WebSphere Enterprise Service Bus V6.1 mediation programming model

Lab Four – Retry with alternate endpoints

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What this exercise is about

The objective of this lab is to provide you with an understanding of how automated service call retry capabilities can use alternate endpoints when retrying a call.

This lab is provided **AS-IS**, with no formal IBM support.

Lab requirements

- WebSphere Integration Developer V6.1 installed on Windows or Linux
- WebSphere Enterprise Service Bus V6.1 or WebSphere Process Server V6.1. The server can either be the test server installed by WebSphere Integration Developer or a remote server from a separate WebSphere Enterprise Service Bus V6.1 or WebSphere Process Server V6.1 installation.

What you should be able to do

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

- Understand the service message object structure for dynamic endpoints and alternate endpoints and how they can be initialized
- Configure a service invoke mediation primitive to use alternate endpoints when performing service call retry.

Introduction

This lab exercise is the fourth of a series of four tutorials intended to illustrate the new programming model for mediations introduced by WebSphere Enterprise Service Bus V6.1. The new programming model includes message augmentation using service invoke, splitting and aggregating to handle repeating elements within a message and service call retry capabilities including the use of alternate service endpoints.

The four tutorials are described in the presentation entitled <u>Augmentation, aggregation and retry tutorials</u>. You should familiarize yourself with the tutorials as described in the presentation before attempting this lab.

Exercise Instructions

Some instructions in this lab might be Windows operating system specific. If you plan on running WebSphere Integration Developer on a Linux operating system you will need to issue the appropriate commands and use appropriate files for Linux. The directory locations are specified in the lab instructions using symbolic references, as follows:

Reference variable	Example Windows location	Example Linux location
<wid_home></wid_home>	C:\Program Files\IBM\WID61	/opt/IBM/WID61
<lab_files></lab_files>	C:\Labfiles61\WESB\61ProgModel	/tmp/Labfiles61/WESB/61ProgModel

Instructions if using a remote server for testing

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 the 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></server_name>	server1	sssr011	
<was_home></was_home>	C:\Program Files\IBM\WebSphere\AppServer	/etc/sscell/AppServer	
<hostname></hostname>	localhost	mvsxxx.rtp.raleigh.ibm.com	
<soap_port></soap_port>	8880	8880	
<telnet_port></telnet_port>	N/A	1023	
<profile_name></profile_name>	AppSrv01	default	
<userid></userid>	N/A	ssadmin	
<password></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 "<u>Task: Adding remote server to the WebSphere Integration Developer</u> test environment".

Understanding how to read the instructions

In this lab, the instructions are written to allow an experienced user to complete the steps easily while at the same time providing very explicit instructions needed by the new user. The format of the instructions follows this pattern:

1. This is a sentence or short paragraph that describes a particular task to be completed. In some cases this might be sufficient for an experienced user, but in other cases the experienced user might require some additional specific information to complete the task. In that case, there is a bulleted list that helps the experience user know specifics.

- Additional information for experienced user
- This information, along with the above paragraph, should allow the experienced user to complete the task
- ____a. First step needed by the new user
- ____b. Second step needed by the new user
 - 1) Additional details for completing this step
 - 2) More details for completing this step
- ____ c. Third step needed by new user
- 2. Next task to be completed
 - Info for experience user
 - -----
 - ____a. First step needed by the new user
 - ____b. Second step needed by the new user.

Part 1: Setting up the environment for the lab

What you will do in this part: In this part you are getting the environment set up to do the lab. There are three different ways you might be approaching this which will dictate what you need to do.

(1) **Proceeding from Lab Three** – You are directly continuing from Lab Three and you did not shut down the server and development environment. In this case, there is nothing that needs to be done in this part.

(2) Restarting from Lab Three – You are continuing from Lab Three which you did previously and therefore you did shut down the server and development environment. In this case, you will need to restart the development environment and server but will not need to import a project interchange to initialize the workspace.

(3) Directly starting Lab Four – You are starting this lab from scratch, irrespective of whether you had previously completed Lab Three.

- 1. If you are proceeding from Lab Three there is nothing to do, skip directly to Part 2 Authoring the mediation flow to retry using alternate endpoints
 - -----
- ____ 2. Start WebSphere Integration Developer.
 - Restarting from Lab Three : Use the same workspace used in Lab 3
 - Directly staring Lab 4: Suggested location: <LAB_FILES>/workspaces/ws4
 - -----
 - __a. Select Start → All Programs → IBM WebSphere Integration Developer → IBM WebSphere Integration Developer V6.1 → WebSphere Integration Developer V6.1
 - ____b. From the Workspace Launcher window, enter the name of the workspace in the Workspace field
 - 1) Restarting from Lab 3: Use the same workspace used in Lab 3
 - 2) Directly staring Lab 4: <LAB_FILES>/workspaces/ws4

🥵 Workspace Launcher		×
Select a workspace		
IBM WebSphere Integration Developer 6.1 stores your projects in a Choose a workspace folder to use for this session.	folder called a workspace	
Workspace: C:\Labfiles61\WESB\61ProgModel\workspaces\ws4	<u> </u>	<u>B</u> rowse
0	С	Cancel

____ c. If the Welcome panel is displayed, click on **Go to the Business Integration perspective** or the arrow next to it in the upper right corner of the panel.



