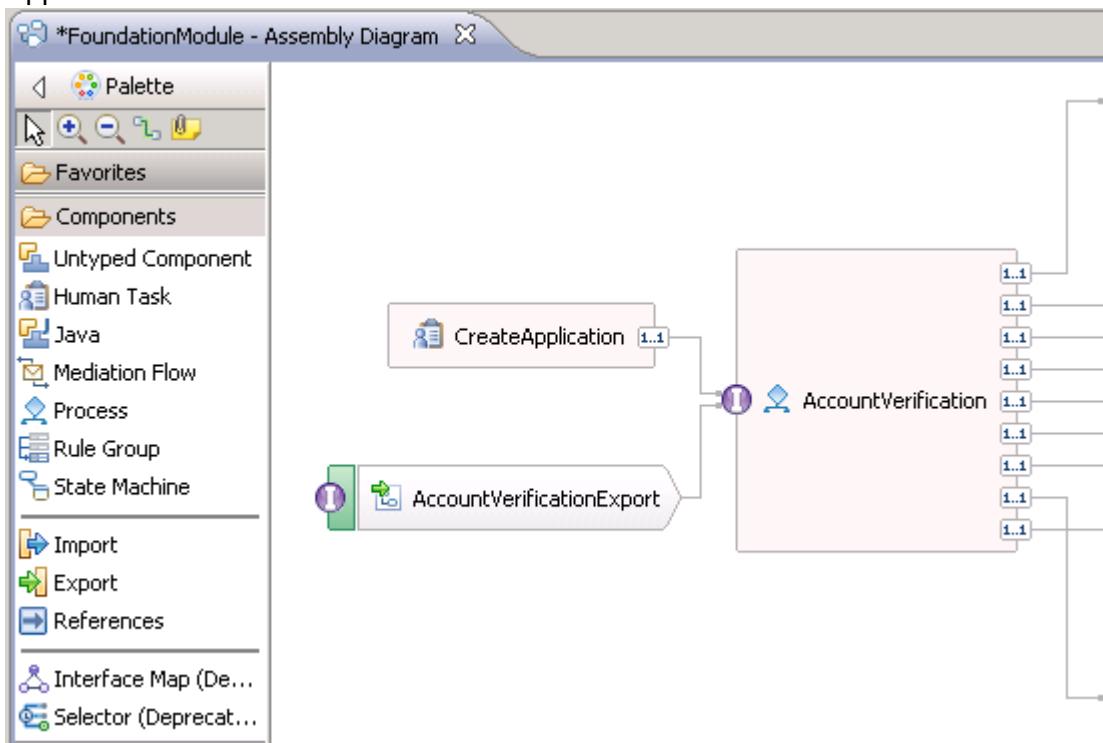
The screenshot shows the IBM Business User Client interface. At the top left is the IBM logo. On the left is a vertical navigation bar with the following items:

- HOME
- > Business Case (selected)
- New
- > User: bpmadmin
- Logout

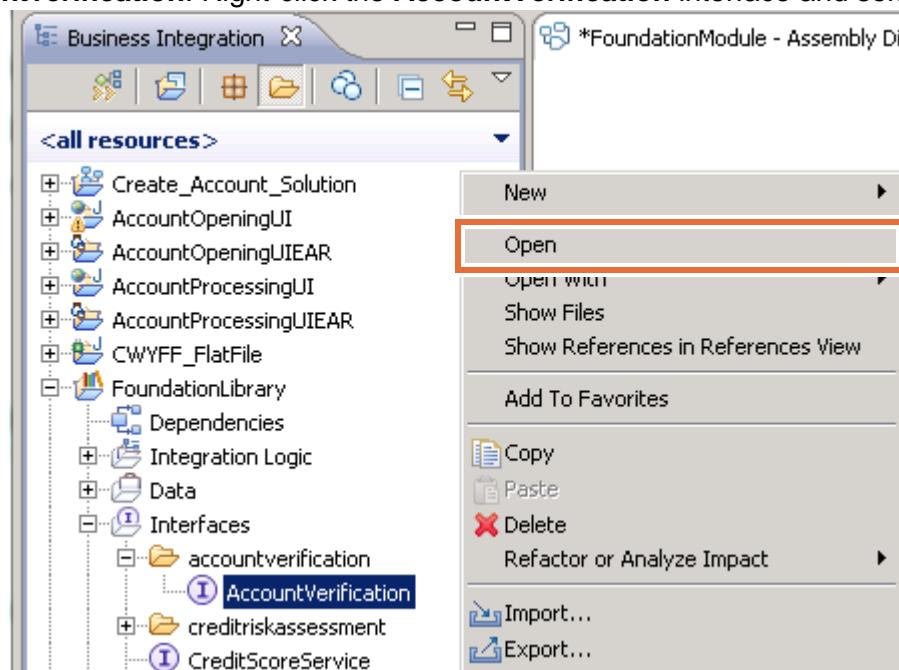
The main content area has a title "Business User Client" and a section titled "Business Case" with a "New" link. Below it is a descriptive text:

→ New
Select this to view a list of all the tasks that you can use to create a business case. For search criteria, you can provide additional information.

CreateApplication is defined in the FoundationModule.



1. In the Business Integration view, expand **Foundation Library > Interfaces > accountverification**. Right-click the **AccountVerification** interface and select **Open**.



You see that **CustomerApplication** is the data type that gets passed to the process.

The screenshot shows the ***FoundationModule - Assembly Diagram** interface. Under the **Operations** section, there is a table for the **InputCriterion** operation. The table has two rows: **Inputs** (highlighted with a red box) and **Outputs**. The **Inputs** row contains a column for **Name** (Input) and **Type** (CustomerApplication). The **Outputs** row contains a column for **Name** (Output) and **Type** (Message).

Name	Type
Inputs	CustomerApplication
Outputs	Message

2. In the Business Integration view, go to **FoundationLibrary > Data > creditserviceitems** to locate the CustomerApplication business object. Double-click **CustomerApplication** to view its definition.

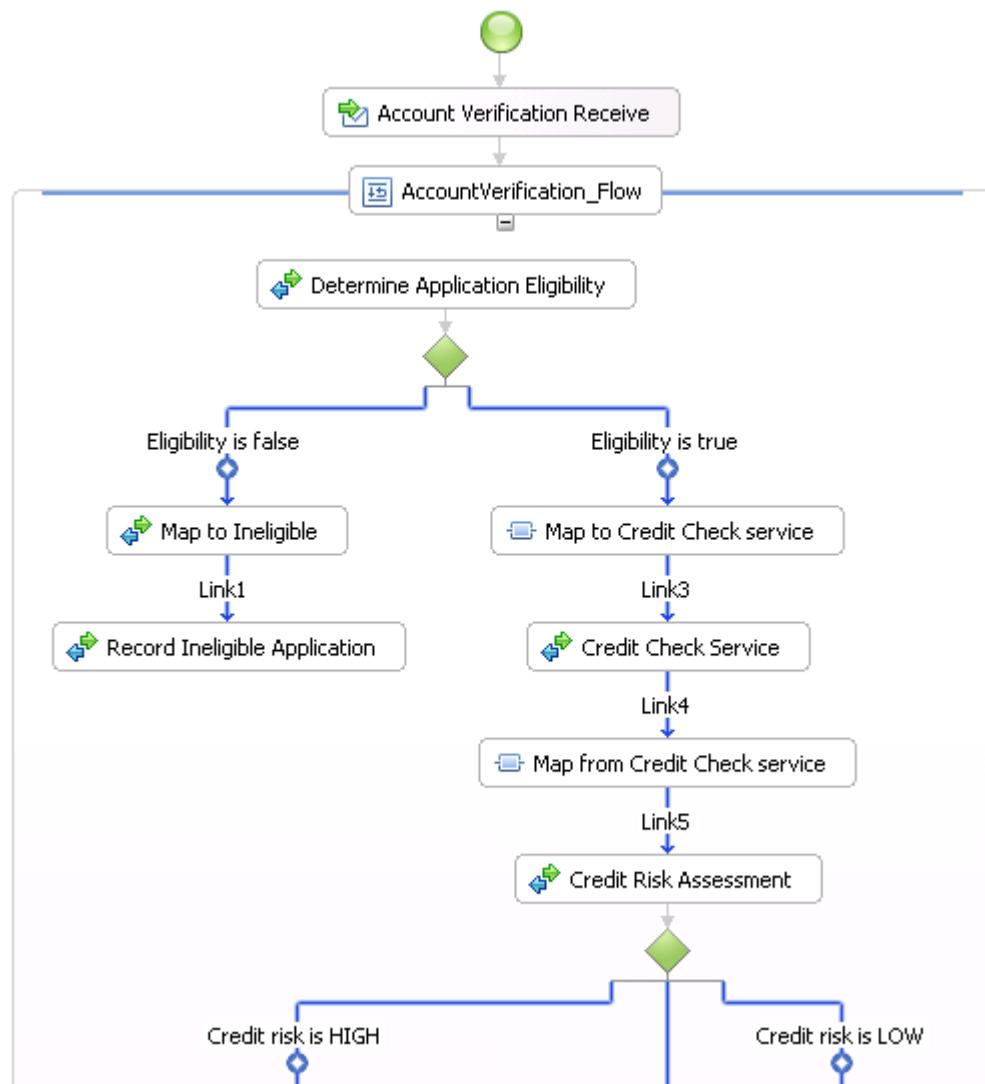
The screenshot shows the **Business Integration** view. On the left, the tree view shows the **CustomerApplication** node under the **creditServiceItems** folder. On the right, the **CustomerApplication** definition is displayed. It lists various properties: accountNumber (string), applicationDate (string), applicationDecision (boolean), comments (string), companyName (string), contactFirstName (string), contactLastName (string), contactPhoneNumber (string), creditRating (string), creditReportNeeded (boolean), creditRisk (string), creditScore (int), customerCity (string), customerCountry (string), eligibleApplication (boolean), and ineligibleReason (string). The **eligibleApplication** property is highlighted with a red box.

At run time, the customer's application eligibility gets evaluated based on the value in the **eligibleApplication** field.



Note

AccountVerification is a BPEL process. You can open the BPEL process by double-clicking the AccountVerification box in the Assembly Diagram.



The flow of the `AccountVerification` business process is that the data gets routed to the `Map to Ineligible` invoke activity if the `eligibleApplication` parameter value is set to `false`. Otherwise, the business event flows to the `Initial Review` activity.

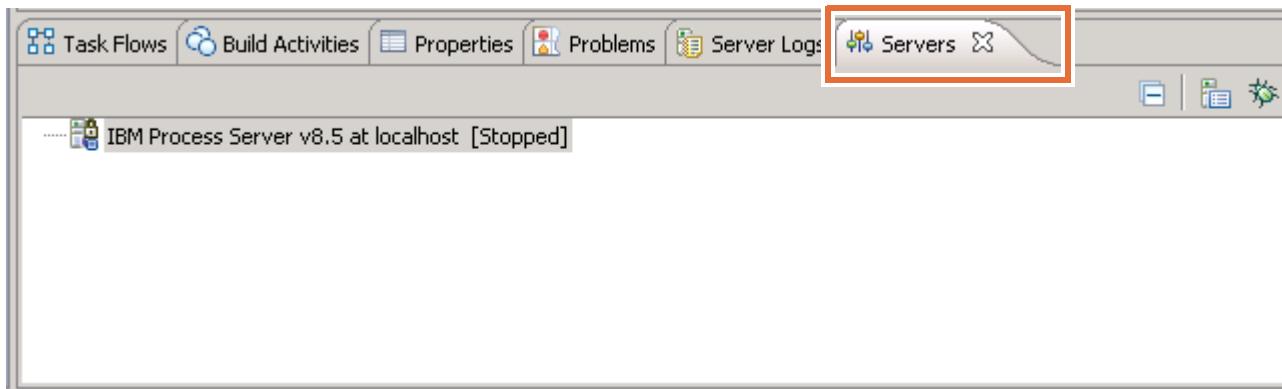
If the `eligibleApplication` parameter value is set to `false`, the request for an account creation gets rejected. The customer information gets archived in a local directory and in a database.

Part 2: Test the imported SOA solution

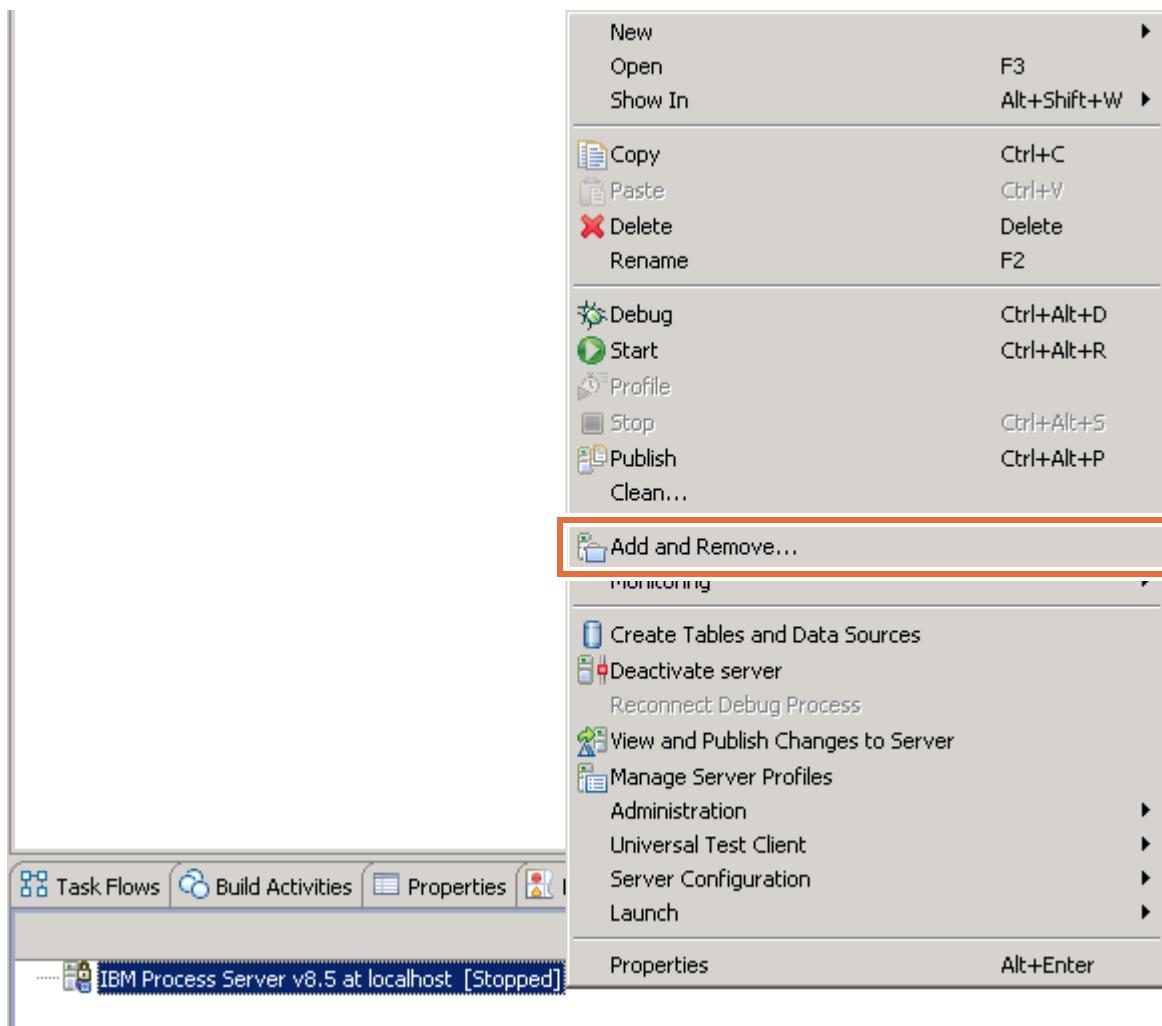
In this section, you are going to test the provided SOA solution.

- __ 1. Deploy the imported applications.

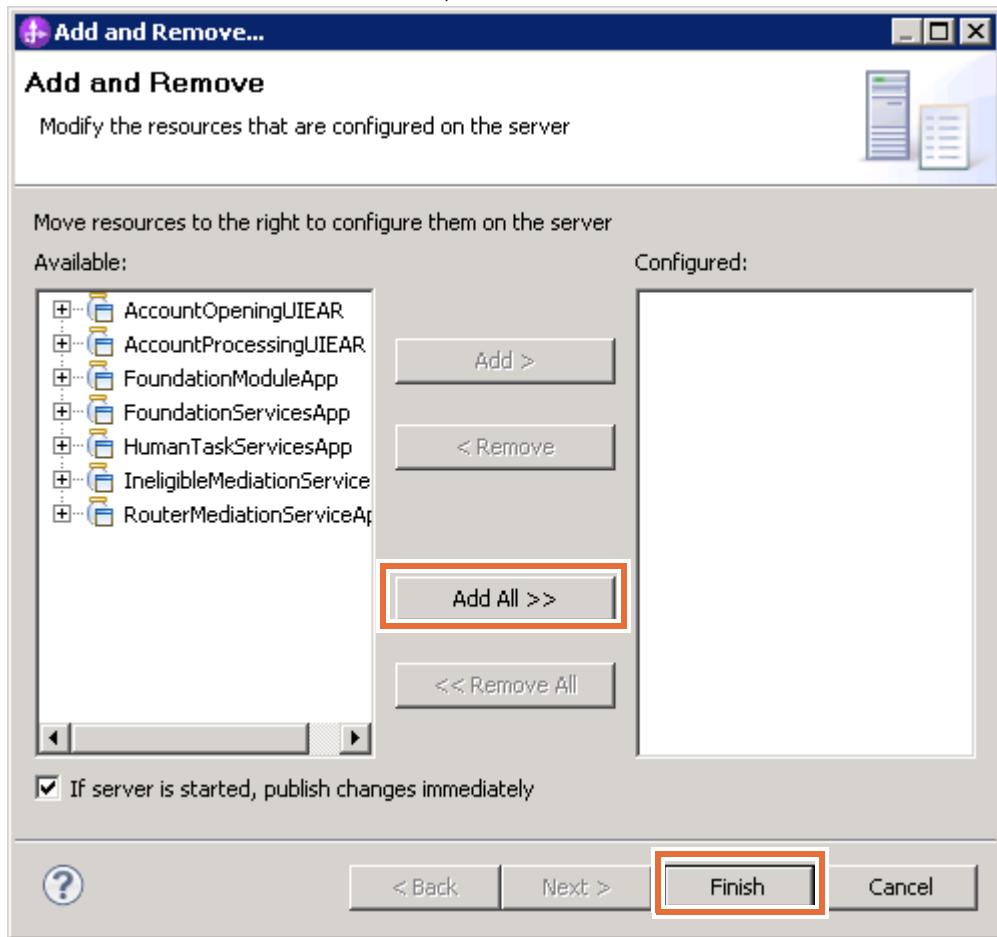
- __ a. Go to the **Servers** tab.



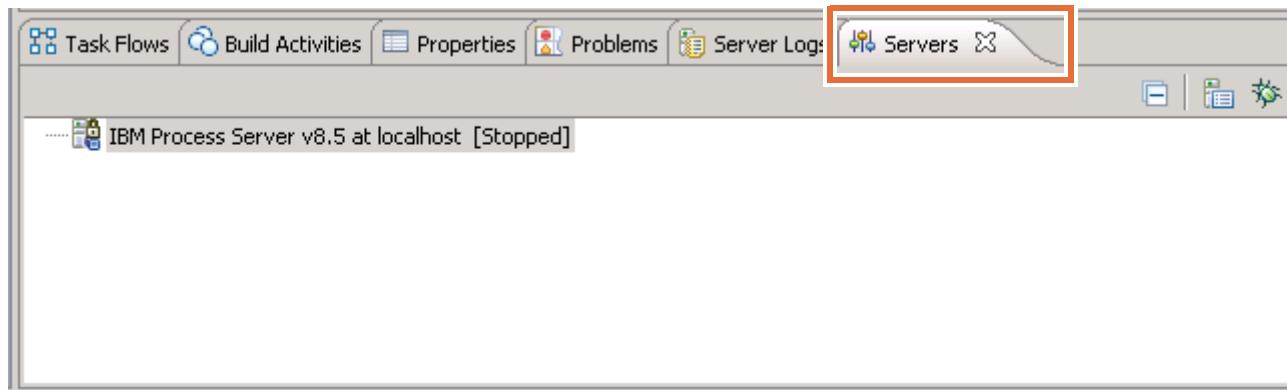
- __ b. Right-click **IBM Process Server v8.5 at localhost** and select **Add and Remove** from the menu.



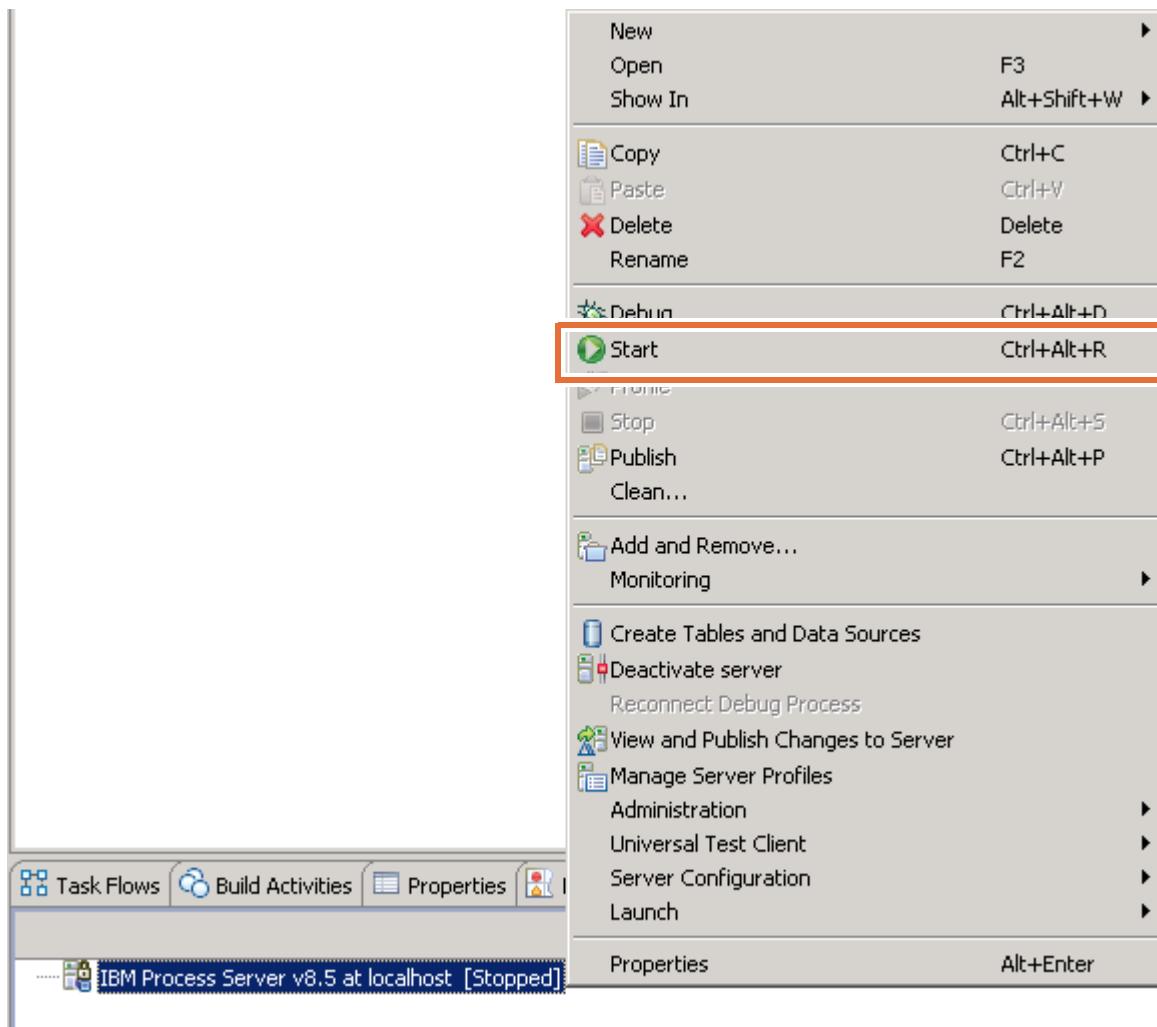
- ___ c. In the “Add and Remove” window, click **Add All**.



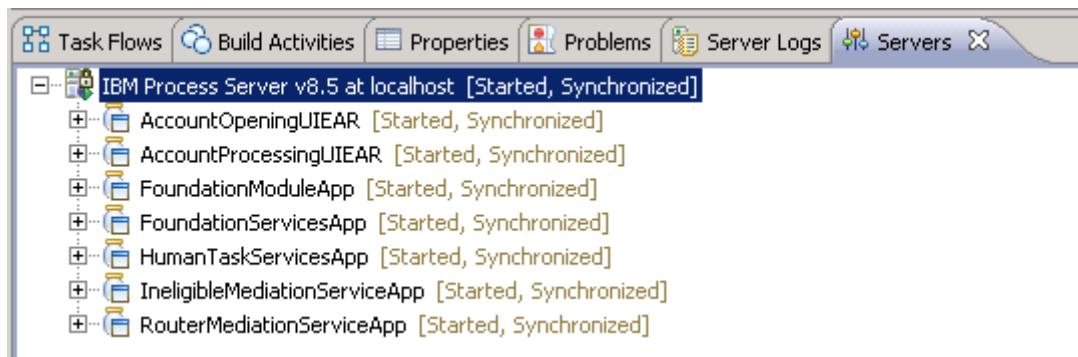
- ___ d. Click **Finish**. Wait until it completes.
___ 2. Start the server from IBM Integration Designer.
___ a. Go to the **Servers** tab.



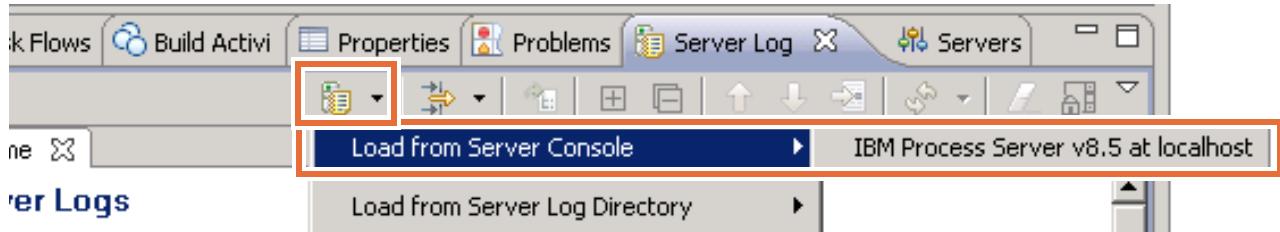
- __ b. Right-click **IBM Process Server v8.5 at localhost** and select **Start** from the menu.



- __ c. Wait until the server status changes to **Started, Synchronized**. This process might take several minutes to complete.
- __ d. When the server has the status of **Started, Synchronized**, you see the Automatically Publish window, which states that the server is set to automatically publish applications after it starts. Click **OK** to close the window.
- __ e. Expand **IBM Process Server v8.5 at localhost** to see the status of the projects that you added to the server.



-
- ___ 3. Clear the Server Logs view before running a test.
 - ___ a. Open the Server Logs view.
 - ___ b. Click the **Load Server Console or Log** icon and select **Load from Server Console > IBM Process Server v8.5 at localhost**.

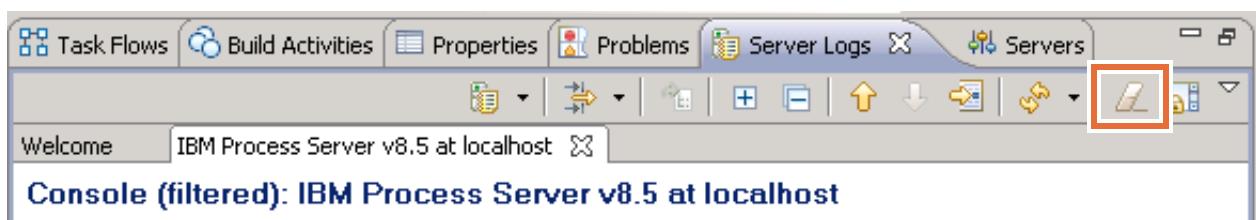


- ___ c. You might not see log entries in the server view. However, if you see log entries, you can click the **Clear Server Console** icon in the Server Logs view menu.



Note

Clearing the Server Logs view is an optional task. You do not have to do this task; however, clearing the server log entries makes it easier for you to find certain output messages during the test.



- ___ 4. Create an account opening request to test the CreateApplication task user interface JSP.
 - ___ a. Open a web browser window, and type the following address in the address field:

<https://localhost:9443/AccountOpeningUI/Index.jsp>

You see the login page for your account creation user interface.



Note

If you see a security certificate warning, confirm the exception and continue to the page.

- ___ b. At the Login window, enter `bpmadmin` in the **Name** field and `web1sphere` in the **Password** field.

Looking at the web address, you can see that this page is a JSP user interface application, which the User Interface Wizard for Human Tasks generated. All of the web pages you see are from that application.



Note

All aspects of the web page presentation that you see can be customized.

- __ c. Click **Login**.
- __ d. Click **New** on the main page.

The screenshot shows the IBM Business User Client interface. At the top is the IBM logo. Below it is a navigation bar with the following items: '+ HOME', 'Business Case' (which is expanded to show 'New'), and 'User: bpmadmin' (which is expanded to show 'Logout'). The main content area is titled 'Business User Client' and contains a section titled 'Business Case' with a 'New' link. A callout box highlights the 'New' link with the text: 'Select this to view a list of all the tasks that you can use to create a business case. For search criteria, you can provide additional information.'

- __ e. **CreateApplication** is the only available task. Click the link.

The screenshot shows the 'Business Cases > New' page. The left sidebar has the same navigation as the previous screenshot. The main content area is titled 'Business Cases > New' and contains a section titled 'Task' with a single item: 'CreateApplication'. This item is highlighted with a red box.

- __ f. To demonstrate the data flow, enter AbcCo in the **companyName** field. You can leave all of the other fields blank.

The screenshot shows the IBM Business Cases application interface. The top navigation bar has the IBM logo. The left sidebar menu includes 'HOME', 'Business Case', 'New', 'User: bpmadmin', and 'Logout'. The main content area is titled 'Business Cases > New > CreateApplication'. It contains a sub-header: 'Enter the values for the input data and optionally provide additional information to create your task.' Below this is a section titled 'Input Data' with several fields:

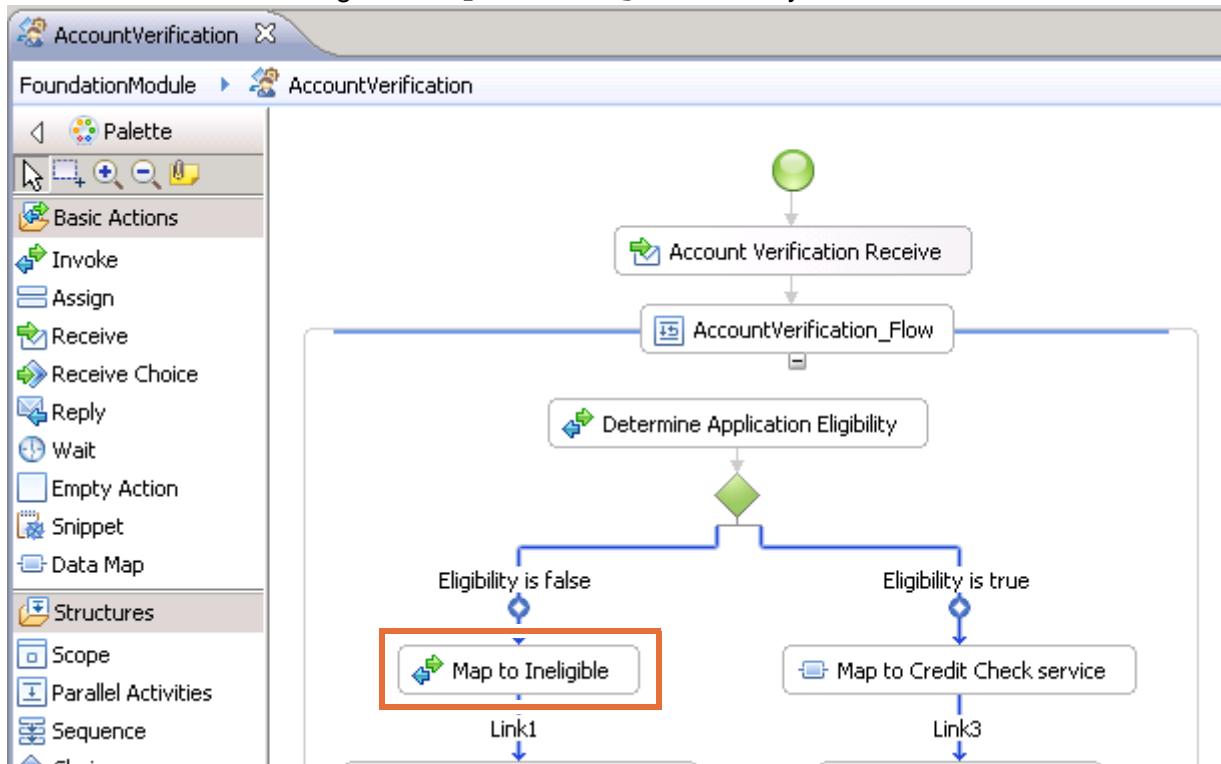
accountNumber	<input type="text"/>
applicationDate	<input type="text"/>
applicationDecision	<input type="checkbox"/>
comments	<input type="text"/>
companyName	AbcCo
contactFirstName	<input type="text"/>

The 'companyName' field is highlighted with an orange border. A note icon (a pencil writing on a notepad) is located on the left side of the note area.

 **Note**

The contents of these fields get populated by the DetermineApplicantEligibility service for AbcCo, so you do not need to enter values for all fields.

- g. Click **Create**. The web browser returns to the **Business Cases > New** page. The AccountVerification business process template defines the application review process, as follows. If the value entered for `eligibleApplication` is true, then the `CustomerApplication` data goes to the `InitialReview` activity. Otherwise, the data would flow through the `Map to Ineligible` activity.

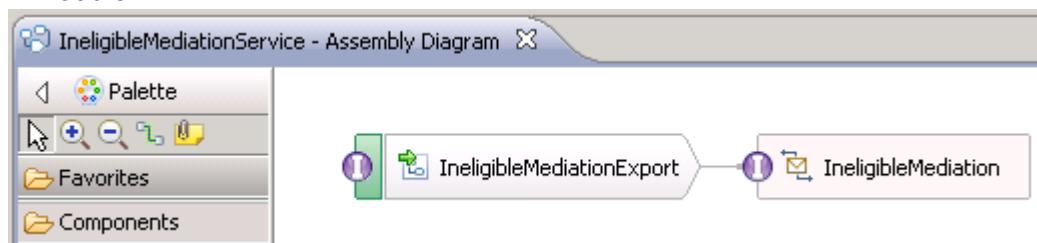


In this test case, `eligibleApplication` is set to `false` for company **AbcCo** by the `DetermineApplicantEligibilityImpl.java` code.

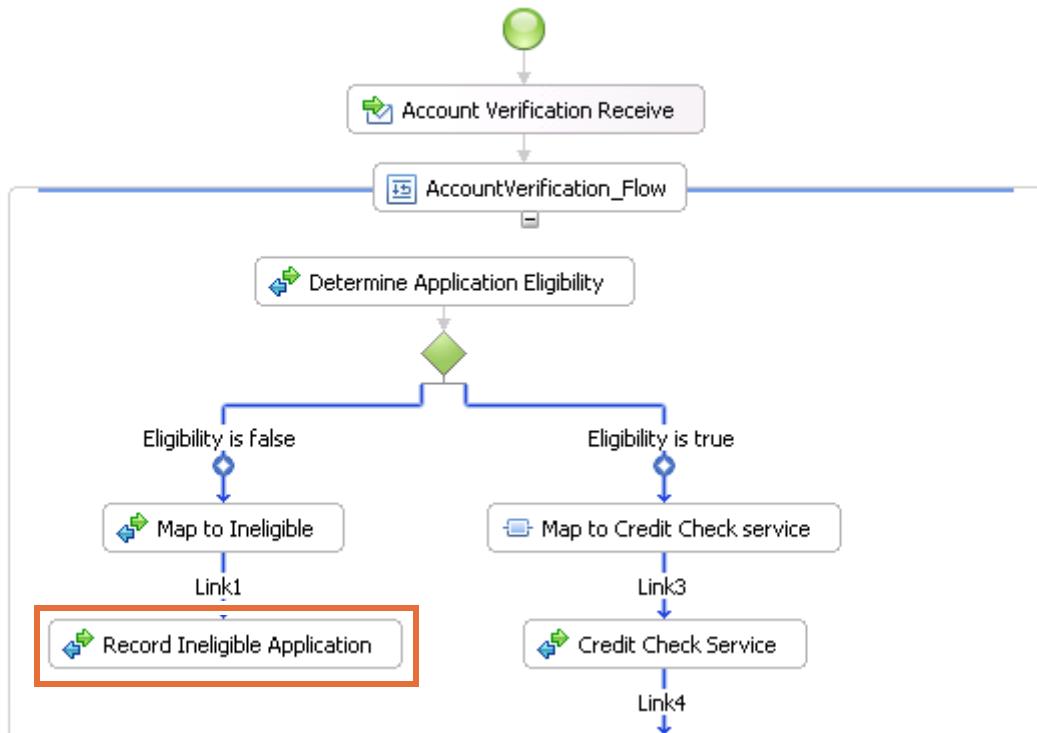
```
...
else if (credappin.getString("companyName").equals("AbcCo")) {
    credappin.setString("applicationDate", date);
    credappin.setString("companyName", "AbcCo");
    credappin.setString("customerCity", "Madrid");
    credappin.setString("customerCountry", "Spain");
    credappin.setString("contactFirstName", "Fernando");
    credappin.setString("contactLastName", "Torres");
    credappin.setString("contactPhoneNumber", "312-555-9725");
    credappin.setInt("requestAccountAmount", 20000);
    credappin.setInt("creditScore", 0);
    credappin.setString("productName", "Tacks");
    credappin.setInt("pricingCode", 51);
    credappin.setString("comments", "Bad credit");
    credappin.setString("creditRating", "F");
    credappin.setString("pricingScore", "31");
    credappin.setBoolean("creditReportNeeded", true);
    credappin.setString("creditRisk", "HIGH");
    credappin.setBoolean("applicationDecision", false);
    credappin.setBoolean("eligibleApplication", false);
    credappin.setString("ineligibleReason", "Bad credit");
    credappin.setString("accountNumber", "ABC001");
...
}
```

Therefore, the data is routed to Map to Ineligible.

This service is provided by `MaptoIneligiblePartner`, which is the `IneligibleMediation` mediation flow in the `IneligibleMediationService` mediation module.



After the successful execution of the Map to Ineligible activity, the Record Ineligible Application activity gets executed.



The RecordIneligibleApplicationPartner is bound to the RecordIneligibleApplicationExport in the FoundationServices module.

This solution invokes WebSphere Adapter for Flat Files through the FlatFileOutboundImport component.



Therefore, you should find an entry in the Server Logs view indicating that the Flat Files adapter was invoked.

The screenshot shows the 'Server Logs' tab in the IBM Process Server interface. The logs list several 'Log message' entries. The last entry, which includes the text '<<< Flat File Outbound service invoked OK! ...', is highlighted with a red box and selected in a detailed properties dialog. The properties dialog shows the type as 'Log message', time as 'Feb 28, 2014 17:01:19.501 PST', thread ID as '0000054f', and contents as '<<< Flat File Outbound service invoked OK! ...'. The 'Translated' radio button is selected.

- h. Open the `C:\IneligibleAppArchive\outdir` directory. You should see the `IneligibleApplication.1.txt` file that was generated.

The screenshot shows a Windows File Explorer window with the path `Computer > Local Disk (C:) > IneligibleAppArchive > outdir`. The 'outdir' folder contains two files: `IneligibleApplication.1.txt` and `IneligibleApplicationSeq.txt`. The `IneligibleApplication.1.txt` file is highlighted with a red box.

If you open the `IneligibleApplication.1.txt` file in a text editor, the **companyName** should match with your entry, **AbcCo**.

The screenshot shows the contents of the `IneligibleApplication.1.txt` file in Notepad. The XML code includes a `<companyName>AbcCo</companyName>` element, which is highlighted with a red box.

```
<?xml version="1.0" encoding="UTF-8"?>
<p:IneligibleApplication xsi:type="p:IneligibleApplication"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
 xmlns:p="http://BusinessItems">
<applicationDate>Feb 28, 2014</applicationDate>
<companyName>AbcCo</companyName>
<requestAccountAmount>20000</requestAccountAmount>
<comments>Bad credit</comments>
<ineligibleReason>Bad credit</ineligibleReason>
</p:IneligibleApplication>
```

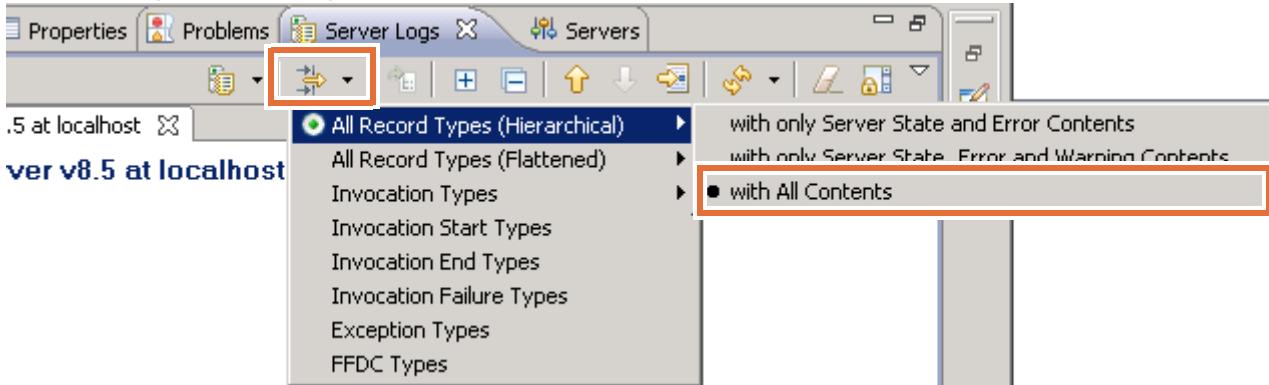
5. Run the test again for company IBM.
- Return to the AccountOpeningUI.jsp page.
 - Click **CreateApplication**.
 - In the CreateApplication window, enter IBM in the **companyName** field. You can leave the rest of the fields blank.
 - Click **Create**.



Note

For the company IBM, the value of `eligibleApplication` is set to true.

- Click the **Server Logs** tab.
- Click the **Select Records to Display** icon, and then select **All Record Types (Hierarchical) > with All Contents**.



The Server Logs view shows the entire contents of the server console logs. Notice the exception error in the logs.

Type	Time	Thread ID	Contents
Log message	Mar 3, 2014 09:32:48....	000001c1	[Java] Determine Applicant Eligibility - ends
Log message	Mar 3, 2014 09:32:50....	000001c1	CHFW0019I: The Transport Channel Service has started chain H
FFDC	Mar 3, 2014 09:32:50....	000001c1	com.ibm.ws.ffdc.impl.FfdcProvider logIncident FFDC1003I: FFDC
Exception	Mar 3, 2014 09:32:50....	000001c1	WSWS57263E: The following exception occurred: java.net.Conn
FFDC	Mar 3, 2014 09:32:50....	000001c1	com.ibm.ws.ffdc.impl.FfdcProvider logIncident FFDC1003I: FFDC
Log message	Mar 3, 2014 09:32:50....	000001c1	com.ibm.ws.ffdc.impl.DMAdapter getAnalysisEngine FFDC1009I
FFDC	Mar 3, 2014 09:32:50....	000001c1	com.ibm.ws.ffdc.impl.FfdcProvider logIncident FFDC1003I: FFDC
FFDC	Mar 3, 2014 09:32:50....	000001c1	com.ibm.ws.ffdc.impl.FfdcProvider logIncident FFDC1003I: FFDC
FFDC	Mar 3, 2014 09:32:50....	000001c1	com.ibm.ws.ffdc.impl.FfdcProvider logIncident FFDC1003I: FFDC
Log message	Mar 3, 2014 09:32:50....	000001c1	CWWBE0057I: Activity 'Invoke3' of processes '_PI:90030144.89

Now, your task is to troubleshoot this runtime error.



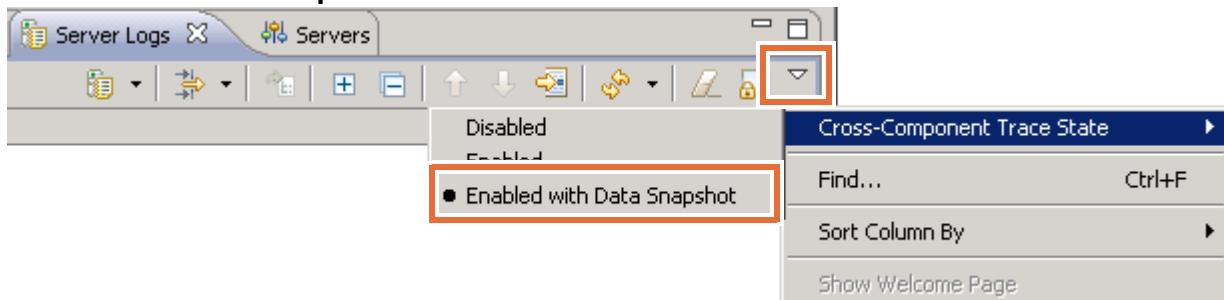
Questions

How would you approach this problem?

Part 3: Troubleshoot the AccountVerification service failure

For the purposes of education, the problem that is introduced here is a simple one to troubleshoot. The main purpose of this section is to demonstrate different tools that are available for you to troubleshoot runtime problems.

- 1. Rerun the test with cross-component trace enabled.
 - a. Access cross-component trace settings by clicking the **View Menu** arrow at the far-right upper corner of the **Server Logs** toolbar.
 - b. Enable cross-component trace by selecting **Cross-Component Trace State > Enabled with Data Snapshot** from the view menu.



Note

You might want to clear the Server Logs view again before sending another event.

- c. From the JSP page, resend the test data for the company **IBM**.

Now that you enabled the cross-component trace, you can see the event flow.

- __ d. Select **Invocation sequence (AccountVerification:InputCriterion)** and click the **Expand** icon so that you can view the entire tree.

Console: IBM Process Server v8.5 at localhost

Type	Time	Thread ID	Contents
Log message	Mar 3, 2014 09:44:48....	0000018d	DYNA1001I
Log message	Mar 3, 2014 09:44:48....	0000018d	DYNA1071T
Invocation sequence (AccountVerification:InputCriterion)	Mar 3, 2014 09:44:59....	0000018d	
Start HTM (_TKI:a01b0144.890c758b.e9aef53.4ad600d3)	Mar 3, 2014 09:44:59....	0000018d	Start of pro
Start invoke (AccountVerification:InputCriterion)	Mar 3, 2014 09:44:59....	0000018d	Start of the
Start component (AccountVerification:InputCriterion)	Mar 3, 2014 09:44:59....	00000047	Start of the
In BPEL process	Mar 3, 2014 09:44:59....	00000047	07e8a3dd-c
Start BPEL process (AccountVerification)	Mar 3, 2014 09:44:59....	000001c1	Start of pro
Start invoke (DetermineApplicantEligibility:Inpu	Mar 3, 2014 09:44:59....	000001c1	Start of the
Start component (DetermineApplicantEligib	Mar 3, 2014 09:44:59....	000001c1	Start of the

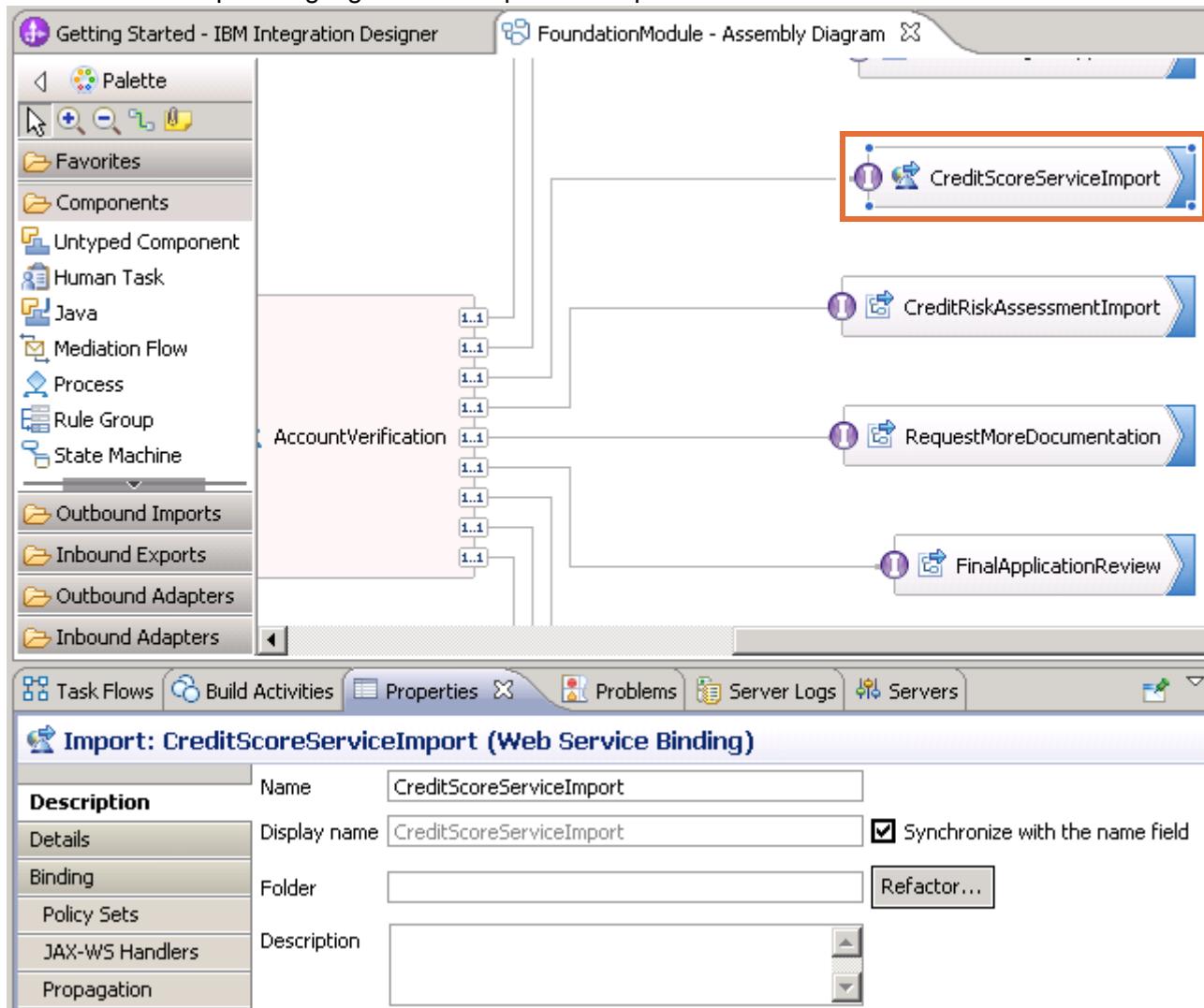
- __ e. In the Server Logs view, right-click **Fail Import (CreditScoreServiceImport:calculateCreditScore)** and select **Show Component in Assembly Diagram** from its menu.

