IBM WEBSPHERE ADAPTER FOR JDBC V6.1 – LAB EXERCISE

JDBC outbound lab – Hierarchy business objects

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What this exercise is about

The objective of this lab is to provide you with an understanding of the WebSphere Adapter for JDBC and outbound request processing.

Lab requirements

- WebSphere Integration Developer V6.1 installed
- WebSphere Process Server V6.1 test environment installed
- WebSphere Adapter for JDBC V6.1 installed
- Sample code in the directory C:\Labfiles61\JDBC (Windows) or /tmp/LabFiles61/JDBC (Linux)

What you should be able to do

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

 Install and deploy the Adapter for JDBC and integrate it into an SCA application for use with outbound request processing. This exercise demonstrate one scenario which is creating a multiple cardinality business objects hierarchy using the external service wizard, instead of editing the parent and child business objects using business object editor. The 'Keep Relationship', 'Ownership' and 'Required' ASIs can also be specified in the configuration parameters screen of external service wizard.

Introduction

This lab introduces you to the WebSphere Adapter for JDBC and the processing of outbound requests to a table in a database. It uses a JDBCTEST Derby database that contains a CUSTOMER table. In the lab, you will import the JDBC Adapter into WebSphere Integration Developer and run External Service to input connection information, create a service description, and discover objects existing in the specified database. You will then assemble an SCA application, wiring together a stand-alone reference and the EIS import file. To test your application, you will use the WebSphere Test Environment and Component Test, exercising various outbound requests, such as create, delete, retrieve, and retrieveAll.

Exercise instructions

Some instructions in this lab are 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 or .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
<lab_name></lab_name>	JDBCOutbound	
<wid_home></wid_home>	C:\Program Files\IBM\WebSphere\ID\6.1	
<wps_home></wps_home>	<wid_home>\runtimes\bi_v6</wid_home>	
<jdbcadapter_home></jdbcadapter_home>	<wid_home>\Resource Adapters\JDBC</wid_home>	
<lab_files></lab_files>	C:\Labfiles61	/tmp/Labfiles61
<temp></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, replace C:\LabFiles61\ with C:/LabFiles61/

Note that the previous table is relative to where you are running WebSphere Integration Developer.

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 test</u> <u>environment</u>".

Part 1: Create the JDBCTEST database using Derby

In this part you will create the JDBCTEST database along with the CUSTOMER and ADDRESS table for user data.

If you choose to run the JDBCInbound lab first, then you only need to create additional table, ADDRESS for this exercise. If you choose to run JDBCOutbound User Defined SQL lab first, then you can skip this part and proceed to Part 2.

If you are using a remote testing environment on z/OS, it is recommended to create the Derby databases on your Windows machine and then FTP the data files to the z/OS environment. Be sure to upload the files in the /log and /seg0 directories in binary format, and the "service.properties" file in ASCII format. You used a directory on the host called /tmp/LabFiles61/DerbyDB. Also be sure to use the CHMOD command to change all the files to 777.

____1. Start Derby ij command

Note: The Derby embedded driver that is being used in the lab, supports a connection from only one JVM at a time. You can have either the server running and connected to the JDBCTEST database, or the vendor GUI tool connected to the JDBCTEST database; but not both at the same time.

__a. Open a command prompt window, navigate to this subdirectory, and run Derby's interactive JDBC scripting tool.

<WPS_HOME>\derby\bin\embedded>ij

- 2. Using the command line, create the JDBCTEST database if it does not already exist. If you have already completed the JDBCOutbound lab, the database, tables, and triggers are the same.
 - ____ a. Type in this script to create JDBC database as user 'Wbidemo' and password 'Wbi15Demo1' in the Console view.

connect 'jdbc:derby:databases\JDBCTEST;create=true;user=Wbidemo;password=Wbi15Demo1';

```
::\IBM\WID61\beta@918\runtimes\bi_v61\derby\bin\embedded>ij
Lj version 10.1
Lj> connect 'jdbc:derby:databases\JDBCTEST;create=true;user=WBIdemo;password=WBI
5Demo1';
Lj>
```

_ 3. Enter SQL to create two tables: CUSTOMER and ADDRESS tables for user data.

NOTE: For your convenience, these SQL code snippets can be found in <LAB_FILES>\JDBC\snippets\CUSTOMERSQL.txt

____a. Paste this script into the command window:

```
CREATE TABLE CUSTOMER
(
pkey VARCHAR(10) NOT NULL PRIMARY KEY,
LName VARCHAR(20),
FName VARCHAR(20),
ccode VARCHAR(10)
);
```

NOTE: For your convenience, these SQL code snippets can be found in <LAB_FILES>\JDBC\snippets\ADDRESSSQL.txt



4. Disconnect and exit the ij command window



Note: You must exit the ij command window, before starting the server as the Derby "embedded" database driver used in this lab allows for only one JVM connection at a time.

Remember that if you are using a remote test environment for this lab, you need to FTP the Derby database files to the remote system, as explained at the beginning of this section.

Part 2: Set up the development environment

In this part, you will start WebSphere Integration Developer, using a new workspace, import RAR file and set up the WebSphere Process Server to be used as the WebSphere Test Environment (WTE).