- 3. If you are **restarting from Lab Three** there is nothing additional to do, skip directly to **Part 2** Authoring the mediation flow to recover from a modeled fault
 - _____
- 4. If you are **directly starting Lab Four** import the project interchange file containing the starting point for the lab
 - <LAB_FILES>/PI4-RetrySolution-AlternateEndpointsStart.zip

____a. From the menu, select File \rightarrow Import...

👍 В	usine	ss Integra	ition - M	ediation	Flow	Editor	StoreMed
File	Edit	Navigate	Search	Project	Data	Run	Window
1	New					Alt+Sł	nift+N 🕨
(Open F	ile					
(Close					Ctrl+V	v
(Close A	All				Ctrl+S	hift+W
	Save					Ctrl+S	;
	Save A	s					
6	Save A					Ctrl+S	hift+S
F	Revert						
ſ	Move.,	,					
F	Renam	е,,,				F2	
F	Refres	h				F5	
(Conver	rt Line Delim	iters To				•
ē P	Print					Ctrl+P	•
	Switch	Workspace					
è 1	ímport						
۵	Export						

Import Select Import a project and i	ts dependent projects from a Zip file.	×
Select an import sou	rce:	
I type filter text	itegration relopment d Logging es Interchange	
0	< Back	Einish Cancel

____b. In the Import dialog, select Other → Project Interchange

- ___ c. Click Next
- ____d. In the Import Project Interchange Contents dialog set the From zip file: value to <pre



____e. Click Select All to selected all of the projects listed

🥵 Import Project	Interchange Contents	🔺 🖬 🔀
Import Projects Import Projects from a	zip file.	
From zip file: Project location root: Project location root: Project location root: From zip file: Project location root: StoreMediation Select All Deselect	C: \Labfiles61\WESB\61ProgModel\PI4-RetrySolution-Alternat C: \Labfiles61\WESB\61ProgModel\workspaces\ws4 vice m t. All Select Referenced	EndpointsStart V Browse
0	<back mext=""></back>	Einish Cancel

___ f. Click Finish

____g. Wait for the build process to complete for the imported projects, which is seen at the lower right corner of WebSphere Integration Developer.

Building workspace: (44%)

Part 2: Authoring the mediation flow to retry using alternate endpoints

What you will do in this part: In this part you will modify the flow so that it initializes the SMO header fields for dynamic target address and alternate endpoints. Then you will modify the CheckInventory service invoke primitive to use the dynamic target address (rather than what is wired on the assembly diagram) and to use the alternate target addresses during service invoke retry processing.

You should see the presentation entitled <u>Augmentation, aggregation and retry tutorials</u> to better understand what this part is doing.

1. Open the StoreMediation flow found in the StoreMediation module.



- ____a. In the Business Integration view, expand StoreMediation → Mediation Logic → Flows and then double-click on StoreMediation to open it in the mediation flow editor
- _ b. The line connecting Ordering → submitOrder and ShippingPartner → shipOrder should be selected for you to view the flow
- 2. Add a message element setter primitive and rewire the flow so that it is in between the StartPrintMsg primitive and the StartIteration primitive. This is used to initialize the target endpoint and alternate endpoints. In a typical production scenario, this is most likely done with an endpoint lookup primitive interfacing with WebSphere Service Registry and Repository.
 - Display Name: SetEndpoints
 - Wire : PrintStartMsg to SetEndpoints
 - Wire : SetEndpoints to StartIteration



• ------

____a. From the **Palette**, select **Transformation** → **Message Element Setter** and then click on the canvas as shown below:



- ____b. You will now see a new message element setter primitive added to the flow. Ensure that this primitive is highlighted and select **Properties → Description**
- ____ c. Change the **Display name** to **SetEndpoints**

Palette Palette	submitOrder : Ord PrintStartMsc MessageElement5
Request: submitOrder)
Build Activities 🔲 Propertie	s × Problems Servers
Description	📩 Message Element Setter : MessageElementSe
Terminal	
Details	Display name: SetEndpoints
Promoted Properties	Name: MessageElementSetter3

- _____d. Remove connection between PrintStartMsg and StartIteration primitives
 - 1) Right-click on the line connecting **PrintStartMsg** and **StartIteration** primitives and select **Delete** from the pop-up menu

____e. Add a connection from **PrintStartMsg** to **SetEndpoints** primitive

1) Hover your mouse over **out** terminal of **PrintStartMsg** to get the 'Add a connection to an input terminal'



- 2) Click on the orange bubble and then click on **SetEndpoints** primitive
- 3) You should now see a connection from PrintStartMsg to SetEndpoints primitive



- _____f. Similarly add a connection from SetEndpoints to StartIteration primitive
 - 1) Hover your mouse over **out** terminal of **SetEndpoints** to get the 'Add a connection to an input terminal'
 - 2) Click on the orange bubble and then click on StartIteration primitive
 - 3) You should now see a connection from SetEndpoints to StartIteration primitive