Console: IBM Process Server v8.5 at localhost

Type	Time	Thread ID	Contents
Start invoke (DetermineApplicantEligibility:Inpu	Mar 3, 2014 09:44...	000001c1	Start of the invocation
Start component (DetermineApplicantEligib	Mar 3, 2014 09:44...	000001c1	Start of the compone
Log message	Mar 3, 2014 09:44...	000001c1	[Java] Determine Appl
Log message	Mar 3, 2014 09:44...	000001c1	[Java] Determine Appl
End component (DetermineApplicantEligibili	Mar 3, 2014 09:44...	000001c1	End of the component
End invoke (DetermineApplicantEligibility:Input	Mar 3, 2014 09:44...	000001c1	End of the invocation
End BPEL process (AccountVerification)	Mar 3, 2014 09:44...	000001c1	End of processing for
Start BPEL process (AccountVerification)	Mar 3, 2014 09:44...	000001c1	Start of processing for
End BPEL process (AccountVerification)	Mar 3, 2014 09:45...	000001c1	End of processing for
Start BPEL process (AccountVerification)	Mar 3, 2014 09:45...	000001c1	Start of processing for
Start invoke (CreditScoreServiceImport:calcula	Mar 3, 2014 09:45...	000001c1	Start of the invocation
Start import (CreditScoreServiceImport:cal	Mar 3, 2014 09:45...	000001c1	Start of the import pr
Log message	Mar 3, 2014 09:45...	000001c1	CHFW0019I: The Tran
Exception	Mar 3, 2014 09:45...	000001c1	WSWS57263E: The follo
Fail import (CreditScoreServiceImport:calculat			
Fail invoke (CreditScoreServiceImport:calculat			
Log message			

Copy Selected Records Ctrl+C
Copy All Records Ctrl+Shift+C
Show Component in Assembly Diagram

This option highlights the component in question.

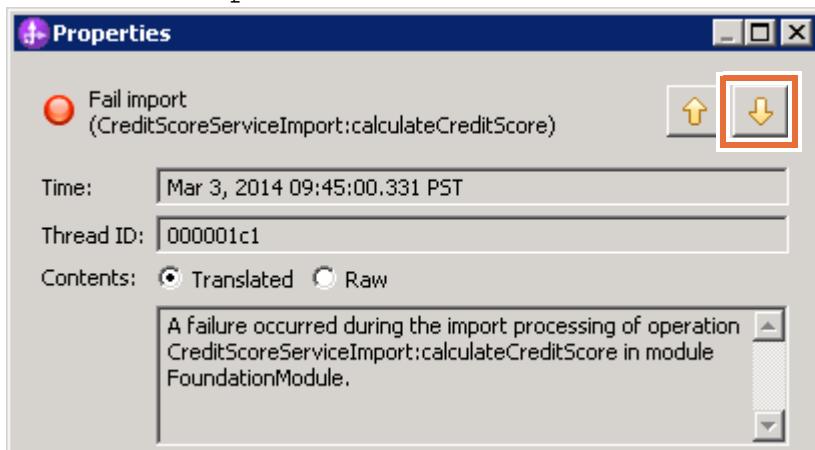


According to the log entry, this component is the point of failure.

- __ f. Return to the Server Logs view, and double-click the **Fail Import** entry to view its properties.

The message states:

A failure occurred during the import processing of operation
CreditScoreServiceImport:calculateCreditScore in module FoundationModule.



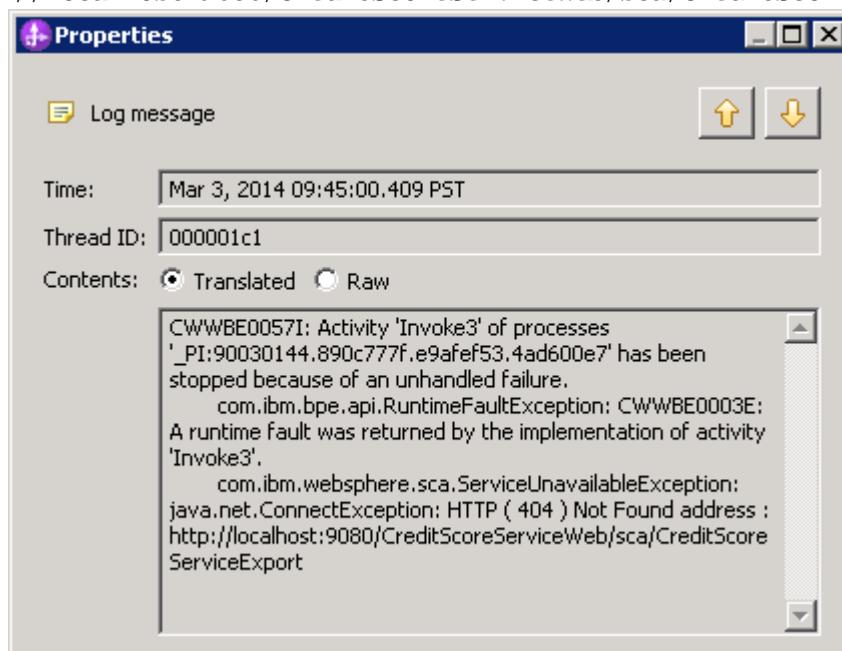
- __ g. Click the down-arrow key to view the next message.

The **Fail Invoke (CreditScoreServiceImport:calculateCreditScore)** should display a similar message.

- __ h. Again, click the down-arrow key to view the **Log message**.

The content should include the following message:

```
CWWBE0003E: A runtime fault was returned by the
implementation of activity 'Invoke3'.
javax.xml.ws.WebServiceException:
java.net.ConnectException: HTTP(404) Not Found address:
http://localhost:9080/CreditScoreServiceWeb/sca/CreditScoreServiceExport
```





Note

The message clearly indicates that the import component failed to connect to the CreditScoreServiceExport web service. Therefore, the next step is to verify the accuracy of the web service address and the availability of the web service.

- ___ i. Click **OK** to close the window.
- ___ 2. Check the administration console to see whether the CreditReportService exists.
 - ___ a. Open a web browser window and enter the following address to open the administrative console:
`https://localhost:9043/ibm/console`
If you get a security warning, confirm the security exception and continue to the website.
 - ___ b. If needed, enter `bpmadmin` in the **User ID** field and `websphere` in the **Password** field and click **Log in**.
 - ___ c. Select **Applications > Application Types > WebSphere enterprise applications**.
Notice that CreditCheckService application cannot be found on the server.

Select	Name	Application Status
You can administer the following resources:		
<input type="checkbox"/>	AccountOpeningUIEAR	
<input type="checkbox"/>	AccountProcessingUIEAR	
<input type="checkbox"/>	AppScheduler	
<input type="checkbox"/>	BPCExplorer_Node1_server1	
<input type="checkbox"/>	BPEContainer_Node1_server1	
<input type="checkbox"/>	BPMAdministrationWidgets_Node1_server1	
<input type="checkbox"/>	BSpaceEAR_Node1_server1	
<input type="checkbox"/>	BSpaceForms_Node1_server1	
<input type="checkbox"/>	BSpaceHelp_Node1_server1	
<input type="checkbox"/>	Business.Rules.Manager_Node1_server1	
<input type="checkbox"/>	BusinessRules_Node1_server1	
<input type="checkbox"/>	DefaultApplication	
<input type="checkbox"/>	FoundationModuleApp	
<input type="checkbox"/>	FoundationServicesApp	

- ___ 3. Check the entries in the Failed Event Manager.
 - ___ a. In the administration console, select **Servers > Deployment Environments**.

- __ b. In the Deployment Environment Name column, click **ProcessServer**.
 __ c. In the Additional Properties section, click **Failed Event Manager**.

The screenshot shows the 'Configuration' screen with the following details:

- General Properties** section:
 - Deployment Environment: ProcessServer
 - Deployment Environment Pattern: (empty)
 - Description: (empty)
- Additional Properties** section:
 - Deferred Configuration
 - Failed Event Manager** (highlighted with a red box)
- Related Items** section:
 - Authentication Aliases

- __ d. Click **Get all failed events** under the **Failed events on this server** section.

The screenshot shows the 'Deployment Environments > Failed Event Manager' page with the following sections:

- Failed events on this server** section:
 - The following are some common methods for searching for failed events:
 - Get all failed events** (highlighted with a red box)
 - Search failed events
- About your failed event manager** section:
 - The Recovery sub-system is enabled.
 - Total failed events: 2
 - IBM WebSphere Application Server
Network Deployment, 8.5.0.2
Build Number: cf021312.01
Build Date: 3/27/13
 - Licensed Material - Property of IBM

- __ e. Since you sent data with the **companyName** of **IBM** twice, you should see two failed events.
 __ f. Click an **Event ID** to see its details.

- __ g. It should indicate that the event type is **BPC**.

Deployment Environments ? -

[Deployment Environments](#) > [Failed Event Manager](#) > [Search results](#) > [_PI:90030144.890c777f.e9afef53.4ad600e7](#)

Use this page to view details about the failed event.

Failed event details

[View business data](#) [Resubmit](#) [Delete](#)

[Open calling process in Business Process Choreographer Explorer](#)

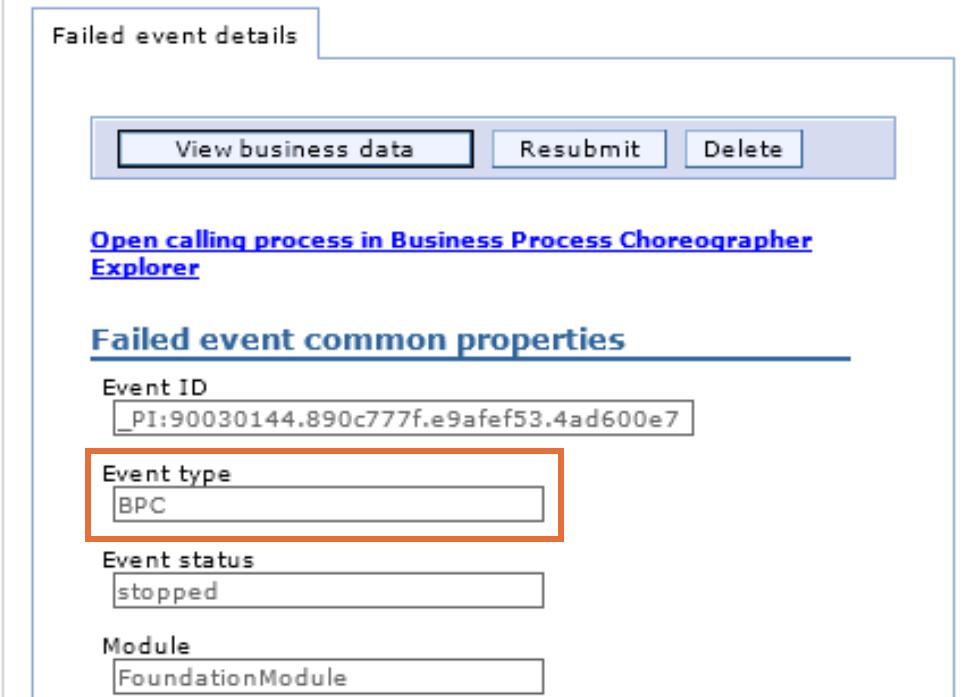
Failed event common properties

Event ID
[_PI:90030144.890c777f.e9afef53.4ad600e7](#)

Event type
BPC

Event status
stopped

Module
FoundationModule



- __ h. Click **View business data** to view the sent message.

Deployment Environments ? -

[Deployment Environments](#) > [Failed Event Manager](#) > [Search results](#) > [_PI:90030144.890c777f.e9afef53.4ad600e7](#)

Use this page to view details about the failed event.

Failed event details

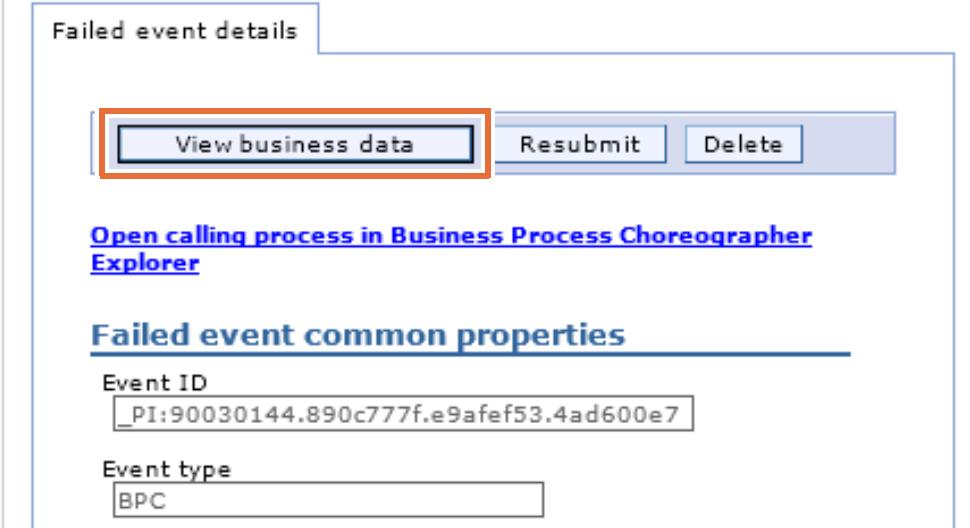
[View business data](#) [Resubmit](#) [Delete](#)

[Open calling process in Business Process Choreographer Explorer](#)

Failed event common properties

Event ID
[_PI:90030144.890c777f.e9afef53.4ad600e7](#)

Event type
BPC



- __ i. Click **Input** to view the parameter values.

Deployment Environments ? -

[Deployment Environments](#) > [Failed Event Manager](#) > [Search results](#) > [PI:90030144.890c777f.e9afef53.4ad600e7](#) > Business data editor

Use this page to view and edit business data parameters.

Parameter name	Parameter value	Parameter type
Input	...	CustomerApplication

Total 1

You can check the parameter values of the Input message that is associated with the failed event.

Deployment Environments ? -

[Deployment Environments](#) > [Failed Event Manager](#) > [Search results](#) > [PI:90030144.890c777f.e9afef53.4ad600e7](#) > Business data editor

Use this page to view and edit business data parameters.

Parameter name	Parameter value	Parameter type
accountNumber		String
creditReportNeeded	false	Boolean
creditRisk		String
creditScore	0	Integer
customerCity		String
customerCountry		String
eligibleApplication	false	Boolean
ineligibleReason		String
pricingCode		String
pricingScore		String

- __ j. Click the **event ID** link to return to its detail view.

Deployment Environments ? -

[Deployment Environments](#) > [Failed Event Manager](#) > [Search results](#) > [PI:90030144.890c777f.e9afef53.4ad600e7](#) > Business data editor

4. Open the Business Process Choreographer Explorer to view information on the failed process instance.
- a. Click **Open calling process in Business Process Choreographer Explorer**.

Deployment Environments

[Deployment Environments](#) > [Failed Event Manager](#) > [Search results](#) > [_PI:90030144.890c777f.e9afef53.4ad600e7](#)

Use this page to view details about the failed event.

Failed event details

[View business data](#) [Resubmit](#) [Delete](#)

[**Open calling process in Business Process Choreographer Explorer**](#)

Failed event common properties

Event ID
_PI:90030144.890c777f.e9afef53.4ad600e7

Event type
BPC

If you get a security warning, continue to open the page and confirm the security exception.

- b. In the Business Process Choreographer Explorer page, enter `bpmadmin` in the **User Name** field and `web1sphere` in the **Password** field, and click **Login**.
- c. Click **View Process State**.

Process Instance

Use this page to view information about a process instance and, optionally, to work on the process instance. [i](#)

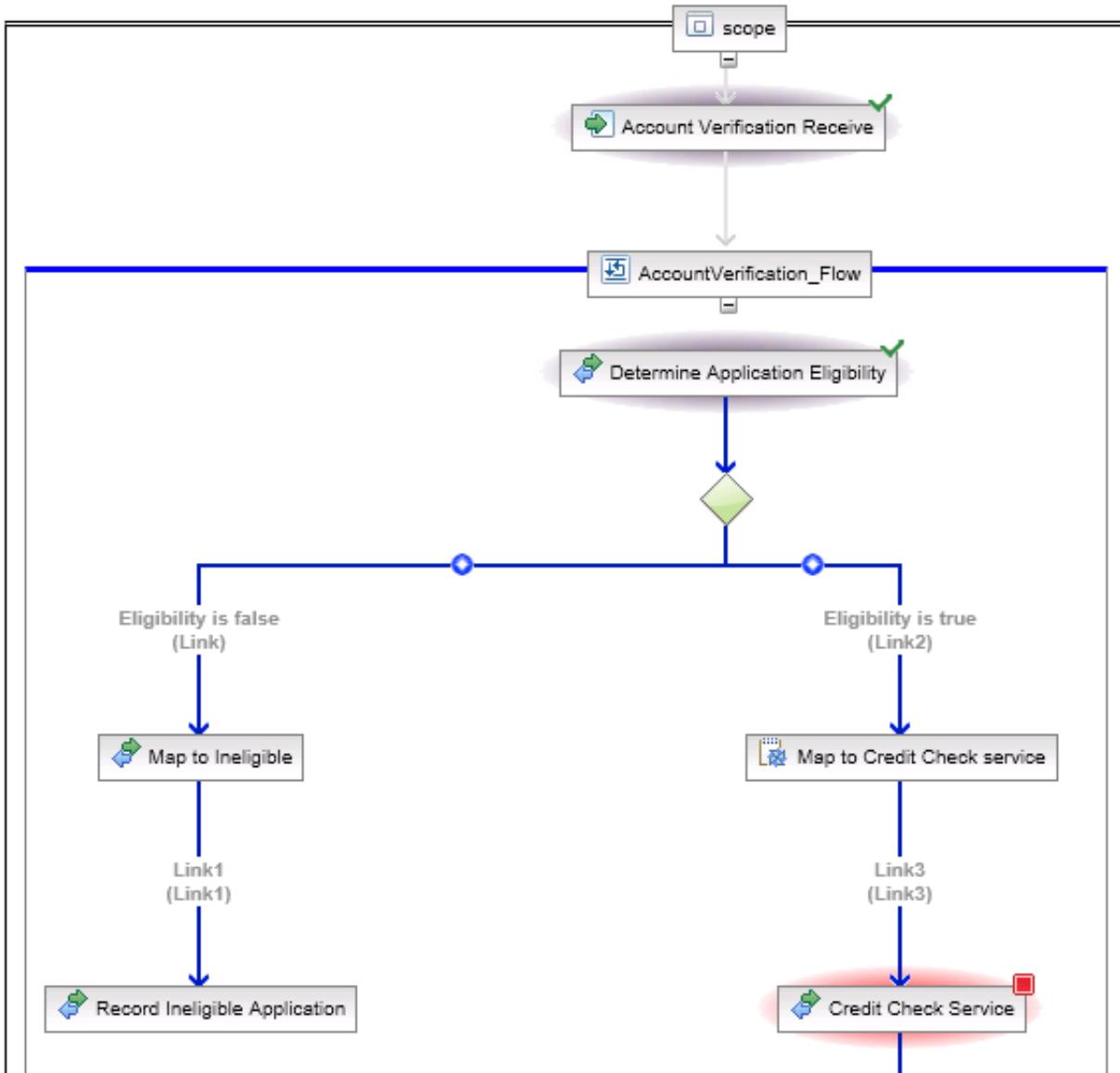
[Terminate](#) [Suspend](#) [Work Items](#) [Create Work Items](#) [**View Process State**](#) [Tasks](#) [Activities](#) [Activity](#)

Process Description

Process Instance Name	_PI:90030144.890c777f.e9afef53.4ad600e7
Description	Account verification for IBM
State	Running

Details	Template Details	Process Input Message	Activities	Waiting Operations	Related Processes	Tasks	Cust Prope
Process Instance ID	_PI:90030144.890c777f.e9afef53.4ad600e7						
Process Template Name	AccountVerification						
Starter	admin						
Administrators	Everybody						
Readers	Nobody						

By viewing the process state, you can see which activities successfully executed, and which activities failed.



__ d. Click **View Process Instance Details** to return to the detail.

__ e. Click **Activities**.

Process Instance

Use this page to view information about a process instance and, optionally, to work on the process instance. i

[Terminate](#) [Suspend](#) [Work Items](#) [Create Work Items](#) [View Process State](#) [Tasks](#) [Activities](#) [Activity](#)

Process Description

Process Instance Name	_PI:90030144.890c777f.e9afef53.4ad600e7
Description	Account verification for IBM
State	Running

___ f. The Activities Instances page should indicate that the status of the **Invoke3** is **Stopped**.

Activity Instances

Use this page to work with activities. [\[i\]](#)

<input type="checkbox"/>	Activity Name	State	Skip requested	Kind	Owner	Activated
<input type="checkbox"/>	Invoke6	Inactive	no	Invoke		
<input checked="" type="checkbox"/>	Invoke3	Stopped	no	Invoke		3/3/2014 9:45:00 AM PST
<input type="checkbox"/>	Invoke	Finished	no	Invoke		3/3/2014 9:44:59 AM PST
<input type="checkbox"/>	Receive	Finished	no	Receive		3/3/2014 9:44:59 AM PST

Items found: 4 Items selected: 0 << Page 1 of 1 >> Items per page:

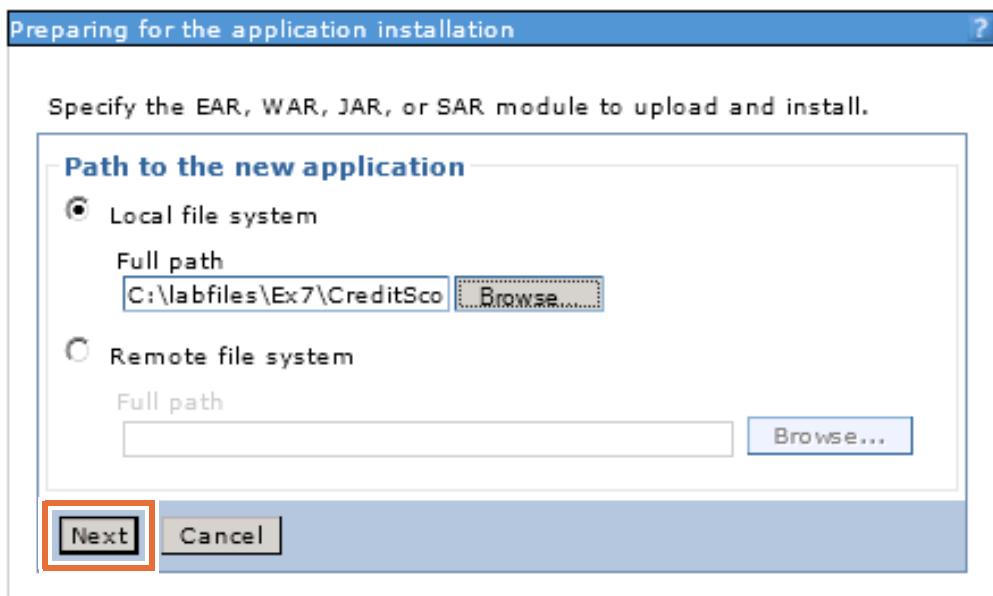
___ 5. The missing service is provided in the `CreditScoreService.ear` file in the `C:/labfiles/ex7` directory. Deploy the web service onto the server.

___ a. In the administration console, select **Application > New Application**, and then click **New Enterprise Application**.

The screenshot shows the IBM WebSphere Application Server Administration Console. On the left, there is a navigation sidebar with various links like 'Welcome', 'Guided Activities', 'Servers', 'Applications', 'Services', 'Resources', 'Security', and 'Environment'. Under 'Applications', 'New Application' is selected and highlighted with a red box. The main content area has a header 'New Application' and sub-header 'New Application'. It says 'This page provides links to create new applications of different types.' Below that is a section titled 'Install a New Application' with three items: 'New Enterprise Application' (with a window icon), 'New Business Level Application' (with a stack of cubes icon), and 'New Asset' (with a single cube icon). The 'New Enterprise Application' link is also highlighted with a red box.

___ b. In the “Path to the new application” section, make sure that **Local file system** is selected, and click **Browse**.

- __ c. Go to the C:/labfiles/ex7 directory, select **CreditScoreService.ear**, and click **Open**. Click **Next**.



- __ d. In the "How do you want to install the application" screen, accept the default, which is **Fast Path**, and click **Next**.
- __ e. Click the **Step 3 Summary** link to accept the default values.

Specify options for installing enterprise applications and modules.

Step 1 Select installation options	Summary						
Step 2 Map modules to servers	Summary of installation options						
→ Step 3: Summary	<table border="1"><thead><tr><th>Options</th><th>Values</th></tr></thead><tbody><tr><td>Precompile JavaServer Pages files</td><td>No</td></tr><tr><td>Directory to install application</td><td></td></tr></tbody></table>	Options	Values	Precompile JavaServer Pages files	No	Directory to install application	
Options	Values						
Precompile JavaServer Pages files	No						
Directory to install application							

- __ f. Click **Finish**.
- __ g. When the installation completes successfully, you see the following message:
Application CreditScoreServiceApp installed successfully.

-
- ___ h. Click the **Save** link to save the change to the master configuration.

ADMA5113I: Activation plan created successfully.

ADMA5011I: The cleanup of the temp directory for application CreditScoreServiceApp is complete.

ADMA5013I: Application CreditScoreServiceApp installed successfully.

Application CreditScoreServiceApp installed successfully.

To start the application, first save changes to the master configuration.

Changes have been made to your local configuration. You can:

- [Save directly to the master configuration.](#)
- [Review changes before saving or discarding.](#)

To work with installed applications, click the "Manage Applications" link.

[Manage Applications](#)

- ___ i. Return to the application list by selecting **Applications > Application Types > WebSphere enterprise applications**.

- __ j. Locate and select the **CreditScoreServiceApp** check box. Click **Start**.

The screenshot shows the IBM BPM Administration Console interface. At the top, there is a toolbar with buttons for Start, Stop, Install, Uninstall, Update, Rollout Update, Remove File, and Export. The 'Start' button is highlighted with a red box. Below the toolbar is a search bar with 'Select' and 'Name' dropdown menus, and an 'Application Status' button with a blue arrow icon. A message says 'You can administer the following resources:' followed by a list of application names. The 'CreditScoreServiceApp' row is selected, indicated by a red box around its entire row. It has a checked checkbox in the first column, the name 'CreditScoreServiceApp' in the second column, and a red X icon in the third column. Other applications listed include AccountOpeningUIEAR, AccountProcessingUIEAR, AppScheduler, BPCExplorer Node1 server1, BPEContainer Node1 server1, BPMAuthorizationWidgets Node1 server1, BSpaceEAR Node1 server1, BSpaceForms Node1 server1, BSpaceHelp Node1 server1, Business.Rules.Manager Node1 server1, BusinessRules Node1 server1, DefaultApplication, and CreditScoreServiceApp.

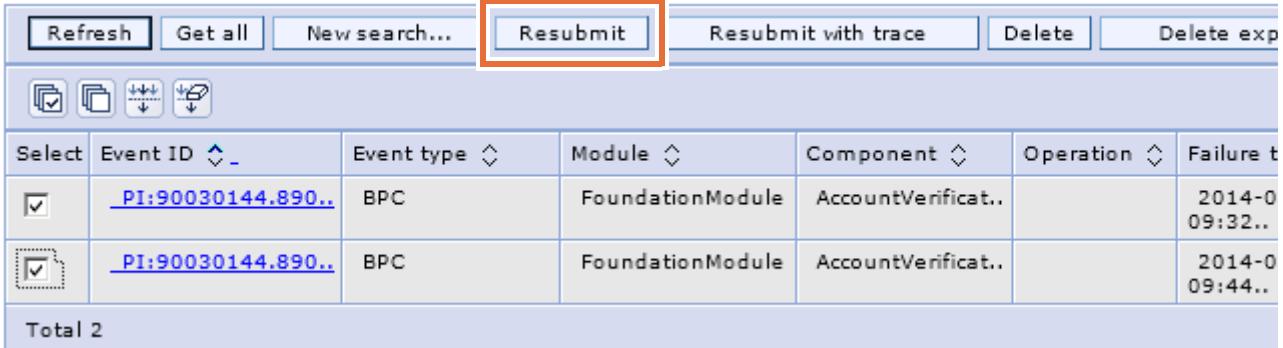
	Name	Application Status
You can administer the following resources:		
<input type="checkbox"/>	AccountOpeningUIEAR	
<input type="checkbox"/>	AccountProcessingUIEAR	
<input type="checkbox"/>	AppScheduler	
<input type="checkbox"/>	BPCExplorer Node1 server1	
<input type="checkbox"/>	BPEContainer Node1 server1	
<input type="checkbox"/>	BPMAuthorizationWidgets Node1 server1	
<input type="checkbox"/>	BSpaceEAR Node1 server1	
<input type="checkbox"/>	BSpaceForms Node1 server1	
<input type="checkbox"/>	BSpaceHelp Node1 server1	
<input type="checkbox"/>	Business.Rules.Manager Node1 server1	
<input type="checkbox"/>	BusinessRules Node1 server1	
<input checked="" type="checkbox"/>	CreditScoreServiceApp	
<input type="checkbox"/>	DefaultApplication	

When the application is successfully started, the application status for the CreditScoreServiceApp should change to a green arrow.

This application should resolve the issue for the failed invocation.

- __ 6. Resubmit the failed events through the Failed Event Manager to complete the process.
- __ a. In the administration console, go to **Servers > Deployment Environments**, click **ProcessServer**, and then click **Failed Event Manager**.
- __ b. Select **Get all failed events** under the **Failed events on this server** section.

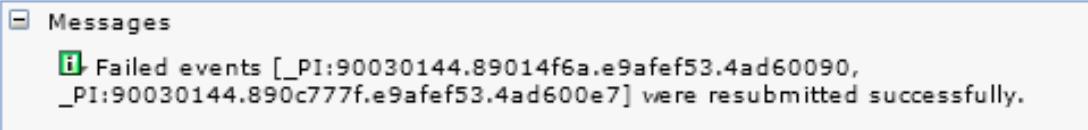
- ___ c. Select the check box for all failed events, and click **Resubmit**.



The screenshot shows a table with columns: Select, Event ID, Event type, Module, Component, Operation, and Failure t. Two rows are selected, both labeled PI:90030144.890.., BPC, FoundationModule, AccountVerificat., and 2014-09:32.. and 2014-09:44.. respectively. The 'Resubmit' button at the top right is highlighted with a red box.

Select	Event ID	Event type	Module	Component	Operation	Failure t
<input checked="" type="checkbox"/>	PI:90030144.890..	BPC	FoundationModule	AccountVerificat..		2014-09:32..
<input checked="" type="checkbox"/>	PI:90030144.890..	BPC	FoundationModule	AccountVerificat..		2014-09:44..
Total 2						

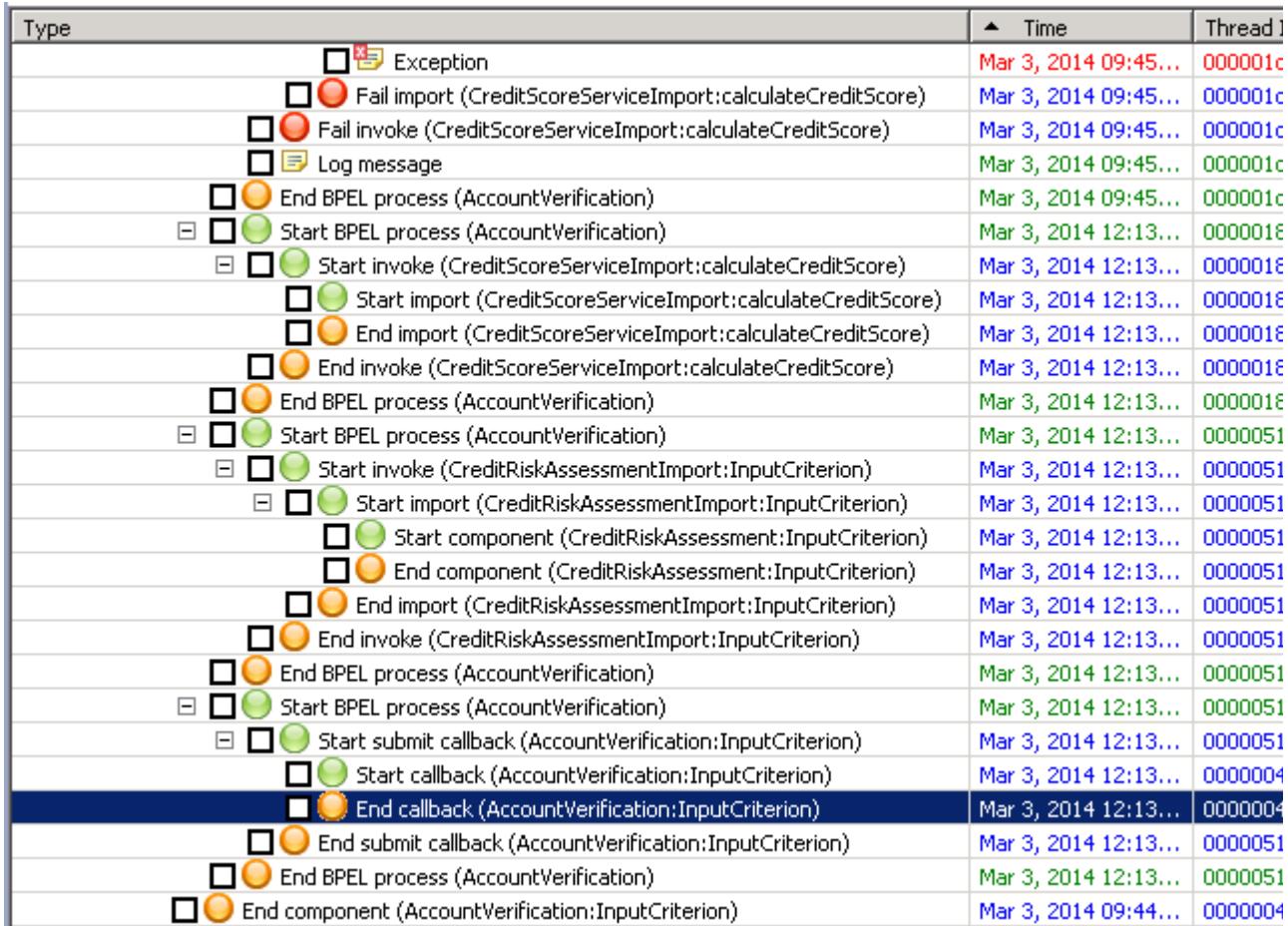
A message should indicate that the event resubmission was successful.



The screenshot shows a log entry under the 'Messages' section: 'Failed events [_PI:90030144.89014f6a.e9afef53.4ad60090, _PI:90030144.890c777f.e9afef53.4ad600e7] were resubmitted successfully.'

- ___ d. Go to the Integration Designer Server Logs view.

The cross-component trace continues with the hung process to complete them. You should be able to find the logs that indicate that the failed events were resubmitted successfully.



The screenshot shows a table of logs with columns: Type, Time, and Thread ID. The logs detail a sequence of events including exceptions, imports, and component operations across multiple threads (000001c, 0000018, 0000051) over a period from Mar 3, 2014 09:45... to Mar 3, 2014 09:44... The logs show the progression of a BPEL process, its imports, and the subsequent resubmission of failed events.

Type	Time	Thread ID
Exception	Mar 3, 2014 09:45...	000001c
Fail import (CreditScoreServiceImport:calculateCreditScore)	Mar 3, 2014 09:45...	000001c
Fail invoke (CreditScoreServiceImport:calculateCreditScore)	Mar 3, 2014 09:45...	000001c
Log message	Mar 3, 2014 09:45...	000001c
End BPEL process (AccountVerification)	Mar 3, 2014 09:45...	000001c
Start BPEL process (AccountVerification)	Mar 3, 2014 12:13...	0000018
Start invoke (CreditScoreServiceImport:calculateCreditScore)	Mar 3, 2014 12:13...	0000018
Start import (CreditScoreServiceImport:calculateCreditScore)	Mar 3, 2014 12:13...	0000018
End import (CreditScoreServiceImport:calculateCreditScore)	Mar 3, 2014 12:13...	0000018
End invoke (CreditScoreServiceImport:calculateCreditScore)	Mar 3, 2014 12:13...	0000018
End BPEL process (AccountVerification)	Mar 3, 2014 12:13...	0000018
Start BPEL process (AccountVerification)	Mar 3, 2014 12:13...	0000051
Start invoke (CreditRiskAssessmentImport:InputCriterion)	Mar 3, 2014 12:13...	0000051
Start import (CreditRiskAssessmentImport:InputCriterion)	Mar 3, 2014 12:13...	0000051
Start component (CreditRiskAssessment:InputCriterion)	Mar 3, 2014 12:13...	0000051
End component (CreditRiskAssessment:InputCriterion)	Mar 3, 2014 12:13...	0000051
End import (CreditRiskAssessmentImport:InputCriterion)	Mar 3, 2014 12:13...	0000051
End invoke (CreditRiskAssessmentImport:InputCriterion)	Mar 3, 2014 12:13...	0000051
End BPEL process (AccountVerification)	Mar 3, 2014 12:13...	0000051
Start BPEL process (AccountVerification)	Mar 3, 2014 12:13...	0000051
Start submit callback (AccountVerification:InputCriterion)	Mar 3, 2014 12:13...	0000051
Start callback (AccountVerification:InputCriterion)	Mar 3, 2014 12:13...	0000004
End callback (AccountVerification:InputCriterion)	Mar 3, 2014 12:13...	0000004
End submit callback (AccountVerification:InputCriterion)	Mar 3, 2014 12:13...	0000051
End BPEL process (AccountVerification)	Mar 3, 2014 12:13...	0000051
End component (AccountVerification:InputCriterion)	Mar 3, 2014 09:44...	0000004

__ 7. Examine the cross-component trace logs.

- __ a. In the Server Logs view, notice that there is another entry for **Start import (CreditScoreServiceImport:calculateCreditScore)**.

The first attempt failed due to the missing web service. When the failed event was resubmitted, cross-component trace shows that the event went through successfully.

Type		Time	Thread ID
Start BPEL process (AccountVerification)	[Start BPEL process (AccountVerification)]	Mar 3, 2014 09:45...	000001
Start invoke (CreditScoreServiceImport:calculateCreditScore)	[Start invoke (CreditScoreServiceImport:calculateCreditScore)]	Mar 3, 2014 09:45...	000001
Start import (CreditScoreServiceImport:calculateCreditScore)	[Start import (CreditScoreServiceImport:calculateCreditScore)]	Mar 3, 2014 09:45...	000001
Log message	[Log message]	Mar 3, 2014 09:45...	000001
Exception	[Exception]	Mar 3, 2014 09:45...	000001
Fail import (CreditScoreServiceImport:calculateCreditScore)	[Fail import (CreditScoreServiceImport:calculateCreditScore)]	Mar 3, 2014 09:45...	000001
Fail invoke (CreditScoreServiceImport:calculateCreditScore)	[Fail invoke (CreditScoreServiceImport:calculateCreditScore)]	Mar 3, 2014 09:45...	000001
Log message	[Log message]	Mar 3, 2014 09:45...	000001
End BPEL process (AccountVerification)	[End BPEL process (AccountVerification)]	Mar 3, 2014 09:45...	000001
Start BPEL process (AccountVerification)	[Start BPEL process (AccountVerification)]	Mar 3, 2014 12:13...	000001
Start invoke (CreditScoreServiceImport:calculateCreditScore)	[Start invoke (CreditScoreServiceImport:calculateCreditScore)]	Mar 3, 2014 12:13...	000001
Start import (CreditScoreServiceImport:calculateCreditScore)	[Start import (CreditScoreServiceImport:calculateCreditScore)]	Mar 3, 2014 12:13...	000001
End import (CreditScoreServiceImport:calculateCreditScore)	[End import (CreditScoreServiceImport:calculateCreditScore)]	Mar 3, 2014 12:13...	000001
End invoke (CreditScoreServiceImport:calculateCreditScore)	[End invoke (CreditScoreServiceImport:calculateCreditScore)]	Mar 3, 2014 12:13...	000001
End BPEL process (AccountVerification)	[End BPEL process (AccountVerification)]	Mar 3, 2014 12:13...	000001
Start BPEL process (AccountVerification)	[Start BPEL process (AccountVerification)]	Mar 3, 2014 12:13...	000001

- __ b. Double-click the second **Start import (CreditScoreServiceImport:calculateCreditScore)** to view its property.

Properties

Start import (CreditScoreServiceImport:calculateCreditScore)	
Time:	Mar 3, 2014 12:13:07.417 PST
Thread ID:	0000018c
Contents:	<input checked="" type="radio"/> Translated <input type="radio"/> Raw
Start of the import processing of operation CreditScoreServiceImport:calculateCreditScore in module FoundationModule.	
Data:	<?xml version="1.0" encoding="UTF-8"?><request xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="cr:CreditCheckRequest"><accountNumber>IBM007</accountNumber><companyName>IBM</companyName><creditScore>0</creditScore><dateRequested>2014-03-03-08:00</dateRequested></request>

- __ c. Click the down-arrow button to view the **End import (CreditScoreServiceImport:calculateCreditScore)** entry.

This entry shows that the **creditScore** value is **11** instead of **0**.

The screenshot shows the 'Properties' window for an imported operation. The title bar says 'Properties'. The main area has a yellow circular icon next to the text 'End import (CreditScoreServiceImport:calculateCreditScore)'. Below it are fields for 'Time' (Mar 3, 2014 12:13:07.558 PST), 'Thread ID' (0000018c), and 'Contents' (radio buttons for 'Translated' and 'Raw', with 'Translated' selected). A scrollable text area contains the log message: 'End of the import processing of operation CreditScoreServiceImport:calculateCreditScore in module FoundationModule.' Below this, another scrollable text area labeled 'Data' contains an XML response:

```
<?xml version="1.0" encoding="UTF-8"?><calculateCreditScoreReturn
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:type="cr:CreditCheckRequest">
<accountNumber>IBM007</accountNumber>
<companyName>TRM</companyName>
<creditScore>11</creditScore>
<dateRequested>2014-03-03-08:00</dateRequested>
</calculateCreditScoreReturn>
```

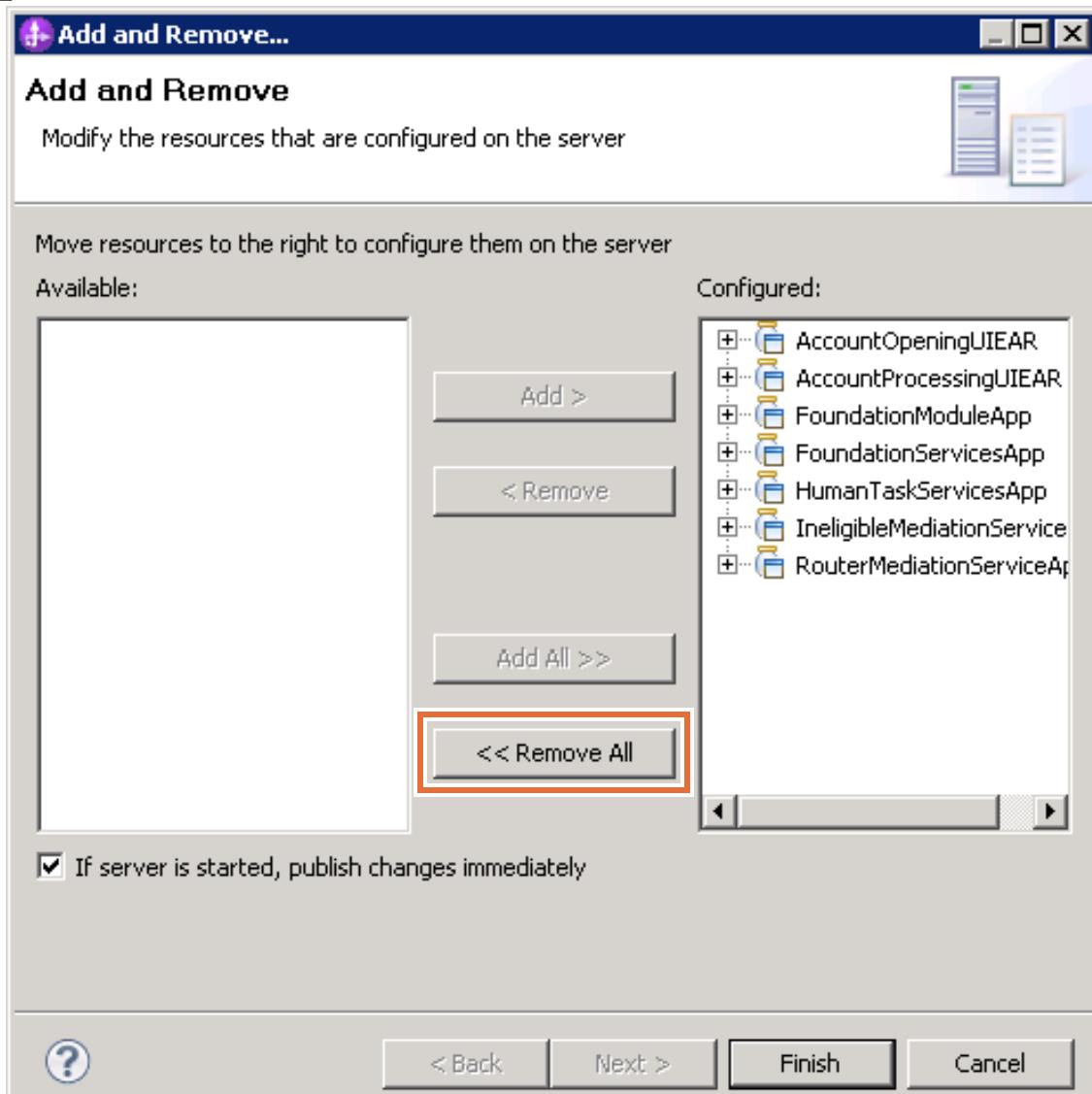
At the bottom left is a question mark icon, and at the bottom right is an 'OK' button.

- ___ d. Click **OK** to close the Properties window.

Part 4: Clean up the environment

- ___ 1. Remove all of the deployed projects from the server.
 - ___ a. In the Servers view, right-click **IBM Process Server v8.5 at localhost**, and click **Add and Remove** from its menu.

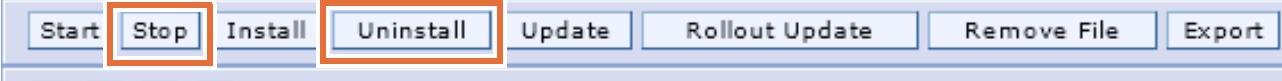
- __ b. Click Remove All.



- __ c. Click Finish.

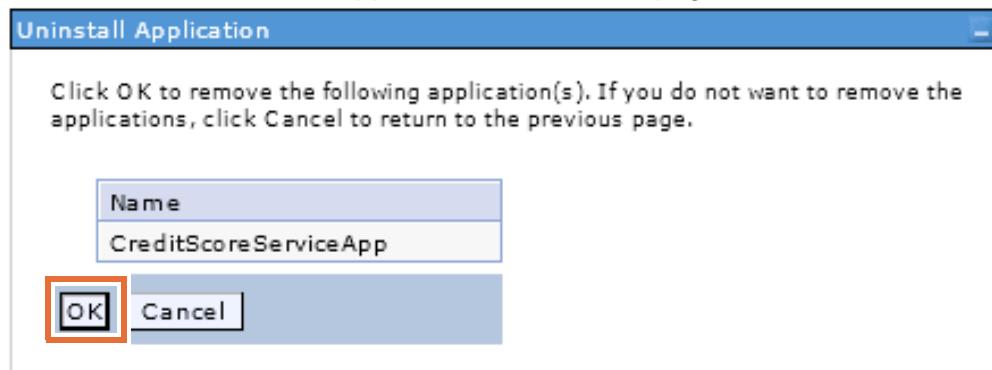
- __ 2. Uninstall the CreditScoreService web service.
- In the administration console, go to **Applications > Application Types > WebSphere enterprise applications**.
 - Select the **CreditScoreServiceApp** check box, and click **Stop**.

- ___ c. When the application is stopped, select the **CreditScoreServiceApp** check box again, and click **Uninstall**.

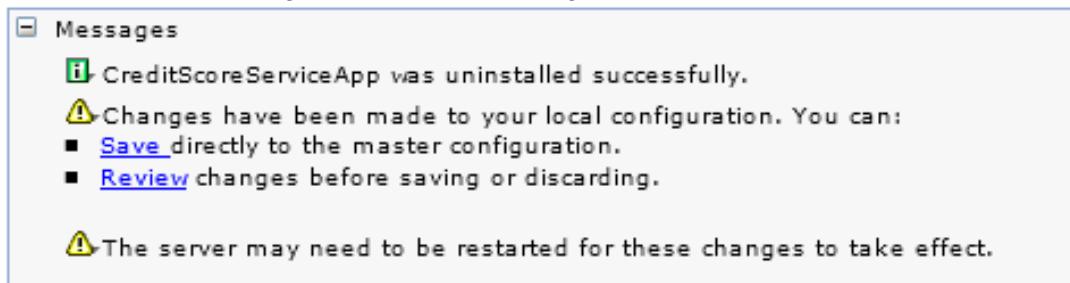


Start	Stop	Install	Uninstall	Update	Rollout Update	Remove File	Export
Select	Name	Application Status					
You can administer the following resources:							
<input type="checkbox"/>	AppScheduler						
<input type="checkbox"/>	BPCExplorer_Node1_server1						
<input type="checkbox"/>	BPEContainer_Node1_server1						
<input type="checkbox"/>	BPMAutomationWidgets_Node1_server1						
<input type="checkbox"/>	BSpaceEAR_Node1_server1						
<input type="checkbox"/>	BSpaceForms_Node1_server1						
<input type="checkbox"/>	BSpaceHelp_Node1_server1						
<input type="checkbox"/>	Business.Rules.Manager_Node1_server1						
<input type="checkbox"/>	BusinessRules_Node1_server1						
<input checked="" type="checkbox"/>	CreditScoreServiceApp						
<input type="checkbox"/>	DefaultApplication						

- ___ d. Click **OK** at the Uninstall Application confirmation page.



