

WebSphere Enterprise Service Bus Lab 4

Deploying and Administering Mediation Modules

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What this exercise is about

The objective of this lab is to learn how to create EAR files from mediation modules, install EAR files to the WebSphere ESB Server profile, and edit/connect SCA Binding information without using WebSphere Integration Developer. See Introduction below for more information.

Lab Requirements

List of system and software required for the student to complete the lab.

- WebSphere Integration Developer V6.0.1 with the WebSphere Enterprise Service Bus test server option installed.

What you should be able to do

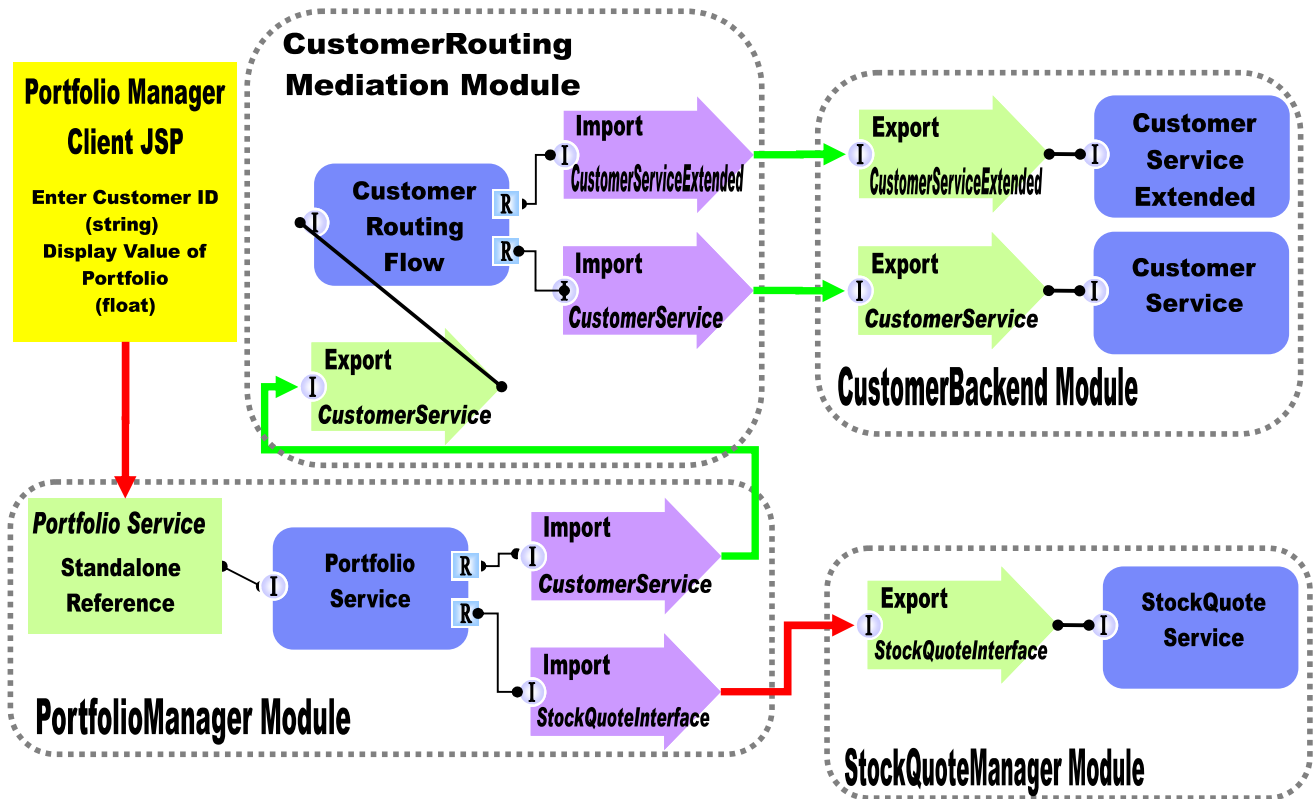
At the end of this lab you should be able to:

- Import project interchange files into the WebSphere Integration Developer V6.0.1 development environment.
- Export a mediation module as an EAR (Enterprise Archive) file.
- Start/Stop the WebSphere ESB Server profile from a command prompt.
- Install/Uninstall a mediation module EAR file using the Administration Console.
- Use the Administration Console to edit/connect SCA bindings for the mediation modules.
- Test the mediation module by running a JSP on the WebSphere ESB Server profile.