- ____3. Configure the SetEndpoints message element setter primitive to set up the target address and alternate target addresses. To illustrate retry with alternate endpoints, the target address is set to the endpoint that always fails and thus a retry will always occur. Then the alternate addresses are set to the endpoints that randomly fail and always work, in that order. So in some cases, the first alternate endpoint will work and in other cases it will fail, but the second alternate endpoint will always work.
 - Set properties of message element setter to assign string values as follows

Target location in SMO	String value
/headers/SMOHeader/Target/address	sca://InventoryService/InvFails
/headers/SMOHeader/AlternateTarget[1]/address	sca://InventoryService/InvRandom
/headers/SMOHeader/AlternateTarget[2]/address	sca://InventoryService/InvWorks

Message Elements:

Target	Туре	Value
/headers/SMOHeader/Target/address	String	sca://InventoryService/InvFails
/headers/SMOHeader/AlternateTarget[1]/address	String	sca://InventoryService/InvRandom
/headers/SMOHeader/AlternateTarget[2]/address	String	sca://InventoryService/InvWorks

Note: Ensure that the setting of alternate target address[1] comes before the setting of alternate target address[2] in the table. If not, use the up or down icons to rearrange the table rows so that they match the screen capture.

• -----

_ a. Set /headers/SMOHeader/Target/address to the string URL value sca://InventoryService/InvFails

- Ensure that the SetEndpoints primitive is highlighted and then select Properties → Details
- 2) Under Message Elements table, click the Add... button. The Add/Edit window is opened
- 3) Define Target:
 - a) Click Edit... next to Target. The XPath Expression Builder wizard is opened
 - b) Expand ServiceMessageObject →headers → SMOHeader → Target
 - c) Drag address and drop it under XPath Expression (or double-click on address)

😓 XPath Expression Builder			×
XPath Expression Builder Select the target from the Schema viewer, Function viewer or Op nodes in the source viewer below.	perator viewer and drag a	and drop the	55
Data Types Vie w er	XPathctions	Operrs	
Data Types ServiceMessageObject Deta Type Context Deta Context Det	Poly String Poly String Poly Boolean PolyBoolean PolyBoolean		
XPath Expression	,	,	_
address : anyURI			A
0		Einish	Cancel

d) You should now see this expression under XPath Expression



- e) Click Finish button. You are now back to Add/Edit window
- 4) For Type, select String (default) from the drop down list
- 5) For Value, enter sca://InventoryService/InvFails
- 6) Your Add/Edit window should look like this:

🚯 Add/Edit	×
Add/Edit	properties
Specify the p	roperties.
Target:	/headers/SMOHeader/Target/address
Type:	String <
Value:	sca://InventoryService/InvFails <
?	Cancel

7) Click Finish

8) You will see this entry in the Message Elements table:

Message Elements:						
	Target	Туре	Value	Add		
	/headers/SMOHeader/Target/address	String	sca://InventoryService/InvFails			
				Edit		

____b. Similarly, set /headers/SMOHeader/AlternateTarget[1]/address to the string URL value sca://InventoryService/InvRandom

1) Under Message Elements table, click the Add... button. The Add/Edit window is opened

- 2) Define Target:
 - a) Click Edit... next to Target. The XPath Expression Builder wizard is opened
 - b) Expand ServiceMessageObject →headers → SMOHeader → AlternateTarget
 - c) Drag address and drop it under XPath Expression (or double-click on address)
 - d) An Element declaration occurrence window is opened. Enter '1' for Occurrence

🚯 Element declaration occurrence	×
Element declaration AlternateTarget must contain an	index between 1 and unbounded .
Occurrence: 1	
🗹 Use array index.	
	OK Cancel

e) Click OK

f) You should now see this expression under XPath Expression



/headers/SMOHeader/AlternateTarget[1]/address

g) Click **Finish** button. You are now back to Add/Edit window

3) For Type, select String (default) from the drop down list

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- 4) For Value, enter sca://InventoryService/InvRandom
- 5) Your Add/Edit window should look like this:

Target:	/headers/SMOHeader/AlternateTarget[1]/address	
Type:	String	-
Value:	sca://InventoryService/InvRandom	

6) Click Finish

7) You will see the second entry in the Message Elements table:

Message Elements:

Target	Туре	Value	Add
/headers/SMOHeader/Target/address	String	sca://InventoryService/InvFails	
/headers/SMOHeader/AlternateTarget[1]/address	String	sca://InventoryService/InvRandom	Edit
ht ht			
Ĭ			Remove

- ___ c. Finally, /headers/SMOHeader/AlternateTarget[2]/address to the string URL value sca://InventoryService/InvWorks
 - 1) Under Message Elements table, click the Add... button. The Add/Edit window is opened
 - 2) Define Target:
 - a) Click Edit... next to Target. The XPath Expression Builder wizard is opened
 - b) Expand ServiceMessageObject →headers → SMOHeader → AlternateTarget
 - c) Drag address and drop it under XPath Expression (or double-click on address)
 - d) An Element declaration occurrence window is opened. Enter '2' for Occurrence