- __ e. After the application is successfully uninstalled, you should see a message where you can save the change to the master configuration.



- __ f. Click **Save** to save the configuration.
__ g. Click **Logout** to log out of the administration console.

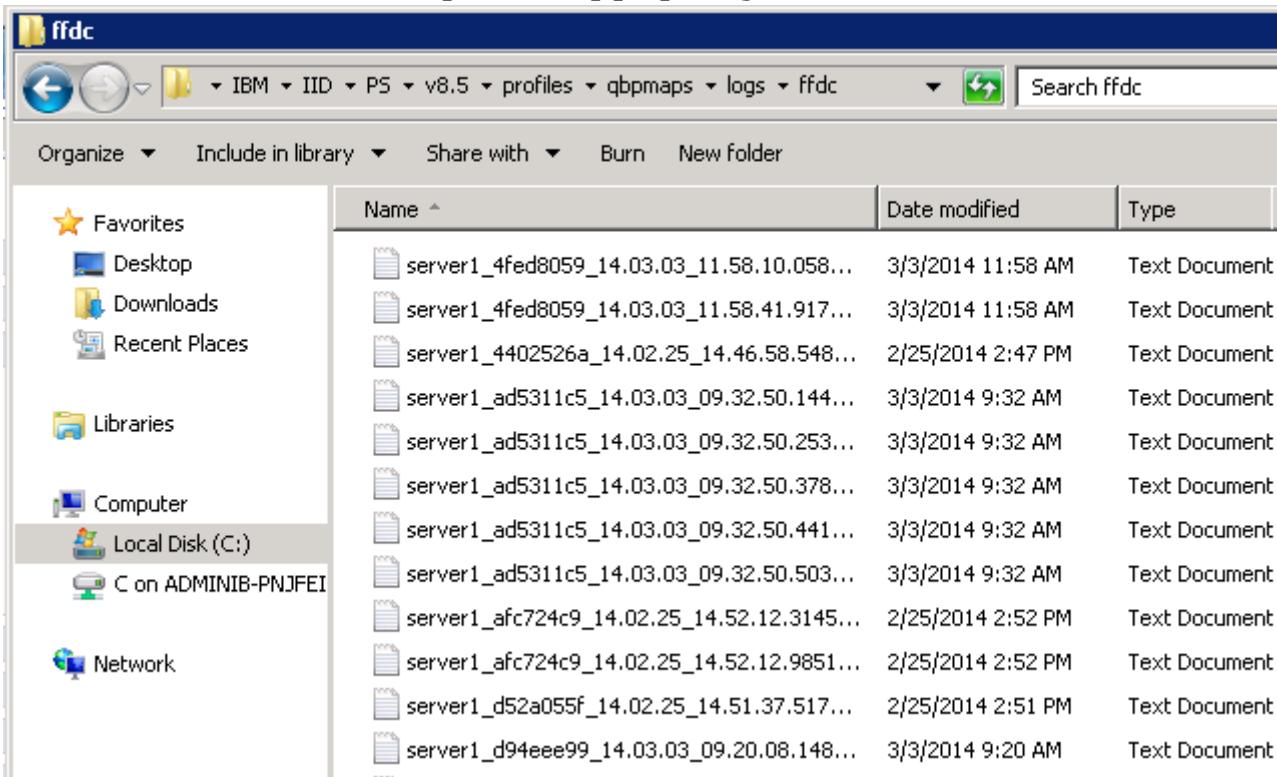
Part 5: Examining FFDC logs

The first-failure data capture (FFDC) log files save information that is generated from a processing failure, such as a Java exception. Captured data is saved in log files for use in analysis. These files include an index file that references all of the exceptions that are logged in FFDC, and an exception file for each exception type from each probe.

These files are deleted after a maximum number of days. FFDC is enabled by default, since capturing FFDC data does not affect performance.

- __ 1. Examine the FFDC logs for ProcessServer.

- __ a. Open Windows Explorer and go to
C:\IBM\IID\PS\v8.5\profiles\qbpmaps\logs\ffdc.



___ b. Typically, you see dozens of files in the `ffdc` directory. These files include:

- `nodeagent.<Thread_ID>.<Timestamp>.<Seq_No>.txt` (several)
- `nodeagent_exception.log`
- `<app_server_name>.<Thread_ID>.<Timestamp>.<Seq_No>.txt` (several)
- `<app_server_name>_exception.log` (one per application server)

The `SystemOut.log` files for the node agent and the application servers contain messages that the **FfdcProvider** writes for each failure incident. These messages point to the relevant text file in the `ffdc` directory, which contains the exception and the stack trace (call stack).

___ 2. Examine a specific FFDC incident.

___ a. Open the `server1_exception.log` file by double-clicking the file.

Index	Count	Time of first occurrence	Time of last occurrence	Exception Sour
0	1	3/3/14 9:20:08:132 PST	3/3/14 9:20:08:132 PST	com.ibm.websphere
1	2	3/3/14 9:32:50:144 PST	3/3/14 9:45:00:284 PST	java.net.Connec
2	2	3/3/14 9:32:50:253 PST	3/3/14 9:45:00:300 PST	java.net.Connec
3	2	3/3/14 9:32:50:378 PST	3/3/14 9:45:00:300 PST	javax.xml.ws.so
4	2	3/3/14 9:32:50:441 PST	3/3/14 9:45:00:300 PST	com.ibm.webspher
5	2	3/3/14 9:32:50:503 PST	3/3/14 9:45:00:362 PST	com.ibm.webspher
6	3	3/3/14 11:47:21:749 PST	3/3/14 13:16:25:288 PST	com.ibm.webspher
7	2	3/3/14 11:47:21:890 PST	3/3/14 11:47:21:999 PST	com.ibm.webspher
8	2	3/3/14 11:47:21:905 PST	3/3/14 11:47:21:999 PST	com.ibm.webspher
9	5	3/3/14 11:47:21:905 PST	3/3/14 11:47:21:984 PST	com.ibm.webspher
10	2	3/3/14 11:47:21:968 PST	3/3/14 11:47:21:999 PST	com.ibm.webspher
11	2	3/3/14 11:47:21:984 PST	3/3/14 11:47:21:999 PST	com.ibm.webspher
12	2	3/3/14 11:47:21:984 PST	3/3/14 11:47:21:999 PST	com.ibm.webspher
13	2	3/3/14 11:47:21:984 PST	3/3/14 11:47:21:999 PST	com.ibm.webspher
14	2	3/3/14 11:58:10:058 PST	3/3/14 11:58:37:652 PST	com.ibm.wsspi.r
15	3	3/3/14 11:58:41:917 PST	3/3/14 12:13:07:323 PST	java.lang.Excep

Each row has an index and a count number. The count is the number of occurrences of the exception and is useful for seeing whether there is an unusual number of any particular exception.

___ b. Select any exception of interest and record its text file name:

___ c. Close the `server1_exception.log` file.

-
- __ d. Open the `ffdc` directory, find the text file that you recorded, and open it. In this file, you see the actual Java exception and the stack trace.



The screenshot shows a Windows Notepad window titled "server1_ad5311c5_14.03.03_09.32.50.2531506083766738537982.txt - Notepad". The window contains a Java stack trace:

```
[3/3/14 9:32:50:253 PST] | FFDC Exception:java.net.ConnectException  
SourceId:com.ibm.ws.websvcs.transport.http.HTTPTransportSender.invoke  
ProbeId:390  
Reporter:com.ibm.ws.websvcs.transport.http.HTTPTransportSender@6fe859fe  
java.net.ConnectException: HTTP ( 404 ) Not Found address :  
http://localhost:9080/CreditScoreServiceWeb/sca/CreditScoreServiceExport  
at  
com.ibm.ws.websvcs.transport.http.SOAPOverHTTPSender.processStatusCode  
(SOAPOverHTTPSender.java:3672)  
at com.ibm.ws.websvcs.transport.http.SOAPOverHTTPSender.send  
(SOAPOverHTTPSender.java:599)  
at com.ibm.ws.websvcs.transport.http.HTTPTransportSender.invoke  
(HTTPTransportSender.java:366)  
at org.apache.axis2.engine.AxisEngine.send(AxisEngine.java:544)  
at org.apache.axis2.description.OutInAxisOperationClient.send  
(OutInAxisOperation.java:406)  
at org.apache.axis2.description.OutInAxisOperationClient.executeImpl  
(OutInAxisOperation.java:229)  
at org.apache.axis2.client.OperationClient.execute  
...
```

- __ e. After you are finished examining the text file, close it.
__ f. Close the web browser and any other open windows.

End of exercise

Exercise review and wrap-up

In this exercise, you learned how to use the cross-component trace to find the service component where the failure first occurred. When there is a long-running business process, the service invocation is always asynchronous. Therefore, the failure gets captured by the Failed Event Manager. After the problem is fixed, the failed events can be resubmitted for completion. You also saw that the business process instances can be monitored by using the Business Process Choreographer Explorer.

The problem in this exercise was simple to detect. However, you can apply the cross-component trace techniques to every SCA application.

Exercise 8. Troubleshooting a long-running business process

What this exercise is about

In this exercise, you troubleshoot a long-running business process. The error is traced with the cross-component trace and Business Process Choreographer Explorer.

What you should be able to do

At the end of this exercise, you should be able to:

- Start the Business Process Choreographer Explorer to examine problems with running business process instances
- Check configuration properties
- Find business process instances that are related to a failed event
- Check the activity log and find business process-related messages to get additional information

Introduction

This exercise demonstrates how a long-running business process interacts with external services. The exercise itself is short and simple. You are going to find the process instance that is associated with a captured failed event.

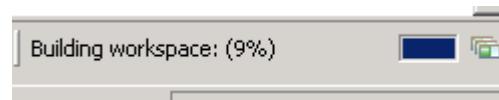
Requirements

Completing the exercises for this course requires a lab environment. This environment includes the exercise support files, IBM Process Designer, IBM Process Portal, IBM Process Center, IBM Process Server, and IBM Integration Designer test environment.

Exercise instructions

Part 1: Set up the environment

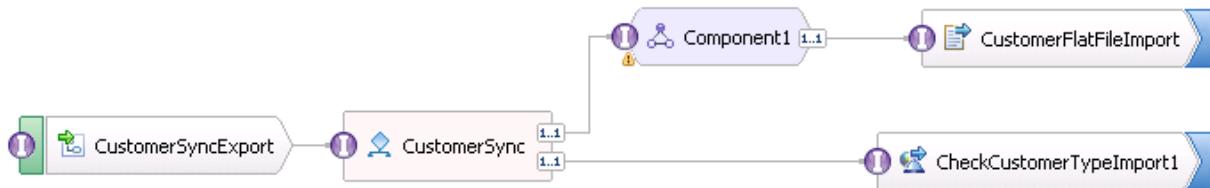
- __ 1. Double-click the **IBM Integration Designer** icon from desktop.
- __ 2. In the workspace launcher, enter `C:\workspaces\ex8` and click **OK**. If IBM Integration Designer is already running, select **File > Switch Workspace > Other**.
- __ 3. If the Process Center Login dialog appears, click **Cancel**.
- __ 4. Close the **Getting Started - IBM Integration Designer** tab.
- __ 5. Import the lab files for this exercise.
 - __ a. Click **File > Import**.
 - __ b. In the Import dialog, scroll down to select **Other > Project Interchange**.
 - __ c. Click **Next**.
 - __ d. Click the **Browse** button for the **From zip file** field to open `C:\labfiles\ex8\ex8_start.zip`.
 - __ e. Click **Open**.
 - __ f. Verify that you selected all entries.
 - __ g. Click **Finish**. Wait until the `Building workspaces` message in the lower right corner is 100% complete.



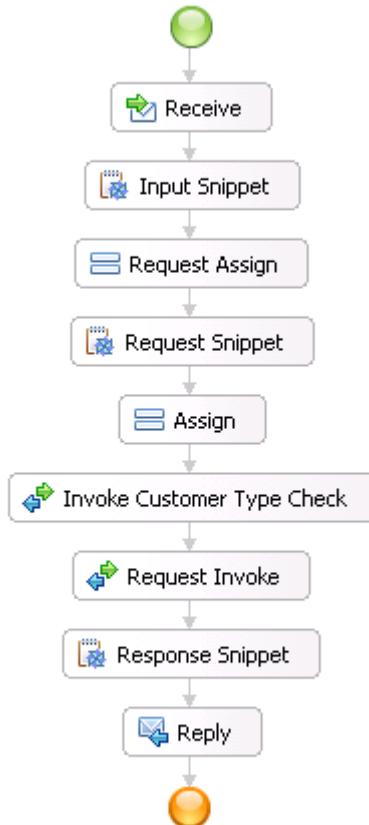
Part 2: Understand the asynchronous communication in a long-running business process

This simple scenario demonstrates a case where a long-running business process invokes a slow target. Often times, the performance drawback can be the slow target. In other words, the external service, which your application invokes, takes a long time to process the request and respond. You explore what behavior you see when your long-running business process is dealing with a slow target.

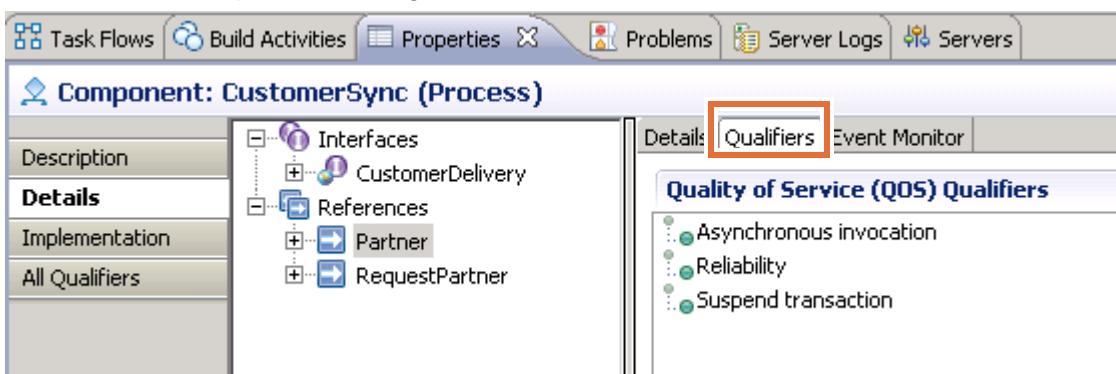
- __ 1. Review the contents of the imported projects.
 - __ a. In the Business Integration view, expand **CustomerSync_Module** and double-click **Assembly Diagram**.



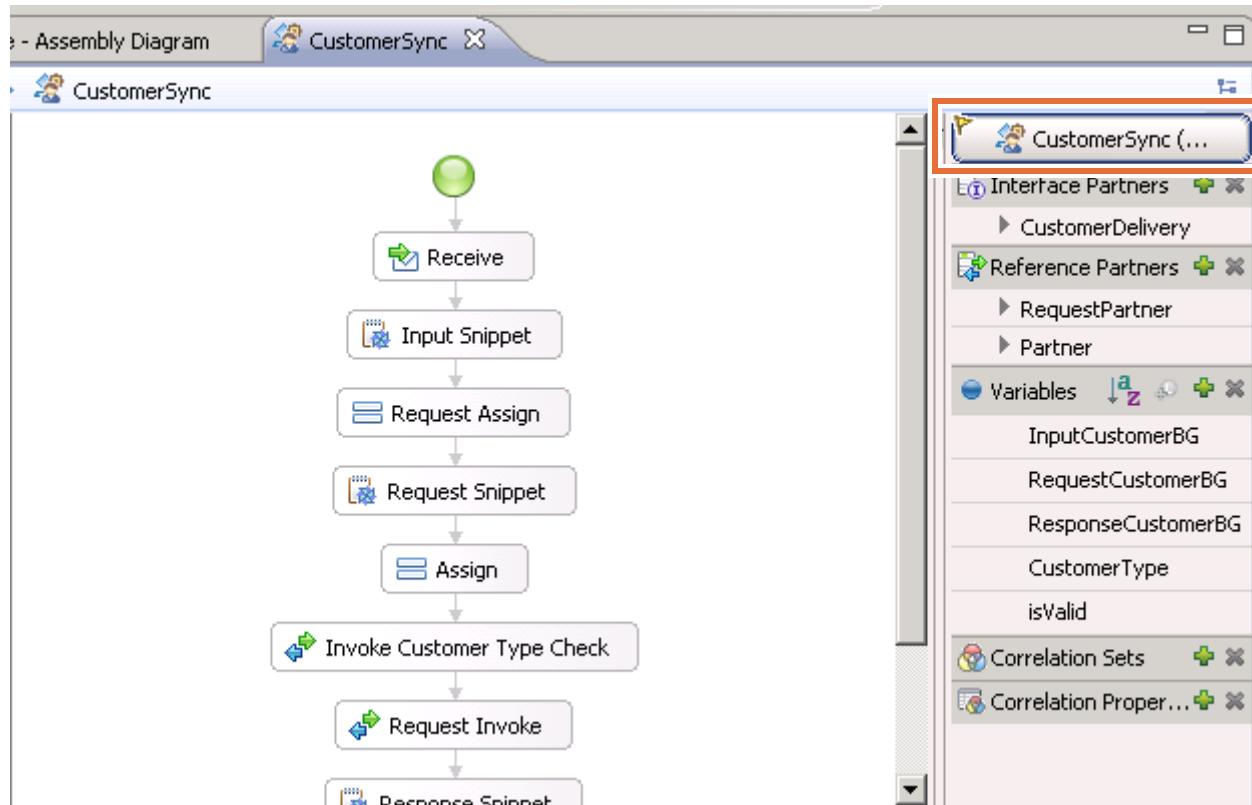
- ___ b. CustomerSync is a long-running business process, which invokes external services through the FlatFileImport and CheckCustomerTypeImport1 imports. Since CustomerSync is a long-running process, it invokes the external service asynchronously by its nature.
- ___ c. Double-click the **CustomerSync** business process component to open its implementation. The business flow is kept to a minimum for demonstration purposes.



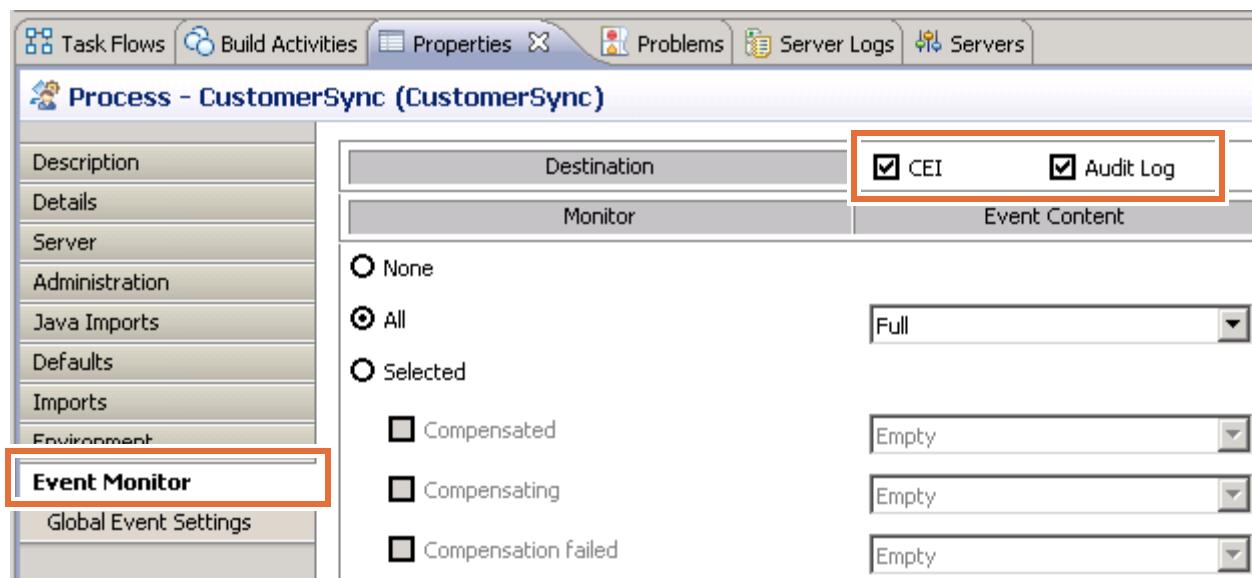
- ___ d. Return to the CustomerSync_Module assembly diagram, right-click **CustomerSync**, and select **Show in > Properties View**.
- ___ e. In the Properties view, select the **Details** tab.
- ___ f. Select **Partner** under References, and click the **Qualifiers** tab on the right pane. Examine the qualifier settings.



2. Enabling the audit logging allows users to examine the CustomerSync business process properties for additional information.
- a. Click the **CustomerSync** icon on the upper right, and view its properties.



- b. In the Properties view, scroll down to click the **Event Monitor** tab, and verify that the check boxes for **CEI** and **Audit Log** are selected.



**Note**

Although the check boxes for **CEI** and **Audit Log** are both selected in this exercise, it is not a good practice in the production environment. From a performance point of view, the audit log has significantly less impact on runtime performance.

- ___ 3. If the server is not running already, start the server.
 - ___ a. In the Servers tab, right-click **IBM Process Server v8.5 at localhost** and select **Start** from the menu.
 - ___ b. Wait until the server status changes to **Started**. It takes a few minutes to start.
- ___ 4. In the administrative console, enable the Business Flow Manager's audit logging.
 - ___ a. Start the browser and enter the following address if it is not already opened:
`https://localhost:9043/ibm/console`
 - ___ b. In the Untrusted Connection window, click **I Understand the Risks** to expand the option.
 - ___ c. Click **Add Exception**.
 - ___ d. Click **Confirm Security Exception**. The administrative console login page is now visible.
 - ___ e. Enter `bpmadmin` in the **user ID** field and `websphere` in the **Password** field, and click **Log in**.
 - ___ f. Select **Servers > Server Types > WebSphere application servers** from the left pane.
 - ___ g. Click the **server1** link to open its properties.
 - ___ h. In the **Business Process Manager** section, expand **Business Process Choreographer** and select the **Business Flow Manager** link.

Business Process Manager

- [Business Space rest services endpoint registration](#)
- [REST services](#)
- [Business Process Choreographer](#)
 - [Business Process Choreographer Containers](#)
 - **[Business Flow Manager](#)**
 - [Human Task Manager](#)
 - [Business Process Choreographer Explorer](#)
 - [WebSphere Business Integration Adapter Service](#)

- ___ i. Click the **Runtime** tab.

- __ j. Select the check box for **Enable audit logging**.

[Application servers](#) > [server1](#) > [Business Flow Manager](#) > Runtime Configuration

Replay failed messages that are in the hold and retention queues.

The screenshot shows the 'Runtime Configuration' screen for 'server1' under 'Business Flow Manager'. The 'Configuration' tab is active. In the 'General Properties' section, there are two text input fields: 'Hold queue messages' containing '0' and 'Retention queue messages' containing '0'. Below these, there is a large text area labeled 'Message exceptions' which is currently empty. In the 'State Observers' section, there are three checkboxes: 'Enable Common Event Infrastructure logging' (unchecked), 'Enable audit logging' (checked and highlighted with a red border), and 'Save runtime changes to configuration as well' (unchecked).

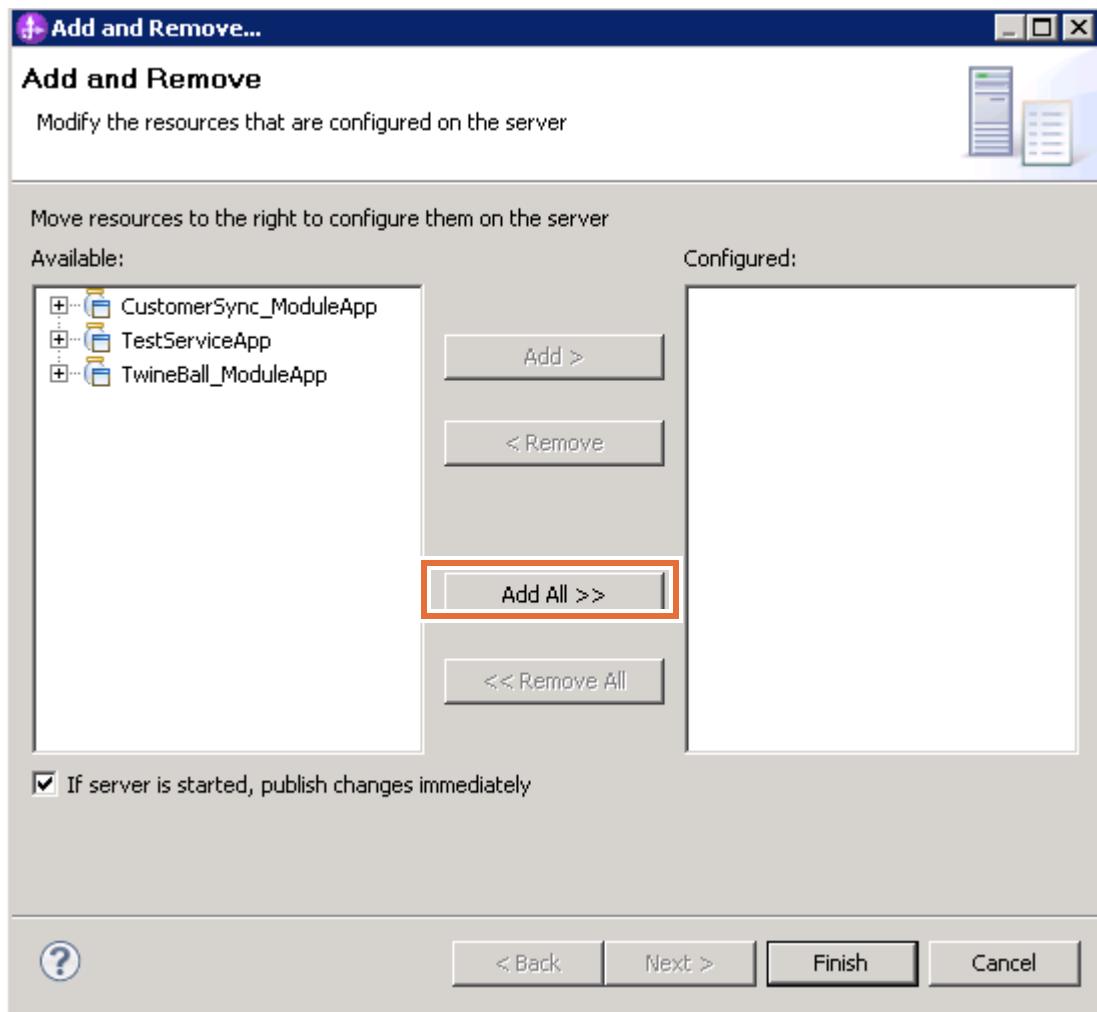


Warning

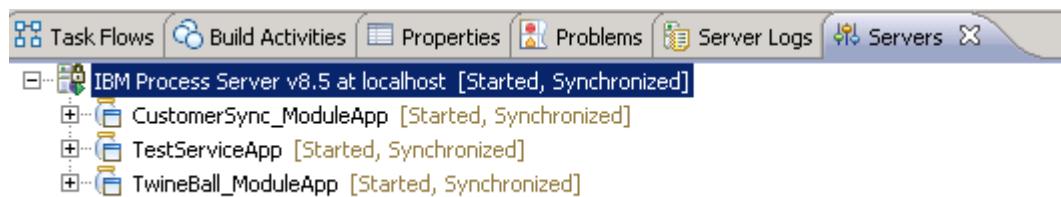
Do not select the check box for **Enable Common Event Infrastructure logging**, or you might have unexpected test results. Your class image did not install with Common Event Infrastructure.

- __ k. Click **Apply**.
- __ 5. Deploy and run the imported application to test it.
- __ a. Return to IBM Integration Designer.
- __ b. In the **Servers** tab, right-click **IBM Process Server v8.5 at localhost** and select **Add and Remove**.

- ___ c. In the Add and Remove window, click **Add All**.



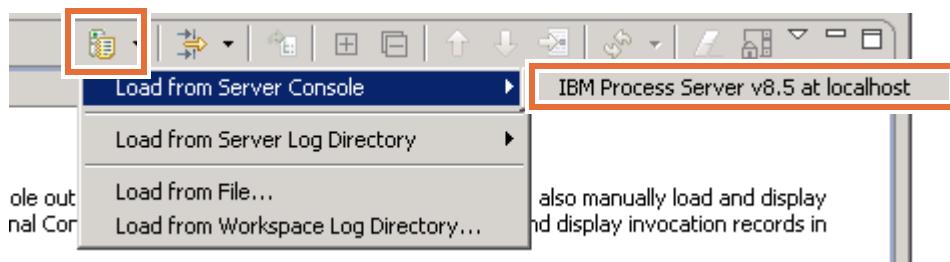
- ___ d. Click **Finish**. Wait until all three applications – **CustomerSync_ModuleApp**, **TestServiceApp**, and **TwineBall_ModuleApp** – are started and synchronized.



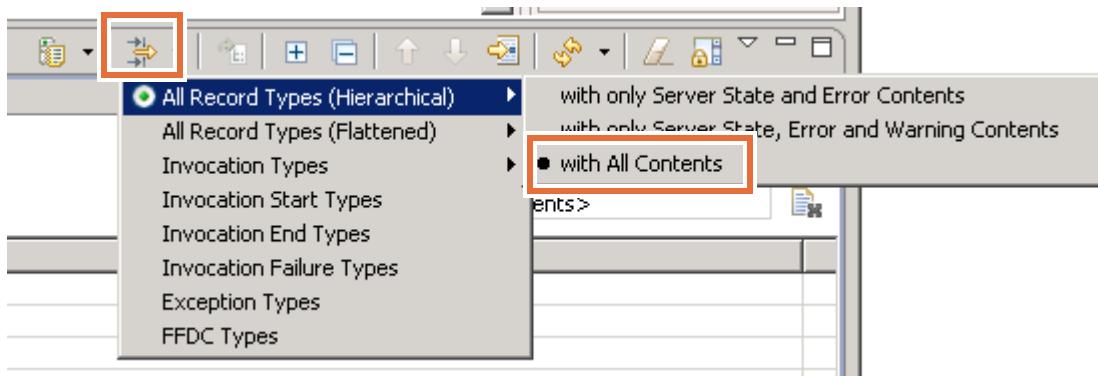
Note

If any of the applications did not start, right-click the application and select **Restart**. Click **Yes** to republish the application.

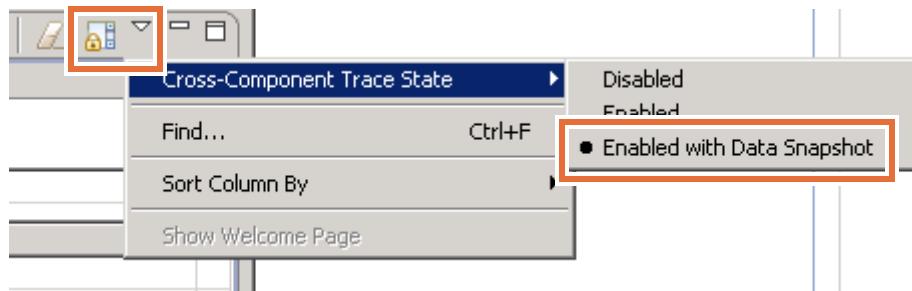
- ___ 6. Test the end-to-end solution with the test component.
- ___ a. In the Server Logs view, click the **Load Server Console or Log** icon, and then select **Load from Server Console > IBM Process Server v8.5 at localhost** to display its entire contents.



- ___ b. In the Server Logs view, click the **Select Records to Display** icon, and then select **All Record Types (Hierarchical) > with All Contents** to display its entire contents.

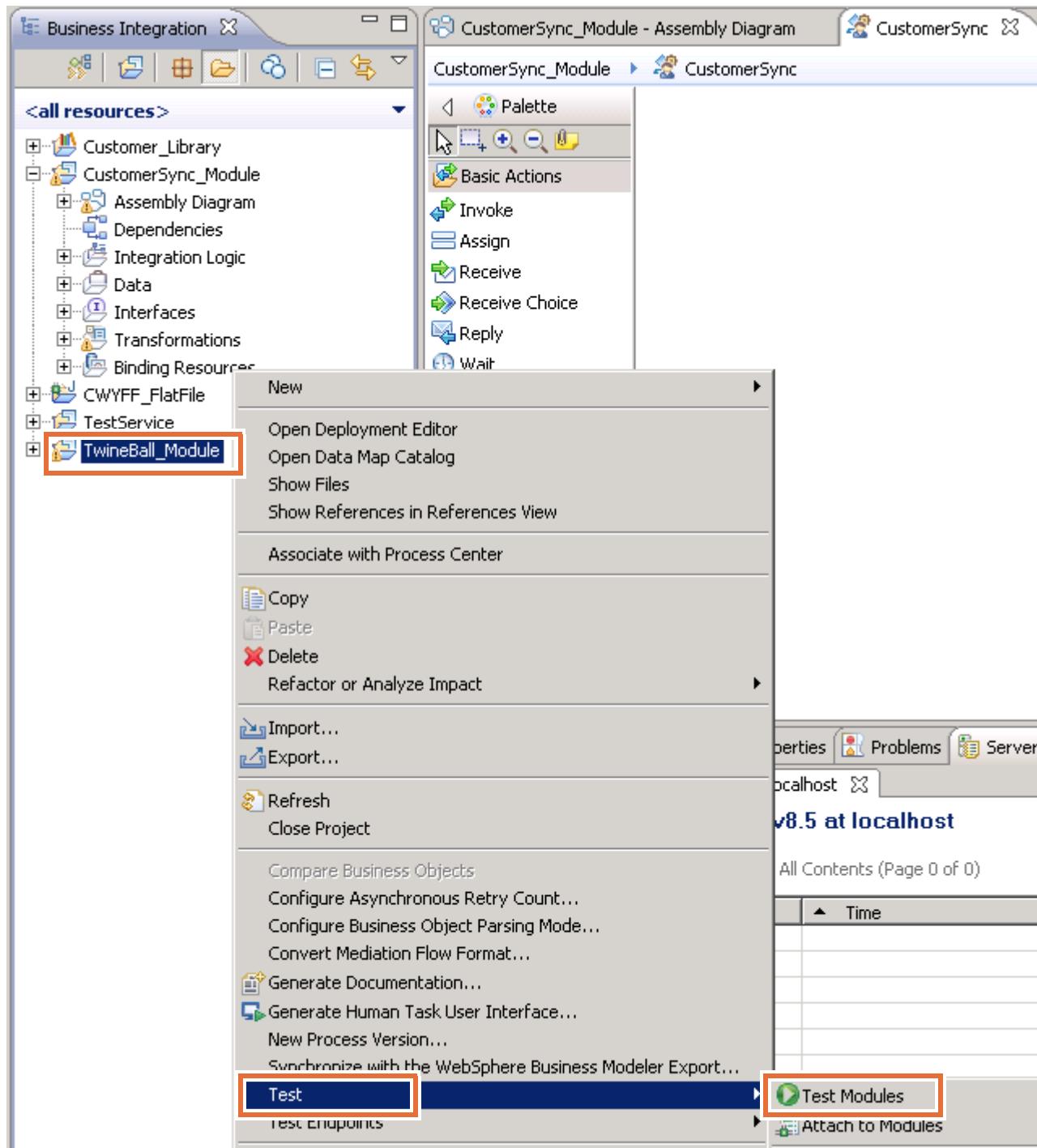


- ___ c. To enable the **cross-component trace** settings, click the **View menu** arrow at the upper right of the Server Logs toolbar, and select the **Cross-Component Trace State > Enabled with Data Snapshot** option.



- ___ d. Click the **Clear server console** icon.

- ___ e. In the Business Integration view, right-click **TwineBall_Module**, and select **Test > Test Module**.



- ___ f. In the **Initial request parameters** fields, enter some test data to send. Since you are testing, you can enter some random data to populate each field.

- **primaryKey:** 123
- **FirstName:** John
- **LastName:** Doe

▶ Initial request parameters:

Value editor XML editor

Name	Type	Value
TwineBallCustomerRequest	TwineBallCustomerBG	[ab]
verb	verb<string>	[ab] Create
TwineBallCustomer	TwineBallCustomer	[ab]
primaryKey *	primaryKey<string>	[ab] 123
FirstName	FirstName<string>	[ab] John
LastName	LastName<string>	[ab] Doe
CustomerType	CustomerType<string>	[ab]
Title	Title<string>	[ab]
Sex	Sex<string>	[ab]

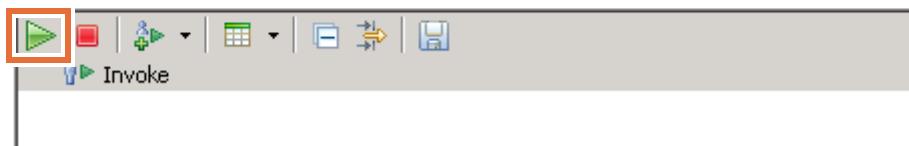
(i) To edit values, start typing or press F2.

- ___ g. Click **Continue** to run the test.

Integration Test Client: TwineBall_Module_Test

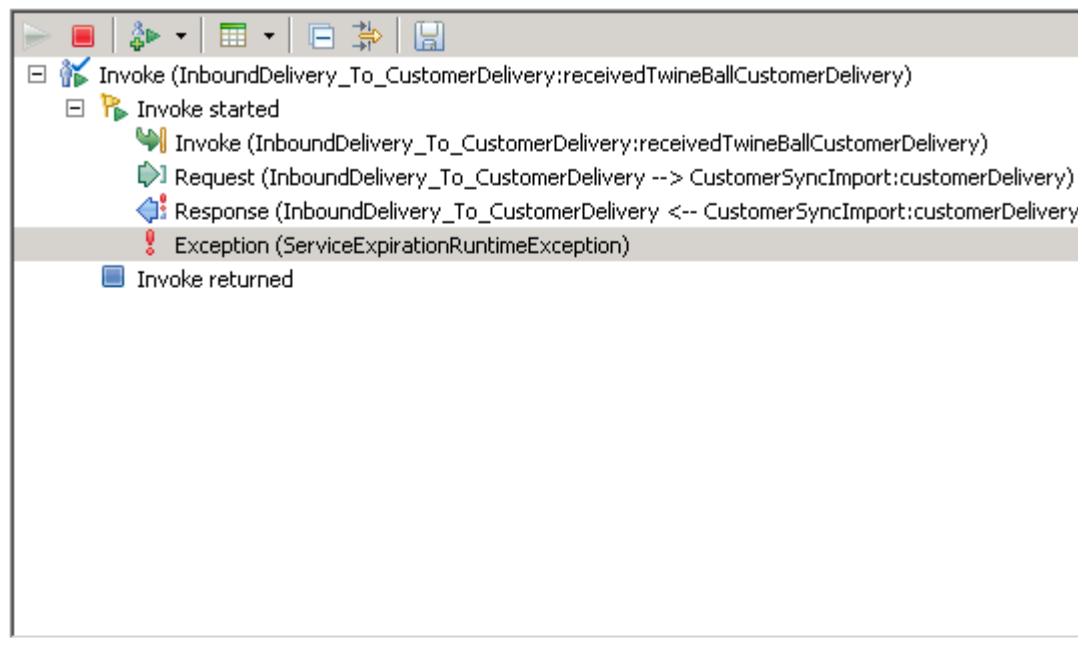
Events

This area displays the events in a test trace. Select an event to display its properties in the General Properties and Detailed Properties sections. [More...](#)



- ___ h. If you see the Deployment Location window, click **Finish**.
 ___ i. If the User Login window appears, click **OK**.

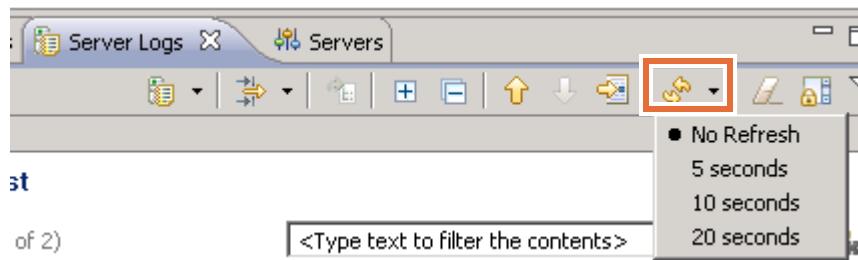
- __ j. It takes few minutes for the test to complete. This test results in ServiceRuntimeException. Right-click the **Exception** and select **Show in Server Logs View**; this action takes you to the entry in the Server Logs view.



Type	Time
FFDC	Apr 28, 2014 14:51:05.943 PDT
Fail invoke (com/wbi/map/InboundDelivery_Tl)	Apr 28, 2014 14:51:05.943 PDT
Log message	Apr 28, 2014 14:51:06.021 PDT
Log message	Apr 28, 2014 14:49:13.833 PDT
Log message	Apr 28, 2014 14:49:13.974 PDT
Invocation sequence (TestComponent:checkCus)	Apr 28, 2014 14:49:14.224 PDT

This action highlights the corresponding log message in the Server Logs view.

- __ k. Select the **No Refresh** icon to stop refreshing the server log view.



- ___ 7. In the administration console, examine the failed event manager.
- ___ a. Return to administration console and expand **Servers**.
 - ___ b. Select **Deployment Environment**.
 - ___ c. Click **ProcessServer**.
 - ___ d. Under Additional Properties, select **Failed Event Manager**.
 - ___ e. Select **Get all failed events** under the Failed events on this server section.
 - ___ f. Select the **failed event** link and view its details.

Select	Event ID	Event type	Module	Component
<input type="checkbox"/>	PI:90030145.aa5..	BPC	CustomerSync_Mod..	CustomerSync

Total 1

- ___ g. Click the **Open calling process in Business Process Choreographer Explorer** link.

Failed event details

View business data Resubmit Delete

[Open calling process in Business Process Choreographer Explorer](#)

Failed event common properties

Event ID
PI:90030145.aa501b0c.91afef53.820043

Event type
BPC

- ___ h. In the Untrusted Connection window, click **I Understand the Risks** to expand the option.
- ___ i. Click **Add Exception**.
- ___ j. Click **Confirm Security Exception**. It opens the browser with Business Process Choreographer Explorer.
- ___ k. Enter the login information:
 - **User Name:** bpmadmin
 - **Password:** web1sphere
- ___ l. The detail of the associated business process opens with an instance of the **CustomerSync** process template.

__ m. Select the **Activities** tab.

Process Instance

Use this page to view information about a process instance and, optionally, to work on the process instance. 

[Delete](#) [Restart](#) [Work Items](#) [View Process State](#) [Tasks](#) [Activities](#) [Activity Variables](#) [Skip](#)

You see that the **InvokeCustomerTypeCheck** activity failed its execution.

Activity Instances

Use this page to work with activities. 

[Restart](#) [Force Complete](#) [Reschedule](#) [View Process State](#) [Refresh](#)

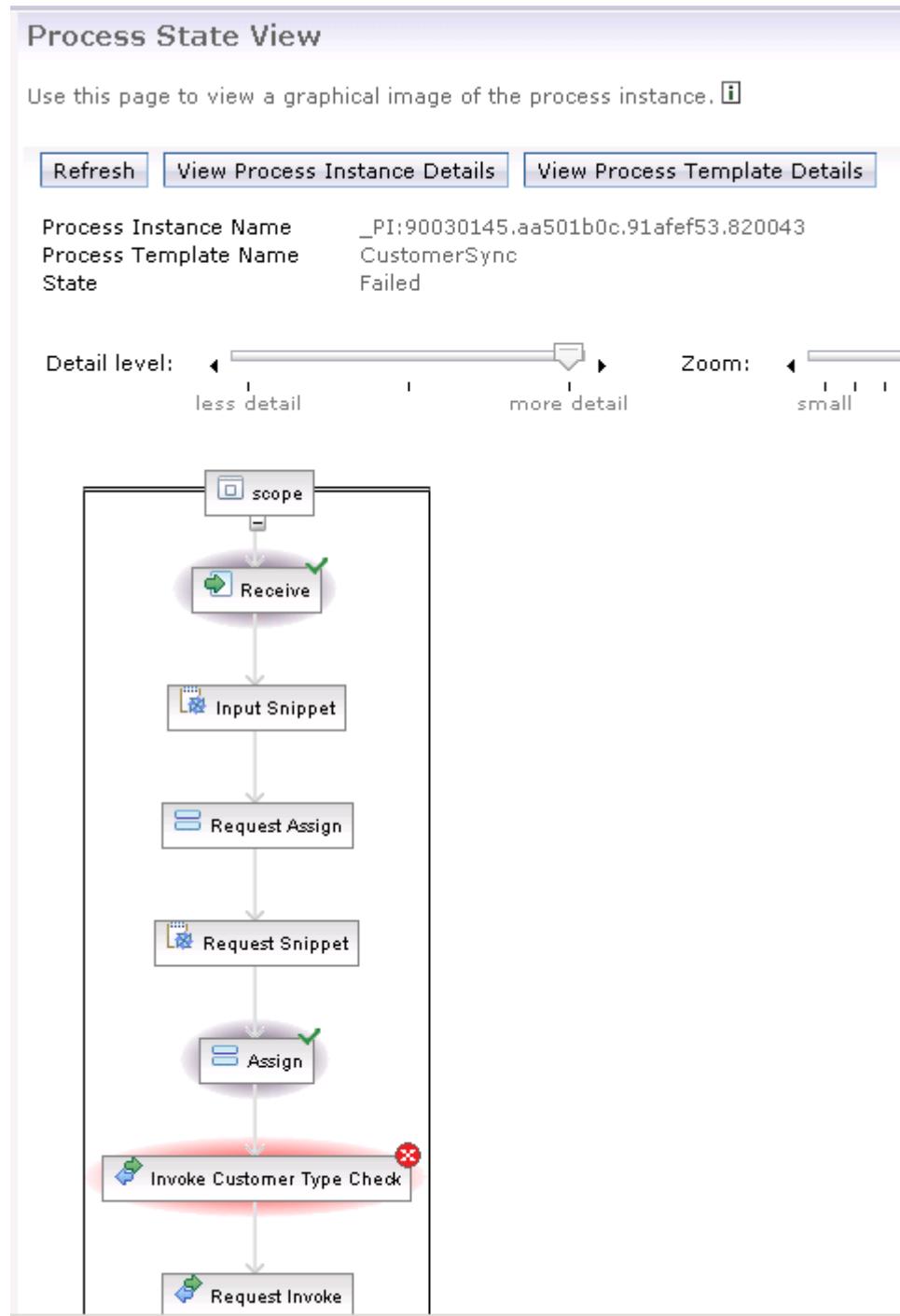
<input type="checkbox"/> Activity Name	State	Skip requested
InvokeCustomerTypeCheck	Failed	no
Assign	finished	no
Receive	Finished	no

Items found: 3 Items selected: 0

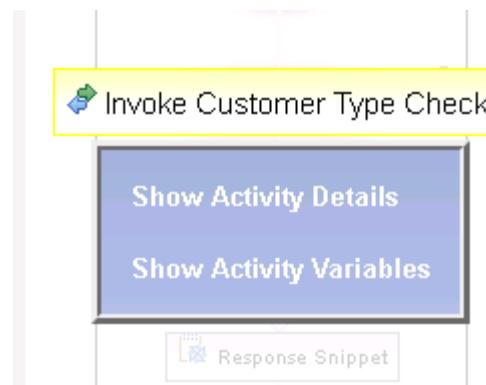
Page 1 of 1

__ n. Click the check box next to **InvokeCustomerTypeCheck**.

- __ o. Click View Process State. The failed Invoke Customer Type Check activity is highlighted in red.



- __ p. Click the **Invoke Customer Type Check** activity. The Show Activity Details and Show Activity Variables options appear.



- __ q. Click **Show Activity Details**.
__ r. Click the **Error Details** tab to display the runtime error message.

Details	Activity Input Message	Activity Output Message	Tasks	Custom Properties	Error Details
Activity Instance ID	_AI:90040145.aa502e07.91afef53.820070				
Activated	4/28/2014 2:49:12 PM PDT				
Completed	4/28/2014 2:51:09 PM PDT				
Expires on					
Owner					
Process Instance Name	_PI:90030145.aa501b0c.91afef53.820043				
Process Template Name	CustomerSync				
Continue on Error	yes				
Skip requested	no				

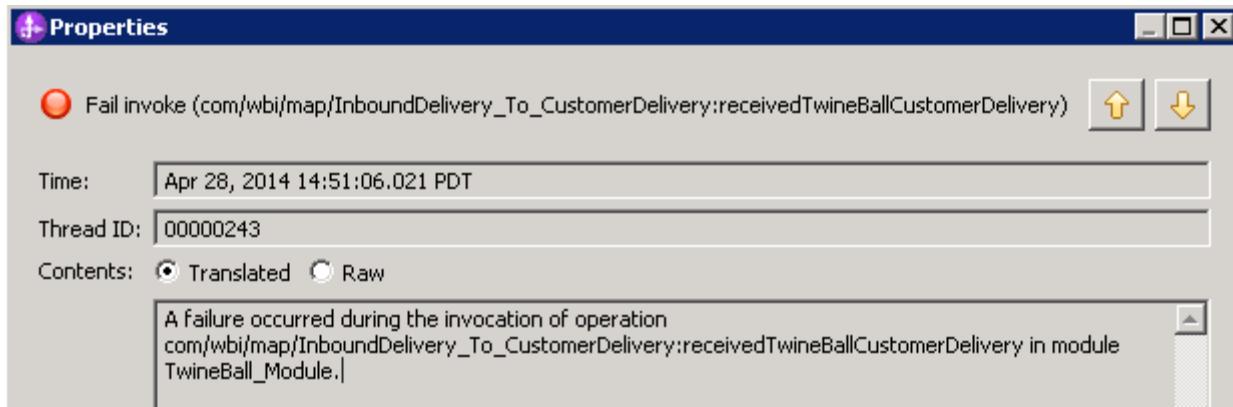
CWWBE0003E: A runtime fault was returned by the implementation of activity 'InvokeCustomerTypeCheck'.