- 1. Start WebSphere Integration Developer V6.1 with a new workspace.
 - ____a. From the start menu select Start > Programs > IBM Software Development Platform > IBM WebSphere Integration Developer 6.1> IBM WebSphere Integration Developer V6.1
 - __ b. When prompted enter <LAB_FILES>\JDBC\jdbcoutbound-hierarchy\ for your workspace and click OK

🚯 Worksp	ace Launcher 🛛 🔀
Select a w	vorkspace
	ere Integration Developer 6.1 stores your projects in a folder called a workspace. rkspace folder to use for this session.
Workspace:	C:\IBM\WIDProjects\workspace\JDBC\jdbcoutbound-Hierarchy Browse
(?)	OK Cancel

_ c. When WebSphere Integration Developer V6.1 opens, close the Welcome page

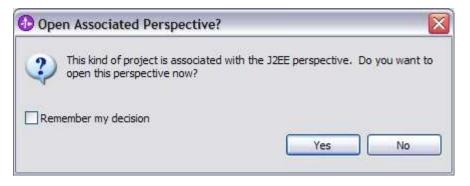
🕑 E	usin	ess Integ	ration -	IBM We	ebSph	ere <mark>Integ</mark> r	ation	Develop	er 6.1	- C:\IBM\WIDProjects\workspace\JDBC\jdbci
File	Edit	Navigate	Search	Project	Data	ClearCase	Run	Window	Help	
0	Welco	me 🛛								
	We	bSphere	Inte	grati	on D	evelop	er			Go to the Business Integration perspective
			1							

- 2. Import the JDBC Adapter Resource Archive (RAR) file. This will create a J2EE Connector Project.
 - ____a. From the top Menu bar, select File -> Import
 - ____ b. Select RAR file, click next

- ____ c. Complete the Connector Import panel
 - 1) Connector file: **Browse...** to the location of the CWYBC_JDBC.rar adapter file and select it.
 - a) For example: c:\<WID_HOME>\Resource Adapters\jdbc\deploy\CWYBC_JDBC.rar
 - 2) Make sure Target Runtime is WebSphere Process Server V6.1
 - 3) Deselect the "Add module to an EAR project" and select Finish

🚯 Import		×
Connector Impor Import a Connector	ort module from the file system	B
Connector file:	C:\IBM\WID61\beta0918\ResourceAdapters\JDBC_6.1.0.0\depl	Browse
Connector module:	CWYBC_JDBC	
Target runtime:	WebSphere Process Server v6.1	N <u>e</u> w
EAR Membership	an EAR	
EAR Project Name	CWYBC_JDBCEAR	New

____ d. At the Confirm Perspective Switch prompt, click No



Part 3: Create the JDBC Outbound application

In this part you will run External Service to discover objects and create the necessary SCA artifacts, and assemble the adapter into an SCA application.

NOTE: If you are using a remote test environment on z/OS, you will first need to enable your Derby database for network access using these steps:

On the host, login to the system using telnet.

In order to allow connections to the network server, you need to edit the /<WPS_HOME>/cloudscape/db2j.properties file. Delete the '#' (pound sign) to uncomment this line:

db2j.drda.host=0.0.0.0

Navigate to /<WPS_HOME>/derby/bin/networkServer

Issue the command ./startNetworkServer.sh

Keep this telnet window open during the next few steps; this window will show when a connection has been successfully made from WebSphere Integration Developer to the database server.

**NOTE that there are security concerns with enabling the network server for Derby in this manner. Read the information in the db2j.properties file regarding these security concerns to determine if your installation will allow for the use of the network server for Derby. If not, you can continue doing the lab using the integrated test client in WebSphere Integration Developer instead of your remote test environment.

- __1. In the Business Integration Perspective, run the External Service wizard. A Business Integration project is created for you during this process.
 - ____a. From the top Menu bar, select Window > Open Perspective > Other ... > Business Integration (default) click OK

____b. From within the Business Integration Perspective, select File > New > External Service

____ c. Select Adapter and click Next

C External Se	ervice
New externa This wizard helps	I service you obtain a service which establishes connectivity with other systems. Select the type of connectivity you would like to create.
• Adapters	You can connect to an external system or data by using an adapter to exchange information.
O Registries	You can establish connections with external registries and retrieve web services by selecting them.
O Messaging	You can connect to systems by sending and receiving messages.

- ____ d. Expand IBM WebSphere Adapter for JDBC (IBM:6.1)
- ____e. Highlight CWYBC_JDBC and click Next

ها ا
ECIResourceAdapter (IBM : 5.1.0.2)
ECIResourceAdapter (IBM : 6.0.2.1)
ECIResourceAdapter (IBM : 7.0.0)
IBM WebSphere Adapter for Email (IBM : 6.1)
IBM WebSphere Adapter for Flat Files (IBM : 6.1)
ftp IBM WebSphere Adapter for FTP (IBM : 6.1)
😑 📵 IBM WebSphere Adapter for JDBC (IBM : 6.1)
JDE IBM WebSphere Adapter for JD Edwards EnterpriseOne (IBM : 6.1.0)
BIM WebSphere Adapter for PeopleSoft Enterprise (IBM : 6.1)
IBM WebSphere Adapter for SAP Software (IBM : 6.1)
😳 IBM WebSphere Adapter for Siebel Business Applications (IBM : 6.1)
IMS Connector for Java (IBM : 9.1.0.1.5a)
IMS Connector for Java (IBM : 9.1.0.2.4a)

2. Add any external dependencies your adapter has to the imported project. These are dependencies that the adapter can have on the JDBC applications (adapter–specific).

____a. Click on Add and browse to the location of c:\<WPS_HOME>\derby\lib and select the **derby.jar**. If you are using a remote test environment on z/OS, you will also need to select **db2jcc.jar** and **db2jcc.license.jar**. The db2jcc.jar file is sometimes located in directory \derby\lib\otherJars.