🚯 Element declaration occurrence	×
Element declaration AlternateTarget must contain ar	n index between 1 and unbounded .
Occurrence: 2	
Use array index.	
	OK Cancel

e) Click OK



f) You should now see this expression under XPath Expression

/headers/SMOHeader/AlternateTarget[2]/address

- g) Click Finish button. You are now back to Add/Edit window
- 3) For **Type**, select **String** (default) from the drop down list
- 4) For Value, enter sca://InventoryService/InvWorks
- 5) Your Add/Edit window should look like this:

Target:	/headers/5MOHeader/AlternateTarget[2]/address	
Type:	String 💌	l
Value:	sca://InventoryService/InvWorks	

6) Click Finish

Message Elements:

7) You will now see the third entry in the Message Elements table:

Target	Туре	Value	Add
/headers/SMOHeader/Target/address	String	sca://InventoryService/InvFails	
/headers/SMOHeader/AlternateTarget[1]/address	String	sca://InventoryService/InvRandom	Edit
/headers/SMOHeader/AlternateTarget[2]/address 📐	String	sca://InventoryService/InvWorks	
h.			Remove

_____d. Sometimes the Message Elements table does not enter the element settings in the same order they were created. For example, it might look like this with AlternateTarget[2] listing before AlternanateTarget[1]. This will fail at runtime as the array elements need to be created in order. To fix this, perform these steps:

Message Elements:					
Target	Туре	Value	Add		
/headers/SMOHeader/Target/address	String	sca://InventoryService/InvFails			
/headers/SMOHeader/AlternateTarget[2]/address	String	sca://InventoryService/InvWorks	Edit		
/headers/SMOHeader/AlternateTarget[1]/address	String	sca://InventoryService/InvRandom			
	-				

1) Select the row containing AlternanateTarget[1] so that it is highlighted in dark blue.

Message Elements:

Target	Туре	Value	Add
/headers/SMOHeader/Target/address	String	sca://InventoryService/InvFails	
/headers/SMOHeader/AlternateTarget[2]/address	String	sca://InventoryService/InvWorks	Edit
/headers/SMOHeader/AlternateTarget[1]/address	String	sca://InventorvService/InvRandom	

2) Use the up arrow to move the selected row up the table.

Message Elements:					
	Target	Туре	Value	Add	
	/headers/SMOHeader/Target/address	String	sca://InventoryService/InvFails		
	/headers/SMOHeader/AlternateTarget[2]/address	String	sca://InventoryService/InvWorks	Edit	
	/headers/SMOHeader/AlternateTarget[1]/address	String	sca://InventoryService/InvRandom		
				Remove	
•				2, 7	
Validate input Up					

3) Check that your resulting table looks like this.

	Message Elements:					
		Target	Туре	Value	Add	
[/headers/SMOHeader/Target/address	String	sca://InventoryService/InvFails		
		/headers/SMOHeader/AlternateTarget[1]/address	String	sca://InventoryService/InvRandom	Edit	
		/headers/SMOHeader/AlternateTarget[2]/address	String	sca://InventoryService/InvWorks		

- 4. Modify the CheckInventory service invoke primitive to take the endpoint URL from the target address field and to perform retries using the endpoint URLs from the alternate target address array.
 - Dynamic endpoint: Check "Use dynamic endpoint if set in message header" option on Details panel

	and the transfer of	Ch I T	
Description			
Terminal			
Details	Reference name:	InventoryPartner	
· Retry			
Promoted Properties	Operation name:	checkInventory	
	Use dynamic endpoint if set in the message header		
	Async timeout (seconds):	5	
	Require mediation flow	to wait for service response	

 Alternate endpoints: Check "Try alternate endpoints" option on Retry panel

Description	💰 Service Invoke : CheckInventory			
Terminal				
Details • Retry	Retry on:	Modeled fault		
Promoted Properties	Retry count:	3		
	Retry delay (seconds):	0		
	Try alternate endpoints			

- ------
- ____a. From the mediation flow, select CheckInventory service invoke and then select Properties → Details

Build Activities 🔲 Propert	ies 🗙 Problems Serve	ers
Description	💰 Service Invoke	e : CheckInventory
Terminal		
Details	Reference name:	InventoryPartner
· Retry	Operation name:	checkInventory
Promoted Properties	Use dynamic endpoin	t if set in the message header
	AsyNc timeout (seconds)	: 5
	Require mediation flo	w to wait for service response when the flow component is invoked asynchronously with callback

____b. Check the box for 'Use dynamic endpoint if set in the message header'

- ____ c. Select Retry under Details
- ____ d. Check the box for 'Try alternate endpoints'

Build Activities 🔲 Propert	ies 🗙 Problems Serv	/ers
Description	💰 Service Invok	e : CheckInventory
Terminal		
Details	Retry on:	Modeled fault
· Retry	Retry count:	3
Promoted Properties	Retry delay (seconds):	0
	Try alternate endpo	ints