Details	Activity Input Message	Activity Output Message	Tasks	Custom Properties	Error Details
					CWWBE0003E: A runtime fault was returned by the implementation of activity 'InvokeCustomerTypeCheck'. ----- com.ibm.websphere.sca.ServiceRuntimeException - <soapenv:Body xmlns:soapenv="http://schemas.xmlsoap.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"><soapenv:Fault><faultcode>soap</faultcode><faultstring>com.ibm.websphere.sca.ServiceExpirationRuntimeException: A response does not arrive within the des<detail encodingStyle="">/></soapenv:Fault></soapenv:Body>

- __ 8. Analyze the cross-component trace in the Server Logs view.
- __ a. Return to the **IBM Integration Designer** workspace, and view the cross-component trace in the Server Logs view.
__ b. If the focus is lost, right-click **Exception** in Events, and select **Show in Server Logs View** again.

- ___ c. In the Server Logs view, double-click the highlighted entry to view its properties. The message says:

A failure occurred during the invocation of operation com/wbi/map/InboundDelivery_To_CustomerDelivery:receivedTwineBallCustomerDelivery in module TwineBall_Module.



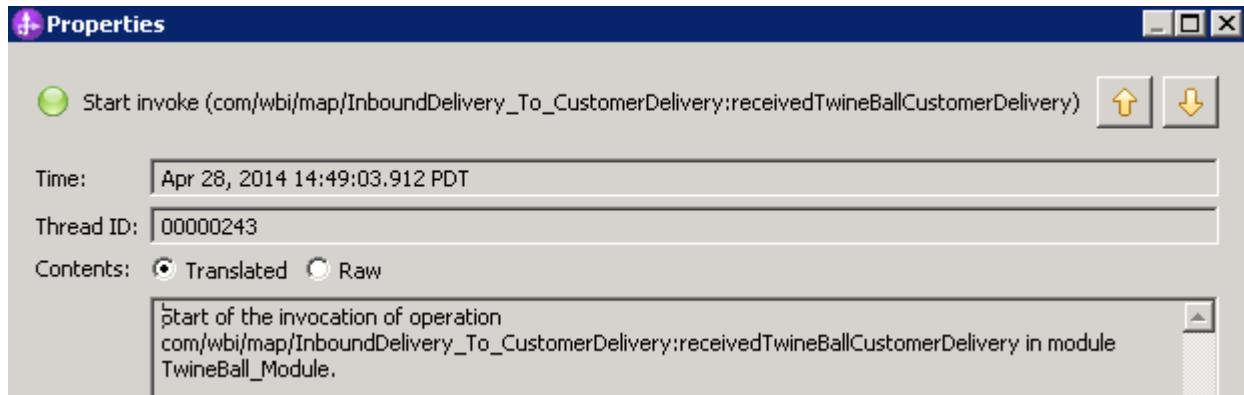
- ___ d. Close the Properties window.
 ___ e. Look for the **Start Invoke** in the cross-component trace log. You need to scroll up to find this log.

Start of the invocation of operation com/wbi/map/InboundDelivery_To_CustomerDelivery:receivedTwineBallCustomerDelivery in module TwineBall_Module

The screenshot shows the 'Server Logs' tab in the IBM Process Server interface. The title bar includes 'Task Flows', 'Build Activities', 'Properties', 'Problems', 'Server Logs', and 'Servers'. The main area is titled 'Console: IBM Process Server v8.5 at localhost'. The log table has columns for 'Type' and 'Time'. One entry is highlighted with a red box:

Type	Time
Log message	May 6, 2014 19:13:30.517 PDT
Invocation sequence (com/wbi/map/InboundDelivery_To_CustomerDelivery:receivedTwineBallCustomerDelivery in module TwineBall_Module)	May 6, 2014 19:13:32.220 PDT
Start invoke (com/wbi/map/InboundDelivery_To_CustomerDelivery:receivedTwineBallCustomerDelivery in module TwineBall_Module)	May 6, 2014 19:13:32.220 PDT
Start component (com/wbi/map/InboundDelivery_To_CustomerDelivery:receivedTwineBallCustomerDelivery in module TwineBall_Module)	May 6, 2014 19:13:32.235 PDT
Start invoke (CustomerSyncImport:customerDelivery)	May 6, 2014 19:13:33.548 PDT
Start import (CustomerSyncImport:customerDelivery)	May 6, 2014 19:13:33.579 PDT
Log message	May 6, 2014 19:13:34.282 PDT
Log message	May 6, 2014 19:13:34.688 PDT
Start component (CustomerSync:customerDelivery)	May 6, 2014 19:13:35.345 PDT
Log message	May 6, 2014 19:13:36.579 PDT

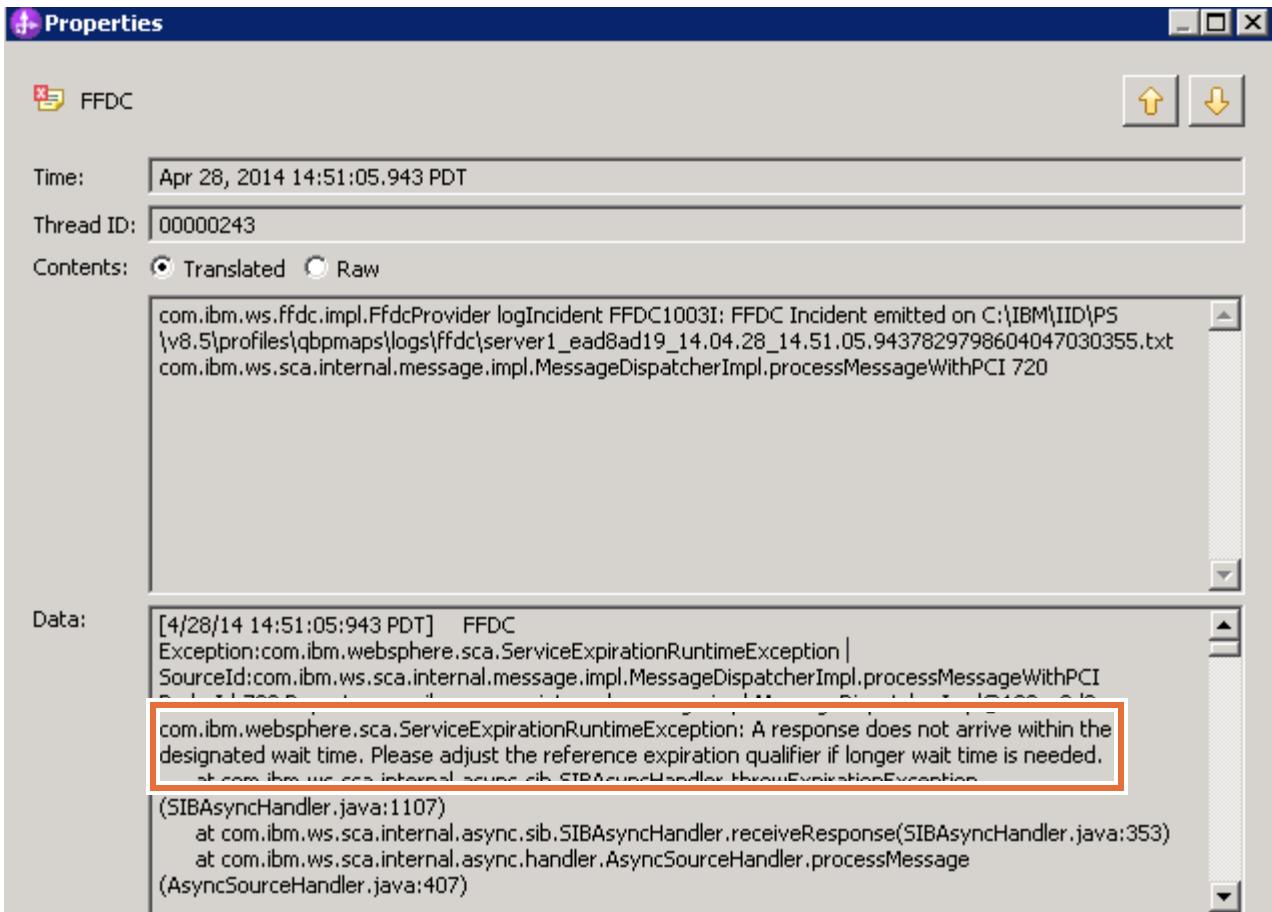
- ___ f. Double-click the **Start invoke** message to view the details.



This message states that the InboundDelivery_To_CustomerDelivery component in TwineBall_Module was invoked successfully.

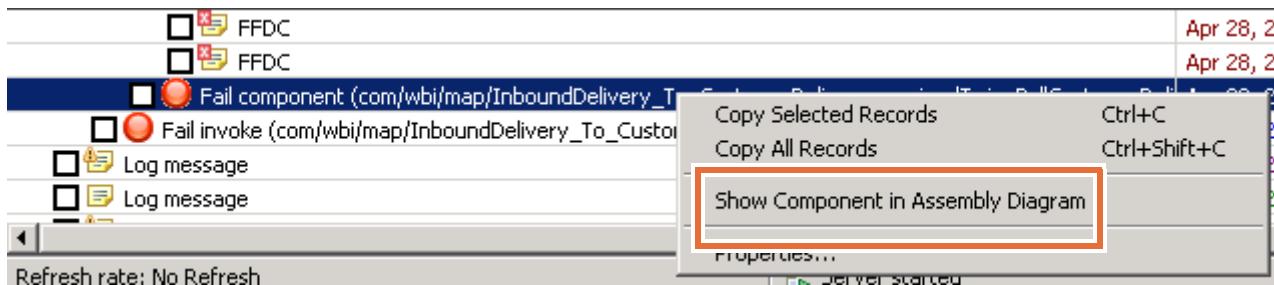
- ___ g. Close the Properties window.
 ___ h. Look for the FFDC log right above the **Fail component** error. The runtime exception states the following message:

A response does not arrive within the designated wait time. Please adjust the reference expiration qualifier if longer wait time is needed.

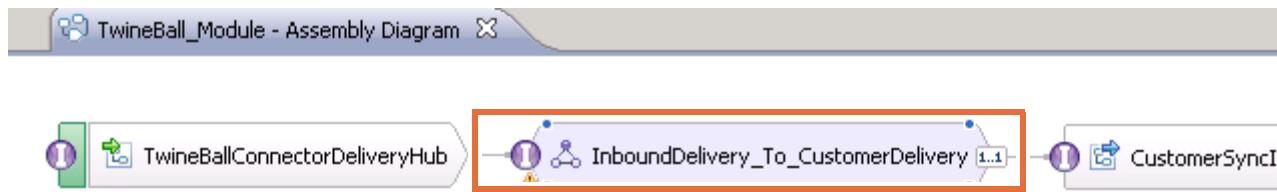


- ___ i. Close the Properties window.

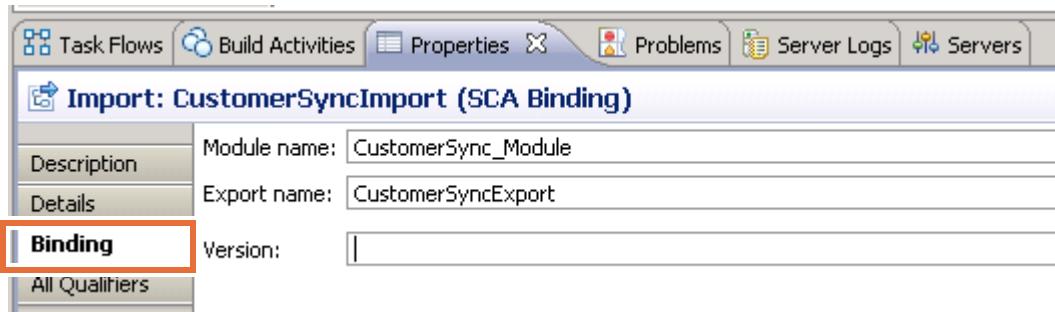
- ___ 9. Examine the assembly diagram to better understand the flow.
- ___ a. Right-click the **Fail component** after the FFDC log, and select **Show Component in Assembly Diagram**.



- ___ b. It brings up **InboundDelivery_To_CustomerDelivery**, which is an interface mapping component.

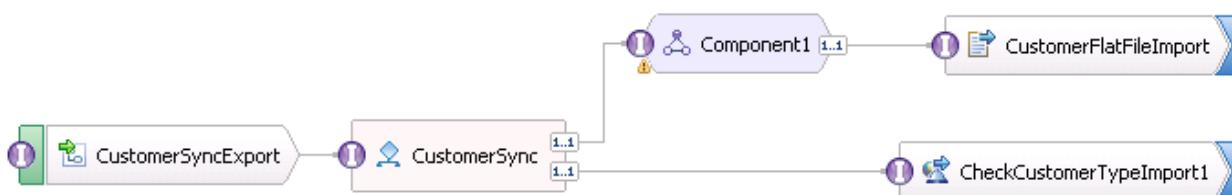


- ___ c. Remember that the FFDC log stated that this component did not receive the response within a designated wait time. It means that the downstream component, the CustomerSyncImport import component, did not return the response back in time.
- ___ d. Right-click **CustomerSyncImport** and select **Show In > Properties View**.
- ___ e. In the Properties view, click the **Binding** tab.



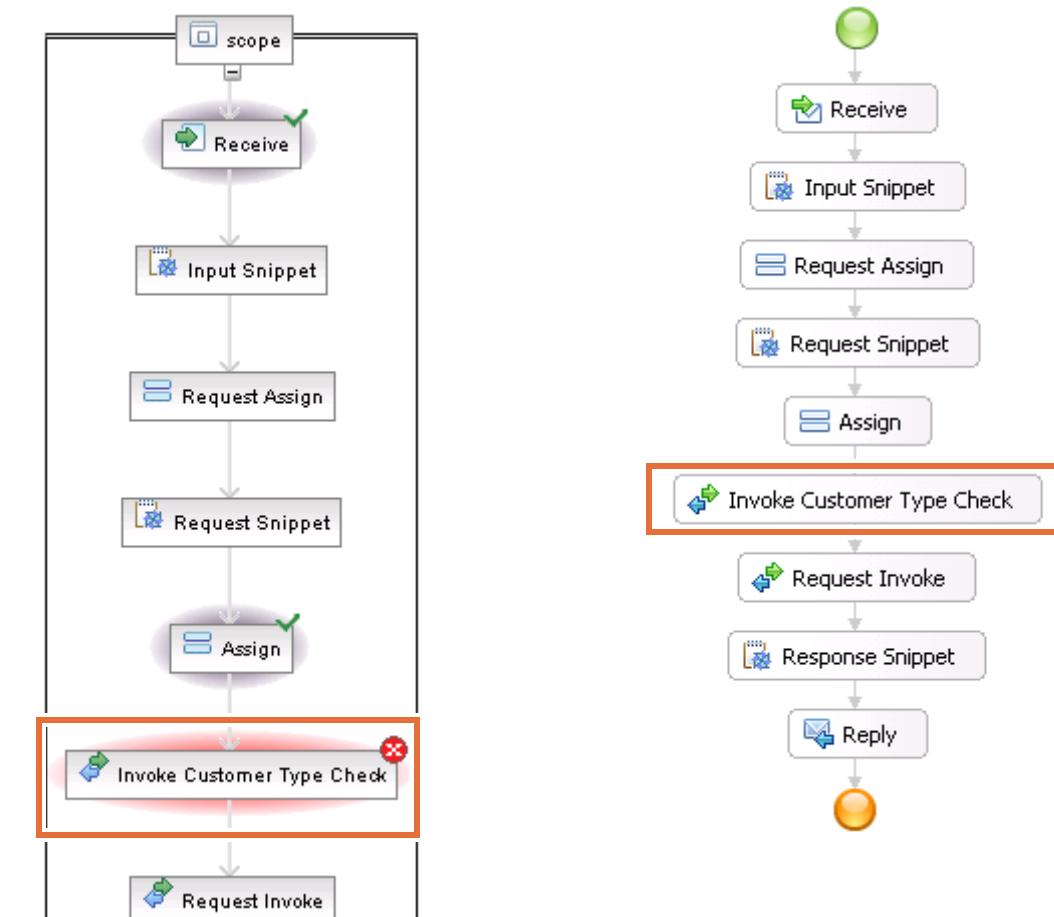
This import component invokes **CustomerSyncExport** in the CustomerSync_Module.

- ___ 10. Examine the CustomerSync_Module.
- ___ a. In the Business Integration view, return to **CustomerSync_Module - Assembly Diagram**.



The target of the **CustomerSyncExport** is a business process component, CustomerSync.

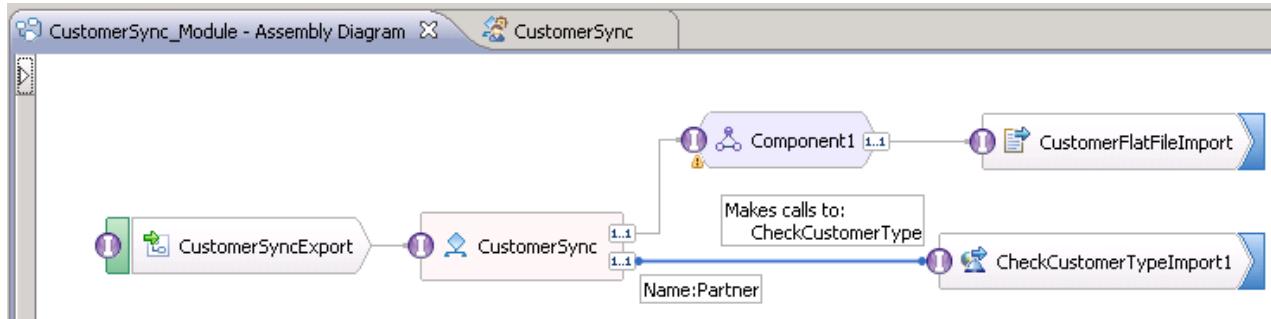
- ___ b. Double-click the **CustomerSync** component to open it in a business process editor. Remember in the previous step, the Business Process Choreographer Explorer displayed that the failure occurred during the invocation of the **Invoke Customer Type Check** activity.



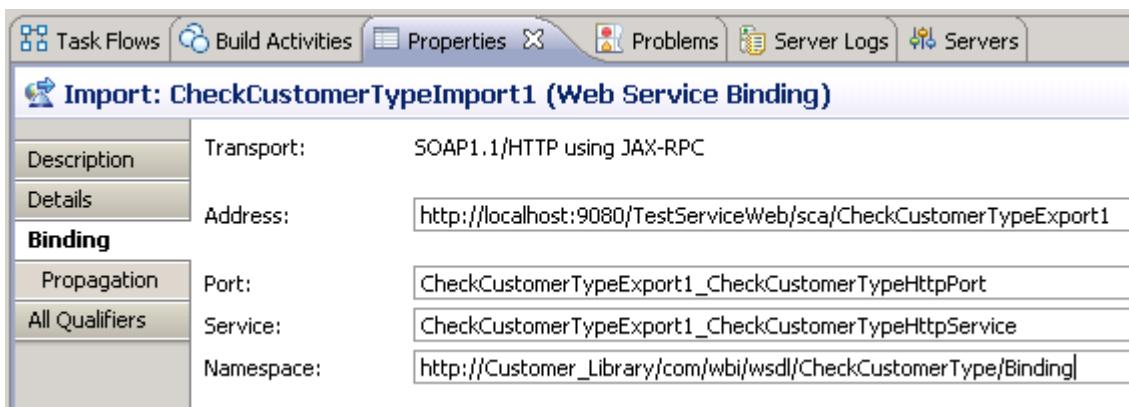
- ___ c. Select the **Invoke Customer Type Check** invoke activity to check its properties in the Properties view.
- ___ d. Click the **Details** tab.

Invoke - Invoke Customer Type Check (InvokeCustomerTypeCheck)													
Description	Partner:* partner												
Details	Interface:/* CheckCustomerType												
Server	Operation:/* checkCustomerType												
Administration	<input checked="" type="checkbox"/> Use data type variables mapping												
Exit Condition													
Compensation													
Correlation													
	<table border="1"> <thead> <tr> <th></th> <th>Name</th> <th>Type</th> <th>Read from Variable</th> </tr> </thead> <tbody> <tr> <td>Inputs</td> <td>inputCustomerType</td> <td>string</td> <td>CustomerType</td> </tr> <tr> <td></td> <td>Name</td> <td>Type</td> <td>Store into Variable</td> </tr> </tbody> </table>		Name	Type	Read from Variable	Inputs	inputCustomerType	string	CustomerType		Name	Type	Store into Variable
	Name	Type	Read from Variable										
Inputs	inputCustomerType	string	CustomerType										
	Name	Type	Store into Variable										

- __ e. This invoke activity invokes a service that is provided from the Partner with **CheckCustomerType** interface.
- __ f. Return to the CustomerSync_Module assembly diagram, and select the **CustomerSync** component. By moving the cursor over to the references, you can see which downstream component represents the Partner reference.



- __ g. Select **CheckCustomerTypeImport1** and examine its properties.
- __ h. Click the **Binding** tab to see its binding information.

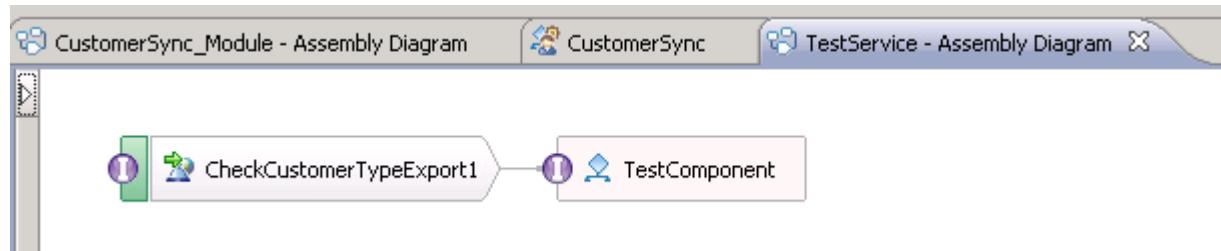


Important

For the purposes of education, this check customer type web service is implemented in the TestService module. Typically, the check customer type service is running outside of your IBM Process Server, and it is not a good practice to use web service bindings between SCA applications on the same server.

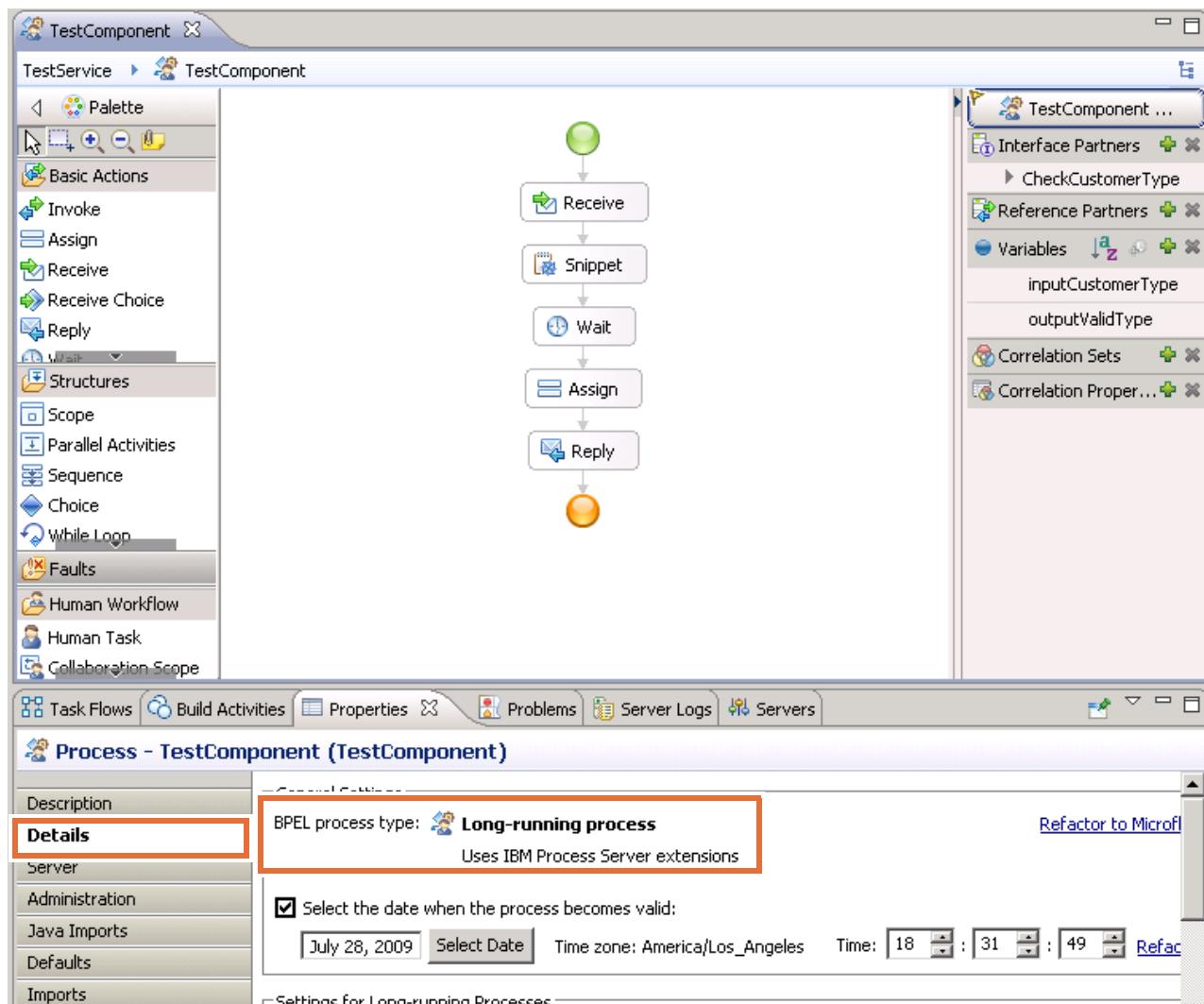
- __ i. As you can see in the address, the Web Service Binding is wired to the CheckCustomerTypeExport1 in the TestService module.

- __ j. In the Business Integration view, expand the **TestService** module and double-click the Assembly Diagram to open its implementation.



The **CheckCustomerTypeExport1** is wired to the **TestComponent** business process. This business process is exposed as a web service, since its export component has a Web Service Binding.

- __ k. Double-click **TestComponent** in the assembly diagram to open its business process template.



This business process is a long-running process.

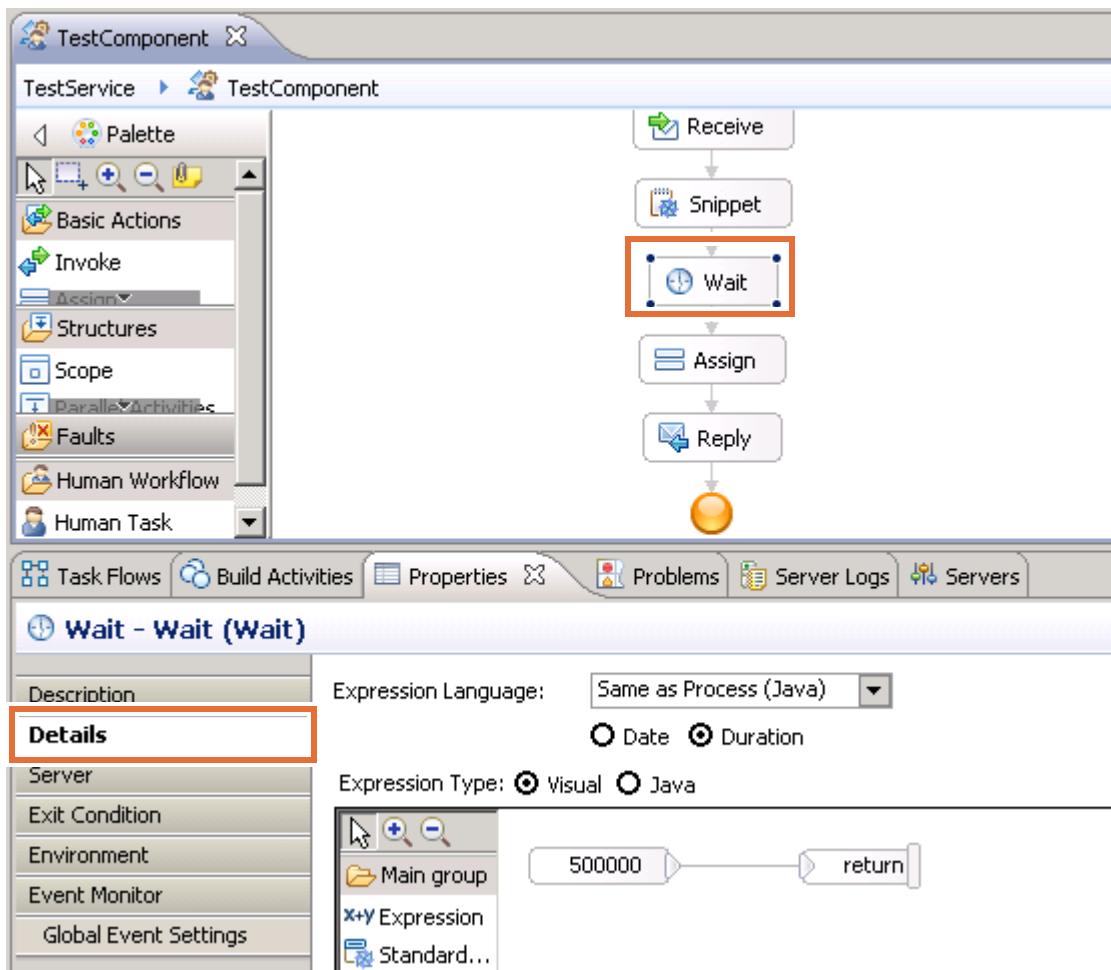


Information

In production, it is not a good practice to expose a long-running business process as a web service. However, for this lab, it is designed this way to represent a web service that takes much longer than expected to complete its request.

When you are invoking a slow target, it is a good practice to invoke it asynchronously. Remember that your applications are running in a multithreaded environment, and the threads are shared resources.

- __ I. Click the **Wait** activity and examine its properties.
- __ m. In the Properties view, click the **Details** tab.



This Wait activity goes to sleep for 500000 milliseconds (about 8.3333 minutes), which triggers the asynchronous call timeout.

- __ 11. Check the timeout parameter value.
 - __ a. In the administration console, select **Servers > Server Types > WebSphere application servers**.

- ___ b. Select **server1**, and click the **Runtime** tab.
- ___ c. In the Additional Properties section, select **Transaction service**.

[Application servers > server1 > Transaction service](#)

Use this page to specify settings for the transaction service. The transaction service is a server resource manager to ensure atomic updates of data. Transactions are started and ended by application code.

The screenshot shows the 'Runtime' tab selected in the navigation bar. The 'General Properties' section contains several configuration fields:

- Transaction log directory: C:\IBM\IID\PS\v8.5\profiles\qbpmaps\tranlog\PSCell1\Node1\server1\transaction
- * Total transaction lifetime timeout: 120 seconds
- * Async response timeout: 30 seconds (highlighted with a red box)
- * Client inactivity timeout: 60 seconds
- * Maximum transaction timeout: 14400 seconds
- Manual transactions - [Review](#): 0
- Retry transactions - [Review](#): 0
- Heuristic transactions - [Review](#): 0
- Imported prepared transactions - [Review](#): 0
- Enable file locking
- Enable transaction coordination authorization

The **Async response timeout** field is set to 30 seconds.

- ___ 12. For this part of the exercise, delete the failed event.
- ___ a. Return to administration console and expand **Servers**.
- ___ b. Select **Deployment Environment**.
- ___ c. Click **ProcessServer**.
- ___ d. Under Additional Properties, select **Failed Event Manager**.
- ___ e. Select **Get all failed events** under the Failed events on this server section.
- ___ f. Select the check box next to the failed event, and click **Delete**.

The screenshot shows a table titled 'Failed Events' with the following columns: Select, Event ID, Event type, Module, Component, Operation, Failure time, and E. A single row is selected, and the 'Delete' button in the toolbar is highlighted with a red box.

Select	Event ID	Event type	Module	Component	Operation	Failure time	E
<input checked="" type="checkbox"/>	PI:90030145_aa5_	BPC	CustomerSync_Mod..	CustomerSync		2014-04-28 14:51..	1

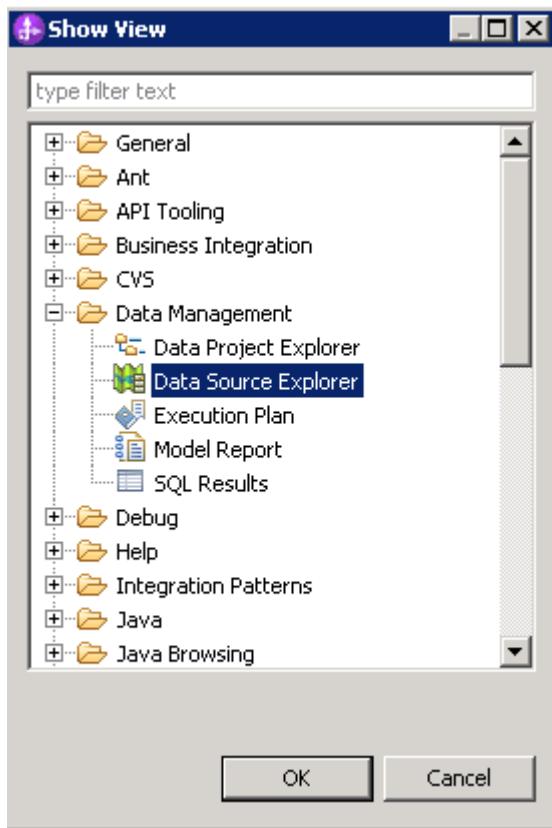
Total 1

- ___ g. Click **Delete** to confirm the deletion of the failed event.
- ___ h. Log out of the administration console.

Part 3: Examine the audit log entries

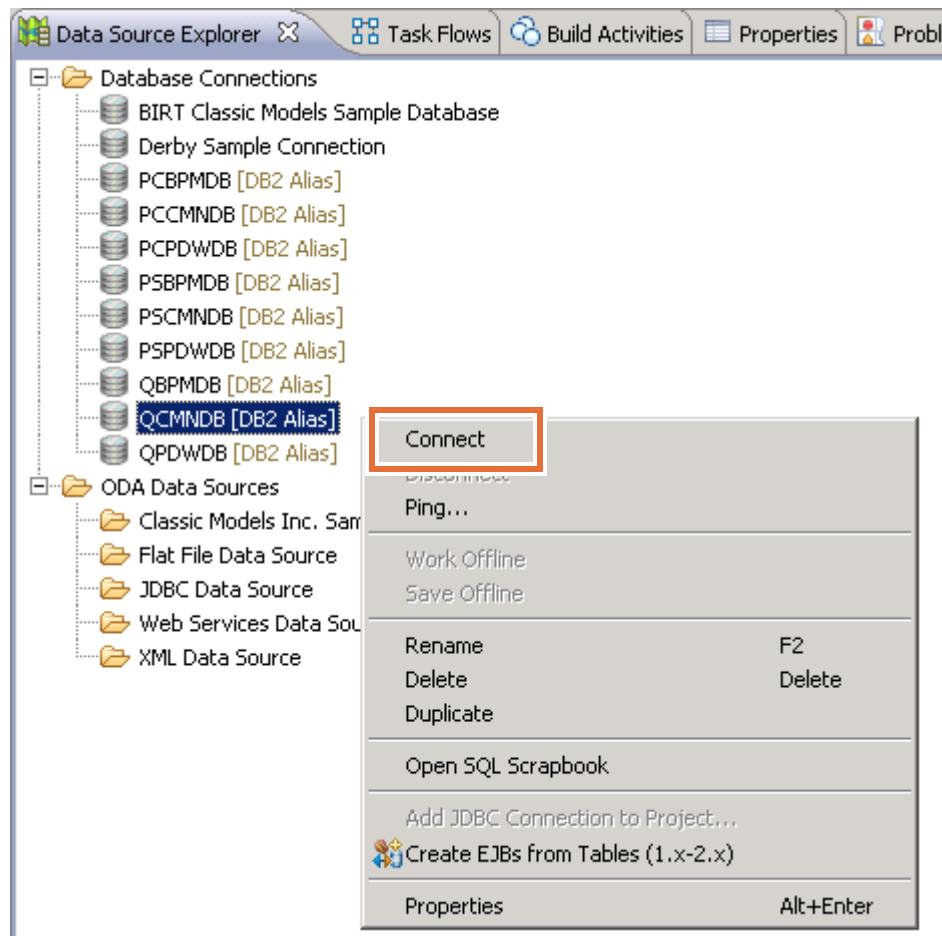
This part of the exercise demonstrates how to view the entries that were logged in the audit log.

- ___ 1. Stop the server.
 - ___ a. Return to the **IBM Integration Designer** workspace, and close the **test component** tab without saving any changes. Close any other open tabs.
 - ___ b. Select the **Servers** view.
 - ___ c. Select **IBM Process Server v8.5 at localhost**, and click the **Stop** icon.
 - ___ d. Wait until the server state changes to Stopped.
- ___ 2. Open the Data Source Explorer in your workspace.
 - ___ a. Select **Window > Show View > Other**.
 - ___ b. Expand **Data Management** and select **Data Source Explorer**.



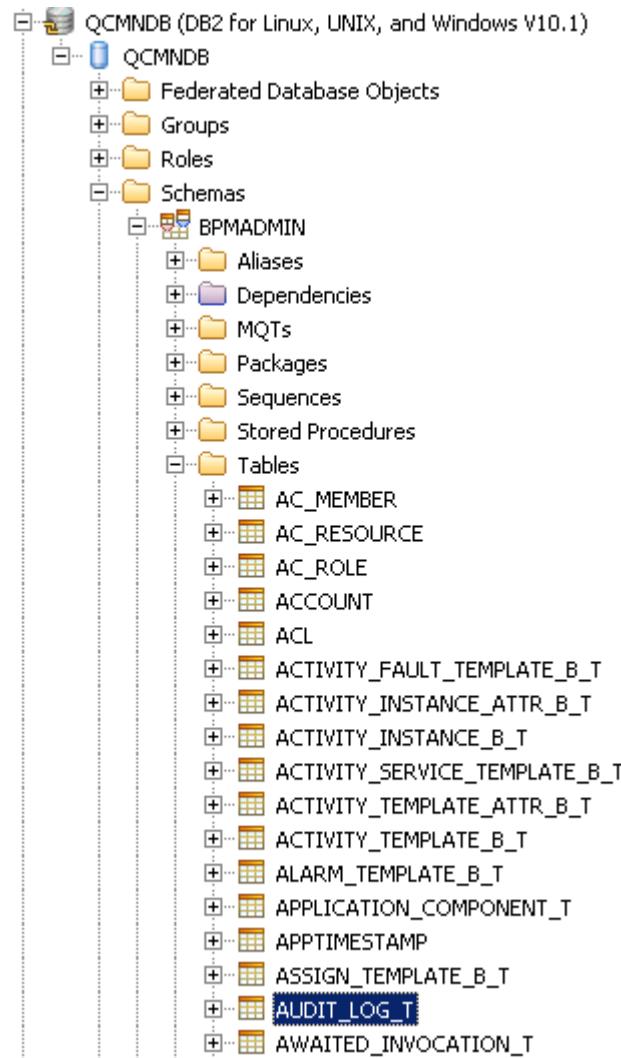
- ___ c. Click **OK**. It might take a couple of minutes to open the Data Source Explorer view.

- ___ d. In the Data Source Explorer view, expand **Database Connections**, right-click **QCMNDB**, and select **Connect**.

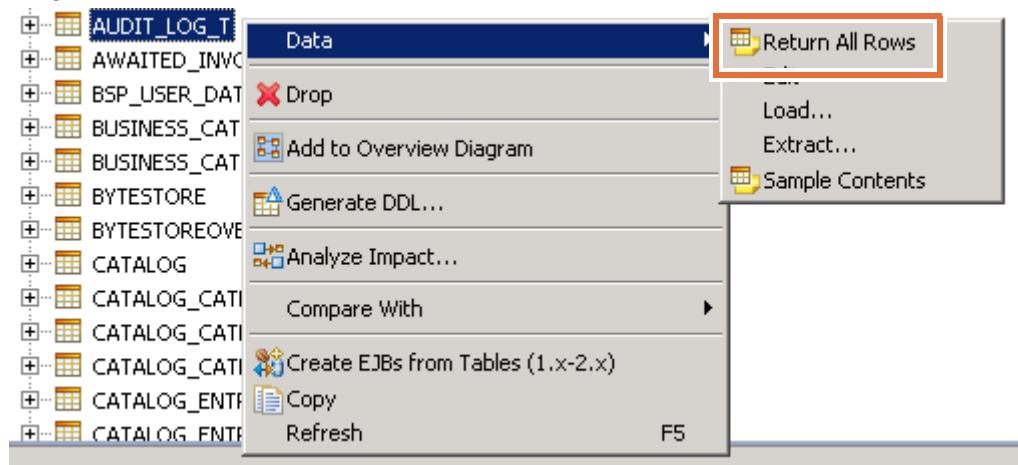


- ___ e. In the Driver Properties window, enter the following information:
- **User name:** bpmadmin
 - **Password:** Web1Sphere [case sensitive]
- ___ f. Click **OK**.

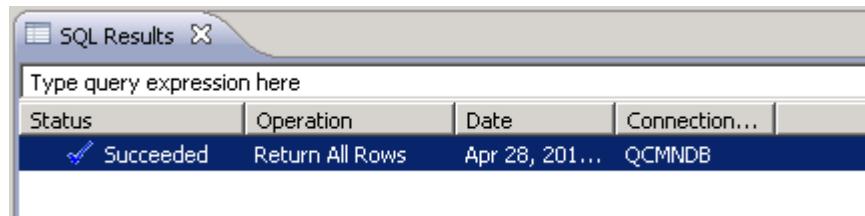
- __ g. Expand QCMNDB > Schemas > BPMADMIN > Tables > AUDIT_LOG_T.



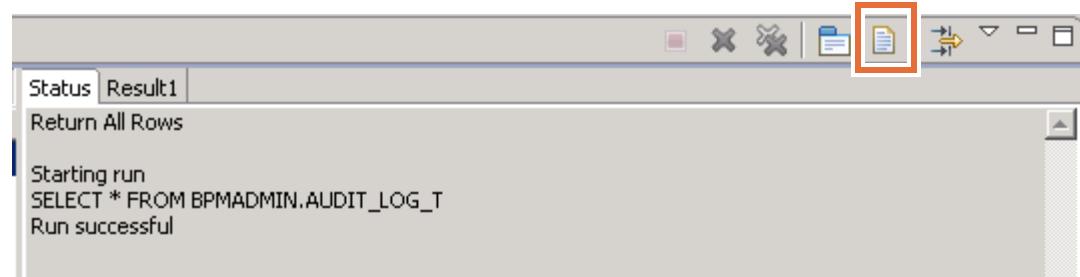
- __ h. Right-click AUDIT_LOG_T and select Data > Return All Rows.



- ___ i. The SQL Result view opens.



- ___ j. Click the **Display results in text mode** icon.



- ___ k. The text mode expands for better viewing.

ALID	EVENT_TIME	EVENT_TIME_UTC
800b0145aa3fe5f191afef530082002a	2014-04-28 14:31:25.553	2014-04-28 21:31:25.5
800b0145aa40095791afef5300820042	2014-04-28 14:31:34.615	2014-04-28 21:31:34.6
800b0145aa5020b991afef530082005b	2014-04-28 14:49:08.693	2014-04-28 21:49:08.6
800b0145aa50363591afef5300820087	2014-04-28 14:49:14.662	2014-04-28 21:49:14.6
800b0145aa51f66491afef53008200b5	2014-04-28 14:51:09.412	2014-04-28 21:51:09.4
800b0145aa51f6d191afef53008200b6	2014-04-28 14:51:09.521	2014-04-28 21:51:09.5
800b0145abba21df91afef53008200b8	2014-04-28 21:24:33.503	2014-04-29 04:24:33.5

This entry was generated in the audit log.

- ___ l. The IBM Business Process Manager Version 8.5 documentation lists the audit event definition for your reference:

<http://pic.dhe.ibm.com/infocenter/dmndhelp/v8r5m0/topic/com.ibm.wbpm.bpc.doc/topics/rg5attbl.html>

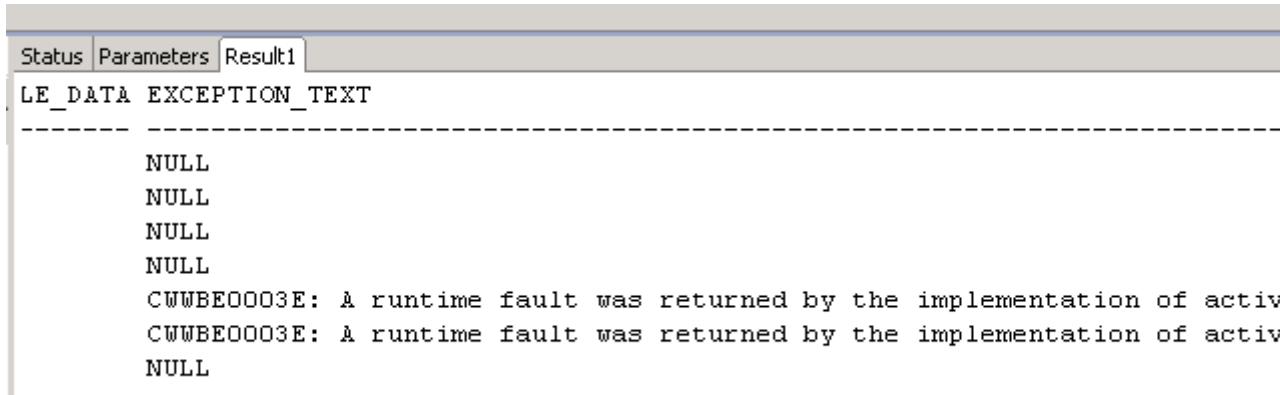


Note

For instance, the AUDIT_EVENT values that you can examine based on this test are as follows:

- 21000 indicates PROCESS_STARTED
- 42010 indicates PROCESS FAILING
- 42001 indicates PROCESS FAILED
- 21020 indicates PROCESS_DELETED
- 42006 indicates PROCESS_INSTALLED

- ___ m. If you scroll to the right to the **EXCEPTION_TEXT** column in the results, you can view the process failure text.



LE_DATA	EXCEPTION_TEXT
NULL	
NULL	
NULL	
NULL	
CWWBEO0003E: A runtime fault was returned by the implementation of activ	
CWWBEO0003E: A runtime fault was returned by the implementation of activ	
NULL	

- ___ n. When you are done, close the **SQL Results** tab.

This exercise demonstrated how you can use various administrative tools to narrow down the source of the failure. In this exercise, you used the following methods:

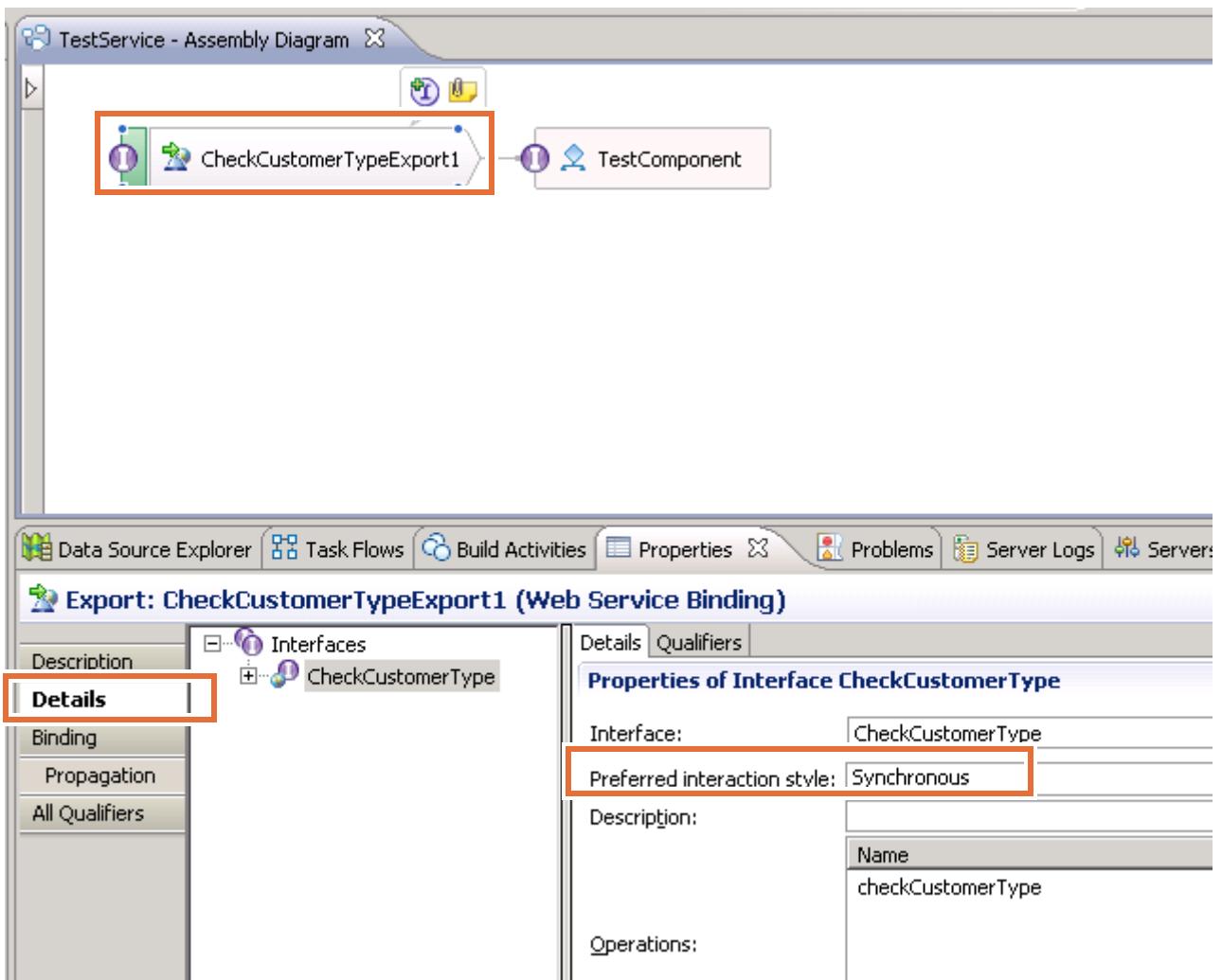
- Server Logs view
- Cross-component trace
- Failed Event Manager
- Business Process Choreographer Explorer
- Business flow manager audit log

By analyzing all of these data, you were able to detect that the slow-target triggered the failure. This scenario often happens in a production environment. If a third party provides the target web service, it is out of your control, and you need to contact the service provider.