External Service	
Connector Project Settings Specify the location of any dependent JAR files and libraries.	
	<u></u>
Specify the location of the JDBC driver JAR files required to access the database server. JDBC driver JAR files are shippe If you do not have a local database installation, you can download these files from the database vendor's Web site.	d with the database installation.
JDBC driver JAR files:	
C: \IBM\WID61\beta0918\runtimes\bi_v61\derby.\ib\derby.jar	Add Remove
Specify the location of the database-specific native system libraries required to access the database server. This is requir implementation. The native libraries are shipped with the database server and client installations.	red to use a Type 2 driver
System libraries:	
	Add Remove
⑦ <back next=""></back>	Finish Cancel

___ b. Click Next

- ____ 3. Select the type of processing the adapter will perform at runtime
 - ____a. Select Outbound and click Next

C External Service		
Adapter Style		E 📦
Select the type of processing the adapter will perform at runtime.		
Inbound adapters allow data to be passed into the application from the adapter.		
⊙ Outbound		
Outbound adapters allow data to be passed from the application to the adapter.		
	•	
0	< Back Next >	Finish Cancel

- 4. Complete the Connection Configuration for Discovery Agent Configuration panel to connect to the JDBCTEST database and discover the available services. To connect to the database, these information are necessary: username, password, database URL and JDBC driver class. Check the driver manual for the appropriate values for driver URL and driver class.
 - ____a. From the left panel, expand Generic JDBC and select 1.0
 - ____b. From the right panel, enter/select these following values
 - 1) JDBC Driver type: Other
 - 2) JDBC Driver classname: org.apache.derby.jdbc.EmbeddedDriver
 - 3) Database URL: jdbc:derby:</WPS_HOME>derby\databases\JDBCTEST
 - ____ c. Enter valid user ID and password values, for example

Username: Wbidemo Password: Wbi15Demo1

If you are using a remote test environment, use a valid user ID and password for the remote system.

____d. Enter these values for DatabaseURL and JdbcDriverClass

DatabaseURL: jdbc:db2j:<WPS_HOME>\runtimes\bi_v6\derby\databases\JDBCTEST

JdbcDriverClass: com.ibm.db2j.jdbc.DB2jDriver

NOTE: If using a remote test environment on z/OS use these values:

DatabaseURL: jdbc:db2j:net://<HOST_NAME>:1527//<remote_derbydb_path>/JDBCTEST

JdbcDriverClass: COM.ibm.db2os390.sqlj.jdbc.DB2SQLJDriver

D External Service		
Discovery Agent Configuration Specify the properties to initialize the discovery agent.		
Connection Configuration		
Database system connection information		
* *	Properties:	
建 ··· 🔷 DB2 UDB	JDBC driver type:	Other 🖌
🕀 ··· 🔶 DB2 UDB iSeries	Database;	
⊕ ·· ◇ DB2 UDB ZSeries ⊕ ·· ◇ Oracle	Host name:	
E ♦ SOL Server	Port number:	3
Generic JDBC	JDBC driver classname:	org.apache.derby.jdbc.EmbeddedDriver
	Database URL:	jdbc:derby:C:\IBM\WID61\beta0918\runtimes\bi_v61\dert
	Additional JDBC driver connection properties	
User name: * WBIdemo		
Password: * *********		
Prefix for business object names:		

__c. Click Next.

- ____ 5. Complete the **Find and Discover Enterprise Services** panel
 - ____a. Click the Edit Query button
 - ____b. In the Query Filter Properties window that opens up, check the **Prompt for additional** configuration settings when adding business object check box, click OK.

Query Filter Parameters		1
Set the query filter properties, then press OK.		5
Specify the pattern for schema name filter (exa	amples: DB2ADMIN* or SCOT?)	
Schema name pattern:		
Supported database object types:		
Tables	Add	£
Views Stored Procedures	Rem	ove
Synonyms - Nick Names	- Kon	10.VE
Prompt for additional configuration settings		
Create a query business object to build user Number of select queries to create:		2,
Create a query business object to build user Number of select queries to create: The Select statements are listed under the Que	r-defined select statements	
Create a query business object to build user Number of select queries to create: The Select statements are listed under the Que	r-defined select statements	
Create a query business object to build user Number of select queries to create: The Select statements are listed under the Que Create a batch SQL business object to build Number of batch SQL business objects to creat	r-defined select statements	s

____ c. Click **Run Query** button. A connection is made to the Derby JDBCTEST database and a selection of Meta data objects is presented in a tree-like structure.

- ____d. Expand the schema named WBIDEMO, expand Tables, highlight CUSTOMER, click on button.
- ____ e. It opens up a window for setting the Configuration Parameters for the CUSTOMER table. All the controls, like Choose Parent, for Hierarchy BO Generation are not available as no object is imported yet. Click OK button to add CUSTOMER table.

C External Service		\mathbf{x}
Discover Objects and Services	External Service	
🐼 No discovered object is selected.	Configuration Parameters for 'CUSTOMER'	
Query: SchemaFilterLabel=null; Schema n	Set the configuration parameters, then press OK.	onyms - I Edit Query
Objects discovered by query:	Select status column name and status value for logical delete Name of the column used to perform logical deletes: Value used to indicate a deleted object:	
	An operation can be performed by a standard SQL statement or by a stored procedure. You can run a stored procedure to perform the operation or to do custom processing before or after processing. To use a stored procedure, add it to the list and then configure it: Add Remove	
Customer	⑦ OK Cancel	
0	< <u>Back</u> Next > E	inish Cancel

___ f. Select Address table and click on 🔛 button.

- ___ g. It opens up a window for setting the Configuration Parameters for the ADDRESS table where you can select Parent table and map parent-child attributes.
- ___h. In the Configuration Parameters screen for Address, select these following values
 - 1) Choose CUSTOMER (WBIDEMO) as the Parent table for ADDRESS from the list box.
 - 2) This particular scenario creates business object with multiple cardinality between CUSTOMER and ADDRESS, therefore do not check Single Cardinality check box.
 - **3)** To Map Parent Child Attributes, choose PKEY of CUSTOMER for CUSTID from the dropdown list.
 - 4) Check Parent object owns child object, Preserve ADDRESS when parent is updated, ADDRESS required for operations on parent check boxes to specify the respective ASIs.
 - 5) Click Ok.