____ 5. Ensure that the flow looks similar to this.



____a. From the menu select File → Save All to save your changes

-							
e B	usine	ss Integra	ition - S	toreMed	iation	- Asse	embly Diag
Eile	<u>E</u> dit	<u>N</u> avigate	Se <u>a</u> rch	Project	Da <u>t</u> a	<u>R</u> un	<u>W</u> indow
į	<u>V</u> ew					Alt+Sh	nift+N 🕨
	Open F	ile <u>.</u>					
9	⊆lose					Ctrl+V	/
	Close A	All				Ctrl+S	hift+W
	ave					Ctrl+S	
	Save <u>A</u>	Ş					
匾:	5av <u>e</u> A					Ctrl+S	hift+S
F	Rever <u>t</u>	N					

- _____7. Check that there are no problems reported in the Problems view
 - -----
 - ____a. Select **Problems** view at the bottom. You can ignore warnings, but there should not be any errors at this time:

Build Activities Properties 🚼 Problems 🗴 Servers					
0 errors, 5 warnings, 0 infos					
Description 🔺	Resource	Path	Location		
😑 🔚 Warnings (5 items)					
A The InventoryPartner reference for the	StoreMediati	StoreMediation	Unknown		
A The method getMyService() from the ty	InventoryFa	InventoryService/inventory	line 23		
A The method getMyService() from the ty	InventoryR	InventoryService/inventory	line 27		
A The method getMyService() from the ty	InventoryW	InventoryService/inventory	line 23		
A The method getMyService() from the ty	ShippingJav	StoreMediation/shipping	line 24		

Part 3: Test the retry with alternate endpoints mediation flow

What you will do in this part: In this part you use the component test facilities of WebSphere Integration Developer to test the mediation. The resulting output is explained.

You should see the presentation entitled <u>Augmentation, aggregation and retry tutorials</u> to better understand what this part is doing.

- ___1. If not already running, start the WebSphere Enterprise Service Bus (or WebSphere Process Server) test server.
 - -----
 - _____a. From the Servers view of WebSphere Integration Developer, select WebSphere ESB Server v6.1 and hit 'Start the server' icon (12) from the toolbar

Build Activities Properties Problems 👫	Servers 🗙	参 🕻	N 🖉 🐁 🔳 🔁 🛛 🕄 🗖
Server	Status	State	Start the server
👪 WebSphere ESB Server v6.1	🖥 Stopped	Republish	
WebSphere Process Server v6.1	Stopped	Republish	

____b. Wait until the server Status shows as Started

E	Build Activities	Properties	Problems	녟	Servers	×	Console		
	Server				Status			State	
ſ	🚟 WebSj	phere ESB S	erver v6.1		🚡 Starte	d		Synchronized	
ſ	🛗 WebSj	phere Proce	ss Server v	6.1	遣 Stoppe	edr₹		Republish	

NOTE: Depending upon the preferences you have specified for the **Console** view, the **Console** view might grab the focus from the **Servers** view. If this is the case, the status in the lower right should indicate when the server startup is complete, at which time you can switch back to the **Servers** view

- ____2. Check to see if the InventoryServiceApp and StoreMediationApp are deployed on the server.
 - No, not deployed yet: Add both projects to the server
 - Yes, already deployed: Restart the StoreMediationApp
 - -----
 - _ a. Check the Servers view to see if the InventoryServiceApp and StoreMediationApp are already deployed. If they are, they will appear below the server as shown here. Follow the appropriate instructions in step b or step c

Build Activities Properties Problems	Servers 🗙	
Server	Status	State
🔛 WebSphere Process Server v6.1	🔚 Stopped	Republish
🖃 🧱 WebSphere ESB Server v6.1	🖡 Started	Republish
🛛 🖸 🗄 InventoryServiceApp	🖡 Started	
😐 📻 StoreMediationApp 🔪	🛼 Started	

____b. If the applications are **not deployed yet**, add both projects to the server following these steps

1) Right-click on **WebSphere ESB Server v6.1** under the Servers view and select **Add and remove projects...** from the context menu

2) In the Add and Remove Projects window, click **Add All >>** to add InventoryServiceApp and StoreMediationApp to the Configured projects panel

🚯 Add and Remove Projects			×
Add and Remove Projec Modify the projects that are config			
Move projects to the right to confi	gure them on the server		
<u>Available projects:</u>		\underline{C} onfigured projects:	
InventoryServiceApp StoreMediationApp	Add > < Remove Add All >> << Remove All		
0	< <u>B</u> ack <u>N</u> ext >	Einish	Cancel

3) The projects will now be moved to Configured projects. Click Finish

4) Wait while the projects are being published to the server

Build Activities Properties Problems <table-cell></table-cell>	Servers 🗙 Console		🌼 🖗 🔍 🌾 I	• 🕑 🔍 🗖 🗖
Server	Status	State		
🗖 🧱 WebSphere ESB Server v6.1	🛼 Started	Publishing		
🗉 🛅 InventoryServiceApp	🖡 Started			
🗉 🛅 StoreMediationApp	_			
WebSphere Process Server v6.	1 🔚 Stopped	Republish		
			Publishing to WebSphe:	(100%) 💷 🦉