Introduction

In Lab 4 of this lab series, you are going to learn how to create EAR files for mediation modules, install EAR files to the WebSphere ESB Server profile, and edit/connect SCA Binding information without using WebSphere Integration Developer. You will be using the Administration Console for the WebSphere ESB Server. Throughout the lab you will learn what WebSphere Integration Developer does behind the scenes by manually exporting EAR files, installing EAR files, starting/stopping the ESB server, and using the Administrative Console to edit SCA Binding information. This is helpful to know how to take these actions outside of the development environment and to understand what WebSphere Integration Developer is doing for you when inside the development environment.

Below is a diagram of what the application looks like. The green arrows have null SCA Bindings from the import to the export. Therefore the goal of this lab is to fix those SCA Bindings through the Administrative Console. You will be importing an initial Project Interchange file and exporting 4 EAR files (one for each Module below) from WebSphere Integration Developer. At that time, you will close the development environment and start the WESB profile from a command prompt. Once started, you will open the Administrative Console to install and start all 4 of the EAR files you exported from WebSphere Integration Developer. Then you will be able to see the SCA Modules in the Administrative Console and will edit/save the SCA Binding information. To finish up, you will use a JSP to test the application to see if the SCA Bindings have been correctly connected. Afterwards, you will stop and uninstall the applications, then stop the server.



Exercise Instructions

Some instructions in this lab may be Windows® operating-system specific. If you plan on running the lab on an operating-system other than Windows, you will need to run the appropriate commands, and use appropriate files (.sh vs. .bat) for your operating system. The directory locations are specified in the lab instructions using symbolic references, as follows:

Reference Variable	Windows Location	AIX®/UNIX® Location
<WID_HOME>	C:\Program Files\WebSphere\IBMID\6.0	
<LAB_FILES>	C:\Labfiles601	/tmp/Labfiles601
<TEMP>	C:\temp	/tmp

Windows users note: When directory locations are passed as parameters to a Java™ program such as EJBdeploy or wsadmin, it is necessary to replace the backslashes with forward slashes to follow the Java convention. For example, C:\LabFiles601\ would be replaced by C:/LabFiles601/

Note that the previous table is relative to where you are running WebSphere Integration Developer. The following table is related to where you are running remote test environment:

Reference Variable	Example: Remote Windows test server location	Example: Remote z/OS® test server location	Input your values for the remote location of the test server
<SERVER_NAME>	server1	cl1sr01	
<WAS_HOME>	C:\Program Files\IBM\WebSphere\AppServer	/etc/cl1cell/AppServerNode1	
<HOSTNAME>	localhost	mvsxxx.rtp.raleigh.ibm.com	
<BOOTSTRAP_PORT>	2809	2809	
<TELNET_PORT>	N/A	1023	
<PROFILE_NAME>	AppSrv01	default	
<USERID>	N/A	cl1admin	
<PASSWORD>	N/A	fr1day	

Instructions for using a remote testing environment, such as z/OS, AIX or Solaris, can be found at the end of this document, in the section [“Task: Starting a Remote Server”](#).

Part 1: Prepare Environment for Lab 4

In this section of the lab, you will be importing all projects inside the Lab4 project interchange file into your workspace and then exporting the modules as EAR files.

- ___ 1. Start WebSphere Integration Developer V6.0.1 with a workspace location of **C:\LabFiles601\WESB\Lab4\workspace**.
- ___ 2. Click the curved arrow at top right to **go to workbench**.
- ___ 3. Import Project Interchange file, **WPIv601_ESB_StartLab4_PI.zip**, into the development environment.

Note: This lab does not build on Lab 3 project interchange files. The **WPIv601_ESB_StartLab4_PI.zip** has been specifically created for this lab exercise.