Configuration Parameters for 'ADDRESS' Set the configuration parameters, then press OK. Select status column name and status value for logical delete Name of the column used to perform logical deletes: Value used to indicate a deleted object: Choose parent table from the list for the selected child Choose parent table : CUSTOMER (WBIDEMO) Single cardinality Build a foreign key relationship by selecting a parent table column for each child column ADDRID: NONE	
Select status column name and status value for logical delete Name of the column used to perform logical deletes: Value used to indicate a deleted object: Choose parent table from the list for the selected child Choose parent table : CUSTOMER (WBIDEMO) Single cardinality Build a foreign key relationship by selecting a parent table column for each child column	
Name of the column used to perform logical deletes: Value used to indicate a deleted object: Choose parent table from the list for the selected child Choose parent table : CUSTOMER (WBIDEMO)	
Name of the column used to perform logical deletes: Value used to indicate a deleted object: Choose parent table from the list for the selected child Choose parent table : CUSTOMER (WBIDEMO)	
to perform logical deletes: Value used to indicate a deleted object: Choose parent table from the list for the selected child Choose parent table : CUSTOMER (WBIDEMO) Single cardinality Build a foreign key relationship by selecting a parent table column for each child column	
Value used to indicate a deleted object: Choose parent table from the list for the selected child Choose parent table : Single cardinality Build a foreign key relationship by selecting a parent table column for each child column	
Choose parent table from the list for the selected child Choose parent table : CUSTOMER (WBIDEMO) Single cardinality Build a foreign key relationship by selecting a parent table column for each child column	
Choose parent table : CUSTOMER (WBIDEMO)	_
Single cardinality Build a foreign key relationship by selecting a parent table column for each child column	
ADDRID:	_
CUSTID: PKEY	
CITY: NONE	
ZIPCODE: NONE	
Parent object owns child object (cascade delete)	
✓ Preserve ADDRESS when parent is updated	
✓ ADDRESS required for operations on parent	
An operation can be performed by a standard SQL statement or by a stored procedure. You can run a stored procedure to perform the operation or to do custom processing before or after processing.	
To use a stored procedure, add it to the list and then configure it:	
Add	
Remove	-
⑦ OK Cancel	

___ i. Click Next

- ____a. Leave the default value for Namespace, leave blank for **BOLocation.** Note the Operations available.
- ____ b. Note that Business Graph is optional It will determine if you want to generate business graph or not. If the property is checked then business graphs is generated. By default, the property is checked.

_____ 6. Complete the **Configure Objects** panel

External Service			X
onfigure Objects			
pecify the properties for the objects that wi	ill be imported by the discovery agent.		-
Operations for selected business objects —			-
Operations for these functions will be ad	dded to the service interface:*		
Create Update Delete Retrieve RetrieveAll ApplyChanges		Add Remove	
Create and configure user-defined wrapper Wrapper object names:	objects	Add	
Aximum records for RetrieveAll operation:	100		
Aaximum records for RetrieveAll operation: Business object namespace:	100 http://www.ibm.com/xmlns/prod/websphere/j2ca/jdbc		
	http://www.ibm.com/xmlns/prod/websphere/j2ca/jdbc		
Business object namespace:	http://www.ibm.com/xmlns/prod/websphere/j2ca/jdbc		

___ c. Click Next

- ____7. Complete Publishing Object Configuration Properties
 - ____ a. Leave the **Deploy connector with module** box checked in this exercise.

Note: All IBM WebSphere Adapters are now supported deploying RAR separately. To do so, select "With module for use by single application" from the Deploy connector project drop down list. If you want the adapter to deployed with the module which is packaged as an Enterprise Archive file (EAR file), then the "Deploy connector with module" check box should be checked. Finally, the "Use discovered connection properties" check box should always be checked.

__ 8. Specify the **JAAS Alias security credential** as JNDI data source name is optional for Outbound service. If you want to use the JNDI name, uncheck this JAAS option.

- ____a. Select the radio button to the left of Use discovered connection properties
 - Database Vendor is pre-populated with value Other (If you were using DB2, Oracle, or MSSQLServer, you see those values instead as specific adapter processing is available with those specific databases.)

🔂 External Service 🛛 🔀		
Service Generation and Depk	oyment Configuration	
Specify properties for generating the service and running it on the server.		
Service operations		
	or add a description to the operations ile, press the "Edit Operations" button. Edit Operations	
Deployment properties		
Specify a Java Authentication	and Authorization Services (JAAS) alias security credential.	
J2C Authentication Data Entry:		
Deploy connector project:	With module for use by single application	
Specify the settings used to conn	ect to JDBC at runtime:	
Connection properties:	Specify connection properties	
Connection properties		
Database system conne	tion information	
Database URL:	# sty:C:\IBM\WID61\beta2\runtimes\bi_v61\derby\databases\JDBCTEST	
JDBC driver classnar	ne:* org.apache.derby.jdbc.EmbeddedDriver	
Database vendor:	* OTHER	
Advanced >>		
0	< Back Next > Finish Cancel	

- ____b. Click on Advanced button for additional properties options
- ____ c. Optional expand Advanced connection configuration and enter this following value
 - 1) Data Source JNDI Name: jdbc/Derby XA for JDBC

Note that if you are using a remote test environment, the values for databaseURL and JdbcDriverClass should be what you filled in earlier for the External Service wizard, not what is pictured below.