5) Once the publishing is done, from the Servers view, expand **WebSphere ESB Server v6.1** and you should see the 2 applications started as following:

Build Activities Properties Problems	👯 Servers 🗙 Console	
Server	Status	State
🗖 🚟 WebSphere ESB Server v6.1	🖡 Started	Synchronized
🗄 🛅 InventoryServiceApp —	🖐 🦍 Started	
🗄 🛅 StoreMediationApp	- 🏊 Started	
🎇 WebSphere Process Server v	6.1 遣 Stopped	Republish

- ____ c. If the applications are **already deployed**, restart the StoreMediationApp following these steps:
 - 1) Right click on StoreMediationApp to get the pop-up menu and select **Restart StoreMediationApp**



2) Wait while the application stops and restarts.

📄 🖃 🛗 WebSphere ESB Server v6.1	Ъ Started
🗉 🔁 InventoryServiceApp	🛼 Started
😐 📻 StoreMediationApp	🖡 Starting

3) Once it has restarted, you should see the two applications started as shown here:

Build Activities Properties Problems	Servers 🗙 Console	
Server	Status	State
🗖 🧱 WebSphere ESB Server v6.1	🚡 Started	Synchronized
🗉 🛅 InventoryServiceApp	📕 🖥 Started	
🗉 🛅 StoreMediationApp	📕 🖥 Started	
WebSphere Process Server v6.	1 🔚 Stopped	Republish

- 3. Check if the StoreMediation_Test panel is still present from a previous lab.
 - No: From the assembly diagram for StoreMediation, start Test Component for the StoreMediation component.
 - Yes: Hit the Invoke icon (ቝ) in the Events panel
 - ------
 - ____a. Look at the tabs to see if StoreMediation_Test is still open as shown in this screen capture. Follow the appropriate instructions in step b or step c



- b. No, it is not open. From the assembly diagram for StoreMediation, start Test Component for the StoreMediation component
 - 1) In the Business Integration window, expand **StoreMediation** and double-click on **Assembly Diagram** to open it in Assembly editor

2) From the StoreMediation-Assembly Diagram, right-click on **StoreMediation** component and select **Test Component** from the pop-up menu



3) The **StoreMediation_Test** window is opened where you will enter your test data

___ c. **Yes, it is open**. Hit the Invoke icon (⁽⁾) in the Events panel.



_____4. Initialize the test data

- Set customerID to cust123
- Set items/items[0]/itemID to item001
- Set items/items[0]/quantity to 3
- Set items/items[1]/itemID to item009
- Set items/items[1]/quantity to 5
- Set items/items[2]/itemID to item002
- Set items/items[2]/quantity to 15

Name	Type	Value
🖃 📇 order	Order	✓
🛄 customerID	string	✓ cust123
⊡…[□] items	OrderItem[]	66
🚊 🖳 items[0]	OrderItem	¥
🎦 itemID	string	✓ item001
🛄 quantity	int	✓ 3
🚊 🖳 items[1]	OrderItem	¥
···· 🛄 itemID	string	✓ item009
🛄 🛄 quantity	int	✓ 5
🖮 🖳 items[2]	OrderItem	¥
🎦 itemID	string	✓ item002
🛄 quantity	int	✓ 15

- ____a. Enter this under Initial request parameters table:
 - 1) For customerID, click under Value and enter cust123
 - Right-click any where on the row containing items and select Add Elements... from the pop-up menu

-[] items	OrderItem[]	
[-] 100110		" 📄 ⊆opy Value
		Paste Value
		Select <u>A</u> ll
		Add Elements

3) Enter '3' in the Add Element window:

×
Cancel

4) Click OK

5) Enter values for items[0]:

- a) For itemID, click under Value and enter item001
- b) For quantity, click under Value and enter 3
- 6) Enter values for items[1]:
 - a) For itemID, click under Value and enter item009
 - b) For quantity, click under Value and enter 5
- 7) Enter values for items[2]:
 - a) For itemID, click under Value and enter item002
 - b) For quantity, click under Value and enter 15

IBM WebSphere V6.1 – Lab exercise

- ___ 5. Run the test by hitting the Continue icon (왿)..
 - -----
 - ____a. Click **Continue** icon (¹) under Events panel

Events	
\$⊳ 🖿 ≱	0
Invoke	Continue

_____b. If presented with the **User Login** dialog, enter the **User ID** and **Password**, which by default is normally set to **admin** and **admin**. Optionally, you can select the 'Use the authentication settings in the preference and never ask again' check box to prevent this dialog from being displayed in the future

🥵 User Login - Default Module Test 🔹 💈	×
Security is enabled on the selected runtime environment(s). Please sign in to continue the test.	
User ID:	
þdmin	
Password:	
•••••	
$\hfill\square$ Use the authentication settings in the preference and never ask again.	
OK Cancel	

___ c. Click **OK**

____ d. Wait until the integration test client starts

Starting the integration test client
Operation in progress
Deploying the system applications
Run in Background Cancel Details >>