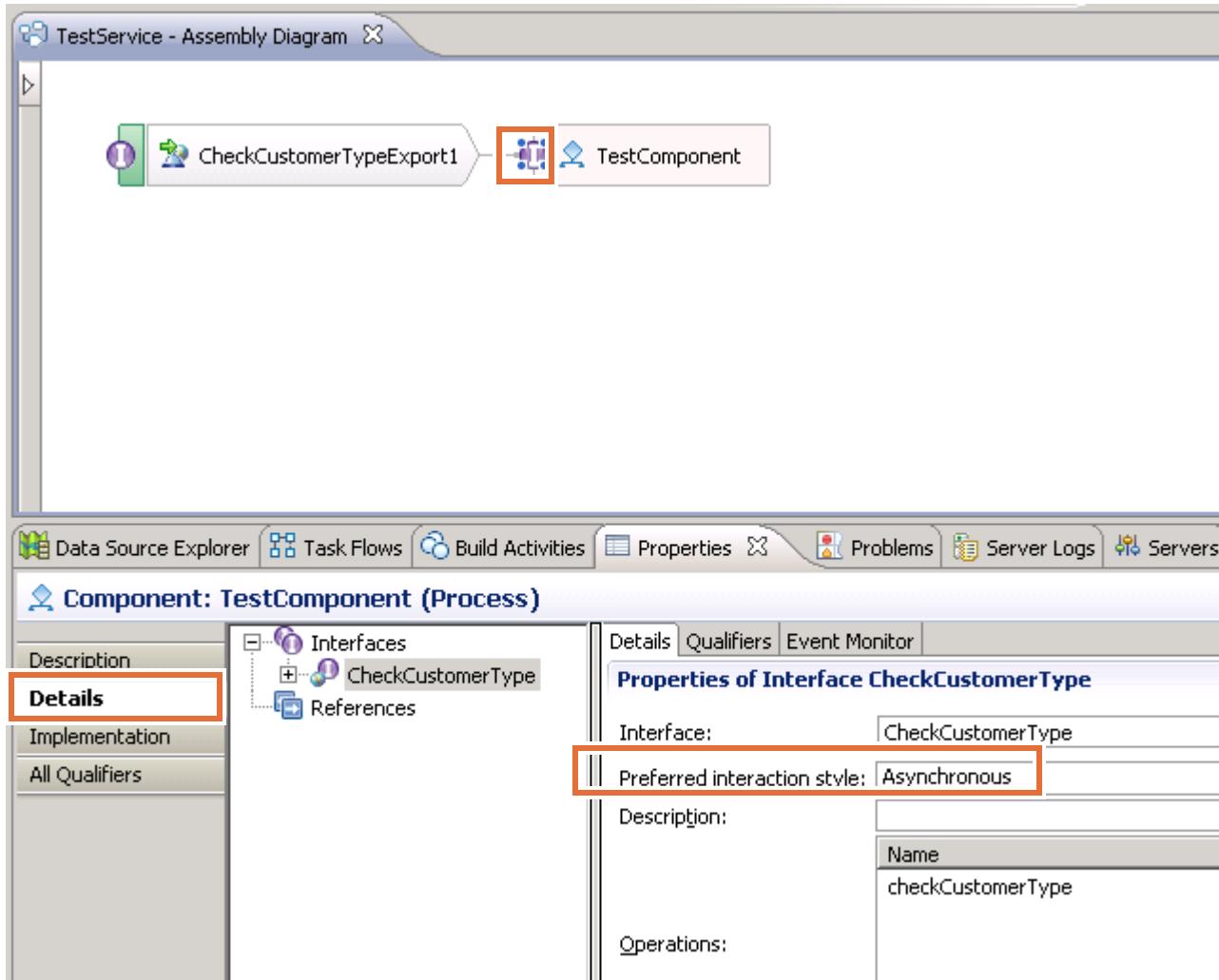
For this exercise scenario, a long-running business process, which is **TestComponent** in the **TestService** module, was exposed as a web service. From a design perspective, this scenario is a poor practice.

- ___ o. In the **TestService** assembly diagram, right-click **CheckCustomerTypeExport1** and select **Show In > Properties View**.

- ___ p. Click the **Details** tab and notice that the Preferred interaction style for a Web Service Binding is **Synchronous**.



- __ q. Similarly, select the **TestComponent** business process and select **Interfaces > CheckCustomerType** interface in the **Details** tab.



The preferred interaction style for the **CheckCustomerType** interface is set to **Asynchronous**.

When you have a long-running business process, its preferred interaction style is asynchronous, while web services are synchronous by nature. This scenario is a design issue that involves the implementation architects and the solution developers.

Like this example, you can find a pitfall in the implementation during troubleshooting. As a process administrator, your role is to find the source of the error in the integrated solution, and to notify the solution owner.

Part 4: Clean up the environment

- __ 1. Clean up the environment, and remove all the deployed projects from the server.
 - __ a. In the Servers view, right-click **IBM Process Server v8.5 at localhost**, and select **Add and Remove**.
 - __ b. Click **Remove All**.
 - __ c. Click **Finish**.

- 2. (Optional) Close IBM Integration Designer.
- 3. Close the web browser and any other open windows.

End of exercise

Exercise review and wrap-up

The prebuilt solution contains a long-running business process, CustomerSync. The CustomerSync process invokes an external service, which goes to sleep for 50000 seconds. This setting generates the timeout exception for you to explore.

Exercise 9. Troubleshooting Advanced Integration services

What this exercise is about

This exercise covers different troubleshooting techniques for Advanced Integration services (AIS) in the IBM Process Designer and IBM Integration Designer that interact with the Process Center.

What you should be able to do

At the end of this exercise, you should be able to:

- Change the version of dependency after migration from the previous version
- Collaborate before defining an Advanced Integration service for missing data objects
- Create a facade service
- Troubleshoot a broken map
- Protect mirrored artifacts in toolkits

Introduction

In this exercise, you import different process models into the Process Center and apply different techniques to troubleshoot problems with Advanced Integration services modules.

Requirements

Completing the exercises for this course requires a lab environment. This environment includes the exercise support files, IBM Process Designer, IBM Process Portal, IBM Process Center, IBM Process Server, and IBM Integration Designer test environment.

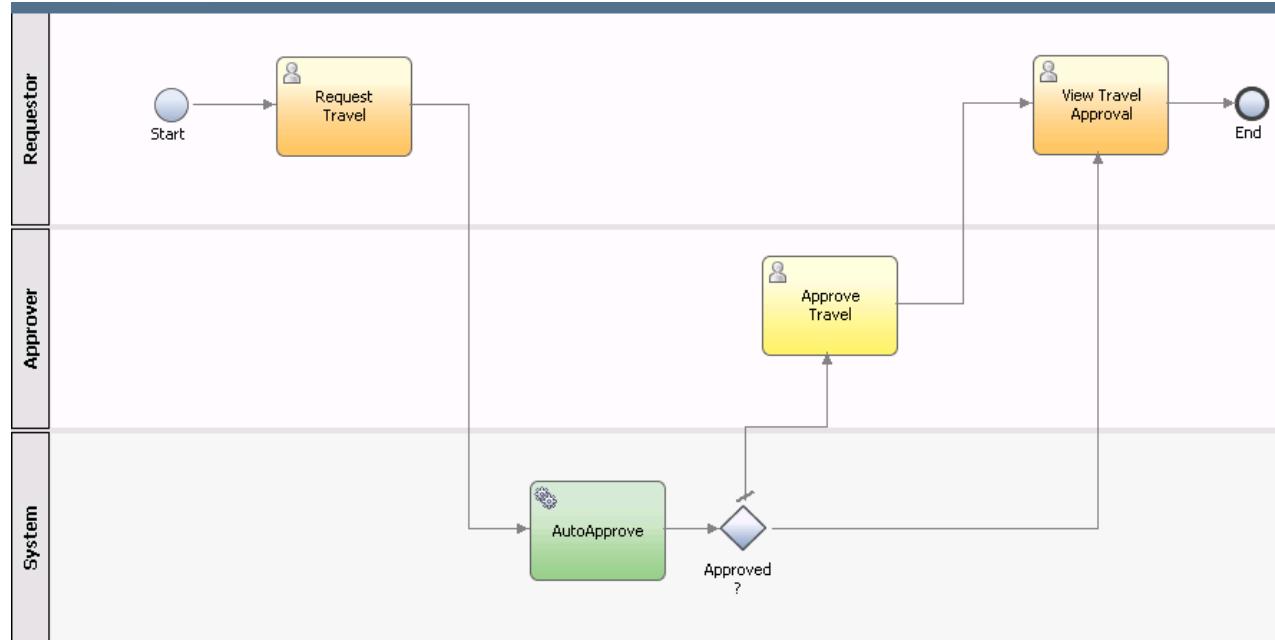
Exercise instructions

IBM Business Process Manager Advanced offers two authoring environments. IBM Process Designer is used to model and execute high-level business processes, which often have human interactions. IBM Integration Designer is used to build and implement services that are automated or that invoke other services such as web services, enterprise resource applications, or applications that exist in the enterprise. It also includes long-running processes that include human tasks. These authoring environments both interact with the Process Center, which is a shared repository and runtime environment.

There are two roles and skill sets to consider when developing business process management (BPM) applications in these environments:

- The business author is responsible for authoring all business processes. This person is able to use services, but is not necessarily involved in the implementation details or how they work. The business author uses Process Designer to create business process definitions (BPD) and Advanced Integration services (AIS) to collaborate with the integration programmer.
- The integration programmer is responsible for doing all of the integration work necessary to support the processes the business author creates. For example, the integration programmer implements all the AISs, and produces mappings between back-end formats and the requirements of current applications. The integration programmer uses Integration Designer.

In this exercise, after starting the servers, you import a simple process application called Travel Approval. See the business process definition of the process model:

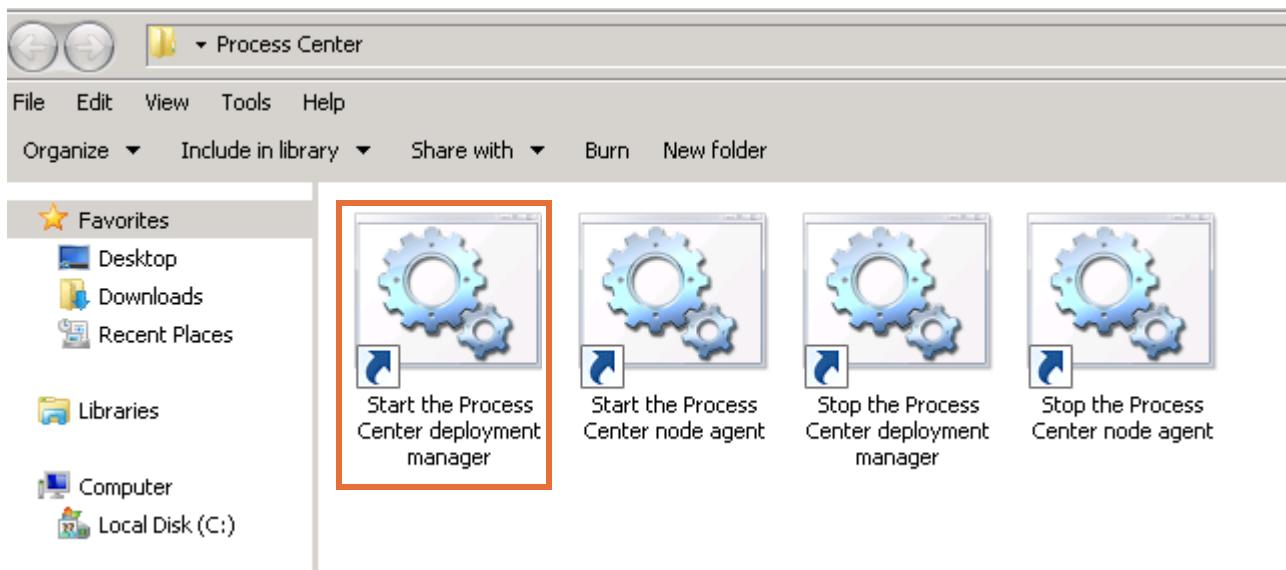


1. Request Travel: Start the travel request
2. Auto Approve: Based on certain criteria, the system automatically approves the request
3. Approved?: An exclusive gateway to either approve travel or view travel approval
4. Approve Travel: Approve the travel manually

5. View Travel Approval: View the travel approval after automatic approval

Part 1: Start the servers

- 1. Start the **Process Center server** if it is not already started.
- a. Double-click the **Start the Process Center Deployment Manager** shortcut icon in the **Process Center** folder on the desktop to start the server, if it is not started.



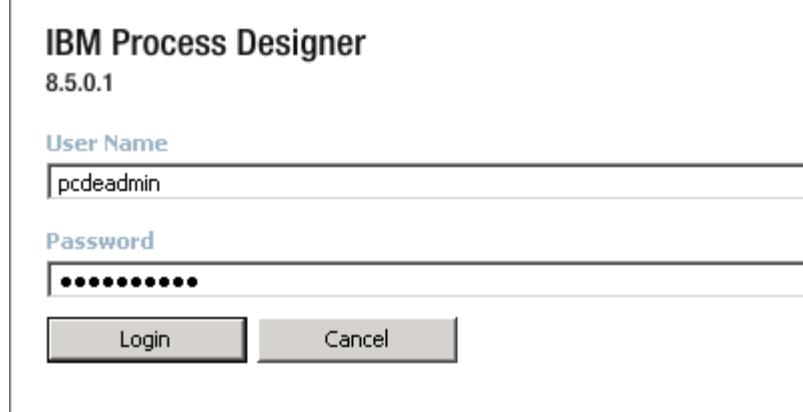
- b. Wait until the start command is successfully completed, and press any key to continue.
- c. Double-click the **Start the Process Center node agent** shortcut icon in the **Process Center** folder in the desktop.
- d. Wait until the start command is successfully completed, and press any key to continue.
- 2. To Start the administrative console, double-click the **Firefox** icon from the desktop to open the web browser, and enter the following URL:

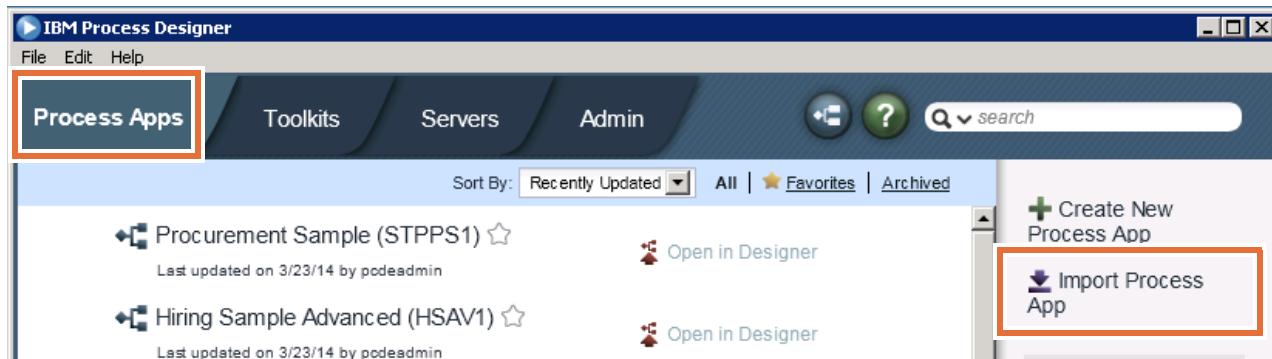
`http://localhost:9061/ibm/console`
- a. In the Untrusted Connection window, click **I Understand the Risks** to expand the option.
- b. Click **Add Exception**.
- c. On the Add Security Exception window, the location is the secure port for the deployment manager. Verify that the location is the following URL:

`https://localhost:9044/ibm/console`
- d. Click **Confirm Security Exception**. The login page for the Integrated Solutions Console, which is also known as the administrative console, is now visible.

3. Log in to the administrative console as:
- **User ID:** bpmadmin
 - **Password:** web1sphere
- a. In the administration console, expand **Servers > Server Types** and click **WebSphere application servers**.
- b. Select the **SingleClusterMember1** check box.
- c. Click **Start**.
- d. Wait until the start command is successfully completed, and the status becomes green.

Part 2: Change the version of dependency

1. Import the Travel App to the IBM Process Designer.
- a. Double-click the **IBM Process Designer** icon from the Desktop.
- b. Log in to the IBM Process Designer as:
- **User Name:** pcdeadmin
 - **Password:** web1sphere
- 
- c. Click **Login**.
- d. If prompted, close the **Getting Started with IBM Process Designer 8.5.0.1** window.
- e. If you are already in the Process Designer view, then click the Process Center icon to switch to the Process Center view. Otherwise, select the **Process Apps** tab, and click **Import Process App**.

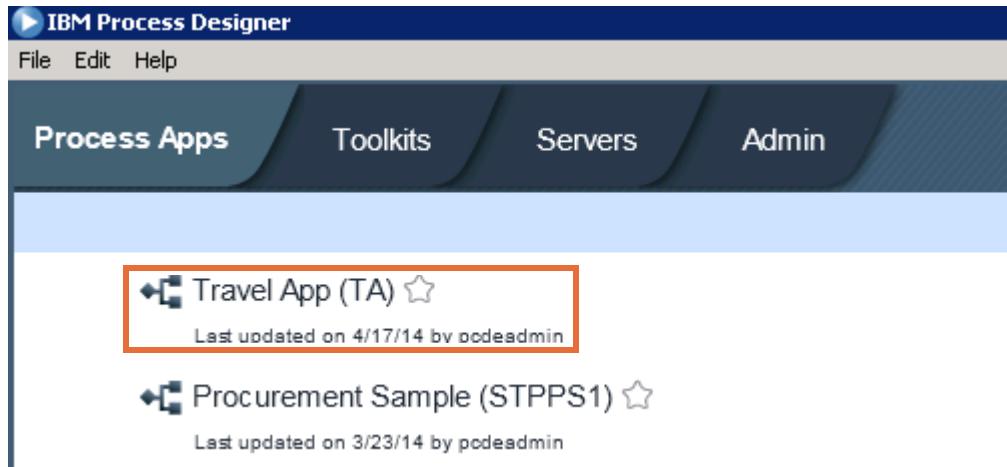


**Information**

If you do not see the **Process Apps** tab, you might need to click the **Process Center** icon in the upper-right corner to return to the Process Apps view.

- ___ f. In the Import Process App window, click **Browse** to select the C:\labfiles\ex9\Travel_AppV1.twx file and click **Open**.
- ___ g. Click **OK**.
- ___ h. Click **Import**.

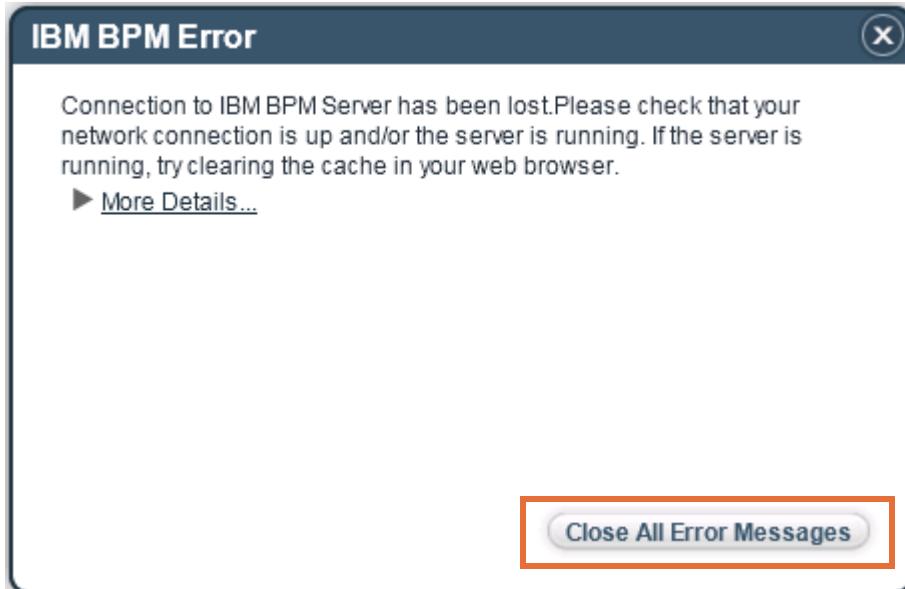
You just imported the Travel App (TA) into your IBM Process Designer.





Note

If you see this error, ignore it and click **Close All Error Messages**.



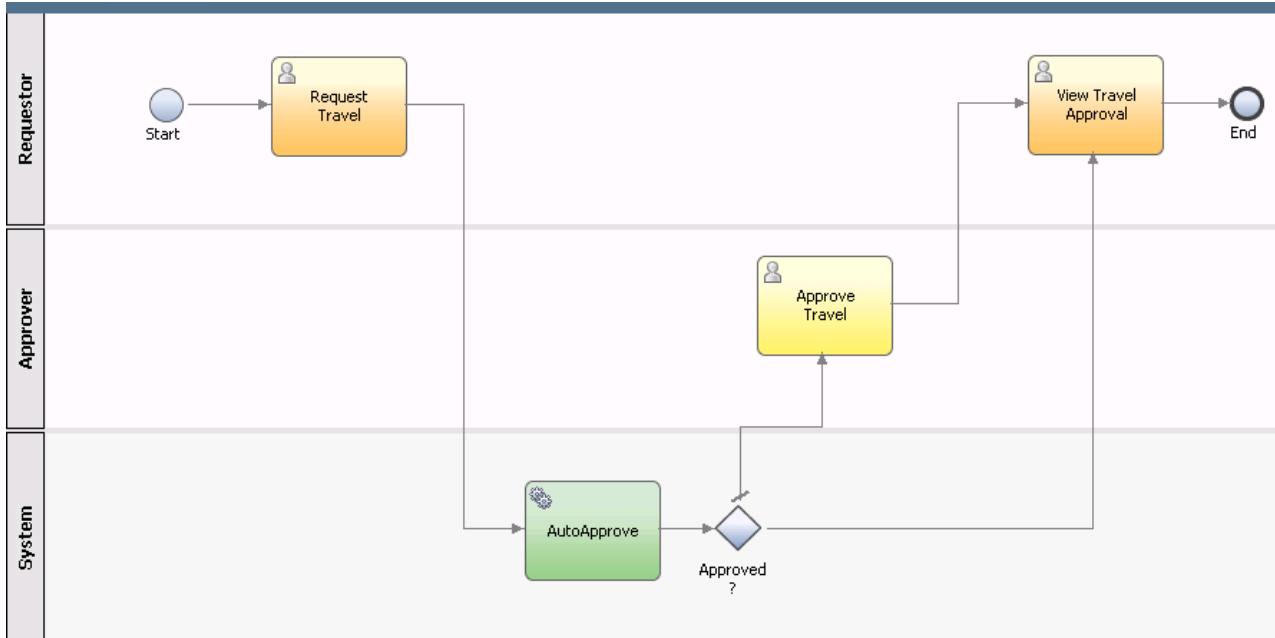
- 2. Run the Travel App process.
 - a. Click **Open in Designer** next to the Travel App (TA).

Application	Last updated	Action
Travel App (TA)	4/17/14	Open in Designer
Procurement Sample (STPPS1)	3/23/14	Open in Designer

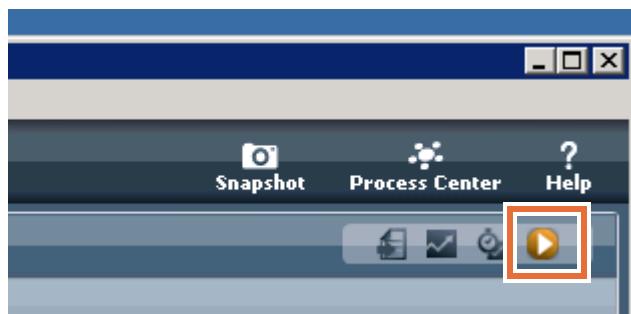
- b. Expand **TRAVEL APP**, click **Processes**, and double-click the **Travel Approval** business process definitions.

Business Process Definitions
Travel Approval

You see the Diagram of the Travel Approval process.



- ___ c. Click **Run** in the upper-right corner to run the process.

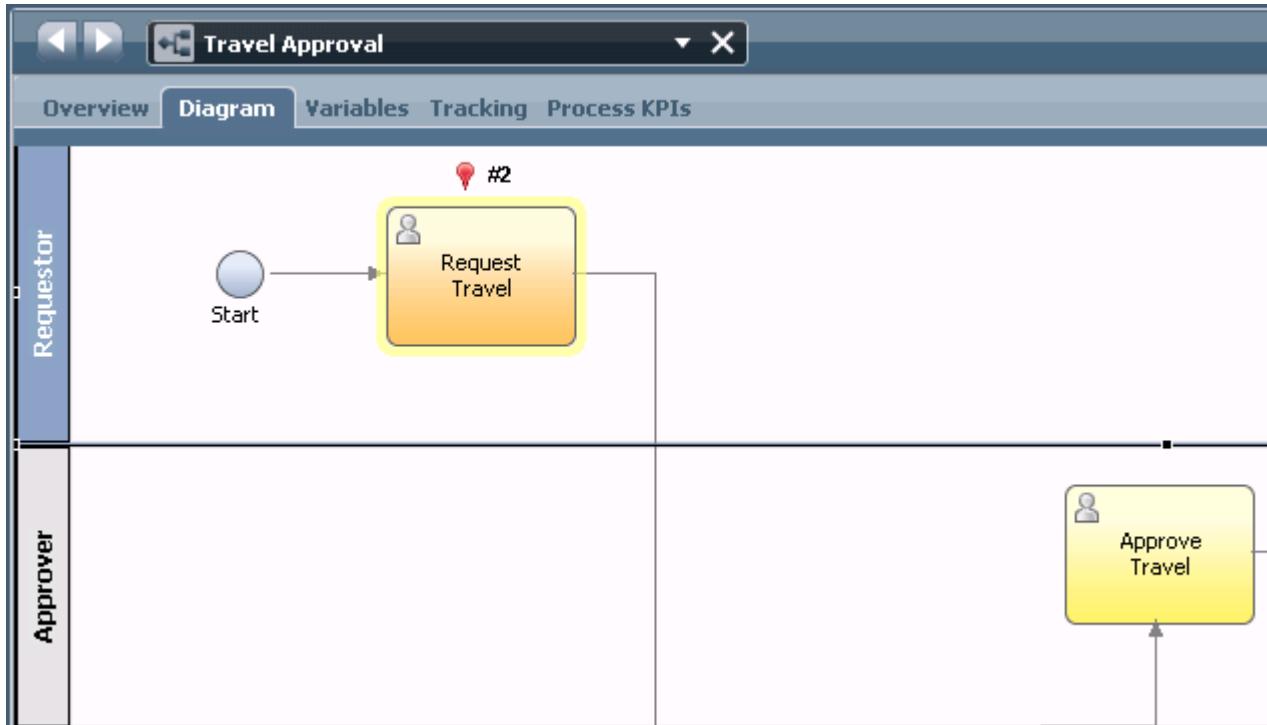


- ___ d. Click **Yes** to switch to the Inspector view.

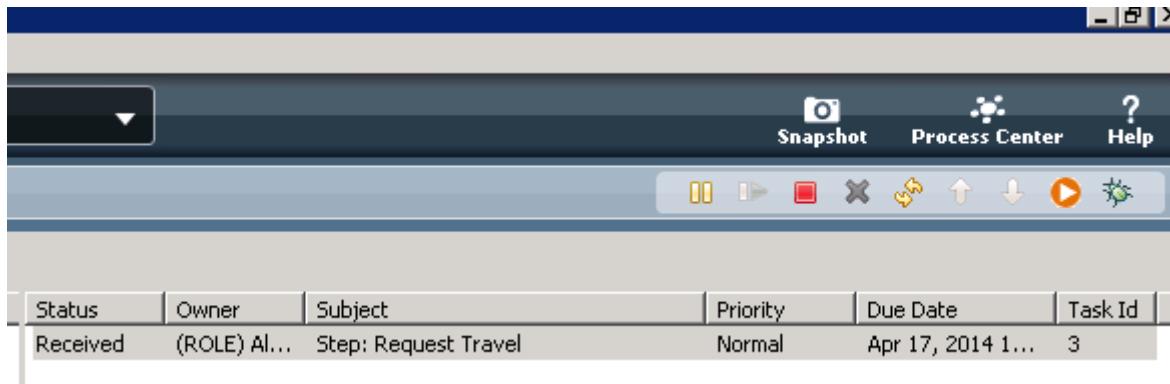
In the Inspector view, there are multiple panes. In the upper-left corner, it creates a process instance.



In the lower-left corner, it shows the process diagram.



In the upper-right corner, it shows the task information that shows the current step that is running.



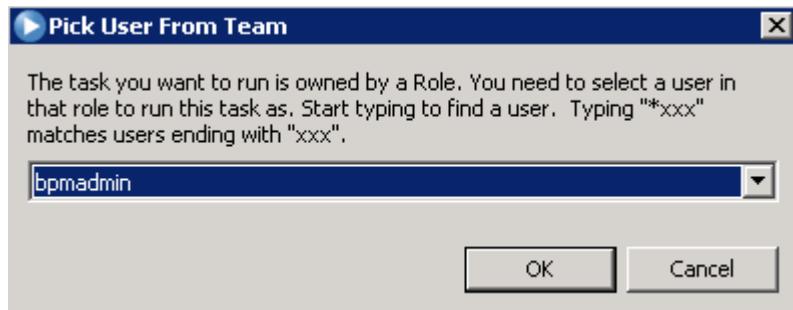
In the lower-right corner, it shows the Execution State and the Variables.



- ___ e. Run the first task that is called Request Travel in the process. Select the task with **Step: Request Travel**, and click the **Run the selected task** icon in the upper right.



- ___ f. Select **bpmadmin** as the user and click **OK**.



- ___ g. Enter `websphere` as the password and click **OK**.

- ___ h. Click **Yes** to remember the password.

A web browser opens and it shows the Travel Request Application. It takes a few moments to load the application page.

- ___ i. Click **Create Request**.

An error message shows on the web page.

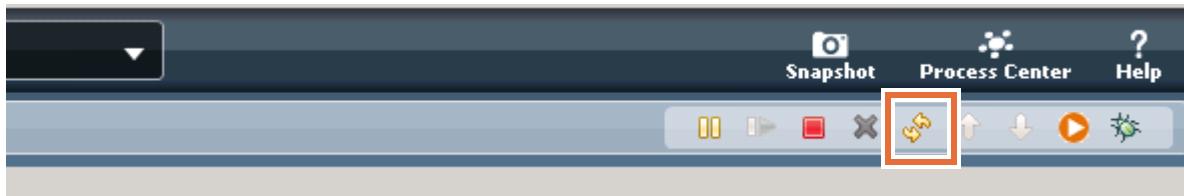
Could not find any parameter in HttpRequest matching a button on the Coach. Button pressed was Button0

Error

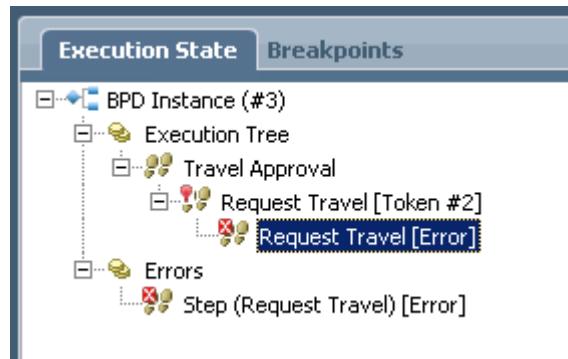
Could not find any parameter in HttpRequest matching a button on the Coach. Button pressed was Button0

- ___ j. Return to the **Inspector** view of IBM Process Designer.

- ___ k. Click the **Refresh** icon.



- __ I. In the Execution State tab, click Request Travel [Error].

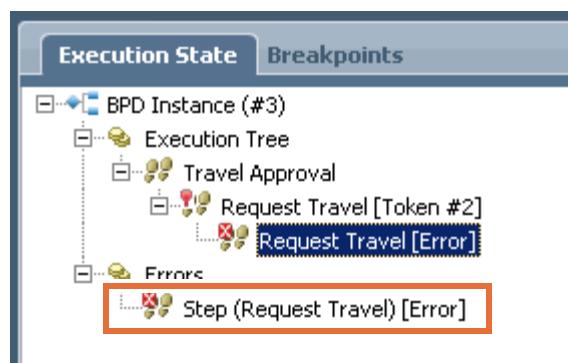


- __ m. The Runtime Error Information window appears. Click **More** to display the details.

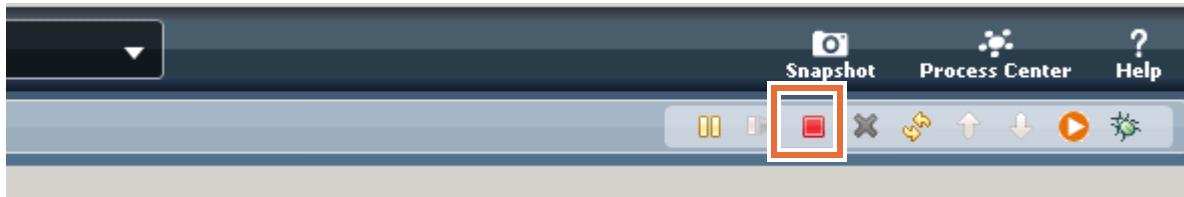


- __ n. Click **OK** to close the Runtime Error Information window.

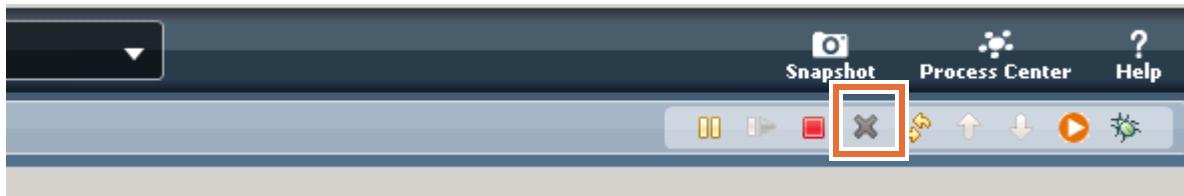
- __ o. The other error in the bottom, **Step (Request Travel [Error])**, also has the same runtime error information.



- ___ p. Click **Stop** to end the selected instance.



- ___ q. Click **Delete** to delete the selected instance.



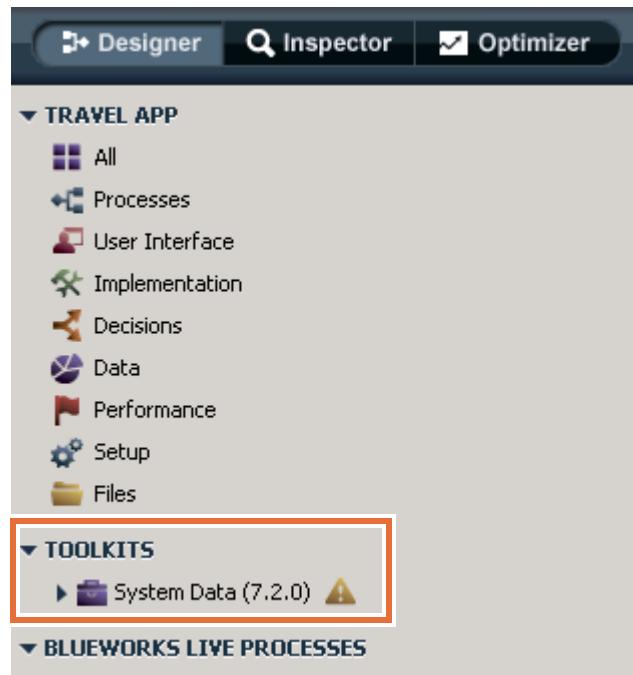
- ___ r. Click **OK** to confirm the deletion.

___ 3. Correct the error.

- ___ a. Click the **Designer** icon in the upper-left corner to return to Designer.

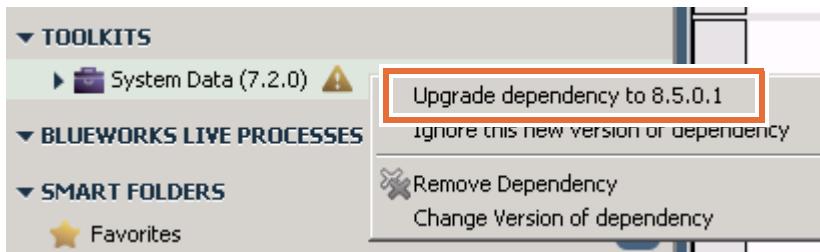


- ___ b. Examine the Designer screen and look at the toolkits. You see a triangle next to System Data (7.2.0).



The version of software in this image is 8.5.0.1, and the incompatible version of system data toolkit dependency causes this error.

- ___ c. To correct this error, right-click **TOOLKITS > System Data**, and select **Upgrade dependency to 8.5.0.1**.

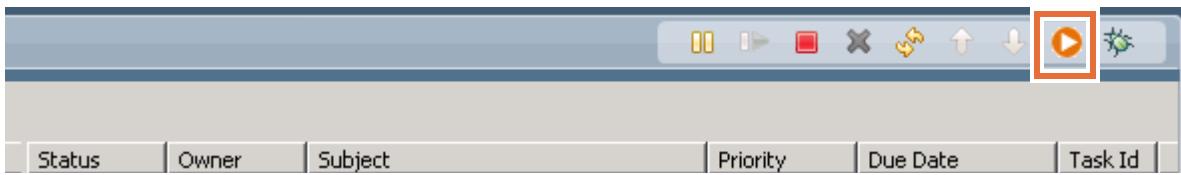


- ___ d. After the upgrade, it shows the current level of dependency at **8.5.0.1**.



- ___ 4. Now run the test again after the change.

- ___ a. Click the **Run** icon on the upper right corner.
- ___ b. Click **Yes** to switch the Inspector view.
- ___ c. Run the first task that is called Request Travel in the process. Select the task with **Step: Request Travel**, and click the **Run the selected task** icon in the upper right.
- ___ d. Select **bpmadmin** as the user and click **OK**.
- ___ e. A web browser opens, and it shows the Travel Request Application. Click **Create Request**.
- ___ f. It takes you to the next step: Request Travel Approval. Enter the following data:
 - **First Name:** John
 - **Last Name:** Sample
 - **Employee Number:** 123
 - **Departure Date:** [any future date]
 - **Return Date:** [any future date after departure date]
 - **Estimated cost:** 1000
- ___ g. Click **Submit**.
- ___ h. Return to the **Inspector** view.
- ___ i. Click the **Refresh** icon to take you to the next step of the process, and that is **Task: AutoApprove**.
- ___ j. In the upper-right corner, select the **Task: AutoApprove** and click the **Run the selected task** icon.



- ___ k. Select **bpmadmin** as the user and click **OK**.

- ___ l. In the AutoApprove page, review the travel request and click **OK** in the lower right corner.
- ___ m. Return to the **Inspector** view.
- ___ n. Click the **Refresh** icon to take you to the next step of the process, and that is **Task: Approve Travel**.
- ___ o. In the upper-right corner, select the **Task: Approve Travel** and click the **Run the selected task** icon.



Status	Owner	Subject	Priority	Due Date	Task Id
Closed	bpmadmin	Step: Request Travel	Normal	Apr 17, 2014 1...	5
Received	(ROLE) Al...	Step: Approve Travel	Normal	Apr 17, 2014 1...	7

- ___ p. Select **bpmadmin** as the user and click **OK**.
 - ___ q. A web browser opens and it shows the Approve Travel page. Scroll down to select **Approve**.
 - ___ r. Click **Submit**.
 - ___ s. Return to the **Inspector** view of IBM Process Designer. Click the **Refresh** icon.
 - ___ t. It takes you to the next step of the process, and that is **Task: View Travel Approval**.
 - ___ u. In the upper-right corner, select the **Task: View Travel Approval** and click the **Run the selected task** icon.
 - ___ v. Select **bpmadmin** as the user and click **OK**.
 - ___ w. In the **View Travel Approve** page, examine the travel request; it has the approval from the previous task.
 - ___ x. Scroll down to click **OK**.
 - ___ y. Return to the **Inspector** view of IBM Process Designer. Click the **Refresh** icon.
- ___ 5. You completed the testing of the Travel Approval process without any errors.



Status	Owner	Subject	Priority	Due Date	Task Id
Closed	bpmadmin	Step: Request Travel	Normal	Apr 17, 2014 1...	5
Closed	bpmadmin	Step: Approve Travel	Normal	Apr 17, 2014 1...	7
Closed	bpmadmin	Step: View Travel Approval	Normal	Apr 17, 2014 4:...	8

- ___ 6. There is no error in the **Execution State** pane.



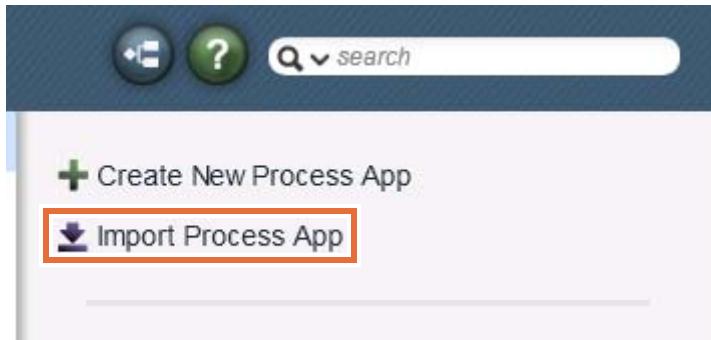
Part 3: Collaborate before business object changes

Advanced integration services (AISs) can exist in both process applications and toolkits. The implementation of an AIS must coexist in the same process application or toolkit as its definition. Thus, where such a definition is made is important for reuse and organization considerations. For example, if the business author needs a particular service for an integration programmer to implement, the business author can define the AIS in the process application or toolkit. However, more care should be taken. The business author should contact the integration programmer to confirm where the AIS should be defined, and thus implemented. It is likely that the integration programmer wants to have the AIS shared among many process applications, in which case the business author should define the AIS in a toolkit. The integration programmer wants to group similar AISs in a specific toolkit. For these reasons, the integration programmer should be consulted on the structure before the business author creates and defines a new AIS.

There is a major difference between Process Designer and Integration Designer. The Process Designer works live from the Process Center repository artifacts. The Integration Designer has local workspaces with physical artifacts and files, and it is able to work offline. Integration Designer contributes modules, libraries, and other projects to process applications or toolkits, which contain BPDs, AISs, and other artifacts that the business author provides.

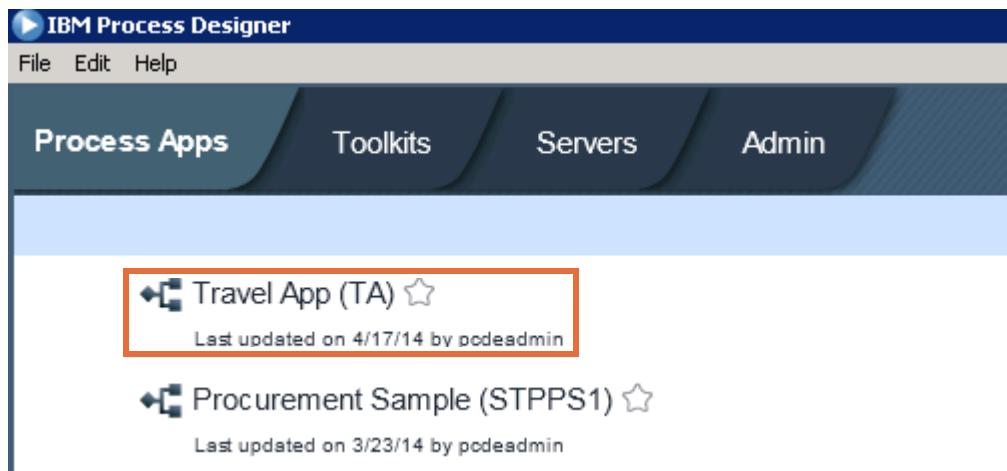
In this section, the integration programmer removes one of the business objects without any communication with the business author. You, as a business author, run the process and get an error.

- __ 1. Import the Travel App from the `labfiles` directory.
 - __ a. Click the **Process Center** icon in the upper right corner.
 - __ b. From the IBM Process Designer, in the Process Apps tab, click **Import Process App** in the upper-right corner.



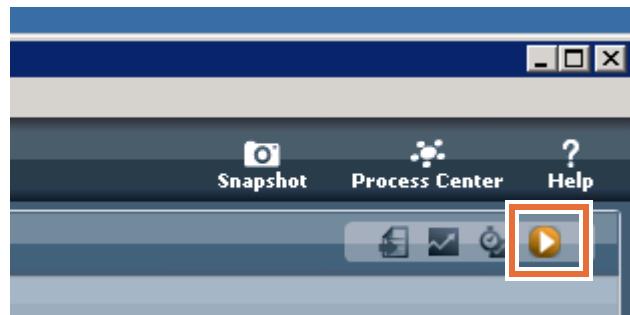
- __ c. In the Import Process App window, click **Browse** to select `C:\labfiles\ex9\Travel_AppV2.twx` file and click **Open**.
- __ d. Click **OK**.
- __ e. Click **Import**.

- ___ f. You imported the Travel App (TA) into your IBM Process Designer.

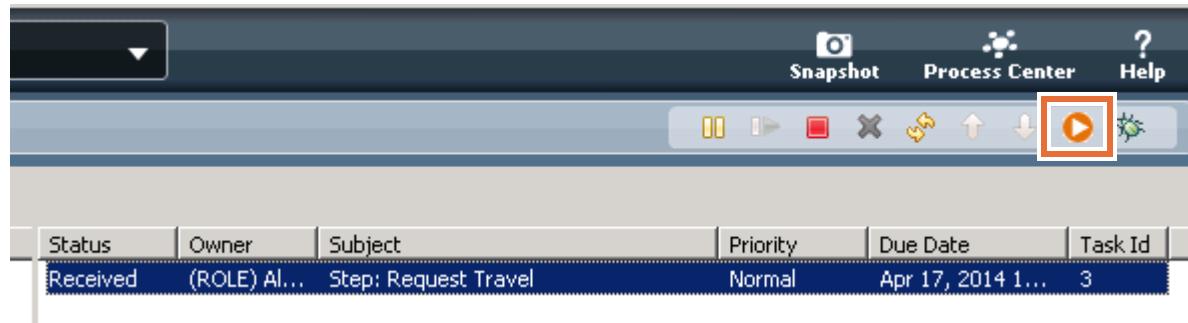


- ___ 2. Run the Travel App process.

- ___ a. Click **Open in Designer** next to the Travel App (TA), and you see the diagram of the Travel Approval process.
- ___ b. Click **Run** in the upper-right corner to run the process.



- ___ c. Click **Yes** to switch to the Inspector view.
- ___ d. Select the task with **Step: Request Travel**, and click the **Run the selected task** icon in the upper-right corner.



- ___ e. Select `bpmadmin` as the user and click **OK**.
- ___ f. A web browser opens, and it shows an error message on the web page.

```
Runtime error in script ("Process: 'Request Travel' ProcessItem:  
'Initialize' Type: 'ITEM'" -1:-1).Internal Script error:  
com.lombardisoftware.core.TeamWorksRuntimeException:
```

com.lombardisoftware.core.TeamWorksException: Property Comment in class TravelRequest is not declared. It must be declared to be used.

Error

Runtime error in script ("Process: 'Request Travel' ProcessItem: 'Initialize' Ty 'ITEM'" -1:-1).Internal Script error:

com.lombardisoftware.core.TeamWorksRuntimeException:

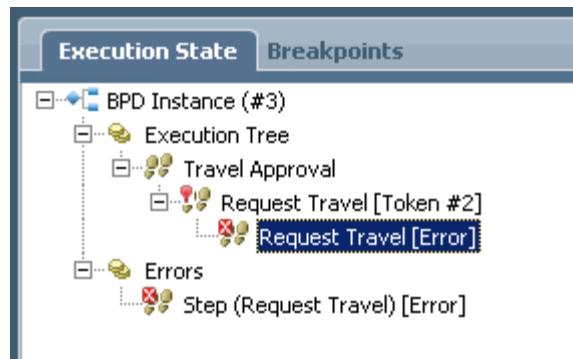
com.lombardisoftware.core.TeamWorksException: Property Comment in class TravelRequest is not declared. It must be declared to be used.

___ g. Return to the **Inspector** view of IBM Process Designer.

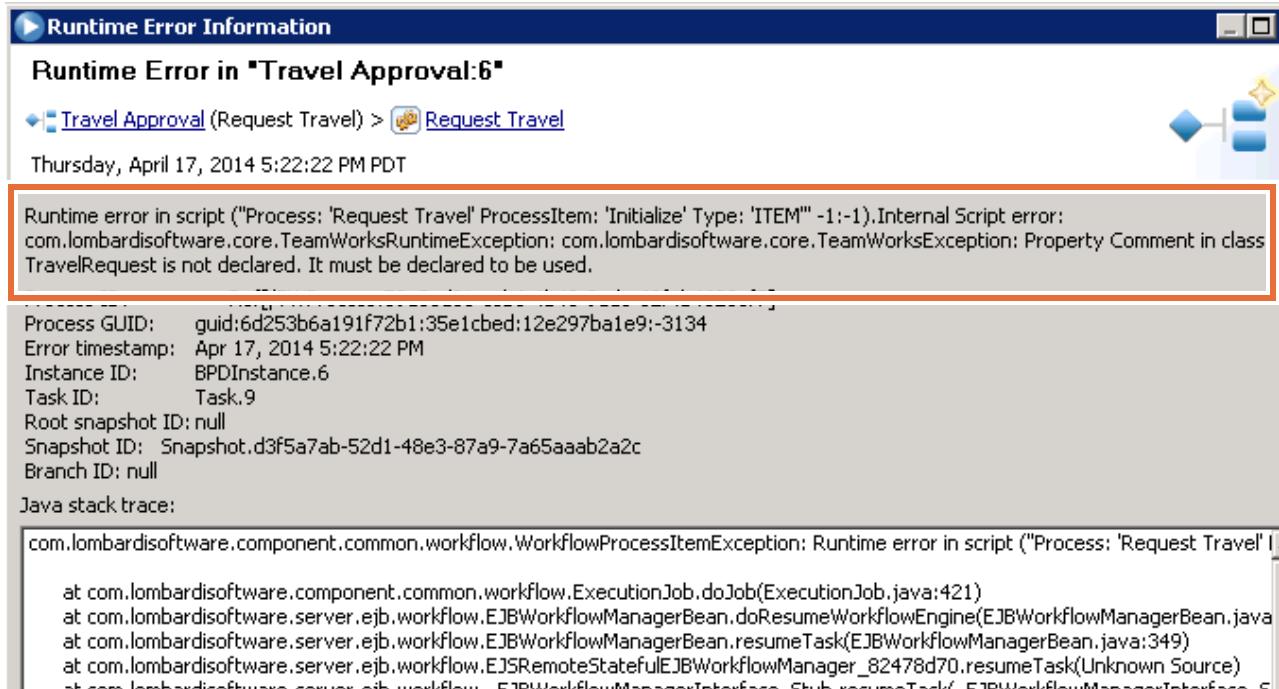
___ h. Click the **Refresh** icon.