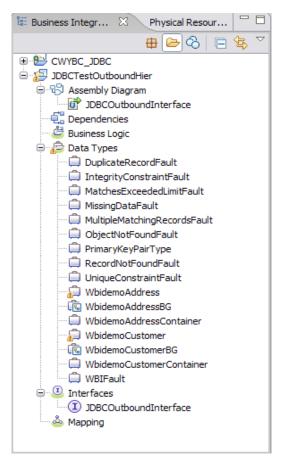
 Alternative ways to specify connection information 	
Datasource JNDI name: (jdbc/Derby XA for JDBC)	
XA datasource name:	
XA database name:	
 Advanced connection configuration 	
Set auto commit on database connection	
Additional JDBC driver connection properties [name:value;name:value]:	
SQL query to verify the connection:	
Query timeout (seconds):	
Return business object even when the false	~
v Logging and tracing	
Adapter ID to use for logging and tracing:* JDBCAdapter	

- ___ d. Click Next
- 9. Complete Publishing Properties panel
 - ____a. A Business Integration Module has not yet been created, select the **New...** button and enter in the name **JDBCTestOutboundHier** for the Module Name.
 - ____b. Leave the default **JDBCOutboundInterface** for the Name value.

🚯 External Service 🛛 🛛 🔀			
Publishing Prop Specify the propert		-	
Properties for serv	vice		
Module:	JDBCTestOutboundHier New)	
Namespace;	http://JDBCTestOutboundHier/JDBCOutboundInterface		
	✓ Use default namespace		
Folder:	Browse)	
Name: *	JDBCOutboundInterface		
	Save Business Objects to a library		
Library:	✓ New		
Description:			
0	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish Cancel		

___ c. Click Finish

_____ 10. Verify the result as given below



- ____ 11. Double click on WbidemoCustomer business object listed under Data Types
 - ____a. Note that multiple cardinality child addressobj has been added. Select this child attribute and in the properties tab, click Description and verify that **Array** and **Required** check boxes are selected.

💭 WbidemoCustomer 🛛	
▼Business object 🛛 🗊 🌣	♥ X ≣
DividemoCustomer	► 🗎 🛱 WbidemoAddress
A	
e pkey string	
e Iname string	
e fname string	
e ccode string	
e addressobj WbidemoAddress	
▼	
Build Activities 🔲 Properties 🕱 🛛 Pro	blems Servers Console
Suiid Activities Properties S Pro	piens servers Console
Description Element - ad	dressobj
Documentation Name: addressob	
Application Info	
<u>Iype</u> : Wbidemo.	Address { http://www.ibm.com/xmlns/prod/websphere/j2ca/jdbc/wbidemoaddress }
Reguired V	Array

b. Click on Application Info in the Properties tab and verify that values against jdbcasi:Ownership and jdbcasi:KeepRelationship are true as you selected Ownership and Keep Relationship check boxes in External Service.

Build Activities Properties X Problems Servers Console				
Description	Element - addressobj			
Documentation				
Application Info	Extensions	Extension Details		
	E JDBC ASI schema JDBCASI schema JDBCAttributeTypeMetadata Ownership [true] KeepRelationship [true]	Add Delete		

- 12. Double click on WbidemoCustomer business object listed under Data Types
 - ____a. Select attribute **custid** attribute and in the **Properties** tab, click on **Application Info**. Verify that **pkey** is specified against **jdbcasi:ForiegnKey**.

💭 WbidemoCustomer	WbidemoAddress 🛛	
Business object	: 🗊 û 4 🗰 📰	
🛱 WbidemoAd	ddress	
e addrid st	ring	
e custid st	ring	
e city st	ring	
e zipcode st	ring	
Build Activities 🔲 Pro	operties 🛛 Problems Servers Console	
Description	Element - custid	
Documentation		
Application Info	Extensions	Extension Details
		text value: pkey

- ____ b. Save your work by selecting File -> Save from the top menu, or using the shortcut key sequence Ctrl + S. Close the file.
- 13. Release the connection to the Derby database by using **Switch Workspace**

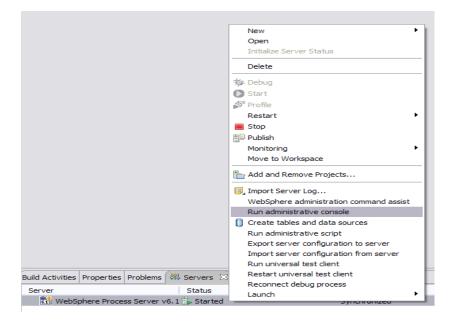
Note: Switch Workspace is a way to release the existing connection to the Derby database from the External Service process. In the next part, you will start the WebSphere Process Server and it will need a connection to the database to create and retrieve records. This step is necessary only because you are using the Derby embedded driver in this exercise which supports a connection from a single JVM.

____a. From the top menu bar, select File > Switch Workspace and select the same workspace from which you have been working.

Part 4: Create J2C authentication alias and configure data sources

In this part you will create a J2C Authentication Alias which is required for connection to the database. You will also create the JNDI data source name that is used by the Adapter to configure itself to the endpoint. You will then use the WebSphere Test Environment and Component Test to test the SCA application by retrieving several records from the CUSTOMER table in the JDBCTEST database.