6. The result of running should look like this. Notice that, unlike in the previous labs, there are no calls shown to the inventory service. That is because test component only shows request/response flows that are explicitly wired in the SCA assembly. Since the calls to the inventory service in this case used dynamic addresses, the calls do not show



7. Switch to the Console view and examine the output, which should look similar to this screen capture. You will see several calls to the inventory service. Notice that there is a mixture of calls to the different inventory service implementations (InvFails, InvRandom and InvWorks) because of the use of alternate endpoints. Your screen capture might be slightly different because of the use of the InvRandom implementation of the inventory service. The target address was set to InvFails so the first attempt to access the inventory service for each item should show an exception. The first alternate address was set to InvRandom implementation, so the second call for each item will vary, with some working and others not. In the cases where the second call failed, the third call for the item is OK because the second alternate address was set to the InvWorks implementation. The final ship object sent to the shipping service should contain the three items, each initialized with its appropriate inventory information as the call to the inventory service eventually was successful for each item.

```
0 **************
O ********** START mediation flow *********
0 ***
0 ***** InvFails - EXCEPTION: InventoryFault for itemID = item001
0 ***** InvRandom - returning InventoryItem for itemID = item001
0 ***** InvFails - EXCEPTION: InventoryFault for itemID = item009
0 ***** InvRandom - returning InventorvItem for itemID = item009
0 ***** InvFails - EXCEPTION: InventoryFault for itemID = item002
0 ***** InvRandom - EXCEPTION: InventoryFault for itemID = item002
0 ***** InvWorks - returning InventoryItem for itemID = item002
0 ***
O ********** END mediation flow ************
0 -----
0 -- Ship object dump begins ------
O EObject: com.ibm.ws.bo.bomodel.impl.DynamicBusinessObjectImpl@544c544c
O Value:
   customerID = cust123
0
   items = ShipItem[3]
0
0
      items[0] = <ShipItem@549a549a>
0
           itemID = item001
0
           orderOuantity = 3
           inventoryQuantity = 5
0
0
           inventoryStatus = OK - but stock is running low
        items[1] = <ShipItem@54b454b4>
0
0
           itemID = item009
           orderQuantity = 5
0
0
           inventoryQuantity = 45
0
           inventoryStatus = OK - sufficient stock levels
        items[2] = <ShipItem@54ce54ce>
0
           itemID = item002
0
0
           orderQuantity = 15
0
           inventorvOuantity = 10
           inventoryStatus = Backorder - insufficient stock to fill order
0
0
0 -- Ship object dump ends ------
        _____
0 -----
```

- -----
- ____ a. Double click on **Console** view next to Servers view to see the above message (double clicking will maximize the Console view).



- 8. If you like, you can run additional tests using different input data to see how the output varies. Key things to note about the data you use:
 - customerID can be any string and should not have any particular affect on the results
 - The items array can have any number of elements
 - itemID values of "item001" through "item010" are recognized by the inventory service, all other values are not recognized
 - Inventory status will change according to the relationship between the order and inventory quantities
 - -----
 - ____a. Click Invoke icon (



- ____b. Enter values for customerID, itemID, and quantity as per the above instructions
- ___ c. Click **Continue** icon (**(**) under Events panel



Part 4: Clean up the environment

What you will do in this part: Since this is the last lab in this sequence of labs, you should perform this part to clean up your development environment. This will leave your test server in a known state without any of the projects deployed on it.

- 1. Remove the InventoryServiceApp and StoreMediationApp from the test server.
 - -----
 - _____a. Right-click on WebSphere ESB Server v6.1 under the Servers view and select Add and remove projects... from the context menu

____b. From the Add and Remove Projects window, click << Remove All

🚯 Add and Remove Projects	×
Add and Remove Projects Modify the projects that are configured on the s	erver
Move projects to the right to configure them on	the server
<u>A</u> vailable projects:	<u>Configured projects:</u>
	emove
Add	A[>>
(?)	Next > Einish Cancel

- ____ c. Click Finish after you see the applications moved to Available projects.
- ____d. If displayed, click **OK** in 'Removing Project' window. Optionally, you can check the box for 'Do not show again' not to be asked again when you remove projects later



- ____e. Wait until the application is removed from the server
- __ 2. Close the StoreMediation_test panel without saving

a. Click X on the StoreMediation_Test tab 😌 StoreMediation - Assembly Diagram StoreMediation_Test Events Close ____b. Click No from Save Resource window 🚯 Save Resource Y StoreMediation_Test' has been modified. Save changes? Yes <u>N</u>o ____ c. Click X on the StoreMediation – Assembly Diagram tab 🕄 StoreMediation - Assembly Diagram 💥 Palette ि 🗨 🗨 ९ Close 3. Stop the test server _____ _a. From the Servers view of WebSphere Integration Developer, select WebSphere ESB Server v6.1 and hit 'Stop the server' icon (I) from the toolbar Build Activities | Properties | Problems 👫 Servers 🗙 Console 🅸 🜔 🖗 F Serve State Stop the server Started Synchronize e ESB Republish