___ i. In the Execution State, click the **Request Travel [Error]**.

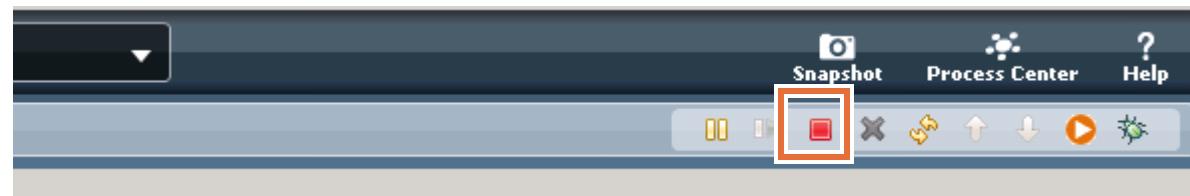


- ___ j. The Runtime Error Information window appears. Click **More** to display the details.

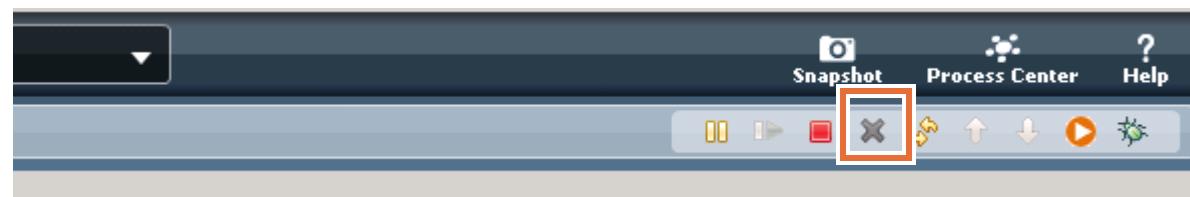


In this case, the integration programmer removed one of the business objects, called `Comment`, in IBM Integration Designer without any communication with the business author who works in Process Designer. As a result, you got an error when you ran the process.

- ___ k. Click **OK** to close the Runtime Error Information window.
 ___ l. Click **Stop** to end the selected instance.



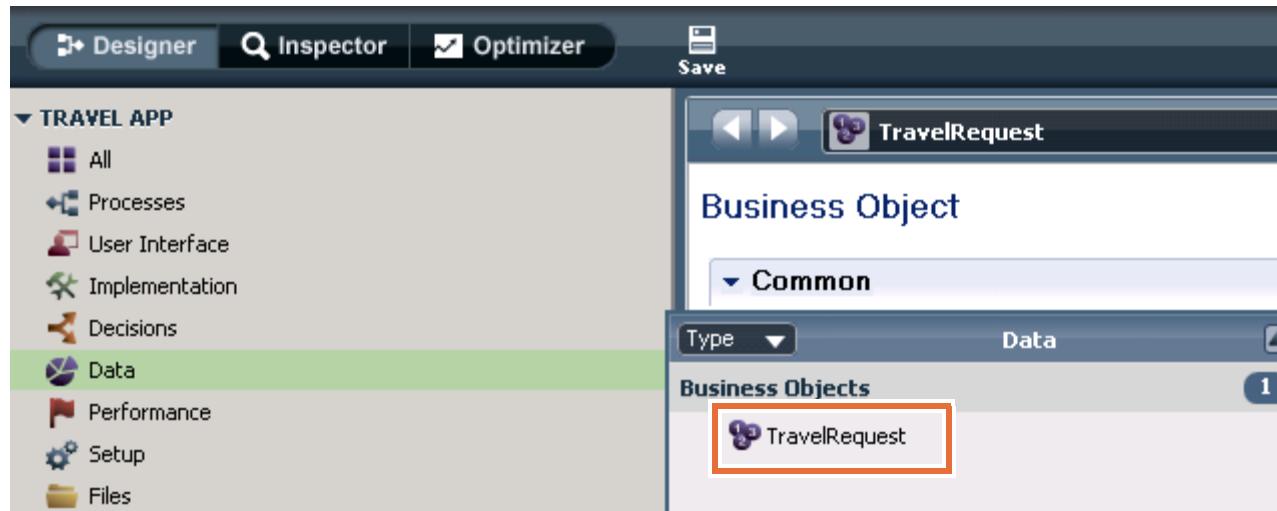
- ___ m. Click **Delete** to delete the selected instance.



- ___ n. Click **OK** to confirm the deletion.

___ 3. Examine the business objects.

___ a. Return to Designer, select **Data**, and double-click **TravelRequest**.



___ b. Examine the parameters. Notice that the business object Comment does not exist.

The screenshot shows the 'Parameters' panel within the IBM Integration Designer. It lists various parameters for the 'TravelRequest' business object, each with a green circular icon and a descriptive name in parentheses:

- requestDate (Date)
- firstName (String)
- lastName (String)
- employeeNumber (String)
- reason (String)
- international (Boolean)
- from (String)
- to (String)
- departureDate (Date)
- returnDate (Date)
- requireAir (Boolean)
- requireHotel (Boolean)
- requireCar (Boolean)
- estimatedCost (Integer)
- approved (Boolean)
- processedBy (String)
- processedDate (Date)

___ 4. Fix the error in IBM Integration Designer.

___ a. Double-click the **IBM Integration Designer** icon on the Desktop.

___ b. In the Workspace Launcher window, enter `C:\workspaces\ex9` and click **OK**.

___ c. In the Process Center Login window, enter the following information:

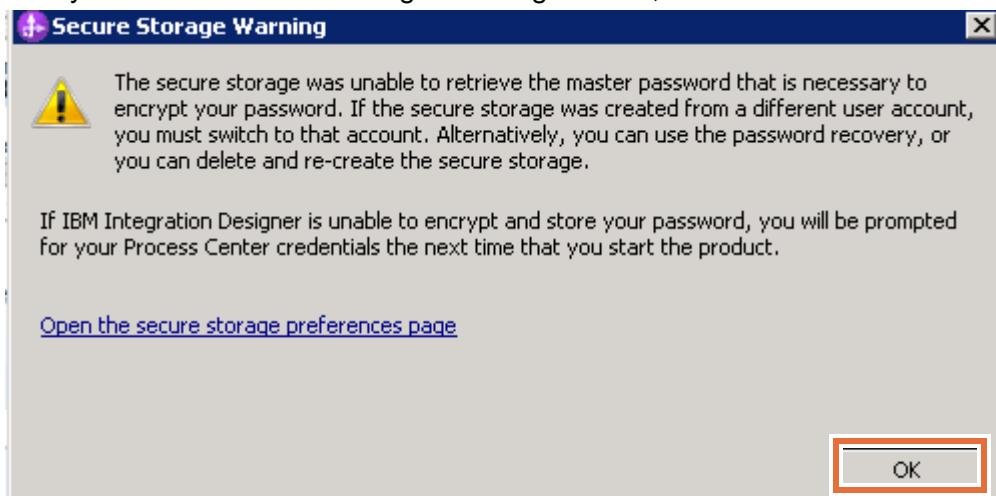
- **Process Center URL:** `http://localhost:9081/ProcessCenter`
- **User Name:** `pcdeadmin`
- **Password:** `web1sphere`

___ d. Click **Login**.

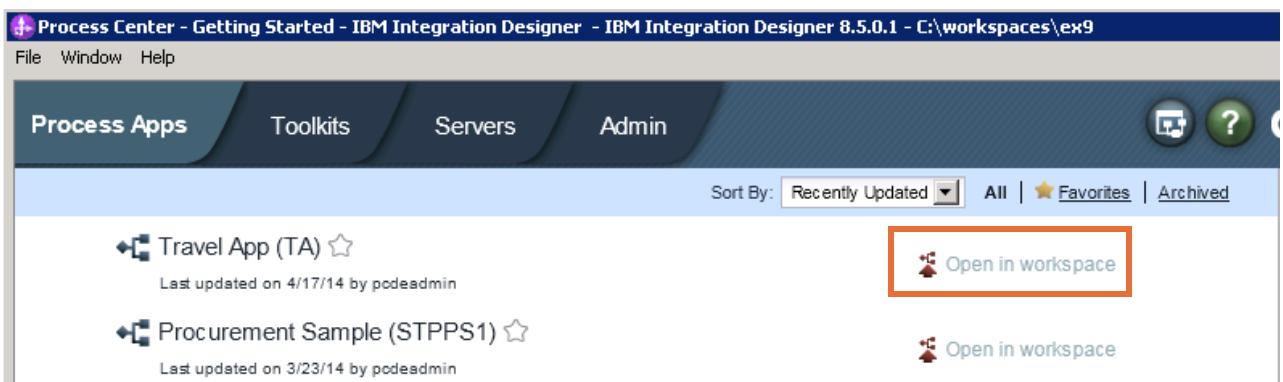
- ___ e. If you see the Secure Storage window, click **Cancel**.



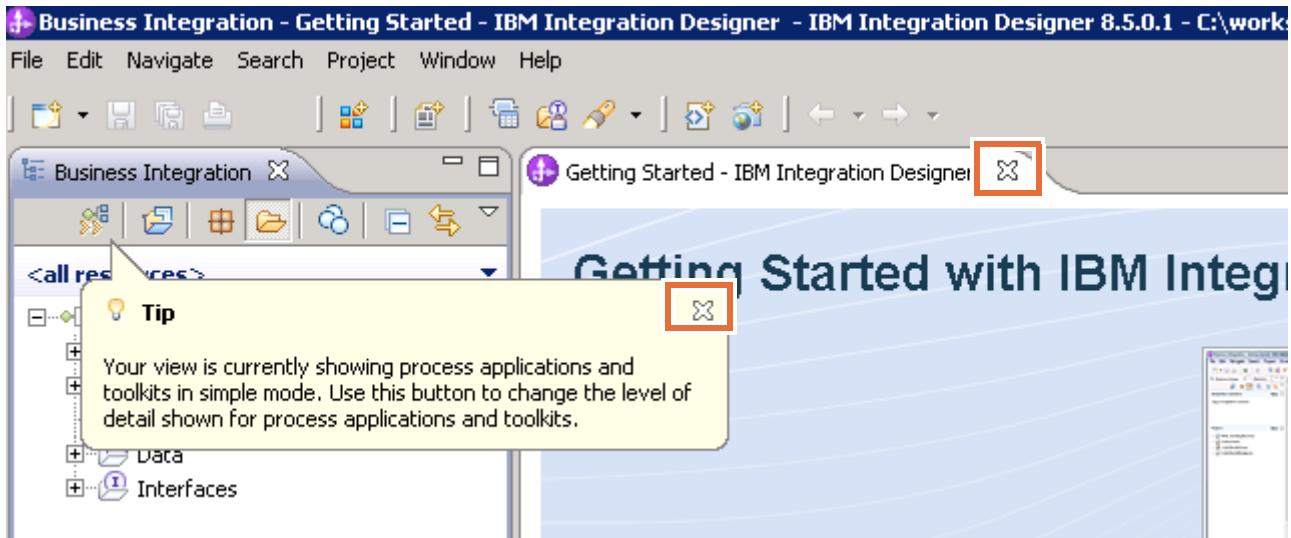
- ___ f. If you see the Secure Storage Warning window, click **OK**.



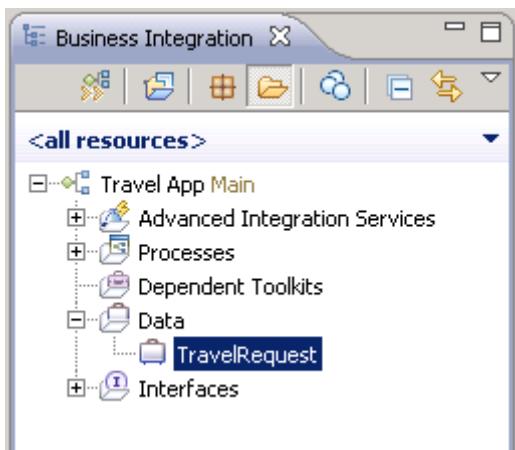
- ___ g. If you see the “Getting Started with IBM Process Center 8.5.0.1” window, click **X** to close it.
- ___ h. Click **Open in workspace** next to the Travel App (TA).



- ___ i. Close both the **Tip** dialog and the **Getting started** tab in IBM Integration Designer.



- ___ j. Wait until the build workspace is 100% complete.
___ k. In the Business Integration pane, expand **Travel App Main > Data**, and double-click **TravelRequest**.



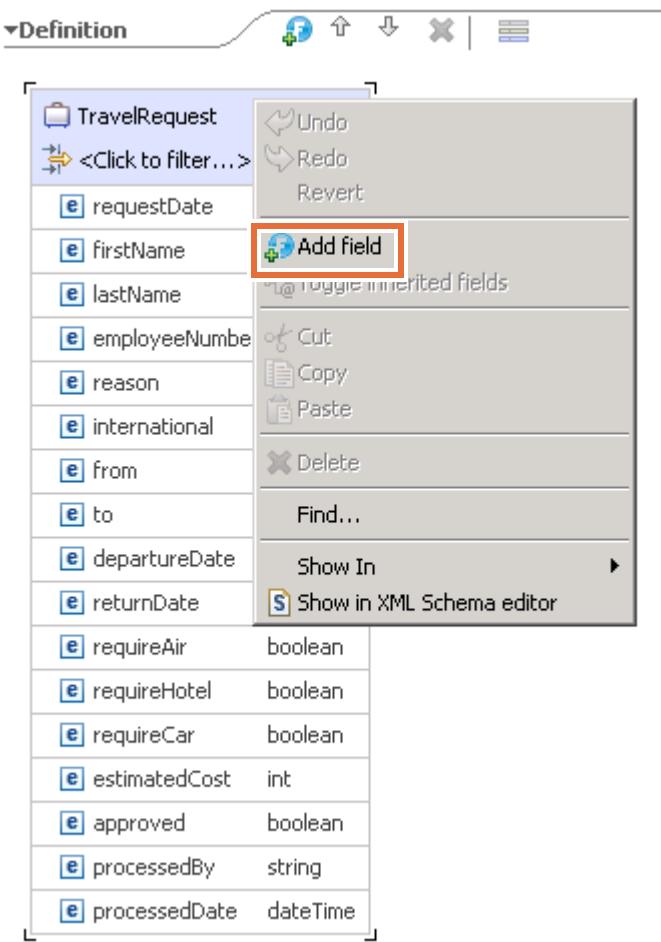
- __ I. The business objects of **TravelRequest** appear on the right.

The screenshot shows the 'Business object' configuration for a 'TravelRequest' business object. The 'Name' is set to 'TravelRequest' and 'Namespace' is 'http://TA'. The 'Definition' section lists various properties:

Property	Type
e requestDate	dateTime
e firstName	string
e lastName	string
e employeeNumber	string
e reason	string
e international	boolean
e from	string
e to	string
e departureDate	dateTime
e returnDate	dateTime
e requireAir	boolean
e requireHotel	boolean
e requireCar	boolean
e estimatedCost	int
e approved	boolean
e processedBy	string
e processedDate	dateTime

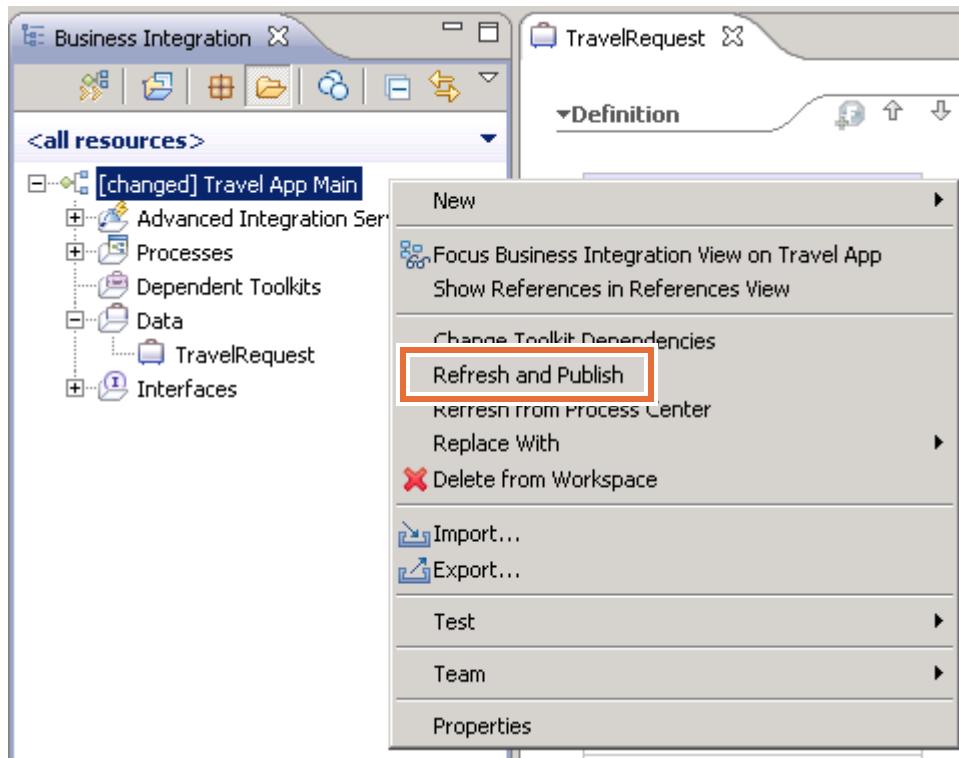
- __ m. The error message indicates in the Process Designer that there was a missing property called `Comment`. You need to add a data definition for `Comment`.

- __ n. Right-click the **TravelRequest** definition and select **Add field**.

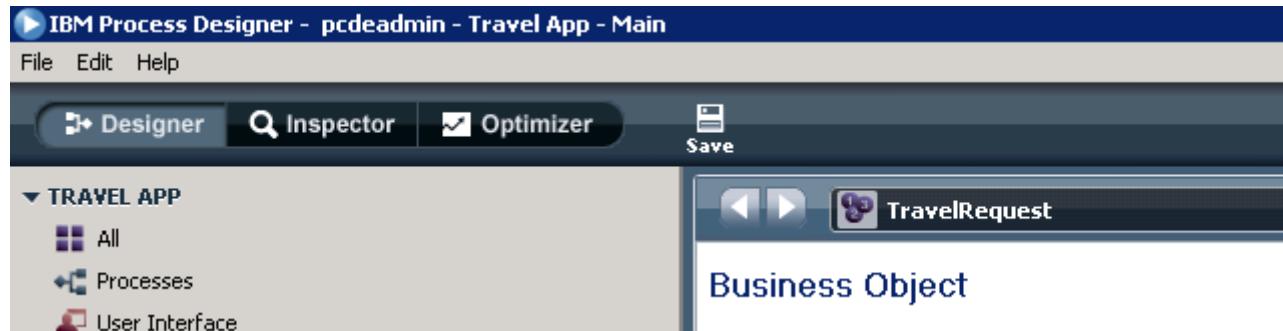


- __ 5. Rename **field1** to **Comment** and press Enter. This name is case-sensitive.
__ 6. Leave the default type at **string**.
__ 7. Press **Ctrl+S** to save.
__ 8. Close the **TravelRequest** editor.

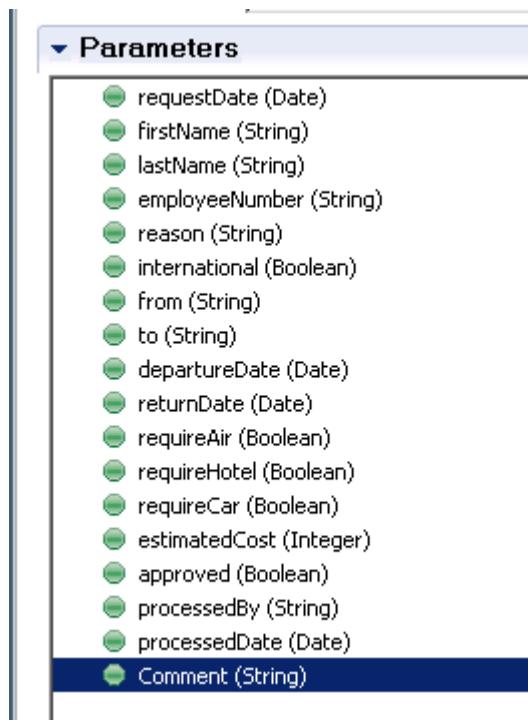
9. In the Business Integration pane, the Travel App Main indicates that there is a change. Right-click **Travel App Main**, and select **Refresh and Publish**.



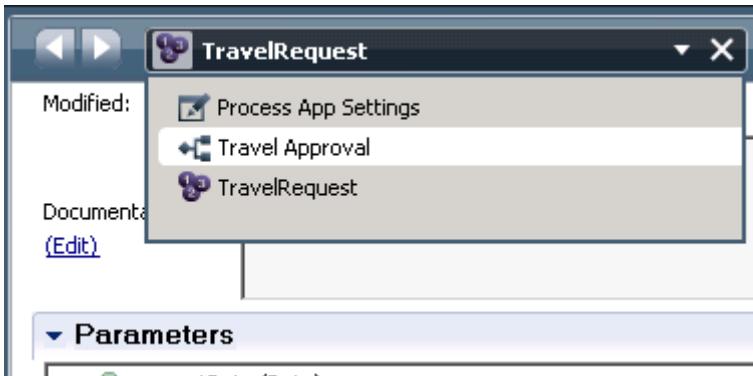
10. Return to **IBM Process Designer**. It still shows the **TravelRequest** business object.



- ___ 11. In the Parameters section, verify that the business object Comment appears now at the bottom. Comment is the field that you just added in IBM Integration Designer.

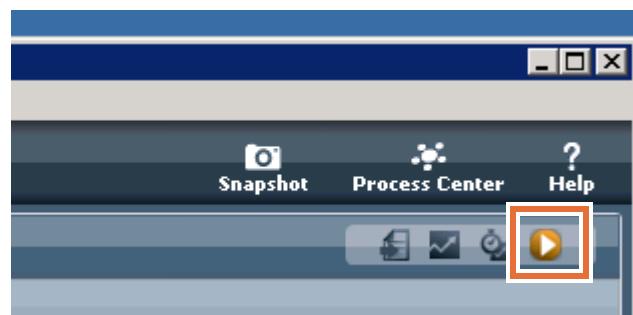


- ___ 12. Return to the **Travel Approval** process.



- ___ 13. Run the Travel App process again.

- ___ a. Click **Run** in the upper right to run the process.



- ___ b. Click **Yes** to switch to the Inspector view.

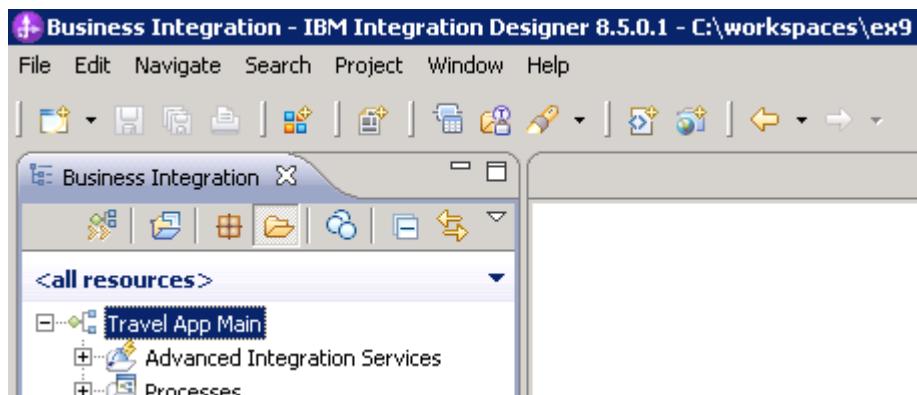
- ___ c. Run the first task that is called **Request Travel** in the process. Select the task with **Step: Request Travel**, and click the **Run the selected task** icon in the upper right.
- ___ d. Select `bpmadmin` as the user, and click **OK**.
A web browser opens and it shows the Travel Request Application.
- ___ e. Click **Create Request**. You are able to pass this step, and the error does not exist anymore.
- ___ f. Close the browser.

Part 4: Add an existing service

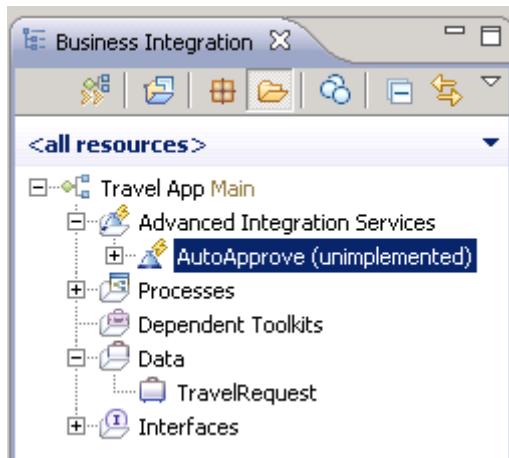
The integration programmer wants to add an existing module as it contains a service with some additional logic. The automatic approval is partially based on whether the employee is an executive or not. The employee number needs to be looked up in a back-end system, which is exactly what the existing module does. There are many other services in this module, but the company decided not to expose them to the business authors in the Process Designer.

The integration programmer starts by adding the module and library to Process Center by using a new toolkit to contain them. The action limits the visibility of the artifacts to the business authors. The toolkit is set up such that business authors have no read or write access, leaving the toolkit under the control of the integration programmer. In addition, the company decided that exposing the service in its current form is not a good idea because the interfaces are not understandable to the business author, and might be too complex.

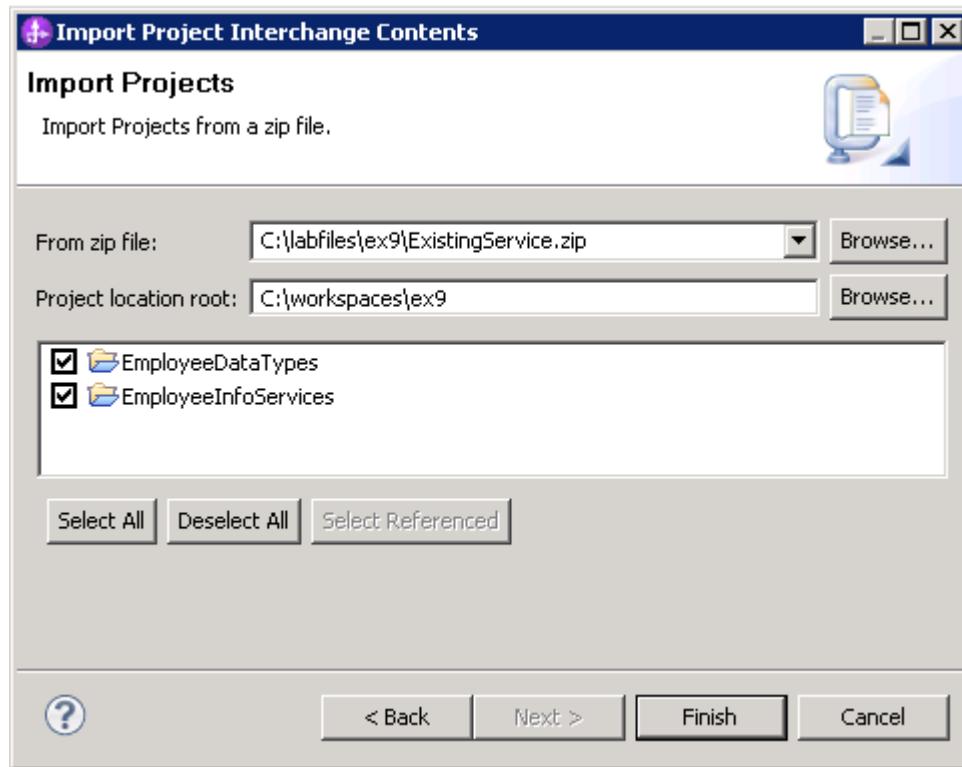
- ___ 1. Import an existing service.
- ___ a. Return to **Business Integration** view in IBM Integration Designer.



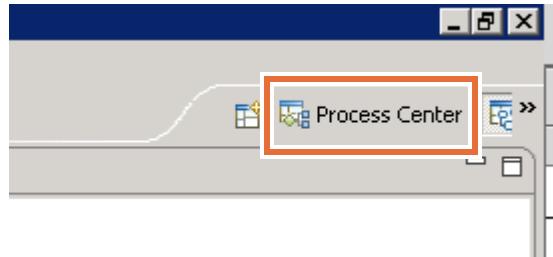
- ___ b. In the Business Integration view, expand **Travel App Main > Advanced Integration Services > AutoApprove**. The **AutoApprove** AIS is defined in the Business Integration view, and marked as unimplemented.



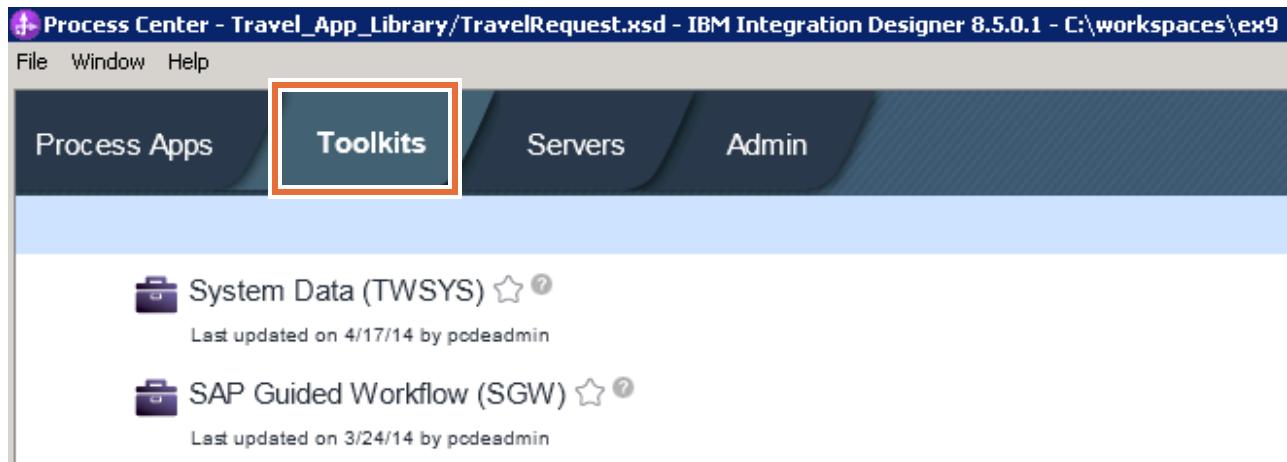
- ___ c. Import an existing module and corresponding library into the Integration Designer from the `labfiles` folder. Right-click **Travel App Main**, and select **Import**.
- ___ d. In the Import window, scroll down to select **Other > Project Interchange**.
- ___ e. Click **Next**.
- ___ f. Next to the **From zip file** field, click **Browse** to open `C:\labfiles\ex9\ExistingService.zip`.
- ___ g. Click **Open**.
- ___ h. Click **Select All**.



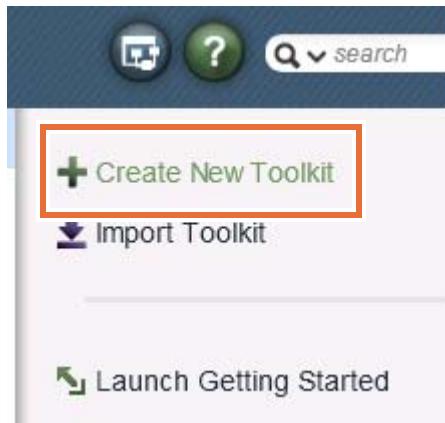
- ___ i. Click **Finish**. Wait until the workspace build is 100% complete in the lower-right corner.
- ___ 2. Create the **EmployeeServImpl** toolkit.
- ___ a. Click the **Process Center** perspective in the upper-right corner to return to the **Process Center** view.



- ___ b. Click the **Toolkits** tab.

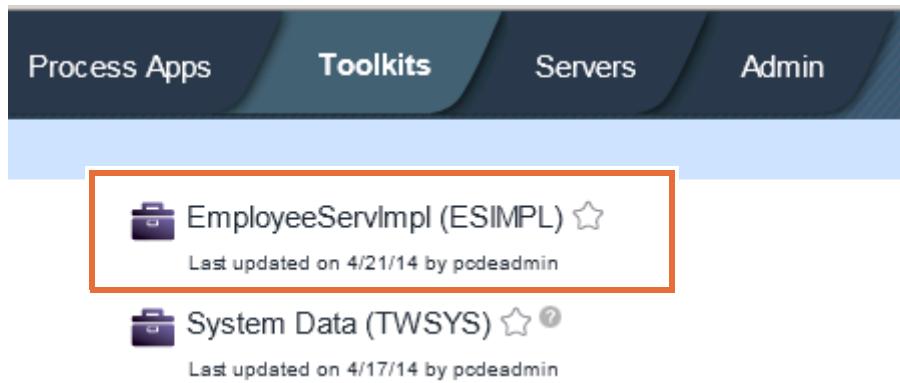


- ___ c. Click **Create New Toolkit** on the upper-right corner.



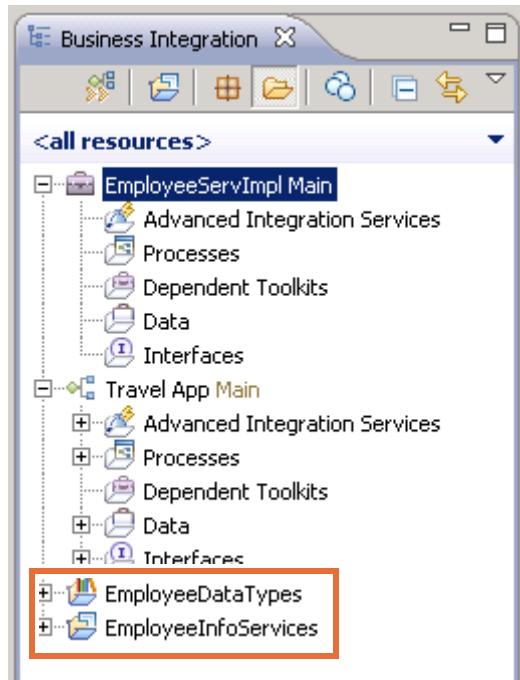
- ___ d. In Create New Toolkit window, enter the following information:
 - **Toolkit Name:** EmployeeServImpl
 - **Acronym:** ESIMPL
- ___ e. Click **Create**.

- ___ f. The new toolkit is created.

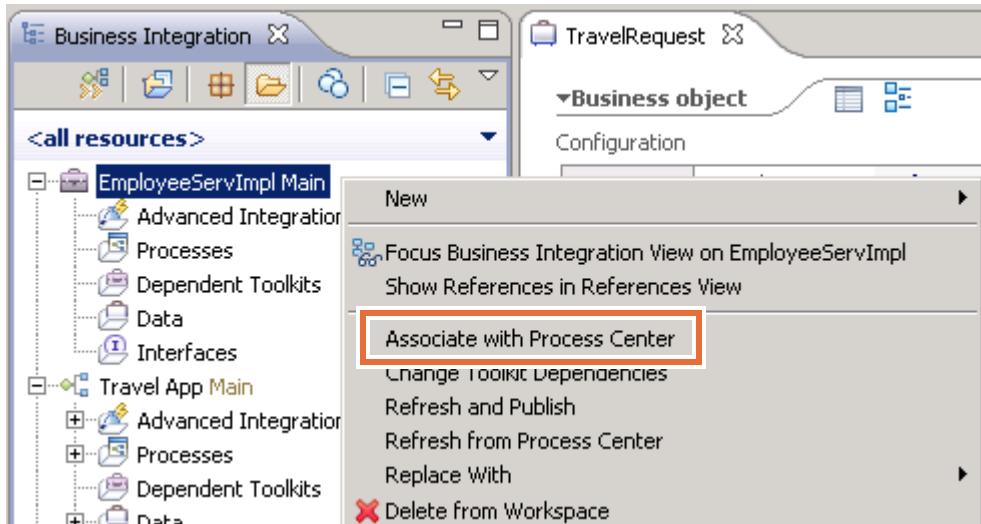


- ___ 3. Associate the toolkit with Process Center.

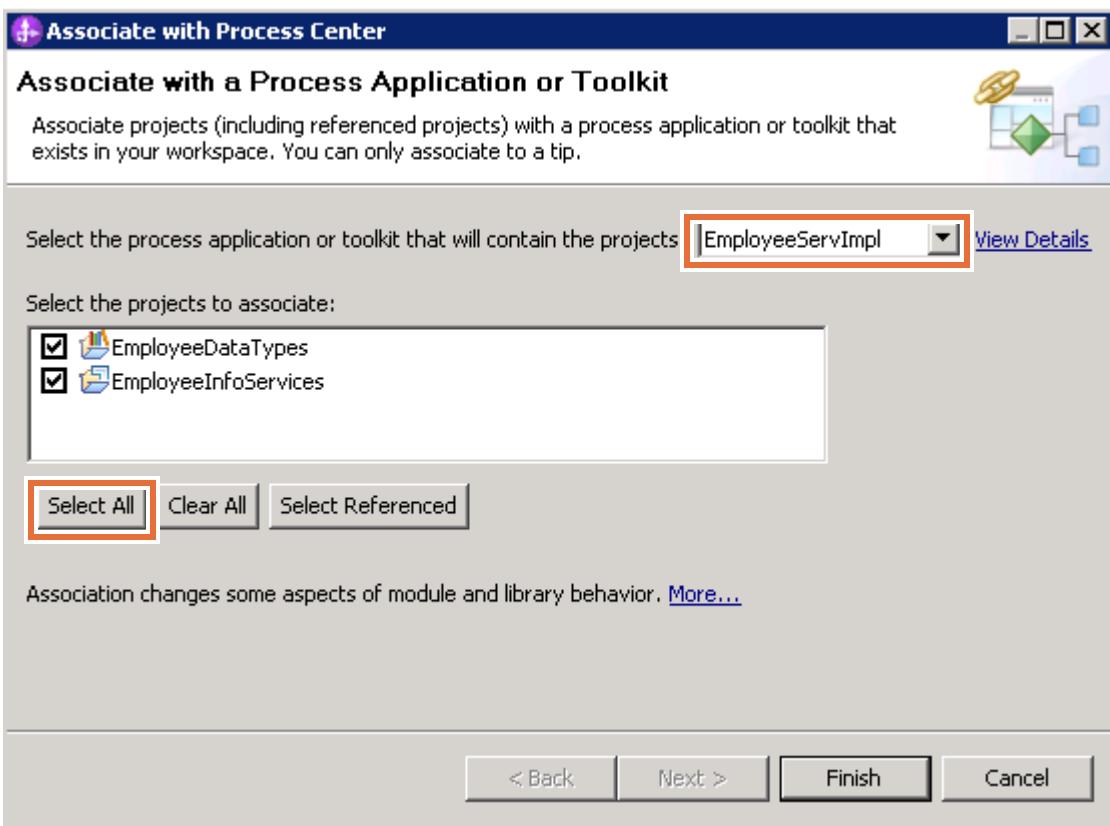
- ___ a. Click **Open in workspace** next to the EmployeeServiceImpl (ESIMPL).
- ___ b. Both the **EmployeeDataTypes** and **EmployeeInfoServices** appear under **EmployeeServiceImpl Main** in the Business Integration view.



- ___ c. Right-click **EmployeeServiceImpl Main** and select **Associate with Process Center**.

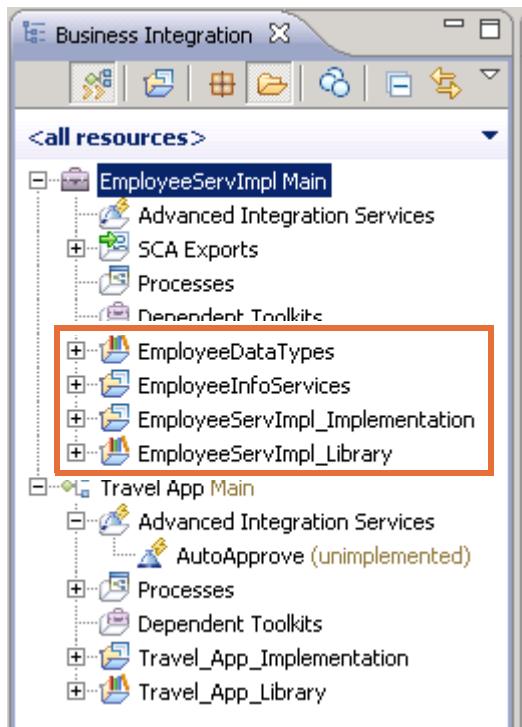


- ___ d. In the “Associate with Process Center” window, make sure that you selected **EmployeeServiceImpl** as toolkit. Click **Select All**.

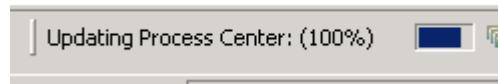


- ___ e. Click **Finish**.
___ f. Click **Yes** to switch to detailed mode.

- ___ g. After the associations are completed, you see the additional libraries under the **EmployeeServiceImpl** toolkit.

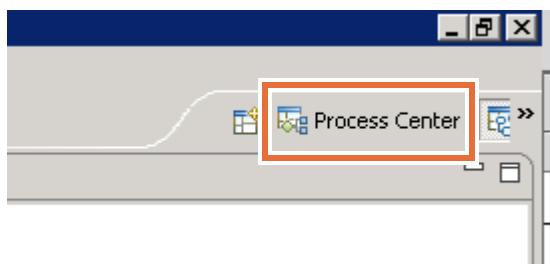


- ___ h. Wait until the update from Process Center is completed by checking the status in the lower-right corner.



After you make the associations, you create a snapshot of the toolkit in Process Center. You also change the permissions on the **EmployeeServiceImpl** toolkit so that only users in a specific role are allowed to view and edit the toolkit.

- ___ 4. Create a snapshot and change the permissions.
- ___ a. Click the **Process Center** perspective in the upper-right corner to return to Process Center.



- ___ b. In the **Toolkits** tab, click the **EmployeeServiceImpl (ESIMPL)** link.
- ___ c. In the Snapshots section, click **Create New Snapshot** in the upper-right corner.
- ___ d. Enter **Version 1** in the **Snapshot Name** field.

- ___ e. Click **Create**. The new Version 1 snapshot is created.

The screenshot shows the Toolkit Management interface. At the top, there are tabs: Process Apps, Toolkits, Servers, Admin. Below that, a sub-navigation bar has tabs: Snapshots (highlighted in green), History, Manage, Governance. The main content area shows the toolkit details:

- EmployeeServiceImpl (EMPSVIM)** (with a yellow star icon)
- Current**: Last changed on 4/18/14 by pcdeadmin (Not Used)
- Version 1 (New)**: Created on 4/18/14 by pcdeadmin. Not Yet Deployed to Process Center Server. A link [Where used:](#)

- ___ f. Click **Manage**.

The screenshot shows the Toolkit Management interface. The tabs at the top are Process Apps, Toolkits, Servers, Admin. The sub-navigation bar below has tabs: Snapshots, History, **Manage** (highlighted with a red box), Governance. The main content area shows the toolkit details, identical to the previous screenshot.

- ___ g. In the “Manage Access to Process Library” section, you can change the permissions on the **EmployeeServiceImpl** toolkit so that only specific users are allowed to view or edit the toolkit.

Manage Access to Process Library

[Add Users](#)

[Add Groups](#)

Read

Write

Admin



pcdeadmin (pcdeadmin)

- ___ h. Click **Add Users** to add a user.
 ___ i. Enter ** in the **Search For Name** field.
 ___ j. Select the check box for testuser.
 ___ k. Click **Add Selected**.

User testuser has read-only access for the toolkit.

Manage Access to Process Library

[Add Users](#)

[Add Groups](#)

Read	Write	Admin	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	pcdeadmin (pcdeadmin)
<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	testuser (testuser)

As mentioned earlier, this action limits the visibility of the artifacts to the business authors. The toolkit is set up such that business authors have no read or write access, leaving the toolkit under the control of the integration programmer. This action prevents errors that data corruption or unplanned data changes might cause.

Part 5: Add a facade service

Data types are one of the main kinds of shared artifacts between Process Designer and Integration Designer. After one tool changes a data type, the definition of the data type in the other format is updated with those changes.

Many other artifacts in both Integration Design and Process Designer use data types. The changes that are made to the types through one tool are likely to break artifacts that are defined in the other tool. A good pattern to avoid excessive or accidental breakages is to “facade” the data types and the interfaces, isolating the models from changes that are introduced through the other tool. For example, suppose that an input variable refers to a specific data type in a business process definition in Process Designer. Further, suppose that the same data type is used in a BPEL process, some Java snippets, and in a state machine in Integration Designer. If the business author decides to delete the type, or move it to another toolkit, then the BPEL process, Java snippets, and state machine in Integration Designer are all broken. However, if a facade pattern was used, these artifacts would not be broken at all. Instead, only the facade logic, such as a data map, would be broken. Since the breakage does not occur within the business logic of the BPEL, the snippets, or the state machine, it is easier and less error prone to adjust the facade.

After the integration programmer works with the existing service that is associated with a toolkit, the integration programmer decides to create a more reusable service for business authors to use in the future. The integration programmer creates another toolkit, EmployeeServices, to contain the public service interface for the business authors. A dependency is made from EmployeeServices to the snapshot of EmployeeServiceImpl. The integration programmer implements the facade pattern by creating interfaces and data types in EmployeeServices that represent a subset of EmployeeServiceImpl.

To complete the facade pattern, the integration programmer implements a simple mediation flow in EmployeeServices to mediate from the public interfaces and data types to the existing service.

- 1. You now import the completed facade pattern. First, you import the **EmployeeServices** toolkits as part of the solution, and then import the revised **TravelApp** process application.
 - a. Select the **Toolkits** tab, and click **Import Toolkit**.

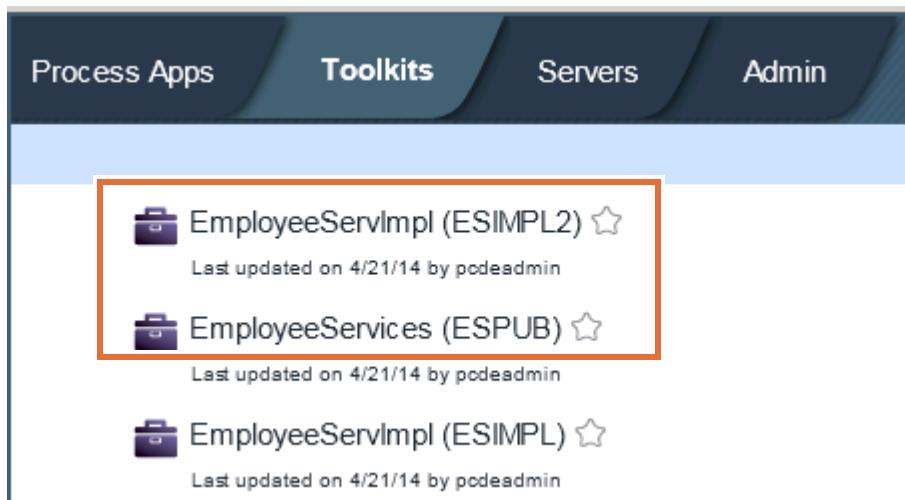
**Note**

If you do not see the **Toolkits** tab, click the **Process Center** icon in Process Designer to get there.

- __ b. Click **Browse** to select the `C:\labfiles\ex9\EmployeeServicesV1.twx` file and click **Open**.
- __ c. Click **OK**.
- __ d. Click **Import**. Since a dependency was made from EmployeeServices to the snapshot of EmployeeServiceImpl, the import includes the EmployeeServiceImpl.



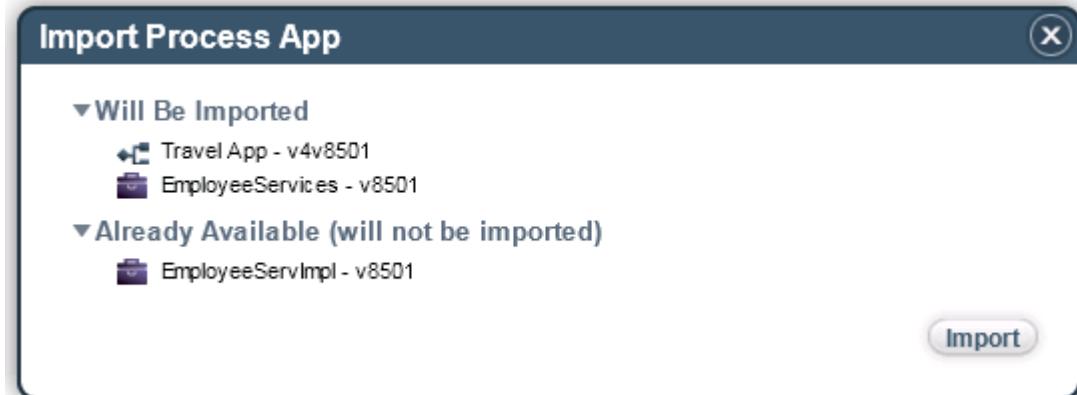
- __ e. After importing the new toolkits, the newly imported **EmployeeServiceImpl** becomes **ESIMPL2**.

**Important**

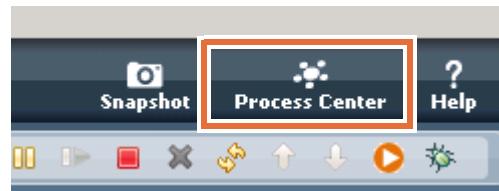
When importing both process applications and toolkits, you need to import the toolkits first, and then the process application, because the process application has a dependency on the toolkits.

- __ 2. Now you import the revised **TravelApp** process application.
 - __ a. Click the **Process Apps** tab.

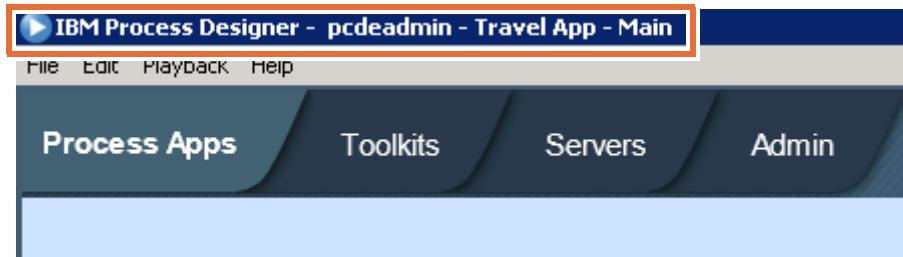
- __ b. Click **Import Process App**.
- __ c. Click **Browse** to select the C:\labfiles\ex9\Travel_AppV3.twx file and click **Open**.
- __ d. Click **OK**.
- __ e. Click **Import** to import the updated Travel App and EmployeeServices. EmployeeServiceImpl is not imported because it was imported previously.