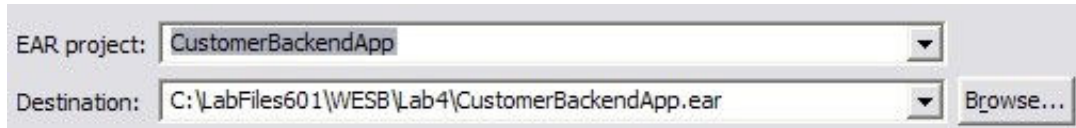
- ___ a. Right-click inside **Business Integration View** (top left view in the Business Integration Perspective)
 - ___ b. Select **Import** from list.
 - ___ c. Select **Project Interchange** from list. Click **Next**.
 - ___ d. Select the top **Browse** button for **From zip file**:
 - ___ e. Navigate to **C:/LabFiles601/WESB/Lab4/ WPIv601_ESB_StartLab4_PI.zip**.
 - ___ f. Click the **Select All** button to check all checkboxes for projects listed.
 - ___ g. Verify you have **CustomerBackend**, **CustomerRoutingMediationModule**, **PortfolioLibrary**, **Portfolio Manager**, and **StockQuoteManager** modules listed in the Business Integration view.
 - ___ h. Click **Finish** button (projects will be imported and auto-build will run).
- ___ 4. Export 4 EAR files.
 - ___ a. Right-click on the first module, CustomerBackend, inside **Business Integration View**.
 - ___ b. Select **Export...** from list.
 - ___ c. Click the **Show All checkbox** to show all export options.
 - ___ d. Select **EAR file** from the list and click **Next**.
 - ___ e. When asked to confirm the enablement of “Base J2EE Support” capabilities in your workspace, Click **OK**.

Additionally you can check the checkbox for “Always enable capabilities and don’t ask me again”. This will tell WebSphere Integration Developer to automatically give you capabilities for certain technologies you are working with.

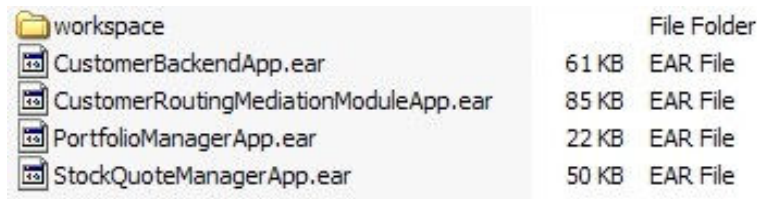
For a little background information, Eclipse (what WebSphere Integration Developer is built upon) turns off menu options until you need to use them. In this case, you are working with the business integration perspective that comes with all the business integration menu options turned on. The reason for this pop-up is because you are trying to export a J2EE EAR file which needs J2EE menu options turned on. The options are grouped into capabilities. View more

capabilities in WebSphere Integration Developer by navigating to **Window -> Preferences -> Workbench -> Capabilities**.

- ___ f. For **EAR Project**:, click the drop down menu icon and select **CustomerBackendApp**.
This is the J2EE application that was generated on creation of the CustomerBackend module.
- ___ g. For **Destination**:, click the Browse button and navigate to **C:/LabFiles601/WESB/Lab4/CustomerBackendApp.ear**.



- ___ h. Click **Finish** to create the EAR file.
- ___ i. Repeat steps a. through h. except for 3 other modules. CustomerRoutingMediationModuleApp, PortfolioManagerApp, and StockQuoteManagerApp.
Notice you do not need to export PortfolioLibrary since this is a Library application and is packaged up with the other projects.
Notice also you will not be prompted for capabilities enablement for "Base J2EE Support" either since you now have that capability turned on.
- ___ j. You should now have 4 .ear files located in **C:/LabFiles601/WESB/Lab4/**.



- ___ 5. Close WebSphere Integration Developer.

Part 2: Start ESB profile from Command Prompt

In this section you will open a command prompt in order to start the server manually.

- ___ 1. Open a command prompt.

If using a remote testing environment, follow the instructions in [Task: Starting a Remote Server](#) at the end of this document, to start the remote server.