- 1. Switch to Servers view by selecting Windows \rightarrow Show View \rightarrow Servers.
- 2. Set the authentication alias from the administrative console
 - ____a. In the Servers tab in the lower-right corner pane, right click on the Server and then select Start
 - ____b. When the server status is **Started**, right click on the **Servers**, and then select **Run** administrative console.



- ____ c. Log in to the administrative console by clicking the "Log in" button
- _____d. Click on Security → Secure administration, application, and infrastructure
- ____e. On the right, expand Java Authentication and Authorization Service under the Authentication heading.

application serving environment is completely secured when administrations the administration and applications also are secured. Figuration	on is resulted. The applications and the initial deta
Security Configuration Wizard Security Con	nfiguration Report
Administrative security Administrative User Roles Enable administrative security Administrative Group Roles	Authentication Use domain-qualified user names Web security
Application security Image: Constraint of the security	RMI/IIOP security Java Authentication and Authorization Servic Application logins
Java 2 security Use Java 2 security to restrict application access to local resources V Warn if applications are granted custom permissions Restrict access to resource authentication data	 System logins J2C authentication data Authentication mechanisms and expiration
User account repository Current realm definition Federated repositories	 External authorization providers Custom properties
Available realm definitions Federated repositories Configure Set as current]

____f. Click on J2C authentication alias. It gives the list of existing aliases.

1) Click New and enter these following values

- a) User ID: Wbidemo
- b) Password: Wbi15Demo1

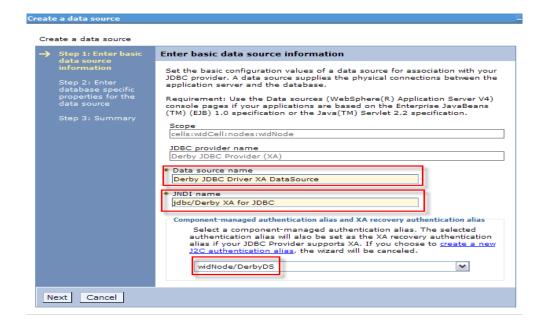
re admir	nistration, applications, and infrastructure	2
	ministration, applications, and infrastructure > <u>JAAS - J2C authentication data</u> > widNode/DerbyDS	
pecifies a	a list of user identities and passwords for Java(TM) 2 connector security to use.	
onfigura	ition	
Gener	al Properties	
* Alia:	-	
	ode/DerbyDS	
* Use		
Wbi	idemo	
* Pas	sword	
••••		
_		
Desc	ription	
Appl	y OK Reset Cancel	

____ g. Click **Ok** and save the changes

- 3. Create a JDBC Provider to which is used to create data source
 - ____a. From administrative console, click on Resources \rightarrow JDBC \rightarrow JDBC Providers
 - ____b. On the right, click on **New** and choose these following values
 - 1) Database type: **Derby**
 - 2) Provider type: **Derby JDBC Provider**
 - 3) Implementation type: XA data source

Create a new JDBC Provider		
Create a new JDBC Provide	er	
→ Step 1: Create new JDBC provider	Create new JDBC provider	
Step 2: Enter database class path information Step 3: Summary	Set the basic configuration values of a JDBC provider, which encapsulates the specific vendor JDBC driver implementation classes that are required to access the database. The wizard fills in the name and the description fields, but you can type different values. Scope cells:widCell:nodes:widNode * Database type Derby * Provider type Derby V * Provider type Derby JDBC Provider * Implementation type XA data source * Name Derby JDBC Provider (XA) Description Derby embedded XA JDBC Provider. This provider is only configurable in version 6.0.2 and later nodes	
Next Cancel		

- ____ c. Click **Next** and review the summary of changes.
- _____d. Click **Finish** and save the changes.
- _____4. Create JDBC data source
 - ____a. On the right, click on Data Sources under Additional Properties heading
 - ____b. Click **New** to set a data source and enter these following values
 - 1) Data source name: Derby JDBC Driver XA DataSource
 - 2) JNDI name: jdbc/Derby XA for JDBC
 - ____ c. Set the Component-managed authentication alias to the one created in the earlier section.



- ___ d. Click Next.
- ____e. Enter the full path to the location of database name **JDBCTEST**.

Create	a data source	
Crea	te a data source	
	Step 1: Enter basic data source	Enter database specific properties for the data source
→	Information Step 2: Enter database specific properties for the data source Step 3: Summary	Set these database-specific properties, which are required by the database vendor JDBC driver to support the connections that are managed through this data source. * Database name \${WBI_INSTALL_ROOT}/derby/databases/JDBC Use this data source in container managed persistence (CMP)
Pr	revious Next Cancel	

- ____ f. Click Next and view the summary
- ____g. Click **Finish** and save the changes.
- __ 5. Test the JDBC Data Source connection
 - _____a. Check the box next to Derby JDBC Driver XA DataSource and click on Test connection from the top of the screen.
 - ____b. You should see this success message on the top of the screen