- __ 3. Manage the toolkits in Process Designer because both toolkits have dependencies that require updates.
 - __ a. Make sure you are in the Process Apps tab. If needed, switch to the Process Center view by clicking **Process Center** in the upper-right corner of IBM Process Designer.

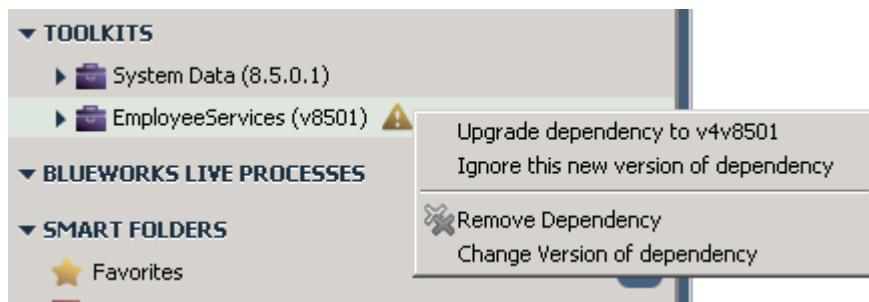


- __ b. If needed, select the **Process Apps** tab.



- __ c. Click **Open in Designer** next to the Travel App (TA).

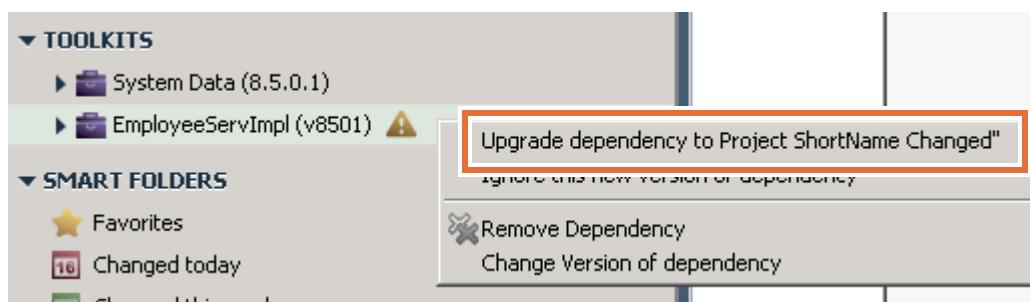
- ___ d. Under TOOLKITS, **EmployeeServices (v8501)** has a dependency and requires an upgrade to the current level. Right-click **EmployeeServices (v8501)**, and select **Upgrade dependency to v4v8501**.



- ___ e. Click the **Process Center** icon.
 ___ f. Click the **Toolkits** tab.
 ___ g. Click the **EmployeeServices (ESPUB)**, and click **Manage**.
 ___ h. Select the check box for **Allow users to update toolkit**.

The screenshot shows the 'Manage' tab for the 'Employee Services (ESPUB)' toolkit. It includes fields for 'Toolkit Name' (EmployeeServices) and 'Acronym' (ESPUB). On the right, there is a checkbox labeled 'Allow users to update toolkit' which is checked and highlighted with a red box.

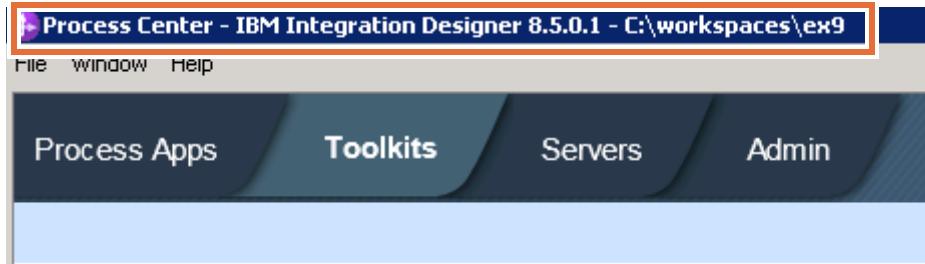
- ___ i. Click the **Toolkits** tab.
 ___ j. Click **Open in Designer** next to **EmployeeServices (ESPUB)**.
 ___ k. Under TOOLKITS, right-click **EmployeeServiceImpl (v8501)**, and select **Upgrade dependency to Project ShortName Changed**.



- ___ l. Click the **Process Center** icon in the upper-right corner.

___ 4. Switch to a new workspace to examine the facade pattern.

___ a. Return to **Process Center - IBM Integration Designer**.



___ b. Click the **Go to Business Integration** icon.



___ c. You open a new workspace to examine the complete solution. Select **File > Switch Workspace > Other**.

___ d. In the Workspace Launcher window, enter `C:\workspaces\ex9A` and click **OK**.

___ e. In the Process Center Login window, enter the following information:

- **Process Center URL:** `http://localhost:9081/ProcessCenter`
- **User name:** `pcdeadmin`
- **Password:** `websphere`

___ f. Click **Login**.

___ g. If the Secure Storage window appears, click **Cancel**.

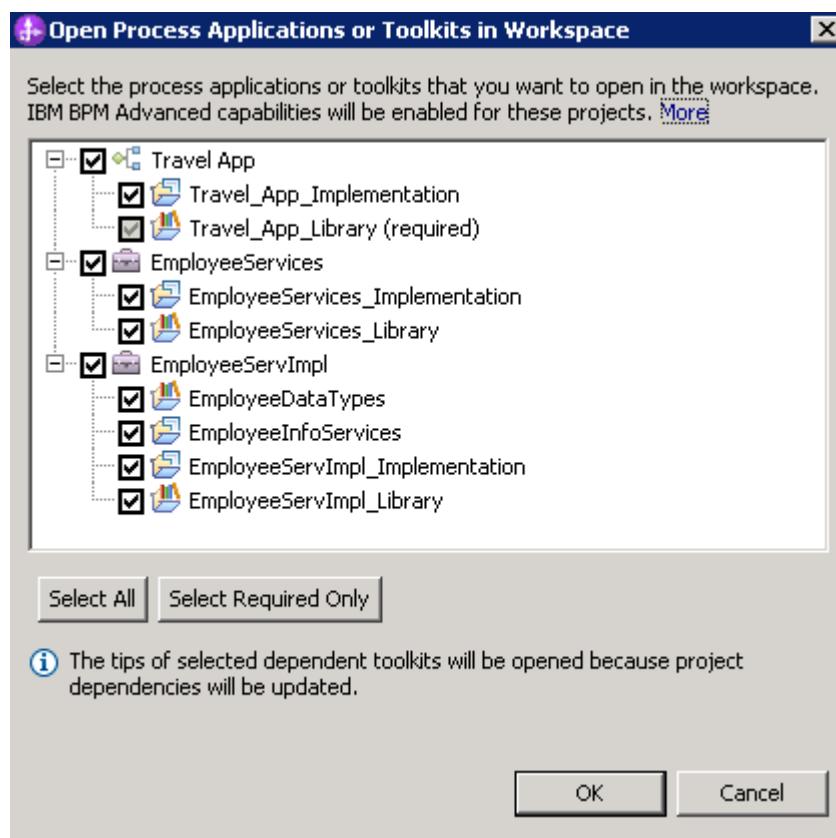
___ h. If the Secure Storage Warning window appears, click **OK**.

___ i. Close the "Getting Started with IBM Process Center 8.5.0.1" window.

___ j. Click the **Process Apps** tab.

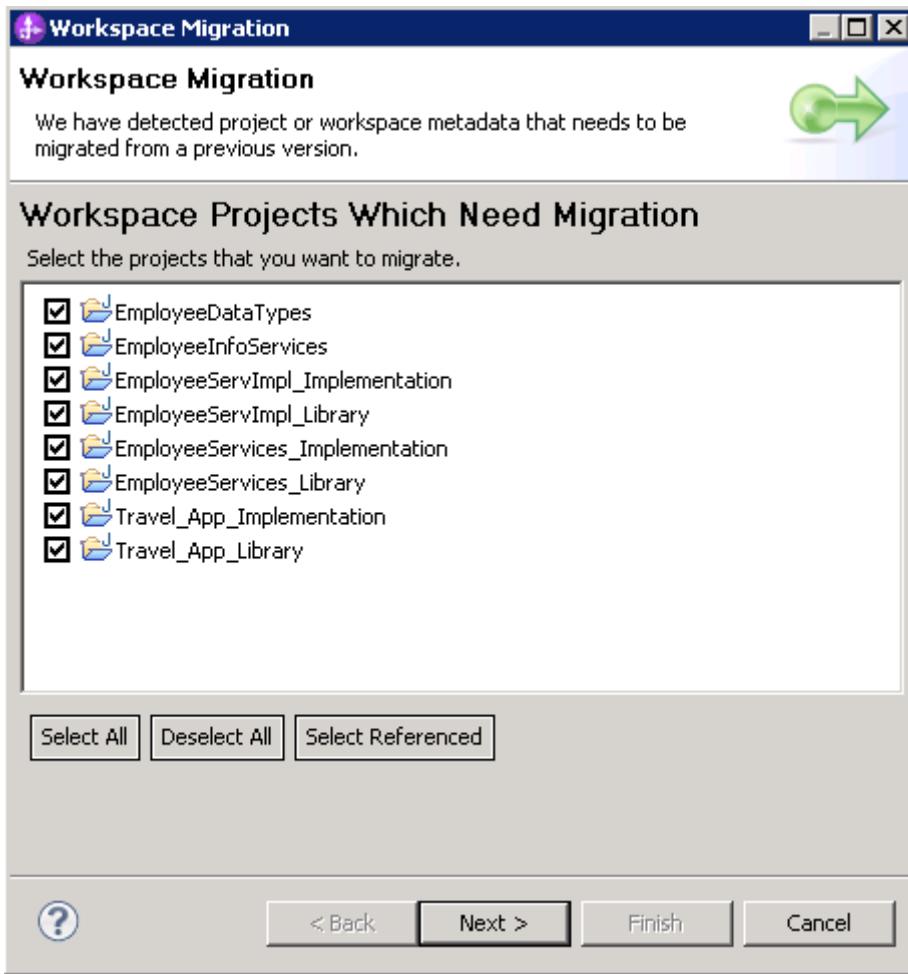
___ k. Click **Open in workspace** next to **Travel App (TA)**.

- __ I. When you open the Travel App in the workspace, it brings its dependent toolkits to the workspace. Make sure that all the check boxes are selected, and click **OK**.

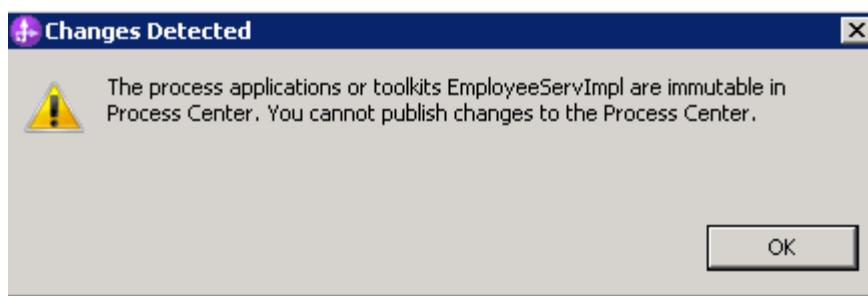


You upgraded the dependency for the Travel App and toolkits in the Process Designer in the previous section in this exercise. Now, you bring them into the workspace in IBM Integration Designer, and it goes through the migration validation as they were originally created in the previous product version.

- __ m. In the Workspace Migration window, click **Next**.

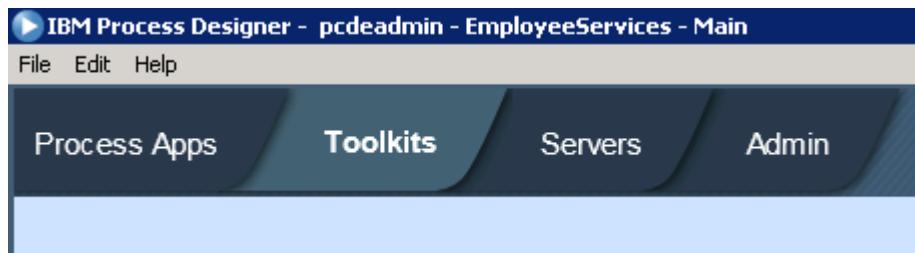


- __ n. Click **Next**.
- __ o. Click **Finish**.
- __ p. Click **OK** for the migration validation.
- __ q. Click **OK** when the migration is complete.
- __ r. Click **OK** for the changes that were detected. It means that you can change only the elements in the Process Center. If you change anything in the workspace, you cannot publish them to the Process Center.



- __ s. Wait until the workspace build is fully complete.

- ___ t. If the “Getting Started with IBM Process Center 8.5.0.1” window appears, click X to close it.
- ___ 5. After you import the complete application, you can examine the facade pattern.
 - ___ a. Return to IBM Process Designer to examine the snapshot of **EmployeeServImpl**.



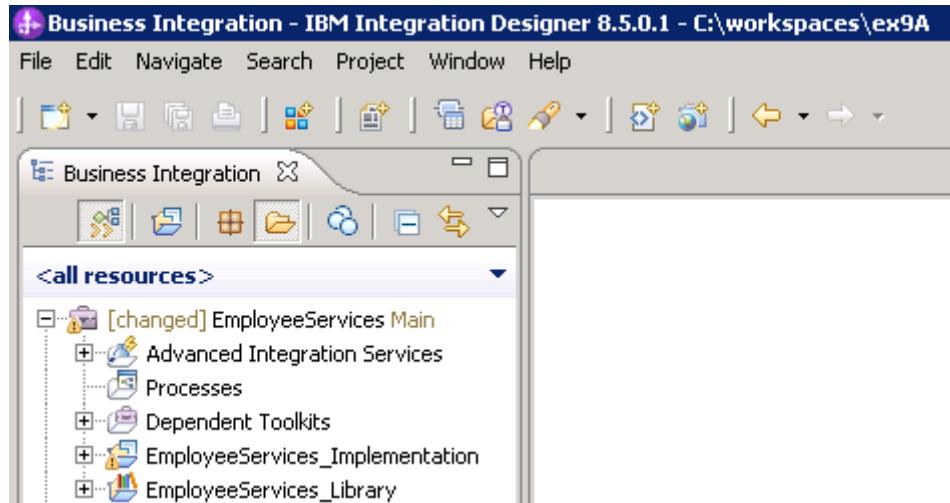
- ___ b. Click the **Toolkits** tab.
- ___ c. Click **Open in Designer** next to **EmployeeServices (ESPUB)**.

The imported process made a dependency from EmployeeServices to the snapshot of EmployeeServImpl.

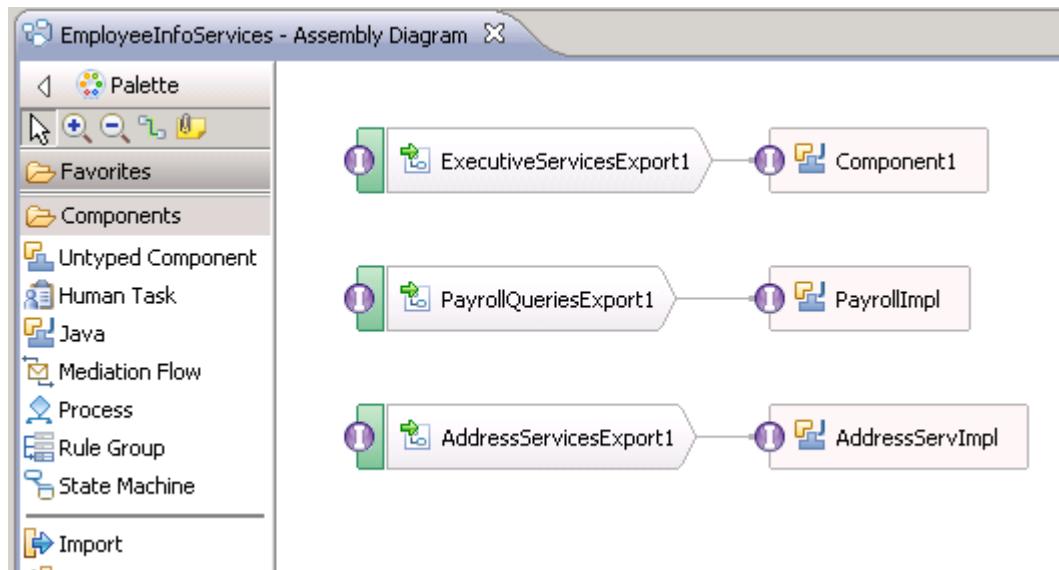


The imported process created interfaces and data types in EmployeeServices that represent a subset of EmployeeServImpl.

- ___ d. Return to the Business Integration view.

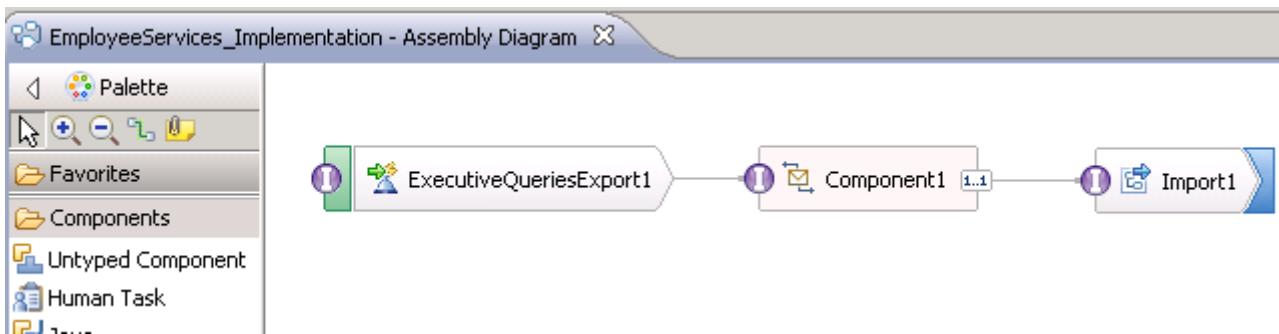


- ___ e. Expand **EmployeeServiceImpl Main > EmployeeInfoServices**, and double-click the **Assembly Diagram**. You see three operations on the interface: executive services, payroll queries, and address services.

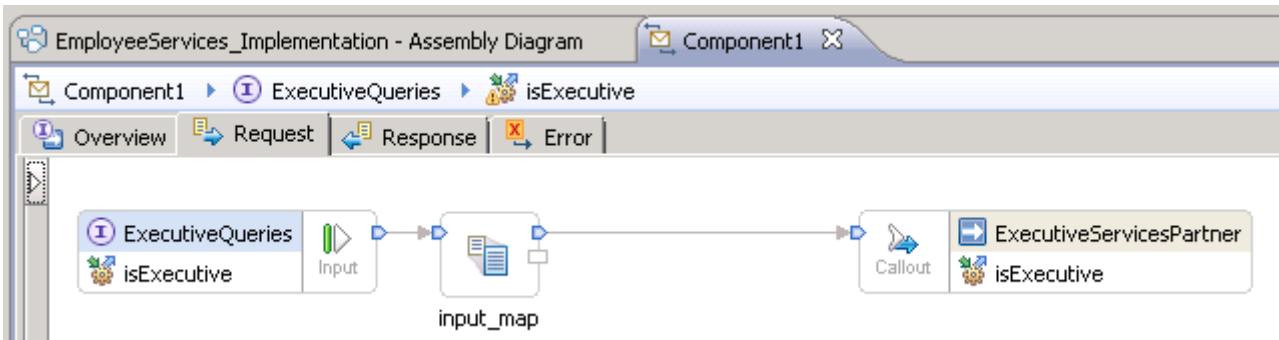


There are three operations on the ExecutiveServices interface, but the integration programmer wants to surface only one of them. Likewise, the integration programmer does not want business authors to see the AddressServices or PayrollQueries services that also exist.

- ___ f. The integration programmer wants to show only one of the services. The integration programmer does not want business authors to see the AddressServices or PayrollQueries services that also exist. Expand **EmployeeServices Main > EmployeeServices_Implementation**, and double-click the **Assembly Diagram**.



- ___ g. To complete the facade pattern, the integration programmer implements a simple mediation flow in EmployeeServices to mediate from the public interfaces and data types to the existing service. Double-click **Component1**, and click **isExecutive**.



- ___ h. If time permits, double-click **input_map** to explore the map.

The integration programmer can now create a snapshot of EmployeeServices and create a dependency from Travel App to EmployeeServices. The integration programmer implements the AIS, with the facade service. In the imported process application, a BPEL process can be used for the AIS implementation. The business author is free to modify the artifacts in EmployeeServices, and the underlying service in EmployeeServiceImpl is not affected.

- ___ i. Close all the editors.

Part 6: Fixing a breakage in the process application

If a process application or toolkit contains content that is authored in both Process Designer and Integration Designer, you must take extra caution to avoid unintended or unnoticed breakages.

The set of artifacts visible to a business author is different from the ones for the integration programmer. For example, a mediation flow that is authored in Integration Designer is not visible to business authors. Conversely, an undercover agent that is authored in Process Designer is not visible to integration programmers. However, some artifacts are visible to both roles, such as data types, business process definitions, and Advanced Integration services. In addition, there are dependencies between process applications and toolkits that enable artifact visibility across project dependencies. For example, a project dependency in Integration Designer must be resolvable in

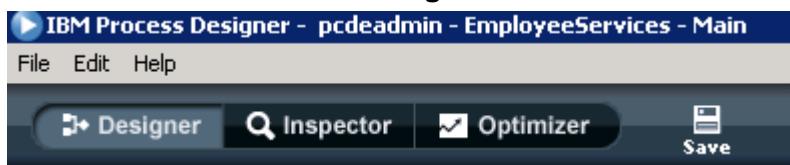
the scope of the process application or toolkit. If a module in a process application depends on a library, the library must be in the same process application or in a dependent toolkit. Integration programmers and business authors can change these artifacts or dependencies, causing an adverse impact to the artifact that is visible to the other role.

To ensure that an entire process application or toolkit is error-free, you open and analyze it in both tools. Using a new workspace in Integration Designer, you select all modules and libraries when opening the process application or toolkit. After the build is complete, you can see any errors in the Problems view.

In this part of the exercise, the integration developer discovered an error in one of the maps. Therefore, a business author removes one of the business objects in the Process Designer without communication to the integration developer.

___ 1. A business author removes a business object called **Employee Number**.

___ a. Return to the **IBM Process Designer**.



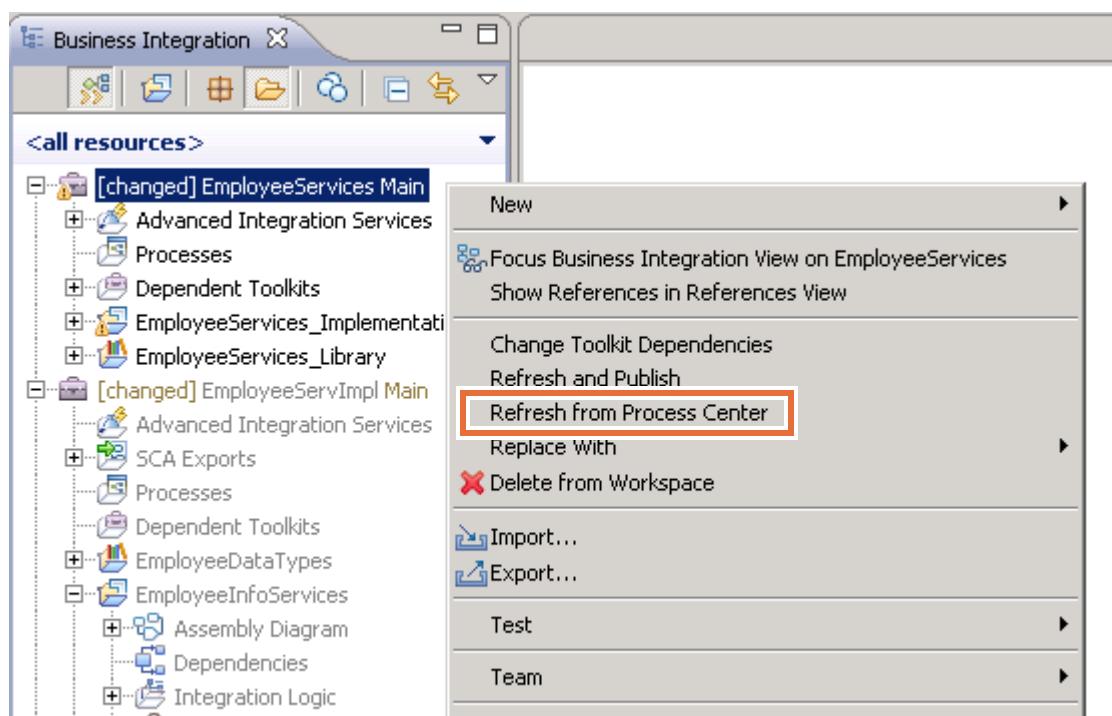
___ b. Select **Data** and double-click the business object **GeneralEmployee**.

___ c. Select **EmployeeNumber** under Parameters.

___ d. Click **Remove**.

___ e. Click **Save**.

2. The integration developer examines the breakage in Business Integration Designer.
- a. In the Business Integration view, right-click the **EmployeeServices Main** and select **Refresh from Process Center**.



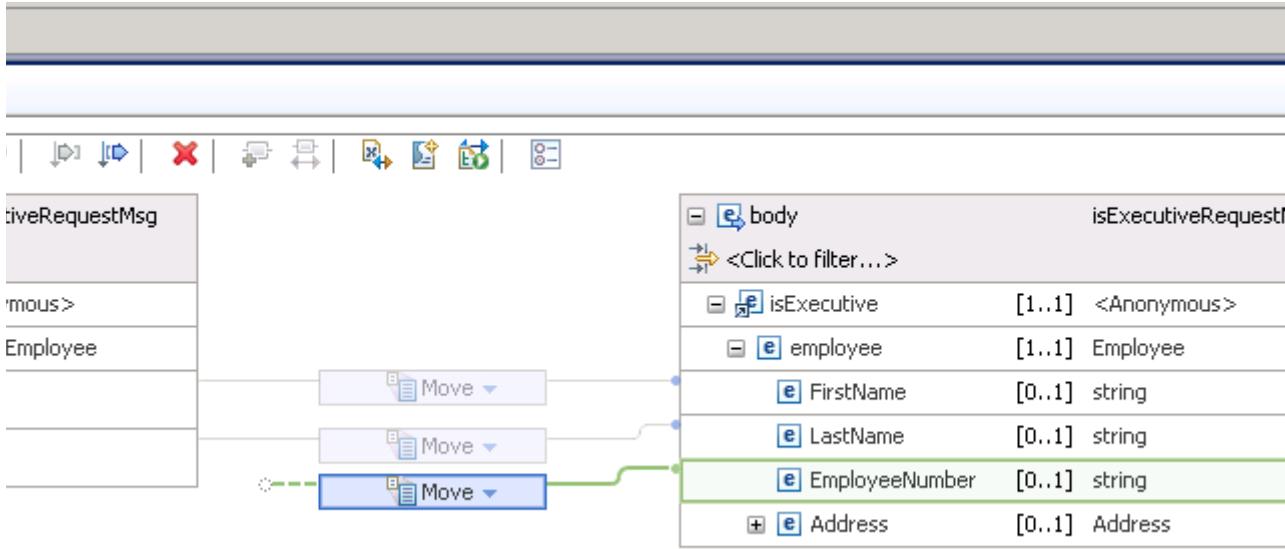
- b. After the refresh is complete, you can see an error in the **Problems** view.

The screenshot shows the 'Problems' view tab selected in the top navigation bar. Below the tab, it says '1 error, 2 warnings, 0 others'. The main area displays a table with columns: Description, Resource, Path, Location, and Type. There is one error listed:

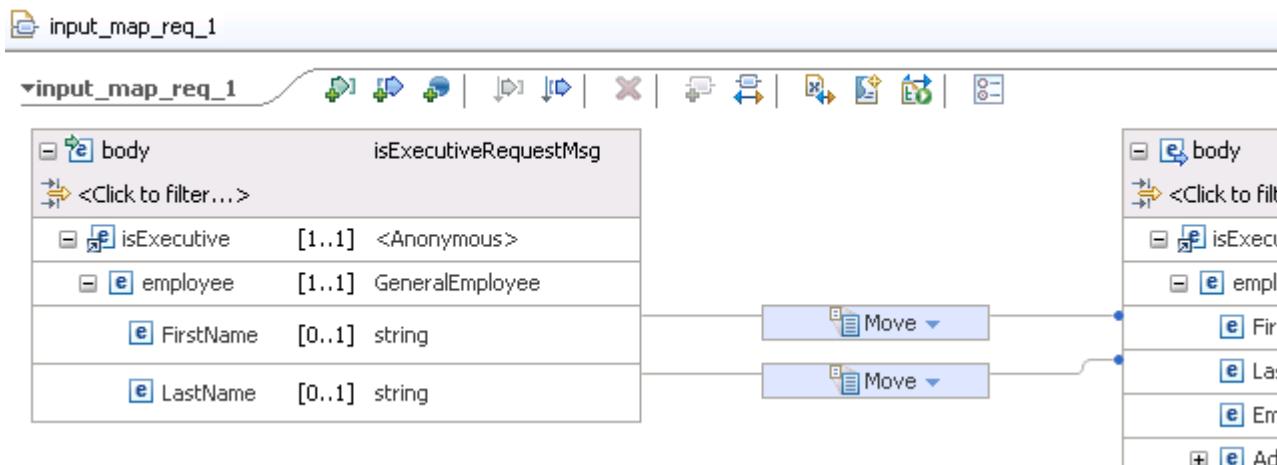
Description	Resource	Path	Location	Type
✖ Errors (1 item)				
✖ The Move input or output object isExecutive/employee/Emplo	input_map_...	/EmployeeServic...	line 16	Map Pr...

The error points to a map problem. The business author decided to change the interface contract slightly, and went into Process Designer to modify the data type by deleting one of the fields. The business author informed the integration programmer that changes were made in the **GeneralEmployee** data type in the toolkit with the public services, EmployeeServices. After the build was complete, there is a problem. A field in the map is now missing.

- ___ c. Double-click the error to open the Mapping editor.



- ___ d. To correct the error, you remove the bottom move node in the map by selecting **Move** and pressing the Delete key.



- ___ e. Press Ctrl+S to save the change.

Part 7: Protect mirrored artifacts in toolkits

Data types are artifacts that are shared between Process Designer and Integration Designer. Business authors and integration programmers can change these artifacts, and those changes are visible to both of them. To support this capability, data types are stored in two forms in Process Center: a Process Designer format (proprietary) and an Integration Designer format (XSD files). After a change is made to a data type, the artifact is updated in both formats with a translation mechanism that keeps them synchronized. When an integration programmer publishes resources to Process Center, the translation occurs and modifies, creates, and deletes the artifacts in the Process Designer format. The business author sees the changes after the publish operation is complete. Conversely, if a business author modifies a data type, the translation occurs immediately after the creation, deletion, or saving the editor. An integration programmer sees the changes the next time that the tool refreshes the workspace.

It is important that the formats have different characteristics and different fidelity for capturing the details that might be present in the other format. The Integration Designer format (XSD) contains structures that cannot be represented in the Process Designer format. If a data type is authored in Integration Designer, published to Process Center, and modified in Process Designer, the original data type format in Integration Designer might be significantly different. It might cause loss of modeled information.

For data types that originate in Integration Designer, either authored or imported, it is desirable to protect them from the loss of modeled information. Process Center is able to set user permissions on process applications and toolkits. Therefore, to protect the Integration Designer data types, you can place them inside a library, and associate the library with a toolkit with permissions that prevent business authors from making changes. In the Process Center perspective, the permissions can be changed such that business authors are given only read access, and not given write access. With this technique, integration programmers are free to modify the data types, and business authors see the updated data types in Process Designer. However, the business author is not able to change the data types in Process Designer, avoiding any translation that might result in loss of modeled information.

Another way of protecting data types is to not mirror them at all. If the data types are not referenced directly or indirectly by an AIS implementation, then the library that is associated with the process application or toolkit can be left as unmarked for mirroring. The default library is always mirrored, meaning that the artifacts are translated to the Process Designer artifact domain. All other libraries are not marked as mirrored by default, as seen in the properties dialog for the library, meaning that the artifacts are not visible in Process Designer. A library should be marked as mirrored only when necessary. With this technique, the business author is not able to see the data types at all, so this method cannot be used if the data types are visible to the business author.

Using either approach greatly reduces the likelihood of data types that a business author modifies in the Process Designer, and it causes a lower fidelity model in Integration Designer.

- ___ 1. Switch to **Integration Designer** to use a new workspace to examine the library mirroring.
 - ___ a. Select **File > Switch Workspace > Other**.
 - ___ b. In the Workspace Launcher window, enter `C:\workspaces\ex9B` and click **OK**.
 - ___ c. In the Process Center Login window, enter the following information:
 - **Process Center URL:** `http://localhost:9081/ProcessCenter`
 - **User Name:** `pcdeadmin`
 - **Password:** `websphere`
 - ___ d. Click **Login**.
 - ___ e. If the Secure Storage window appears, click **Cancel**.
 - ___ f. If the Secure Storage Warning window appears, click **OK**.
 - ___ g. Close the “Getting started” page.
- ___ 2. Open Hiring Sample (HSS) in the workspace.
 - ___ a. Click the **Process Apps** tab.

- __ b. Click **Open in workspace** next to **Hiring Sample (HSS)**.

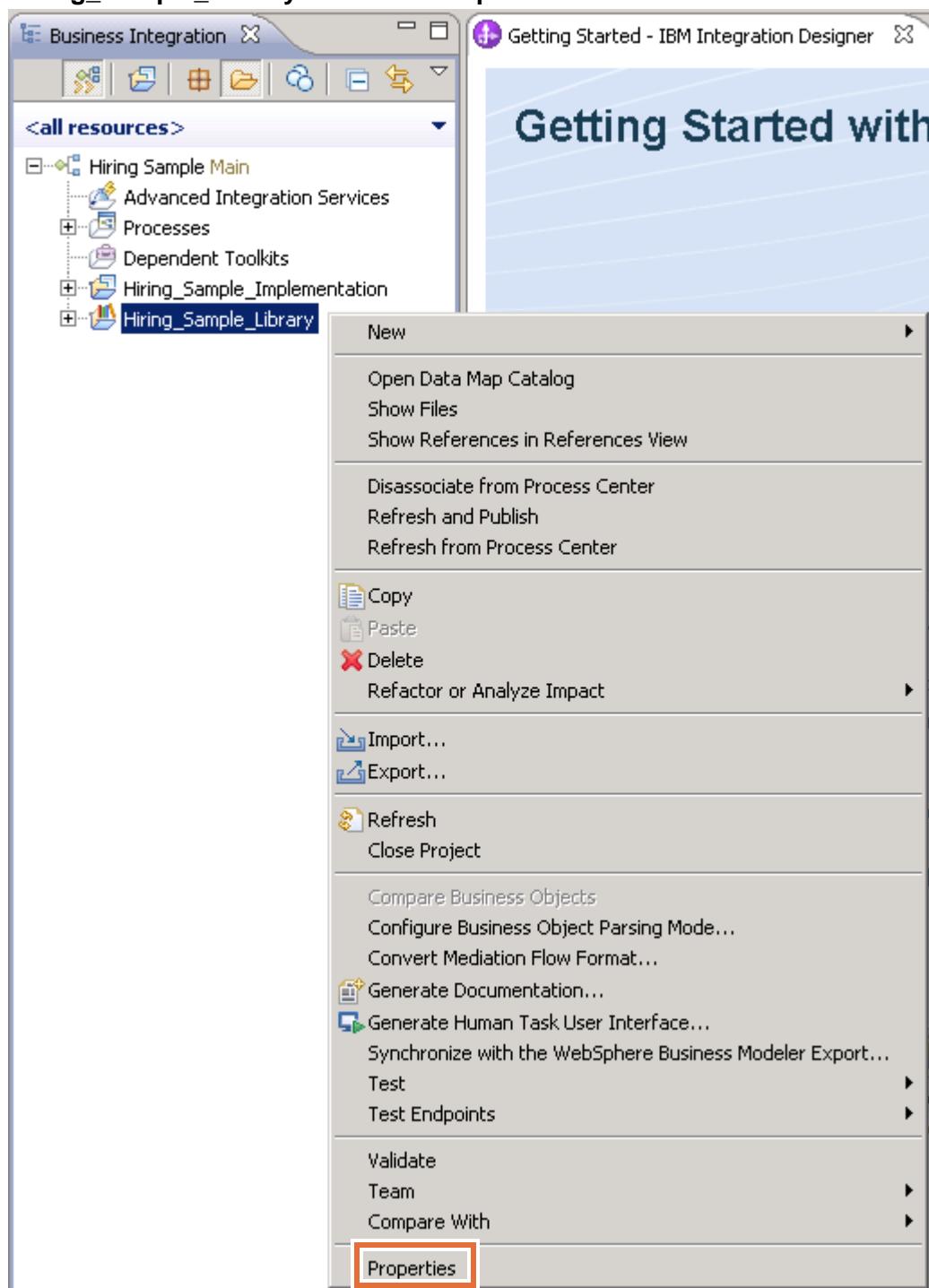
The screenshot shows a software interface for managing process applications. At the top, there are tabs for "Process Apps", "Toolkits", "Servers", and "Admin". Below the tabs, there is a search bar and a "Sort By" dropdown set to "Recently Updated". There are also links for "All" and "Favorites". The main area displays a list of applications with the following details:

Application Name	Last updated	Action
Travel App (TA) ☆	4/21/14	Open in workspace
Procurement Sample (STPPS1) ☆	3/23/14	Open in workspace
Hiring Sample Advanced (HSAV1) ☆	3/23/14	Open in workspace
Hiring Sample (HSS) ☆ ?	3/23/14	Open in workspace

The "Hiring Sample (HSS)" row is highlighted with a red border around the entire row, specifically around the application name, last update date, and the "Open in workspace" button.

- __ c. Click **OK** to open process applications in the workspace.
__ d. Wait until the workspace build is fully complete.

3. Examine the mirrored artifacts setting.
- a. The default library is always mirrored, meaning that the artifacts are translated to the Process Designer artifact domain. In the Business Integration view, right-click **Hiring_Sample_Library** and select **Properties**.



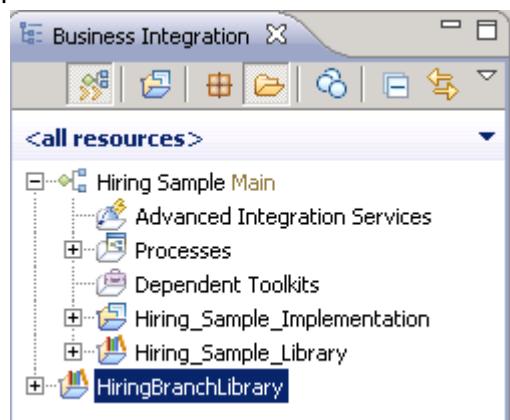
- __ b. In the Properties for Hiring_Sample_Library, expand **Business Integration > Library Mirroring**.



You are not able to change this setting. In a collaborative development environment between IBM Integration Designer and IBM Process Designer, artifacts like business objects are shared in libraries. When you put an artifact in your library in Integration Designer, library mirroring makes the artifact available to others who work with the same library in Process Designer for the same process application or toolkit. When you bring a process application or toolkit into your workspace, the libraries that are associated are enabled for library mirroring. You cannot change the setting.

When you associate a library in your workspace with a process application or toolkit that you bring into your workspace, library mirroring is not enabled by default. You can enable library mirroring if you want to share the artifacts in your library in Integration Designer with Process Designer.

- __ c. Click **Cancel** to close it.
- __ 4. Import a new business object called **Branch**.
 - __ a. Click **File > Import**.
 - __ b. In the Import window, select **Other > Project Interchange**.
 - __ c. Click **Next**.
 - __ d. Click **Browse** next to the **From zip file** field and select `C:\labfiles\ex9\Branch.zip`.
 - __ e. Click **Open**.
 - __ f. Click **Finish**.
 - __ g. Wait until the workspace build is fully complete. **HiringBranchLibrary** is now under **Hiring Sample Main**.



5. Examine the mirrored artifacts setting.
- __ a. Right-click the **HiringBranchLibrary** and select **Properties**.
 - __ b. Expand Business Integration > Library Mirroring. This library is not marked as mirrored by default, which means that the artifact is not visible in Process Designer.

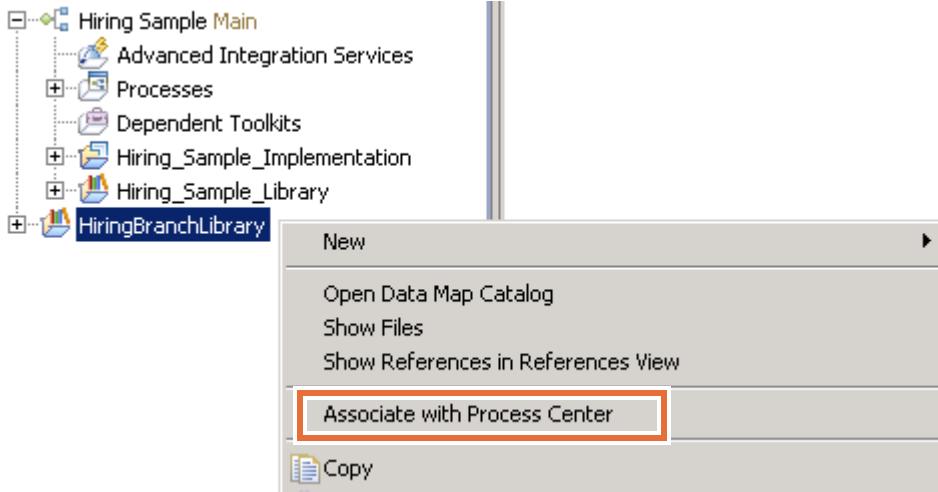


- __ c. Select the check box to mirror the library.



- __ d. Click **OK**.
- 6. Associate HiringBranchLibrary with the Process Center.

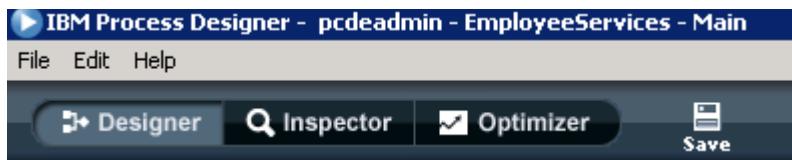
- __ a. Right-click the **HiringBranchLibrary** and select **Associate with Process Center**.



- __ b. Accept the default and click **Finish**.
- __ c. Wait until the workspace update is fully complete.

___ 7. Examine the business object in IBM Process Designer.

___ a. Return to **IBM Process Designer**.

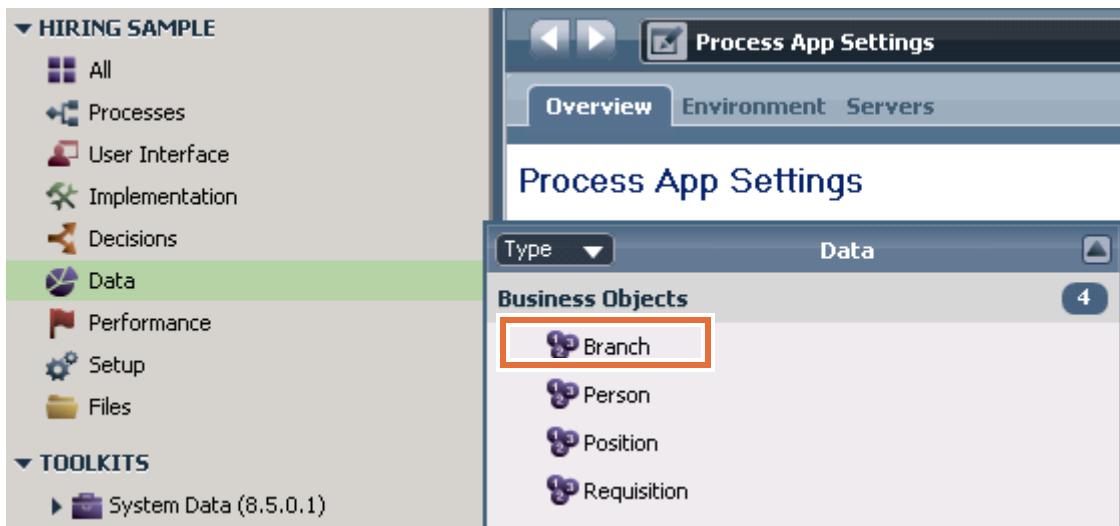


___ b. If you do not see the **Process Apps** tab, click the **Process Center** icon to return to Designer.

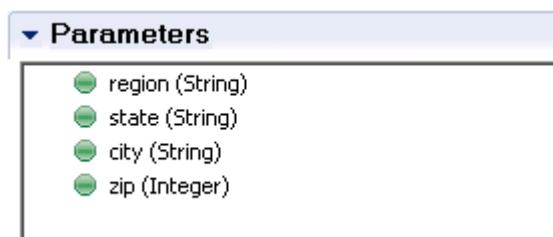
___ c. Click the **Process Apps** tab.

___ d. Click **Open in Designer** next to **Hiring Sample (HSS)**.

___ e. Click **Data**, and double-click **Branch**.



___ f. You can see this option in Designer because you selected the mirrored artifacts check box and associated it with Process Center.



A library should be marked as mirrored only when necessary. With this technique, the business author is not able to see the data types at all, so this method cannot be used if the data types are visible to the business author. This approach greatly reduces the likelihood of data types that a business author modifies in Process Designer, as it causes a lower-fidelity model in Integration Designer.

___ 8. Close all the browsers except for IBM Integration Designer as you need it for next lab exercise.

End of exercise

Exercise review and wrap-up

In this exercise, you imported different process models into the Process Center and applied different techniques to troubleshoot problems with Advanced Integration services modules.

Exercise 10.Troubleshooting WebSphere Adapters

What this exercise is about

This exercise covers troubleshooting WebSphere Adapters. WebSphere Adapters configuration can be complex, depending on the adapter type and on your environment. If your integration solution uses WebSphere Adapters, you should be able to isolate the adapter components from the rest of the SCA components to narrow down the source of an issue. This exercise demonstrates troubleshooting steps that you can use to solve a runtime problem where the adapter appears to be the source of the failure.

What you should be able to do

At the end of this exercise, you should be able to:

- Use the IBM Integration Designer test environment to conduct component tests
- Restrict the source of a problem with cross-component trace
- Isolate an adapter problem and test the adapter components
- Examine log messages to pinpoint a problem

Introduction

In this exercise, you import a prebuilt SOA solution into the IBM Integration Designer workspace. When you send events with an adapter, one of the scenarios results in a failure. The problem that you solve in this exercise is simple. In reality, you might run into more complex problems. The troubleshooting steps in this exercise are designed to demonstrate the use of the IBM Integration Designer test environment, which is a powerful tool when troubleshooting complex issues.

Requirements

Completing the exercises for this course requires a lab environment. This environment includes the exercise support files, IBM Process Designer, IBM Process Portal, IBM Process Center, IBM Process Server, and the IBM Integration Designer test environment.

Exercise instructions

The IBM WebSphere Adapter for Flat Files connects Java Platform, Enterprise Edition components that are running on WebSphere products (such as IBM Process Server or WebSphere Enterprise Service Bus) with file systems. For example, the Java EE component, when configured to work with the adapter, can create a file with specified contents on the file system. The file can then be accessed from the file system by another application.

The IBM WebSphere Adapter for Flat Files facilitates the exchange of business data in the form of delimited records between file systems and Java EE applications. The adapter supports inbound and outbound operations and the use of business objects, business components, and business services.

In this exercise, you import a prebuilt SOA solution into IBM Integration Designer workspace. When you send events with an adapter, one of the scenarios results in a failure. The problem that you solve in this exercise is simple. In reality, you might run into more complex problems. The troubleshooting steps in this exercise are designed to demonstrate the use of the IBM Integration Designer test environment, which is a powerful tool when troubleshooting complex issues.

Part 1: Configure the WebSphere Adapter for Flat Files

In this portion of the exercise, you use the external service wizard to configure the flat file adapter for outbound processing. Though your application needs only outbound, the adapter supports both inbound and outbound communication with the file system.