If using a local testing environment continue with these directions:

From the Windows desktop, click on **Start -> Programs -> Accessories -> Command Prompt**.

- ___ 3. Navigate to **<WID HOME>\pf\esb\bin**.
If WebSphere Integration Developer is installed to the default directory **C:\Program Files\IBM\WebSphere\ID\6.0\pf\esb\bin**.

Type in **CD C:\Program Files\IBM\WebSphere\ID\6.0\pf\esb\bin**.

- ___ 4. Run command **startServer server1**.
If you wanted to be more explicit, you could add **-profileName esb** to the end of the startServer server1 command. Both commands will start the esb profile.

```
ADMU0128I: Starting tool with the esb profile
ADMU3100I: Reading configuration for server: server1
ADMU3200I: Server launched. Waiting for initialization status.
ADMU3000I: Server server1 open for e-business; process id is 400
```

- ___ 5. Leave the command prompt **open**. Either minimize the window or leave open on desktop.

Part 3: Use Administrative Console to Install EAR files

In this section you will open the Administration Console in a browser and install each one of the .ear files you exported from WebSphere Integration Developer.

- ___ 1. Open a browser and enter the URL <http://<HOSTNAME>:<PORT>/ibm/console/>. (such as, localhost:9060/ibm/console/)
- ___ 2. Enter the userid of **wsbeta** and click **Log in**.
- ___ 3. In the Task filtering selector area (in the middle of the screen) select **Server and Bus**. Click **Apply**. This will allow the Administrative Console to display only the Server and Bus information so that you can focus on the task at hand.



- ___ 4. Check to make sure the applications are not installed from a previous lab.
 - ___ a. Click on **Applications -> Enterprise Applications** from the left-hand side menu of the Administrative Console.



- ___ b. If you see the 4 .ear files CustomerBackendApp, CustomerRoutingMediationModuleApp, PortfolioManagerApp, and StockQuoteManagerApp, go ahead and stop all 4 applications. Then uninstall the applications. Remember to Save to master configuration before going on to next step. If you do not have the above mentioned .ear files, go ahead to step 5.
- ___ 5. Install the 4 .ear files.
 - ___ a. Click on **Applications -> Install New Application** from the left-hand side menu of the Administrative Console.
 - ___ b. Once the Install New Application page is up, click on the **Browse** button for Specify Path.
 - ___ c. Navigate to **C:\LabFiles601\WESB\Lab4\CustomerBackendApp.ear**. Click **Open**.
 - ___ d. Click **Next** in the Administrative Console.
 - ___ e. Click **Next** again to take all the defaults.
 - ___ f. Click on the last step, **Summary**, to take all the defaults and go straight to Finish.

- ___ g. Click on **Finish**. This will start the install of the .ear file.
- ___ h. Once the application installs successfully, click on the purple text link **Save to Master Configuration**.

To start the application, first save c








[Save to Master Configuration](#)

To work with installed applications, i

- ___ i. Now you are back to the home screen of the Administrative Console. The application has been installed, but has not been started. Go ahead and repeat steps a. through h. to install the other 3 .ear applications (CustomerRoutingMediationModuleApp, PortfolioManagerApp, and StockQuoteManagerApp).

___ 6. Start the 4 .ear files.

- ___ a. Now that all 4 .ear files have been installed, you need to start them. From the home screen of the Administrative Console, click **Applications -> Enterprise Applications**.
- ___ b. Notice that all 4 of the .ear files you have installed have a red X icon next to them. This says that they were installed, but not started.

<input checked="" type="checkbox"/>	CustomerBackendApp	
<input checked="" type="checkbox"/>	CustomerRoutingMediationModuleApp	
<input type="checkbox"/>	DefaultApplication	
<input type="checkbox"/>	EventServer	
<input type="checkbox"/>	EventServerMdb	
<input type="checkbox"/>	IBMUTC	
<input checked="" type="checkbox"/>	PortfolioManagerApp	
<input checked="" type="checkbox"/>	StockQuoteManagerApp	

- ___ c. Check the checkbox next to **all 4 applications** and click the **Start** button above the table. When the page refreshes, you will see that all the applications are started.