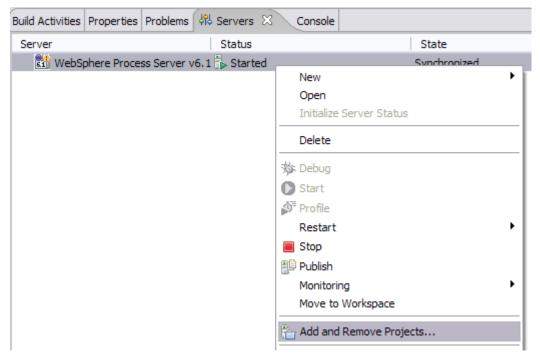
DBC pro	viders					
	 Messages The test server1 at 	t connection operation for a node widNode was success	data source Derby JDBC D ful.	river XA DataSource on s	erver	
Use th your a list of t	is page to edit the setting pplication with connections	provider (XA) > Data source s of a data source that is s for accessing the databas aral information about the	associated with your select se. Learn more about this			
New		ection Manage sta	te			
Select	Name 🛟	JNDI name 🗘	Scope 🗘	Provider 🗘	Description 🗘	Category 🔇
	Derby JDBC Driver XA DataSource	jdbc/Derby XA for JDBC	Node=widNode	Derby JDBC Provider (XA)	New JDBC Datasource. This Datasource type is only configurable in version 6.0.2 and later nodes	
Total	1					

- _____6. Release the connection to the Derby database by using Switch Workspace
 - ____a. From the top menu bar, select File > Switch Workspace and select the same workspace from which you have been working.

Part 5: Test the application using the WebSphere test environment and component test

This lab is using the Derby embedded database driver which allows a connection from only a single JVM at a time. ij.bat, the External Service process, and a running Server configured with an application that connects to the database, each are an active connection. This means you can have only one of these active connections to the database at a time. For example, in this part, you will start the server and run several tests creating and retrieving records from the database. You are not able to use ij.bat to view the database, while the server is active. You need to first stop the server.

- _____1. In the Servers tab in the lower-right corner pane, right click on the Server and then select Start
- _____2. Add the project to the server for the WebSphere Test Environment.
 - ____a. Start the server by right click on Server and select Start.
 - ____b. Right click on the server in the server view and select Add and remove projects ...



____ c. In the Add and Remove Projects dialog, select the JDBCTestOutboundHierApp project from the Available projects panel.

Add and Remove Projects		X
Add and Remove Projects Modify the projects that are configur	ed on the server	
Move projects to the right to configu	are them on the server	
Available projects:		Configured projects:
	Add >	
	< Remove	
	Add All >>	
	<< Remove All	
0	< Back Nex	kt > Finish Cancel

_____d. Click Add > to add it to the Configured projects panel. Click Finish

- ____ 3. Use the Test Component to test the application. The create scenario is to create a record in the database.
 - ____a. Right click on the JDBCTestOutboundHier module and select Test → Test Component
 - b. In JDBCTestOutboundHier_Test, switch to the Configurations tab, if you see JDBCOutboundInterface underneath Emulators, right click, and remove it. You might not see anything under Emulators. You want to connect to and drive the real JDBCTEST database and not have Test Component emulate for you.

Testing Module: JDBCTestOutbound
Configurations Test Configuration Default Module Test Module JDBCTestOutbound Emulators com.test.data/JDBCOutboundInterface
⊡ංසිං Monitors Add ▶ රිහි <globa -="" dinterfacepartner="" remove=""></globa>

____ c. Switch back to the Events tab

- 1) Under **Detailed Properties**, choose createWbidemoCustomerBG as the Operation.
- 2) Under Initial request parameters, enter these following values
 - a) Verb is depreciated so it is no longer required to enter.
 - b) Populate the value for the parent business object.
 - c) Right click on the addressobj attribute and select Add Element to create the child object.

🖗 👌 🚾		
Name	Туре	Value
😑 🖳 createWbidemoCustomerBGInput	WbidemoCustomerBG	✓
···· 抑 verb	verb <string></string>	8
🖮 🖳 WbidemoCustomer	WbidemoCustomer	¥
🖳 💭 pkey	string	✓ 100
	string	✓ Smith
Į⊐ fname	string	✓ Jerry
🖳 💭 ccode	string	✓ Office
[□] addressobj	Paste Value Select All	
	Add Elements	
	Set To	•
	Add Value to Pool Use Value from Pool Import from XML File	
	Use Derived Type	
<	Show Change Summary	

d) In the Add Element window, set the value as 1, since there is only one address element.

🚯 Add Element	
Enter the number of new elements to add:	
1	
	OK Cancel

Name	Type	Value
🗉 🖳 createWbidemoCustomerBGInput	WbidemoCustomerBG	✓
···· 💷 verb	verb <string></string>	84
🖮 🖳 WbidemoCustomer	WbidemoCustomer	✓
🖳 🏥 pkey	string	✓ 100
師 Iname	string	✓ Smith
🛄 fname	string	✓ Jerry
🖳 🛄 ccode	string	✓ Office
⊡…[□] addressobj	WbidemoAddress[]	66
😑 🖳 addressobj[0]	WbidemoAddress	✓
🖳 🛄 addrid	string	✓ 1234
🎾 custid	string	✓ 100
🛄 city	string	✓ Austin
in zipcode	string	✓ 78758
	1111	

____d. Populate date for the child object

_ e. Click 🜌 to continue

Events



____f. In the Choose a deployment location dialog, select the WebSphere Process Server V6.1 server. Select Finish

Deployment Location	$\overline{\mathbf{X}}$
Select Deployment Location	
This server instance is currently running.	
Deployment location:	
WebSphere Process Servers WebSphere Process Server v6.1 Solutions 1, 5, 1/M	New Server
Eclipse 1.5 JVM	
Mode: Run	∼
Use this as the default and do not ask again	
0	Einish Cancel

_____4. In the Events window you will see that Invoke has returned. Check the data in the EIS to ensure it matches expected values.