To configure the WebSphere Adapter for Flat Files:

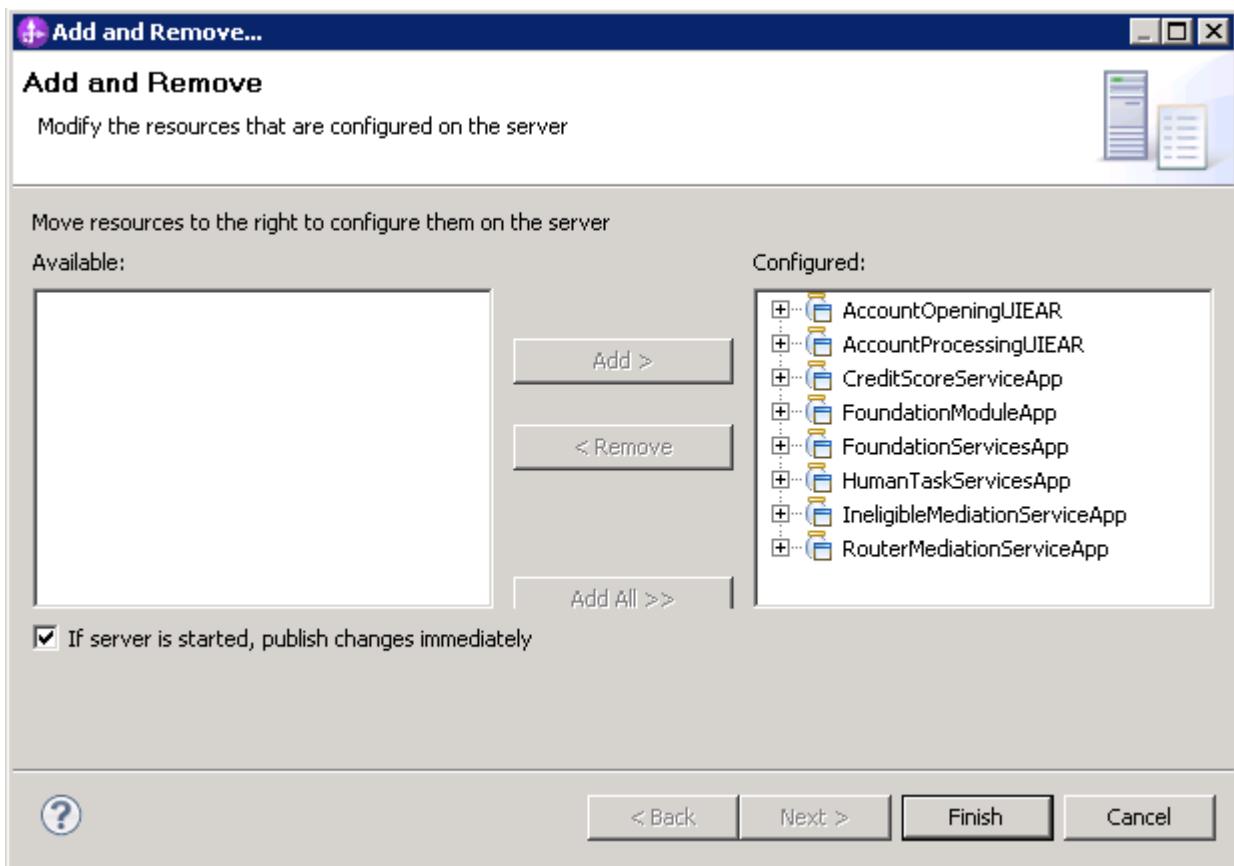
- ___ 1. Start IBM Integration Designer.
 - ___ a. On your desktop, double-click the **IBM Integration Designer** icon.
 - ___ b. Enter the workspace `C:\workspaces\ex10` and click **OK**.
 - ___ c. Click **Cancel** to close the Process Center Login window.
 - ___ d. Close the Getting Started pane by clicking the **X** icon on the **Getting Started - IBM Integration Designer** tab.
- ___ 2. Import the exercise project interchange file into your workspace.
 - ___ a. Select **File > Import**.
 - ___ b. Select **Project Interchange** under the **Other** folder as the import source type. Click **Next**.
 - ___ c. Click **Browse** next to the **From zip file** field.
 - ___ d. Go to `C:\labfiles\ex10\ex10_start.zip`.
 - ___ e. Click **Open**.
 - ___ f. Click **Select All**, and then **Finish**.

The adapter requires a staging directory, `C:\IneligibleAppArchive\staging`, and an output directory, `C:\IneligibleAppArchive\outdir`. When configured, the adapter writes the contents of the IneligibleApplication business object into the `C:\IneligibleAppArchive\outdir` directory.

The `staging` directory is used to temporarily store files to avoid file system write conflicts. The `outdir` directory is the final output directory for the serialized `IneligibleApplication` business objects.

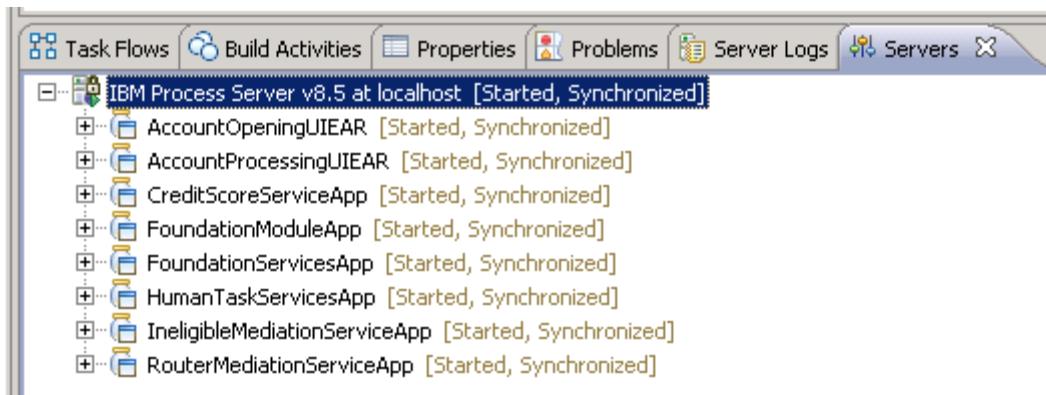
Part 2: Test an adapter in the IBM Integration Designer test environment

- ___ 1. If the server is not already running, start the server.
 - ___ a. In the **Servers** tab, right-click **IBM Process Server v8.5 at localhost** and select **Start** from the menu.
 - ___ b. Wait until the server status changes to **Started**.
- ___ 2. Deploy the imported applications.
 - ___ a. In the **Servers** tab, right-click **IBM Process Server v8.5 at localhost** and select **Add and Remove** to add projects.
 - ___ b. In the Add and Remove window, click **Add All**.

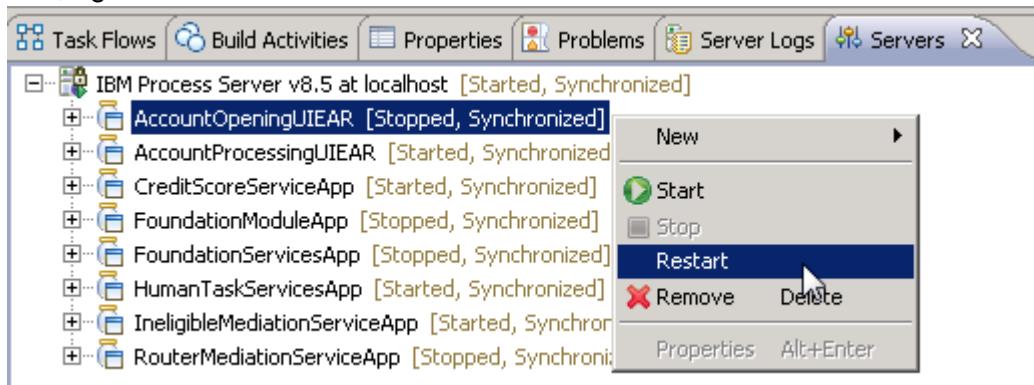


- ___ c. Click **Finish**.

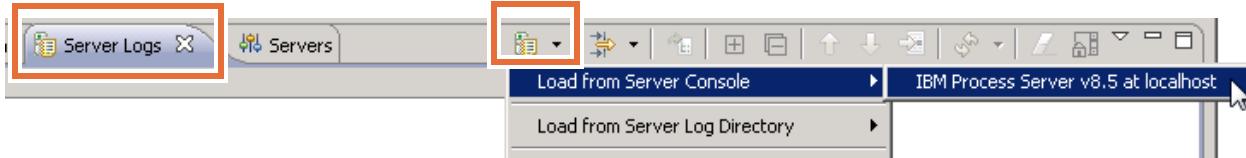
3. Wait until the modules are published and started. It can take several minutes depending on your system resources.

**Note**

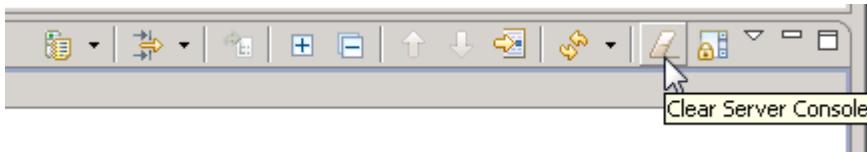
If any of the modules do not start after the **IBM Process Server v8.5 at localhost** is started and synchronized, right-click the module and select **Restart**.



4. Before running the test, to load the server console log records to the Server Logs view, click the **Server Logs** tab. Select the **Load Server Console** icon, and select **Load from Server Console > IBM Process Server v8.5 at localhost**.



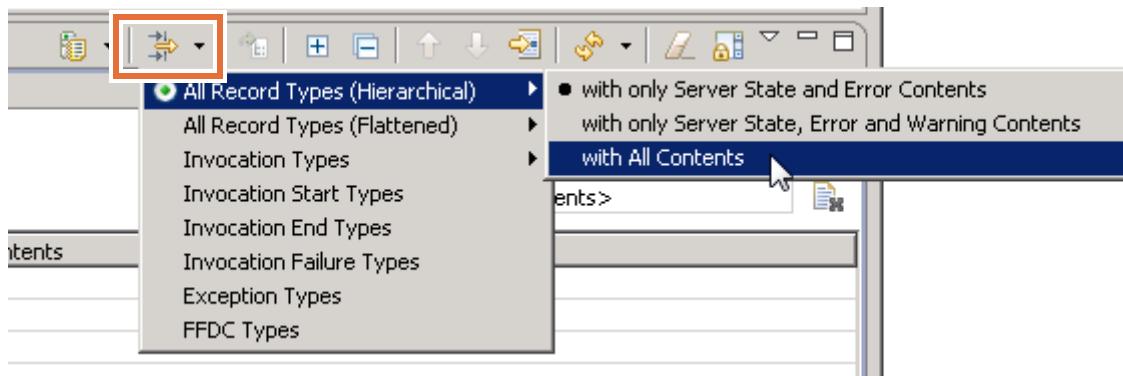
5. Click the **Clear Server Console** icon in the toolbar to clear the Server Logs view.



**Information**

Clearing the logs view is not required; however, clearing the view makes it easier for you to locate output messages during the test.

- 6. Enable the cross-component trace.
- a. In the Server Logs view, click the **Select Records to Display** icon, and then select **All Record Types (Hierarchical) > with All Contents** to display its entire contents.



- b. To enable the cross-component trace settings, click the **View Menu** arrow at the upper-far-right corner of the Server Logs toolbar.

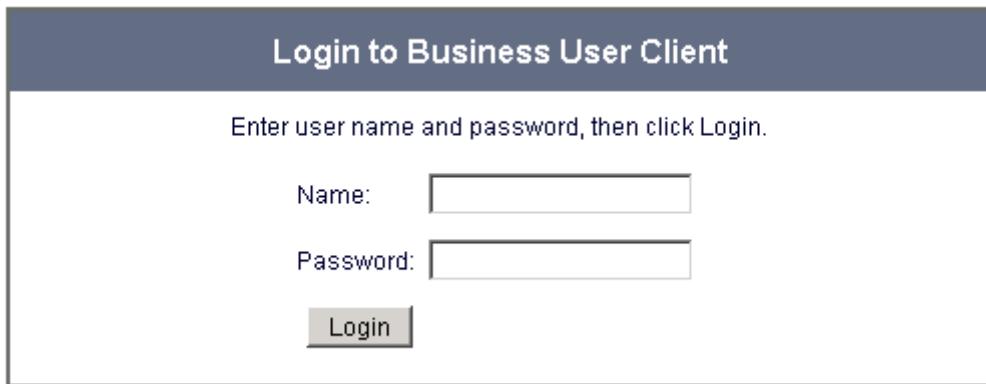


- 7. Select the **Cross-Component Trace State > Enabled with Data Snapshot** option.



- 8. Use the JSP interface for the CreateApplication task to create a new account request.
- a. Start Firefox, and enter the following address to open the login page for the account creation user interface:
`https://localhost:9443/AccountOpeningUI/Index.jsp`
- b. In the Untrusted Connection window, click **I Understand the Risks** to expand the option.
- c. Click **Add Exception**.
- d. Click **Confirm Security Exception**. The administrative console login page is now visible.

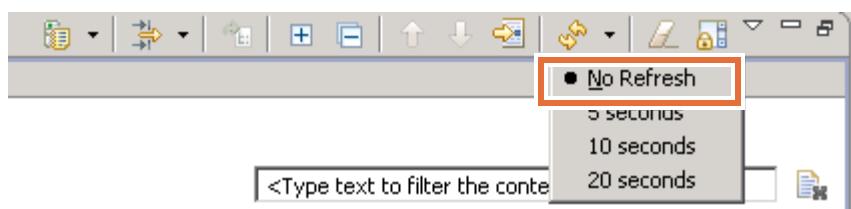
- ___ e. Enter `bpmadmin` in the **Name** field and `websphere` in the **Password** field. Click **Login**.



- ___ f. In the Business Case section, click **New**.
___ g. Under Task, click **CreateApplication**.
___ h. In the Input Data section, enter the required information. To demonstrate the data flow, enter `IBM` in the **companyName** field and leave rest of the fields blank.

The screenshot shows a "Business Cases > New > CreateApplication" form. On the left, there is a sidebar with navigation links: "HOME", "Business Case" (which is selected and highlighted in blue), and "Logout". The main content area is titled "Business Cases > New > CreateApplication" and contains a sub-section "Input Data". It includes several input fields: "accountNumber" (empty), "applicationDate" (empty), "applicationDecision" (checkbox), "comments" (empty), "companyName" (containing "IBM"), and "contactFirstName" (empty). The "companyName" field has a red box around it, indicating it is the target for the exercise.

- ___ i. Scroll to the bottom and click **Create**.
___ 9. Examine the output messages.
___ a. Return to Integration Designer, and in the Server Logs view, click the **No Refresh** icon.



- ___ b. Look for the **End submit callback (AccountVerification: InputCriterion)** entry in the Server Logs view.

Type	Time
Start submit callback (AccountVerification: InputCriterion)	May 7, 2014 15:17:28.837 PDT
Start callback (AccountVerification: InputCriterion)	May 7, 2014 15:17:29.290 PDT
End submit callback (AccountVerification: InputCriterion)	May 7, 2014 15:17:29.415 PDT
END BPEL process (AccountVerification)	May 7, 2014 15:17:29.071 PDT
End component (AccountVerification: InputCriterion)	May 7, 2014 15:17:21.149 PDT

- ___ c. Double-click **End submit callback (AccountVerification: InputCriterion)** to examine its properties.

Properties

End submit callback (AccountVerification: InputCriterion)

Time: Feb 25, 2014 15:35:29.614 PST

Thread ID: 0000019d

Contents: Translated Raw

```
07e8a3dd-ddab-4640-be64-54345fc78d94 END 23698468-42aa-41b5-ac58-252a4df05e14 079188e9
-cb27-4276-b8a3-3a4bfaa1292d SCA(Callback.postSubmitCallback.FoundationModule
{http://www.ibm.com/xmlns/prod/websphere/scdl/6.0.0}AccountVerification
/AccountVerification.InputCriterion Attachment(XCT{server1}{2014-2-25-15}{out.1d879541-cde6-4ddc-
9f38-bfab8fb21db4.xml}))
```

Data:

```
<?xml version="1.0" encoding="UTF-8"?><te:Output
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:type="bu:Message"
xmlns:te="http://tempuri.org">
<message>Risk was LOW. Application automatically approved.</message>
</te:Output>
```

?

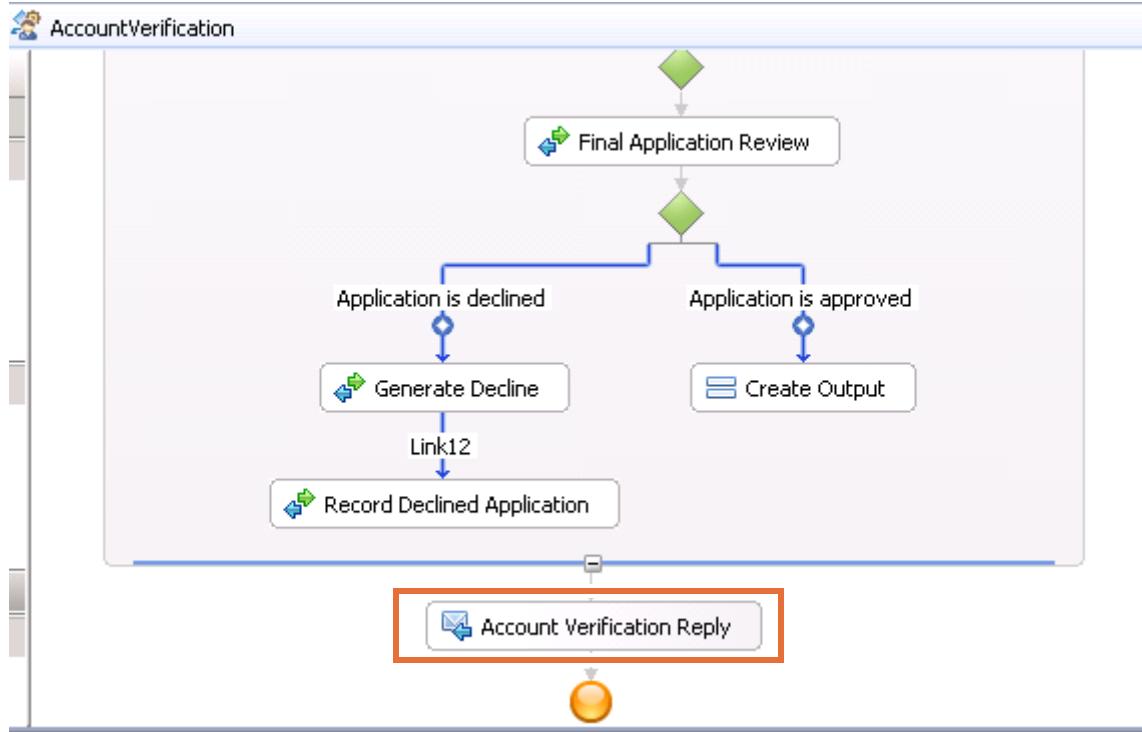
OK

In the Data section, the message says:

Risk was LOW. Application automatically approved.

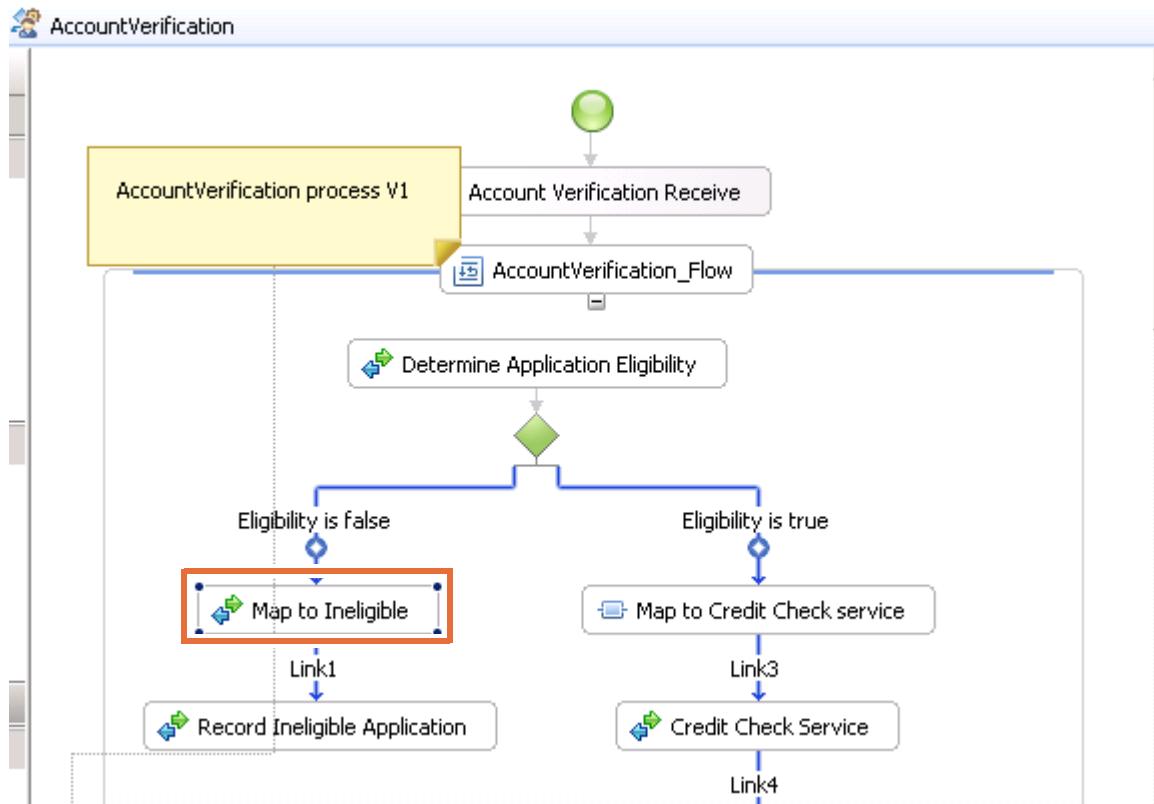
- ___ d. Click **OK** to close.

This message is the reply message from the InputCriterion operation of the AccountVerification interface, which defines the service that the AccountVerification BPEL provides.



Part 3: Troubleshooting failed events

In this part of the exercise, you test the AccountVerification service with a failure path. As described previously, the flow of the AccountVerification business process routes event data to the **Map to Ineligible** invoke activity if the eligibleApplication parameter value is false.



You test the scenario in which the customer application is ineligible, and troubleshoot the exceptions that you see.

- ___ 1. Send a request with the **companyName** AbcCo.
 - ___ a. In the Server Logs view, clear the messages before starting the test.
 - ___ b. Return to the web browser, and in the Business Case section, click **CreateApplication**.

- ___ c. In the **Input Data** section, enter `AbcCo` in the **companyName** field. Leave the remaining fields blank.

The screenshot shows the IBM BPM interface. At the top is the IBM logo. On the left is a navigation sidebar with links: HOME, Business Case (which is selected), New, User: admin, and Logout. The main area is titled "Business Cases > New > CreateApplication". It says "Enter the values for the input data and optionally provide additional information". Below this is a section titled "Input Data" with a dropdown arrow. It contains six input fields:

accountNumber	
applicationDate	
applicationDecision	<input type="checkbox"/>
comments	
companyName	AbcCo
contactFirstName	

- ___ d. Click **Create** and switch to the Server Logs view in IBM Integration Designer. This test fails with exceptions that you troubleshoot.
2. Enable cross-component trace, and run the test again.
- ___ a. Select the **Server Logs** view.
- ___ b. Click the **Refresh** icon to select **5 seconds**.
- ___ c. With cross-component trace enabled, you can see the event flow. The exception occurs on the `recordIneligibleApplication` invoke activity in the AccountVerification process.

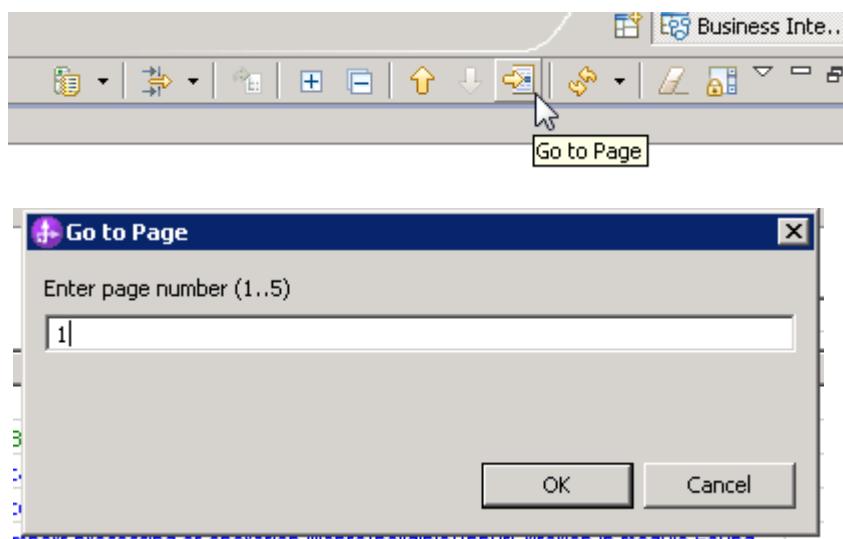
- ___ d. Find the first error log in the cross-component trace log, and double-click the entry to open its properties.

<input type="checkbox"/>		Start BPEL process (AccountVerification)	Feb 25, 2014
<input type="checkbox"/>		Start invoke (RecordIneligibleApplication:InputCriterion)	Feb 25, 2014
<input type="checkbox"/>		Start import (RecordIneligibleApplication:InputCriterion)	Feb 25, 2014
<input type="checkbox"/>		Start component (RecordIneligibleApplication:Input)	Feb 25, 2014
<input type="checkbox"/>		Log message	Feb 25, 2014
<input type="checkbox"/>		Log message	Feb 25, 2014
<input type="checkbox"/>		Log message	Feb 25, 2014
<input type="checkbox"/>		Start invoke (jca/FlatFileOutboundImport:recor	Feb 25, 2014
<input type="checkbox"/>		Start import (jca/FlatFileOutboundImport:r	Feb 25, 2014
<input type="checkbox"/>		Log message	Feb 25, 2014
<input checked="" type="checkbox"/>		Log message	Feb 25, 2014
<input type="checkbox"/>		FFDC	Feb 25, 2014
<input type="checkbox"/>		FFDC	Feb 25, 2014
<input type="checkbox"/>		Exception	Feb 25, 2014
<input type="checkbox"/>		Fail import (jca/FlatFileOutboundImport:rec	Feb 25, 2014
<input type="checkbox"/>		Fail invoke (jca/FlatFileOutboundImport:record	Feb 25, 2014
<input type="checkbox"/>		Log message	Feb 25, 2014

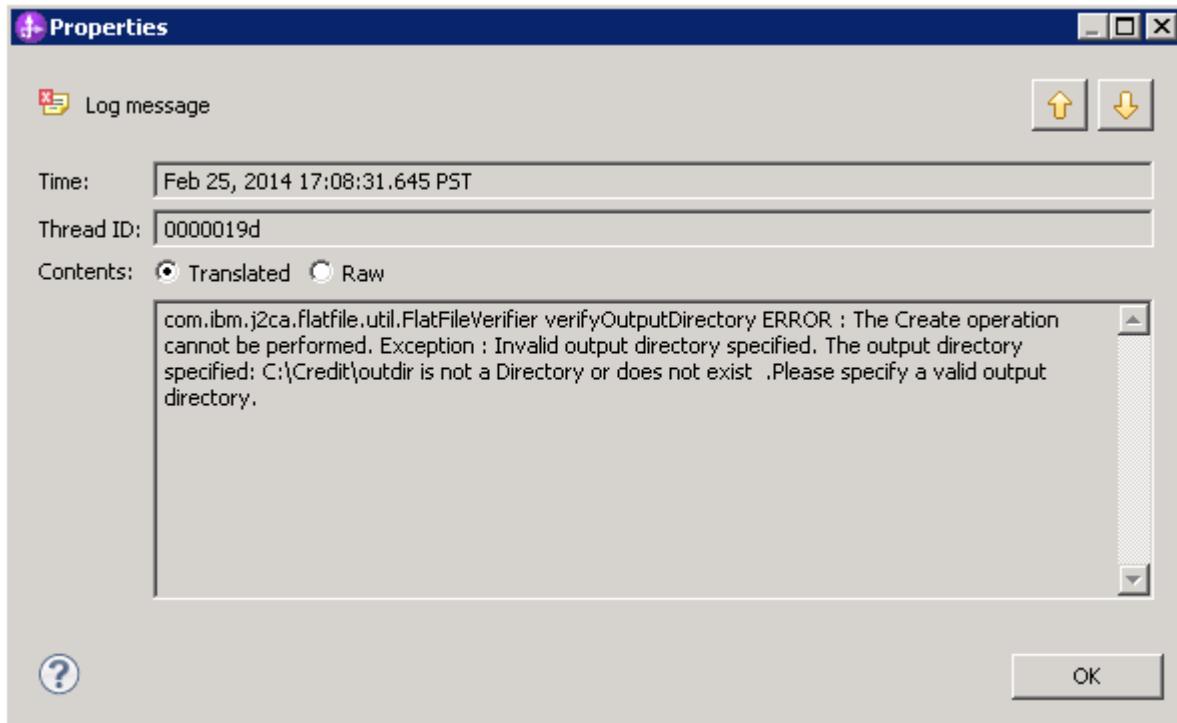


Note

If the logged message is too long and the Server Logs view does not display the business process level traces, click the **Go To Page** icon. Enter 1 to go to the first page, or any page to look for the specific error messages.



- __ e. The Properties window opens, and shows the data that is associated with the invoke activity.



The message says:

```
com.ibm.j2ca.flatfile.util.FlatFileVerifier verifyOutputDirectory ERROR :  
The Create operation cannot be performed. Exception : Invalid output  
directory specified. The output directory specified: C:\Credit\outdir is not  
a Directory or does not exist. Please specify a valid output directory.
```

The suggested user action is: Please specify a valid output directory.

- __ f. Click **OK** to **close** the Properties.

Part 4: Problem resolution

In this section, follow the steps to fix the error.

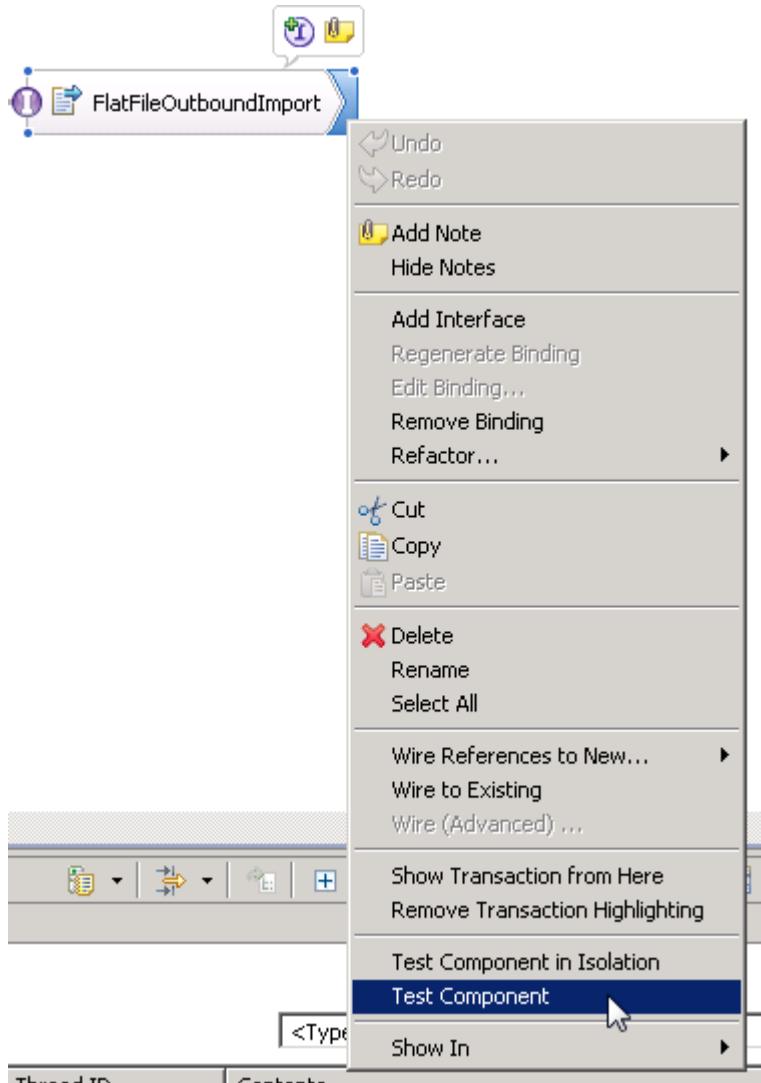
- 1. Unit-test the flat file adapter connection.
 - a. In the Server Logs view, right-click **Start invoke (jca/FlatFileOutboundImport:recordIneligibleApplication)** and select **Show Component in Assembly Diagram** from its menu to see where the failing point is in the solution.

<input type="checkbox"/> Log message	Feb 25, 2014 17:08:31.223 PST	0000019d
<input checked="" type="checkbox"/> Start invoke (jca/FlatFileOutboundImport:recordIneligibleApplication)	Feb 25, 2014 17:08:31.223 PST	0000019d
<input type="checkbox"/> Start import (jca/FlatFileOutboundImport:recordIneligibleApplication)	Feb 25, 2014 17:08:31.223 PST	0000019d
<input type="checkbox"/> Log message	Feb 25, 2014 17:08:31.223 PST	0000019d
<input type="checkbox"/> Log message	Feb 25, 2014 17:08:31.223 PST	0000019d
<input type="checkbox"/> FFDC	Feb 25, 2014 17:08:31.223 PST	0000019d
<input type="checkbox"/> FFDC	Feb 25, 2014 17:08:31.223 PST	0000019d
<input type="checkbox"/> Exception	Feb 25, 2014 17:08:31.661 PST	0000019d
<input type="checkbox"/> Fail import (jca/FlatFileOutboundImport:recordIneligibleApplication)	Feb 25, 2014 17:08:31.708 PST	0000019d
<input type="checkbox"/> Fail invoke (jca/FlatFileOutboundImport:recordIneligibleApplication)	Feb 25, 2014 17:08:31.754 PST	0000019d

- b. The **FoundationServices** assembly diagram opens with the **FlatFileOutboundImport** component highlighted.



- ___ c. Right-click the **FlatFileOutboundImport** component and select **Test Component** from the menu.



- ___ d. In the **Initial request parameters** of the FoundationServices_Test, enter the following values:
- **companyName**: AbcCo
 - **requestAccountAmount**: 1000
 - **comments**: This is a test
 - **ineligibleReason**: Bad credit

Initial request parameters:

Value editor XML editor

Name	Type	Value
recordIneligibleApplicationInp...	IneligibleApplication	[ab]
applicationDate	string	[ab]
companyName	string	[ab] AbcCo
requestAccountAmount	int	[ab] 1000
comments	string	[ab] This is a test
ineligibleReason	string	[ab] Bad credit

- ___ e. Click **Continue** to run the test.

Events

This area displays the events in a test trace. Select an event to display its properties in the General Properties and Detailed Properties sections. [More...](#)



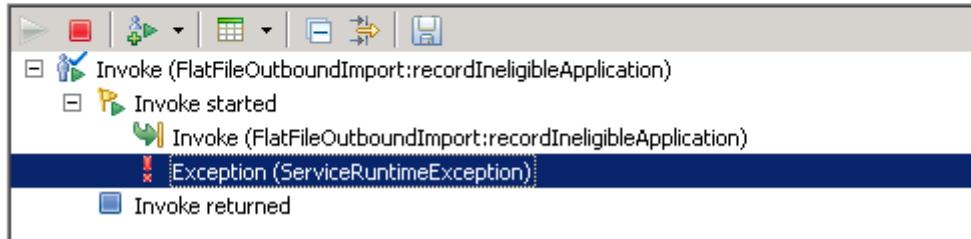
- ___ f. If you see the Deployment Location window, select **IBM Process Server v8.5 at localhost** and click **Finish**.
- ___ g. If you see the User Login - Default Module Test window, accept the default settings and click **OK**.

- __ 2. In the Test Client, you can see the exception error.

Integration Test Client: FoundationServices_Test

Events

This area displays the events in a test trace. Select an event to display its properties in the General Properties and Detailed Properties sections. [More...](#)



- __ a. On the right side, click the **Maximize** icon to open the exception trace in a larger window.

com.ibm.websphere.sca.ServiceRuntimeException

Exception message:

```
FaultException thrown in J2CMethodBindingImpl.invoke()
com.ibm.j2ca.base.exceptions.RecordNotFoundException: The specified Directory C:\Credit\outdir does not exist
```

Exception trace:

```
com.ibm.websphere.sca.ServiceRuntimeException: FaultException thrown in J2CMethodBindingImpl.invoke()
at com.ibm.ws.sca.binding.j2c.J2CMethodBindingImpl.invoke(J2CMethodBindingImpl.java:110)
at com.ibm.ws.sca.binding.j2c.J2CInterfaceBindingImpl.invoke(J2CInterfaceBindingImpl.java:110)
at com.ibm.ws.sca.binding.j2c.handler.J2CImportHandler.invokeDynamicImport(J2CImportHandler.java:110)
at com.ibm.ws.sca.binding.j2c.handler.J2CImportHandler.processBase(J2CImportHandler.java:110)
at com.ibm.ws.sca.binding.j2c.handler.J2CNativeImportHandler.processMessage(J2CNativeImportHandler.java:110)
at com.ibm.ws.sca.internal.message.impl.MessageDispatcherImpl.processMessageWithPC(MessageDispatcherImpl.java:110)
at com.ibm.ws.sca.internal.message.impl.MessageDispatcherImpl.processMessage(MessageDispatcherImpl.java:110)
at com.ibm.ws.sca.internal.message.impl.ManagedMessageImpl.process(ManagedMessageImpl.java:110)
at com.ibm.ws.sca.uow.handler.UOWNativeWASSStrategyImpl.transactionImportExport(UOWNativeWASSStrategyImpl.java:110)
at com.ibm.ws.sca.uow.handler.JoinUOWNativeHandler.processMessage(JoinUOWNativeHandler.java:110)
at com.ibm.ws.sca.internal.message.impl.MessageDispatcherImpl.processMessageWithPC(MessageDispatcherImpl.java:110)
at com.ibm.ws.sca.internal.message.impl.MessageDispatcherImpl.processMessage(MessageDispatcherImpl.java:110)
at com.ibm.ws.sca.internal.message.impl.ManagedMessageImpl.process(ManagedMessageImpl.java:110)
```

- __ b. Scroll down to the bottom where the SCA context is logged:

SCA context:

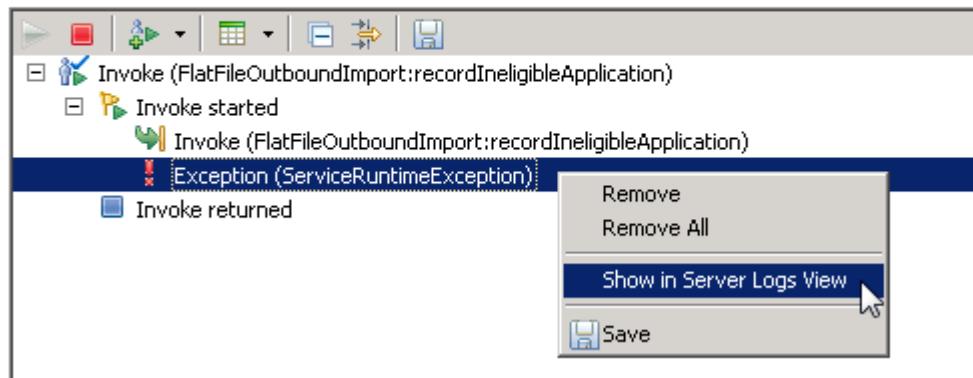
```
Interaction: [invoke,recordIneligibleApplication]
{FoundationServices}sca.default.component#sca/dynamic/reference =>
{FoundationServices}jca/FlatFileOutboundImport.import
Handler: com/ibm/ws/sca/binding/j2c/handler/J2CNativeImportHandler
(com.ibm.ws.sca.binding.j2c.handler.J2CNativeImportHandler,com/ibm/wsspi/
sca/extensions/NativeImportBindingGroup2)
Refer to the server logs for more information.
```

The J2CNativeImportHandler generates the **ServiceRuntimeException**.

- ___ c. Restore the Exception trace.
- ___ d. In the Events view, right-click **Exception (ServiceRuntimeException)** and select **Show in Server Logs View**.

Events

This area displays the events in a test trace. Select an event to display its properties in the General Properties and Detailed Properties sections. [More...](#)



- ___ e. The component test results in a failure. In the Server Logs view, double-click the first **Exception** to open the Properties window.

Type	Time
Log message	Feb 25, 2014 22:01:15.865 PST
Log message	Feb 25, 2014 22:01:16.287 PST
Log message	Feb 25, 2014 22:01:16.287 PST
Invocation sequence (jca/FlatFileOutboundImport:recordIneligibleApplication)	Feb 25, 2014 22:01:16.802 PST
+ Start invoke (jca/FlatFileOutboundImport:recordIneligibleApplication)	Feb 25, 2014 22:01:16.802 PST
Fail invoke (jca/FlatFileOutboundImport:recordIneligibleApplication)	Feb 25, 2014 22:01:17.130 PST
Log	
Properties	
Fail invoke (jca/FlatFileOutboundImport:recordIneligibleApplication)	
Time:	Feb 25, 2014 22:01:17.130 PST
Thread ID:	000012bb
Contents:	<input checked="" type="radio"/> Translated <input type="radio"/> Raw
	A failure occurred during the invocation of operation jca/FlatFileOutboundImport:recordIneligibleApplication in module FoundationServices.

The message content says:

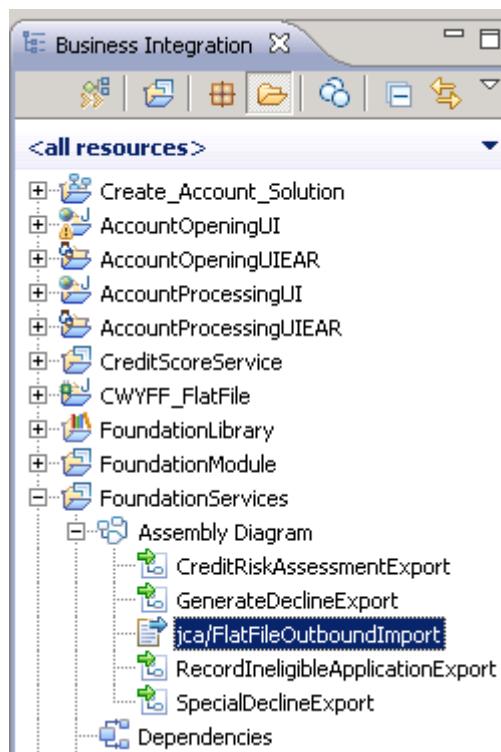
A failure occurred during the invocation of operation
jca/FlatFileOutboundImport:recordIneligibleApplication in module
FoundationServices.

- ___ f. Click the upper arrow until you find the error that triggered the invocation failure. It is the same log message that you saw previously.

```
com.ibm.j2ca.flatfile.util.FlatFileVerifier verifyOutputDirectory ERROR :  
The Create operation cannot be performed. Exception : Invalid output
```

directory specified. The output directory specified: C:\Credit\outdir is not a Directory or does not exist. Please specify a valid output directory.

- ___ g. Click **OK** to close the Properties view.
- ___ 3. Examine the flat file adapter configuration information.
 - ___ a. In the Business Integration view, expand the **FoundationServices > Assembly Diagram**.
 - ___ b. Double-click **FlatFileOutboundImport**.



- ___ 4. Select the **Properties** view.
- ___ 5. Click the **End-point configuration** tab under the **Binding** tab.

6. Scroll down and click **Advanced** to see the detailed configuration information.

Import: FlatFileOutboundImport (EIS Binding)

Description Connection Resource Adapter

Select a configuration view option:

Specify the JNDI name for the pre-configured managed connection factory
 Specify the properties for configuring the new managed connection factory

Managed Connection Factory Properties

Managed connection factory class name: com.ibm.j2ca.flatfile.FlatFileManagedConnectionFactory

File system connection information.

Logging and tracing

Adapter ID: 001

Disguise user data as "XXX" in log and trace files.

Output directory: C:\Credit\outdir

Additional configuration

Default target file name: IneligibleApplication.txt

The staging directory is used to store files temporarily to avoid write conflicts.

Staging directory: C:\IneligibleAppArchive\staging

To add sequence numbers to target file names, specify the location of a sequence file.

Sequence file: C:\Credit\outdir\IneligibleApplicationSeq.txt

7. The Output directory is set to: C:\Credit\outdir

Managed Connection Factory Properties

Managed connection factory class name: com.ibm.j2ca.flatfile.FlatFile

File system connection information.

Logging and tracing

Adapter ID: 001

Disguise user data as "XXX" in log and trace files.

Output directory: C:\Credit\outdir

8. Check to see whether the C:\Credit\outdir directory exists.

The C:\Credit\outdir directory does not exist.

Miscommunication between the developer and the system administrator might cause this error. Or, perhaps, the decision of where to archive the ineligible application data was changed after the developer implemented the FoundationServices module.

There are possible scenarios for fixing this problem. One possible solution is to create the C:\Credit\outdir directory. Another solution is to change the adapter configuration property

to output the ineligible application data to the correct directory:

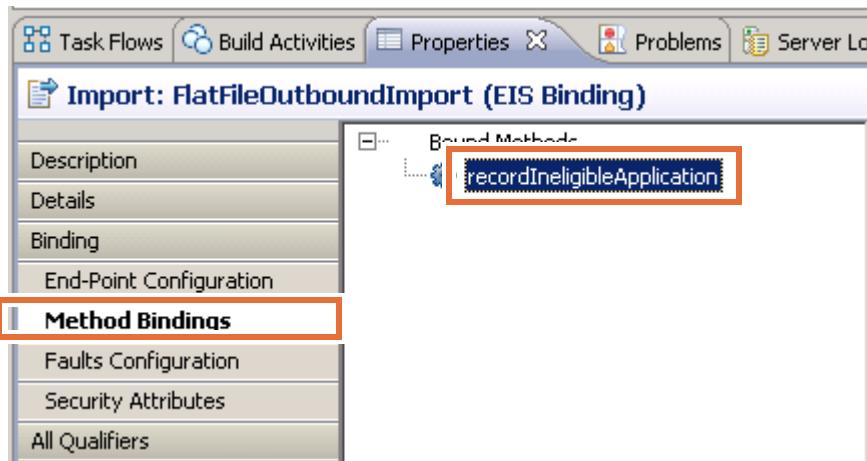
C:\IneligibleAppArchive\outdir

- __ a. In the **End-point Configuration**, change the following fields.

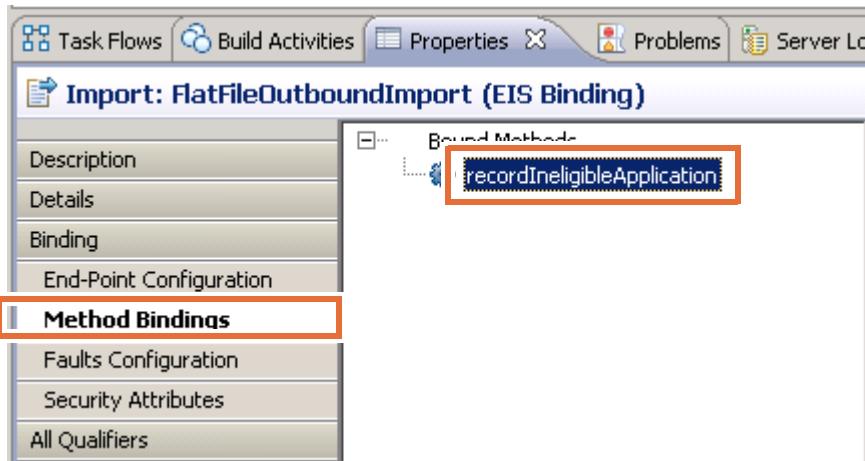
- Output directory: C:\IneligibleAppArchive\outdir
- Sequence file:
C:\IneligibleAppArchive\outdir\IneligibleApplicationSeq.txt



- __ b. In addition to the **End-point Configuration**, you must also change the **Method Bindings**.
- __ c. Select **Method Bindings**, and select **Bound Methods > recordIneligibleApplication**.

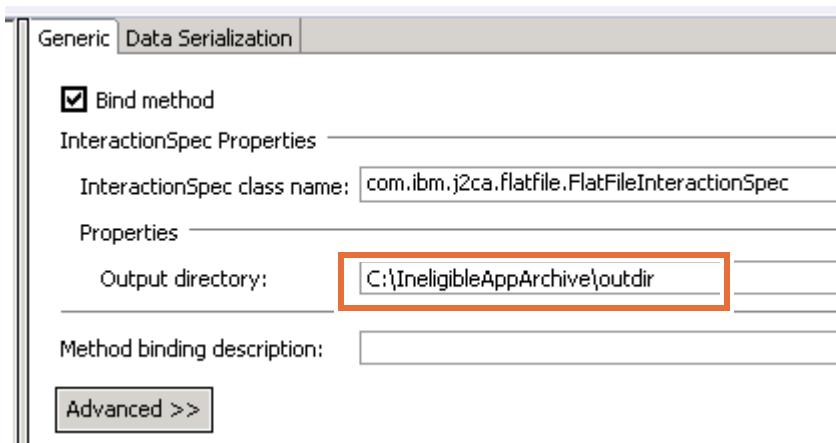


- __ d. Select **Method Bindings**, and select **Bound Methods > recordIneligibleApplication**.



- __ e. Select the **Generic** tab, and change the **Output directory** to

C:\IneligibleAppArchive\outdir



- __ f. Press Ctrl+S to save the changes.

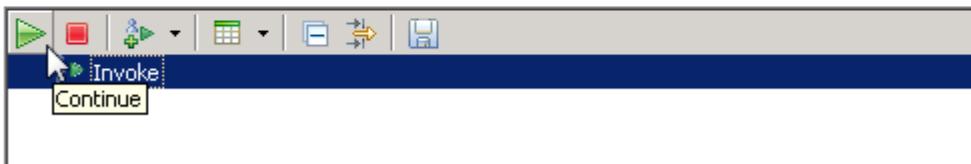
- __ 9. Return to **FoundationServices** assembly diagram to test the solution.

- __ a. Go to the **FoundationServices** assembly diagram with the highlighted **FlatFileOutboundImport** component.
- __ b. Right-click the **FlatFileOutboundImport** component and select **Test Component** from the menu.
- __ c. In the **Initial request parameters** of the FoundationServices_Test, populate the parameter values by entering test data as follows.
 - **companyName**: AbcCo
 - **requestAccountAmount**: 1000
 - **comments**: This is a test
 - **ineligibleReason**: Bad credit

- ___ d. Click **Continue** to run the test.

Events

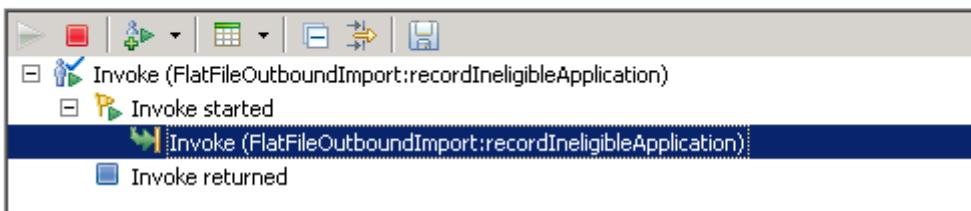
This area displays the events in a test trace. Select an event to display its properties in the General Properties and Detailed Properties sections. [More...](#)



- ___ e. If you see the Deployment Location window, select **IBM Process Server v8.5 at localhost** and click **Finish**.
- ___ f. If you see the User Login - Default Module Test window, accept the default settings and click **OK**.
- ___ 10. In the Test Client, you do not see any errors after the test.

Events

This area displays the events in a test trace. Select an event to display its properties in the General Properties and Detailed Properties sections. [More...](#)



- ___ 11. Close the test component editor without saving.
- ___ 12. Select **File > Exit**.

End of exercise

Exercise review and wrap-up

In this exercise, you imported a prebuilt SOA solution into IBM Integration Designer workspace. When you sent events with an adapter, one of the scenarios resulted in a failure. The problem that you solved in this exercise is simple. In reality, you might run into more complex problems. The troubleshooting steps in this exercise are designed to demonstrate the use of the IBM Integration Designer test environment, which is a powerful tool when troubleshooting complex issues.

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