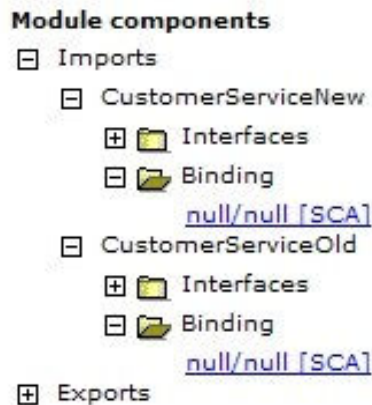
Part 4: Connect SCA Bindings using Administrative Console

In this section you will connect the SCA bindings for two of the applications that have null bindings inside the Administration Console.

- ___ 1. Now that the applications have been installed and started, click on **Applications -> SCA Modules**.
- ___ 2. Click on **CustomerRoutingMediationModule** under the **module column**.
Note: if you click under the application column, you will go to the enterprise application configuration and not the SCA module configuration.

Select	Module ▾	Application ▾
<input type="checkbox"/>	CustomerBackend	CustomerBacke
<input type="checkbox"/>	CustomerRoutingMediationModule	CustomerRoutin
<input type="checkbox"/>	PortfolioManager	PortfolioManage
<input type="checkbox"/>	StockQuoteManager	StockQuoteMan:

- ___ 3. Under Module components on the right hand side, drill down to the SCA bindings by clicking **Imports -> CustomerServiceNew -> Binding** and **Imports -> CustomerServiceOld -> Binding**.
- ___ 4. Notice both should have **null/null [SCA]** for their binding values. This states that SCA Bindings were generated in WebSphere Integration Developer, but the bindings were not assigned to a certain export.



- ___ 5. Change the SCA Binding for CustomerServiceNew.
 - ___ a. Click on the link **null/null [SCA]** under CustomerServiceNew.
 - ___ b. Under the Target box, choose **CustomerBackend** for the module from the **Module** drop-down list.
Note: If an export is not listed in the Export drop-down list, choose another module and come back to CustomerBackend to make the Export choices display.
 - ___ c. In the **Export** drop-down list, click on **CustomerServiceExtendedExport**.

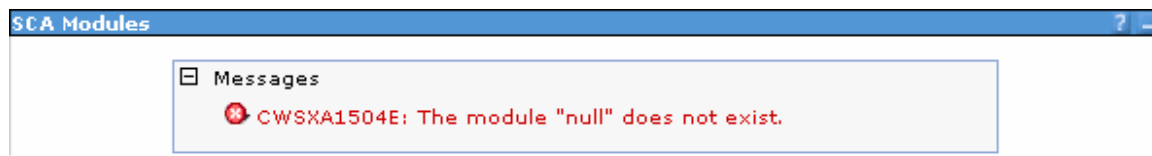
Target

Module
CustomerBackend

Export
CustomerServiceExtendedExport

- ___ d. Click **OK**.
- ___ e. Click the **save** link (in blue text) at the top of the page.
- ___ f. Click **Save** button.

Note: Ignore the following error: (You might come across this error multiple times in this lab)

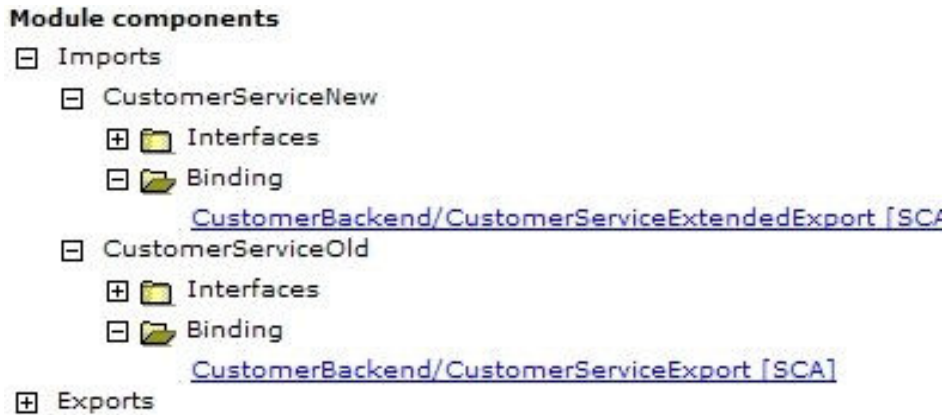


- ___ g. Now back at the SCA modules table, click on **CustomerRoutingMediationModule** under the **module column** again.
- ___ h. Check to see if the SCA Binding has been updated.
 - 1) Under Module components on the right hand side, drill down to the SCA bindings by clicking **Imports -> CustomerServiceNew -> Binding**.