____b. Wait until the server Status shows as Stopped

🗱 WebSphere Process Server v6.1 🛅 Stopped

Build Activities Properties Problems	🛪 Servers 🗙	🔹 🍫 🕑 🖉 🐁 🗉 🔛 🗐 🗖
Server	Status	State
WebSphere ESB Server v6.1	🛓 Stopped	Republish
WebSphere Process Server v6	. 1 🖥 Stopped 场	Republish

4. Exit from WebSphere Integration Developer.

> a. From menu, select **File** \rightarrow **Exit** or click 'X' at the right top corner of your WebSphere Integration Developer window

What you did in this exercise

In this exercise, you modified an augmentation and aggregation message flow so that the 'service invoke' primitive used alternate endpoints when performing a service call retry. This involved setting up the endpoints in the SMO and appropriately configuring the service invoke.

Reviewing the presentation entitled <u>Augmentation, aggregation and retry tutorials</u> will help you better understand what was done in the lab.

Solution instructions

If you want to run this lab with a completed solution rather than authoring the flow yourself, follow these instructions:

- 1. Follow **Part 1: Setting up the environment for the lab**, however use the project interchange file that contains the solution.
 - <LAB_FILES>/PI5-AlternateEndPointsSolution.zip
- 2. Skip to **Part 3: Test the retry with alternate endpoints mediation flow** and proceed through the rest of the lab.

Task: Adding remote server to the WebSphere Integration Developer test environment

This task describes how to add a remote server to the WebSphere Integration Developer Test environment. This example uses a z/OS machine.

- _____1. Define a new remote server to WebSphere Integration Developer.
 - ____a. Right click on the background of the Servers view to access the pop-up menu.
 - _ b. Select New \rightarrow Server.

Build Activities Properties Problems		🌼 🖗 🖉 🗞 🔳 🖽 🗖 🗖
Server	Status	State
🚮 WebSphere Process Server v6.1	🔚 Stopped	Republish
	New Frojects	rver

- ____ c. In the New Server dialog, specify the remote server's host name, <HOSTNAME>.
- _____d. Ensure that the appropriate server type, 'WebSphere Process v6.1 Server' or 'WebSphere ESB v6.1 Server', is highlighted in the server type list

New Server		▲ 🖂 🔀
Define a New Set Choose the type of se	ver rver to create	
Server's host name:	mvsxxx.rtp.raleigh.ibm.com	~
	Don't see your server liste	ed? Click here
Constant Series (Constant Series (C	ere ESB v6.1 Server ere Express v5.1 Server ere Process v6.1 Server ere v5 Server Attach ere v5.1 Server ere v6.0 Server ere v6.1 Server	
Description: Runs ser	View By: Vendor vice projects on the WebSphere Process v6.1 Serv	ver.
Server runtime: We	Sphere Process Server v6.1	Runtimes)
0	< Back Next > Finish	Cancel

___e. Click Next.

_____f. On the WebSphere Server Settings page, leave the radio button for SOAP selected, changing the SOAP connector port to the correct setting (<SOAP_PORT>). If security is on in your server, check the box for 'Security is enabled on this server' and input <USERID> for the user ID and <PASSWORD> for the password.

vebSphere Server S	ettings	
(nput settings for the new \	WebSphere server.	
WebSphere profile name:		×
Server connection type a	nd admin port	
\bigcirc <u>R</u> MI (Designed to impr	ove communication with the server)	
ORB bootstrap port:	2809	
• SOAP (Designed to be	more firewall compatible)	
SOAP <u>c</u> onnector port	8880	
User ID:	ssadmin	
User <u>I</u> D:	ssadmin	
-		
Server na <u>m</u> e:	sssrull	
BASE, Express or unm	anaged Network Deployment server	
0	;erver	
Network Deployment s		
Network Deployment	server name;	
Network Deployment : Network Deployment The server name is in <cell name="">/<no For example, localho the server name is in <cell name="">/<clu< td=""><td>server name: h the form of: de name>/<server name=""> st/localhost/server1. In a cluster environment, the form of: ster name></server></td><td></td></clu<></cell></no </cell>	server name: h the form of: de name>/ <server name=""> st/localhost/server1. In a cluster environment, the form of: ster name></server>	
Network Deployment : Network Deployment The server name is in <cell name="">/<no For example, localho the server name is in <cell name="">/<clu Detect Click this b</clu </cell></no </cell>	server name: the form of: de name>/ <server name=""> st/localhost/server1. In a cluster environment, the form of: ister name> utton to detect the server type.</server>	

___ g. Click Finish.

____h. The new server should be seen in the Server view.

Build Activities Properties Problems 👭 Servers 🔀		🌣 🔘 🖉 🍫 🔳 🕫 🗆
Server	Status	State
👪 WebSphere Process Server v6.1	遣 Stopped	Republish
🔀 WebSphere Process v6.1 Server @ mvsxxx.rtp.raleigh.ibm.com	遣 Stopped	Republish

- 2. 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>'

User ID : <USERID>

Password : <PASSWORD>

____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 sssr01 open for e-business; process id is 0000012000000002