Events

≱ - 🔲 🍰 🔘 🔲 🔚
Invoke (JDBCOutboundInterface:createWbidemoCustomerBG)
😑 🐕 Invoke started
Invoke (JDBCOutboundInterface:createWbidemoCustomerBG)
Return (JDBCOutboundInterface:createWbidemoCustomerBG)
Invoke returned

- 5. To retrieve the record that you've just created, select the **Invoke** button in the top right corner again, under **Detailed Properties**, select the Operation **retrieveWbidemoCustomerBG**. Since Address object is a child of Customer object, you only need to enter value for Customer and that retrieves the data for child Address object as well.
 - ____a. Under **Initial request parameters**, enter a value for pkey of one of the previously created customers. Click **Continue**

General Properties

 Detailed Pro 	perties	
Configuration:	Default Module Test	~
Module:	JDBCTestOutboundHier	~
Component:	JDBCOutboundInterface	v
Interface:	JDBCOutboundInterface	~
Operation:	retrieveWbidemoCustomerBG	~

Initial reguest parameters

R 😫 🏧		
Name	Туре	Value
😑 💾 retrieveWbidemoCustomerBGInpu	WbidemoCustomerBG	✓
···· 💭 verb	verb <string></string>	8
🖮 🖳 WbidemoCustomer	WbidemoCustomer	✓
🖳 💭 pkey	string	✓ 100
🛄 💭 Iname	string	~
🛄 💭 fname	string	~
💭 ccode	string	~
[III] addressobj	WbidemoAddress[]	ନେ
<	1111	>
······		

____b. Upon return, the values matching the ID specified should be displayed in the Return parameters.

Name	Type	Value
retrieveWbidemoCustomerBGOutput	WbidemoCustomerBG	✓
👘 verb	string	8
😑 🖳 WbidemoCustomer	WbidemoCustomer	×
🛄 pkey	string	✓ 100
師 Iname	string	🗸 Smith
🛄 fname	string	🖌 Jerry
💭 ccode	string	✓ Office
⊡…[□] addressobj	WbidemoAddress[]	✓
😑 🖳 addressobj[0]	WbidemoAddress	✓
抑 addrid	string	✓ 1234
🖳 🛄 custid	string	✓ 100
🏛 city	string	🗸 Austin
🛄 zipcode	string	✓ 78758

____6. To test a retrieveAll, select the **Invoke** button, then under **Detailed Properties**, select the Operation **retrieveAllWbidemoCustomerBG**

- ____a. Set the pkey, Iname, fname, and ccode to <unset> by clicking on the field and selecting the <unset> from the drop down menu.
- ____b. Click Continue.

R 😭 🏧		
Name	Type	Value
rieveallWbidemoCustomerE	GIn: WbidemoCustomerBG	✓
verb	verb <string></string>	34,
WbidemoCustomer	WbidemoCustomer	×
🖷 pkey	string	×,
🕮 İname	string	¥,
🕮 fname	string	¥,
🕮 ccode	string	34,
- 💷 addressobj	WbidemoAddress[]	60

- ____ c. Upon return, the values for Customer table existing in the database should be displayed including values from the Address table.
- ____d. View the return parameters box to check for the returned records scrolling as needed.
- _____7. Exit the Test Component panel, remove the JDBCTestOutboundHier project from the server, and stop the server.

What you did in this exercise

• In this exercise, you learned how to create a multiple cardinality business objects Hierarchy using External Service Wizard, instead of editing the parent and child Business Objects using Business Object Editor.

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 → Server.

Build Activities Properties Problems		🌼 🖗 🖉 🗞 🔳 🖽 🗖 🗘
Server	Status	State
🚮 WebSphere Process Server v6.1	遣 Stopped	Republish
	New Serv Add and Remove Projects	ver Lg

- ____ 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

O New Server	🔺 🗗 🔼
Define a New Server Choose the type of server to create	
Server's host name: mvsxxx.rtp.raleigh.ibm.com Select the server type:	ver listed? Click here
IBM I	
View By: V Description: Runs service projects on the WebSphere Process vé	
Server runtime: WebSphere Process Server v6.1 💌 In	istalled Runtimes)
	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	
input settings for the new \	WebSphere server.	
WebSphere profile name:		~
Server connection type a	nd admin port	
ORMI (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 <u>I</u> D:	ssadmin	
Current active authen		
Password:		
Server name:	sssr011	
Server type	5551011	
	anaged Network Deployment server	
	erver	
Network Deployment s		
Network Deployment	server name:	
Network Deployment The server name is ir <cell name="">/<no< td=""><td>n the form of: de name>/<server name=""> st/localhost/server1. In a cluster environment, the form of:</server></td><td></td></no<></cell>	n the form of: de name>/ <server name=""> st/localhost/server1. In a cluster environment, the form of:</server>	
Network Deployment The server name is ir <cell name="">/<no For example, localho the server name is in <cell name="">/<clu< td=""><td>n the form of: de name>/<server name=""> st/localhost/server1. In a cluster environment, the form of:</server></td><td></td></clu<></cell></no </cell>	n the form of: de name>/ <server name=""> st/localhost/server1. In a cluster environment, the form of:</server>	
Network Deployment The server name is in <cell name="">/<no For example, localho the server name is in <cell name="">/<du< td=""><td>the form of: de name>/<server name=""> st/localhost/server1. In a cluster environment, the form of: ster name></server></td><td></td></du<></cell></no </cell>	the form of: de name>/ <server name=""> st/localhost/server1. In a cluster environment, the form of: ster name></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 WebSphere Process v6.1 Server @ mvsxxx.rtp.raleigh.ibm.com	🔓 Stopped	Republish 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