___ 6. Change the SCA Binding for CustomerServiceOld.

- ___ a. Click on the link **null/null [SCA]** under CustomerServiceOld.
- ___ b. Under the Target box, choose **CustomerBackend** for the module from the **Module** drop-down list.
Note: If an export is not listed in the Export drop-down list, choose another module and come back to CustomerBackend to make the Export choices display.
- ___ c. In the **Export** drop-down list, click on **CustomerServiceExport**.
- ___ d. Click **OK**.
- ___ e. Click the **save** link (in blue text) at the top of the page.
- ___ f. Click **Save** button.
- ___ g. Now back at the SCA modules table, click on **CustomerRoutingMediationModule** under the **module column** again.
- ___ h. Check to see if the SCA Binding has been updated.

- 1) Under Module components on the right hand side, drill down to the SCA bindings by clicking **Imports -> CustomerServiceOld -> Binding**.



- ___ 7. Change the SCA Binding for CustomerService in the PortfolioManager SCA module.
- ___ a. Click on **Applications -> SCA Modules** to get back to the SCA modules table.
 - ___ b. Click on **PortfolioManager** under the **module column**.
 - ___ c. Under Module components on the right hand side, drill down to the SCA bindings by clicking **Imports -> CustomerService -> Binding**.
 - ___ d. Click on the link **null/null [SCA]** under CustomerService.
 - ___ e. Under the Target box, choose **CustomerRoutingMediationModule** for the module from the **Module** drop-down list.
 - ___ f. In the **Export** drop-down list, click on **CustomerServiceIn**.
 - ___ g. Click **OK**.
 - ___ h. Click the **save** link (in blue text) at the top of the page.
 - ___ i. Click **Save** button.
 - ___ j. Now back at the SCA modules table, click on **PortfolioManager** under the **module column** again.
 - ___ k. Check to see if the SCA Binding has been updated.

- 1) Under Module components on the right hand side, drill down to the SCA bindings by clicking **Imports -> CustomerService -> Binding**.

Module components



8. Since the SCA bindings have been connected and the applications are running, test the application to make sure the bindings have been connected.

Part 5: Test Applications for SCA Binding Success

In this section you will test the SCA Bindings connected from Part 4 in order to see if the applications work.

1. Open a browser and enter <http://<HOSTNAME>:<PORT>/PortfolioManagerClient/index.jsp> .
Hostname is the name of the system where the WESB server is located. Port is the **WC_defaulthost** port of the WESB profile.

Ex: <http://localhost:9080/PortfolioManagerClient/index.jsp>

Note: You can get the **WC_defaulthost** port by going to **serverindex.xml** file in <WID_HOME>\pf\esb\config\cells\esbCell\nodes\esbNode. Where WID_HOME is the location where WebSphere Integration Developer is installed

Ex: C:\WID601\pf\esb\config\cells\esbCell\nodes\

2. Enter **7777777** (7 seven times) in text input box and click **Submit** to get a response displayed to the JSP. The response should be **“The value is: 3410.0”**.
3. Once you have the value of the customerID in the JSP, **Close** the browser.
4. You are done with this exercise. Go ahead and clean up the workspace (steps below) for future work.

Part 6: Clean Up Server

- ___ 1. Stop the 4 .ear files and uninstall them.
 - ___ a. Click on **Applications -> Enterprise Applications** from the left-side menu.
 - ___ b. Check the **checkboxes** for CustomerBackendApp, CustomerRoutingMediationModuleApp, PortfolioManagerApp, and StockQuoteManagerApp.
 - ___ c. Click the **Stop** button above the table.
 - ___ d. Now all 4 .ear files will have a red X icon denoting that they are stopped. Recheck the **checkboxes** for CustomerBackendApp, CustomerRoutingMediationModuleApp, PortfolioManagerApp, and StockQuoteManagerApp.

<input checked="" type="checkbox"/>	CustomerBackendApp	✘
<input checked="" type="checkbox"/>	CustomerRoutingMediationModuleApp	✘
<input type="checkbox"/>	DefaultApplication	➡
<input type="checkbox"/>	EventServer	➡
<input type="checkbox"/>	EventServerMdb	➡
<input type="checkbox"/>	IBMUTC	➡
<input checked="" type="checkbox"/>	PortfolioManagerApp	✘
<input checked="" type="checkbox"/>	StockQuoteManagerApp	✘

- ___ e. Click the **Uninstall** button above the table.
 - ___ f. Click **OK** to uninstall the applications.
 - ___ g. Click the **save** link (in blue text) at the top of the page.
 - ___ h. Click **Save** button to save all work.
 - ___ i. After the page refreshes, you should now see that the 4 .ear files are not listed in the Enterprise Applications.
 - ___ j. Click **Logout** at the very top of the page. Close **Browser**.
- ___ 2. Stop the WebSphere ESB server profile.
 - ___ a. Open the **command prompt** from which you started the local or remote test server. It should still be open on the desktop or minimized.
If it is not still open, read Step 1 and 2 from Part 2 earlier in this lab.
 - ___ b. Enter **stopServer server1**.
 - ___ c. After you receive the message **Server server1 stop completed**, close the **command prompt**.

```

ADMU0128I: Starting tool with the esb profile
ADMU3100I: Reading configuration for server: server1
ADMU3201I: Server stop request issued. Waiting for stop status.
ADMU4000I: Server server1 stop completed.

```

What you did in this exercise

In this lab you connected SCA Bindings through the Administrative Console. You first imported an initial Project Interchange file and exported 4 EAR files (one for each Module below) from WebSphere Integration Developer. You then closed the development environment and started the WESB profile from a command prompt. Once started, you opened the Administration Console (or Administrative Console) to install and start all 4 of the EAR files you exported from WebSphere Integration Developer. Then you were able to see the SCA Modules in the Administrative Console and were able to edit/save the SCA Binding information. To test if the SCA bindings were successful you used a JSP to test the application. At the end, you stopped and uninstalled the applications, then stopped the server.

Notice that most of these manual steps are done in the background when operating from WebSphere Integration Developer. Starting and Stopping the server in the Servers View. Installing/starting and Stopping/Uninstalling applications are taken care of in one virtual step when using the Add and Remove Projects wizard to publish/unpublish your projects to and from the test server. There is no need to export ear files when WebSphere Integration Developer packages and publishes the ear for you. WebSphere Integration Developer also gives you easy access to the Administrative Console and allows you to simply restart a project instead of the whole server from the Servers view.

Solution Instructions

- ___ 3. There is no **Solution** to this exercise. The lab must be run through in order to learn SCA administration.

Task: Starting a Remote Server

This task describes how to start a remote server. The sample will use a z/OS machine.

___ 1. Start the remote server if it is not already started. WebSphere Integration Developer does not support starting remote servers from the Server View.

___ a. From a command prompt, telnet to the remote system if needed:

```
'telnet <HOSTNAME> <TELNET_PORT>'
```

```
userid : <USERID>
```

```
pw : <PASSWORD>
```

If the remote server runs on a System i[®] server, sign on to the system and start a Qshell session.

___ b. Navigate to the bin directory for the profile being used:

```
cd <WAS_HOME>/profiles/<PROFILE_NAME>/bin
```

___ c. Run the command file to start the server: `./startServer.sh <SERVER_NAME>`

___ d. Wait for status message indicating server has started:

```
ADMU3200I: Server launched. Waiting for initialization status.
```

```
ADMU3000I: Server c11sr01 open for e-business; process id is 0000012000000002
```