IBM WEBSPHERE ADAPTER FOR JDBC V6.1 – LAB EXERCISE

JDBC inbound lab

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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 inbound event processing.

Lab requirements

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

- 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 inbound event processing.

Introduction

This lab introduces you to the WebSphere Adapter for JDBC and the processing of inbound events that have occurred in a database table. It uses a JDBCTEST Derby database along with a CUSTOMER table for user data and a WBIA_JDBC_EVENTSTORE table to record events. In the lab, you will import the JDBC Adapter into WebSphere Integration Developer and run the External Service wizard to input connection information, create a service description, and discover objects existing in the specified table. You will then assemble an SCA application, wiring together a Java[™] component and the EIS export file. In the Java component, you will add implementations for create, update and delete methods.

Before working with the adapter, you will first add a record to the CUSTOMER table, creating a create event. The create trigger runs, inserting a record for that event into the event store table. The event has occurred and is now waiting in the table for the JDBCTestInbound application to start and the JDBC Adapter to start polling for events. To test the inbound application, you will use the WebSphere Process Server Test Environment.

Exercise instructions

Some instructions in this lab can 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 versus .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>	JDBCInBound	
<wid_home></wid_home>	C:\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_6.1.0.0\deploy</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, C:\LabFiles61\ is replaced by 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	Windows test server z/OS [®] 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 Derby database and tables

In this part you will create the JDBCTEST database along with the CUSTOMER table for user data and the WBIA_JDBC_EVENTSTORE table for recording events. You will also add triggers to the CUSTOMER table that will fire whenever create, update, or deletes occur to the CUSTOMER table, inserting a record into the event table. To cause an event, you will create at least one record in the CUSTOMER table. This will fire the trigger for the create operation which will add a record to the WBIA_JDBC_EVENTSTORE.

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. You can skip to step7, where you add records to the CUSTOMER table.
 - ____ 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\beta0918\runtimes\bi_v61\derby\bin\embedded>ij
j version 10.1
j> connect 'jdbc:derby:databases\JDBCTEST;create=true;user=WBIdemo;password=WBI
5Demo1';
.j>
```

_ 3. Enter SQL to create two tables: CUSTOMER table for user data and WBIA_JDBC_EVENTSTORE table for recording events.

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)
);
```

_4. Create the WBIA_JDBC_EVENTSTORE table and create the primary key.

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

____a. Create the WBIA_JDBC_EVENTSTORE table by pasting this script into the SQL window:

```
CREATE TABLE WBIA JDBC EventStore
                          event id INTEGER NOT NULL GENERATED ALWAYS AS IDENTITY (START
WITH 1, INCREMENT BY 1) PRIMARY KEY,
                          xid VARCHAR(200),
                          object_key VARCHAR(80) NOT NULL,
                          object_name VARCHAR(40) NOT NULL,
                          object_function VARCHAR(40) NOT NULL,
                          event_priority INTEGER NOT NULL,
                          event_time TIMESTAMP default CURRENT TIMESTAMP NOT NULL,
                          event_status INTEGER NOT NULL,
                          event_comment VARCHAR(100)
                 );
     ij> CREATE TABLE WBIA_JDBC_EventStore
               event_id INTEGER NOT NULL GENERATED ALWAYS AS IDENTITY <START WITH 1, IN
BY 1> PRIMARY KEY,
     CREMENT
               BY 1> PRIMARY KEY,
xid UARCHAR(200),
object_key UARCHAR(80> NOT NULL,
object_name UARCHAR(40> NOT NULL,
object_function UARCHAR(40> NOT NULL,
event_priority INTEGER NOT NULL,
event_time TIMESTAMP default CURRENT TIMESTAMP NOT NULL,
event_status INTEGER NOT NULL,
event_comment VARCHAR(100>
        rows inserted/updated/deleted
```

5. Create triggers on the CUSTOMER database for create, update, and delete events.

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

a. Paste this script into the SQL window:
CREATE TRIGGER event_create
AFTER INSERT ON CUSTOMER REFERENCING NEW AS N
FOR EACH ROW MODE DB2SQL
INSERT INTO wbia_jdbc_eventstore (object_key, object_name,
object function, event priority, event status)

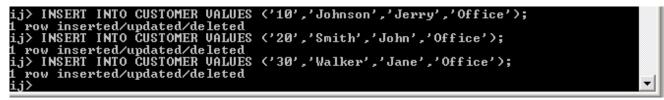
IBM WebSphere Adapter for JDBC V6.1 – Lab exercise

VALUES (N.pkey, 'WbidemoCustomerBG', 'Create', 1, 0); ____b. Paste this script into the command window: CREATE TRIGGER event_udpate AFTER UPDATE ON CUSTOMER REFERENCING NEW AS N FOR EACH ROW MODE DB2SQL INSERT INTO wbia_jdbc_eventstore (object_key, object_name, object_function, event_priority, event_status) VALUES (N.pkey, 'WbidemoCustomerBG', 'Update', 1, 0); ____ c. Paste this script into the command window: CREATE TRIGGER event_delete AFTER DELETE ON CUSTOMER REFERENCING OLD AS O FOR EACH ROW MODE DB2SQL INSERT INTO wbia jdbc eventstore (object key, object name, object_function, event_priority, event_status) VALUES (O.pkey, 'WbidemoCustomerBG', 'Delete', 1, 0); _ | 🗆 🗙 🔤 Command Prompt - ij event_comment VARCHAR(100) * rows inserted/updated/deleted CREATE TRIGGER event_create TER INSERT ON CUSTOMER REFERENCING NEW AS N R EACH ROW MODE DB2SQL INSERT INTO wbia_jdbc_eventstore <object_key, object_name, object_function, even Therefore and the status of the second status of th ij> CREATE TRIGGER event_udpate AFTER UPDATE ON CUSTOMER REFERENCING NEW AS N FOR EACH ROW MODE DB2SQL FOR EACH ROW MODE DB2SQL INSERT INTO wbia_jdbc_eventstore (object_key, object_name, object_function, even t_priority, event_status) VALUES (N.pkey, 'WbidemoCustomerBG', 'Update', 1, 0); Ø rows inserted/updated/deleted ij> CREATE TRIGGER event_delete AFTER DELETE ON CUSTOMER REFERENCING OLD AS O FOR EACH ROW MODE DB2SQL INSERT INTO wbia_jdbc_eventstore (object_key, object_name, object_function, even t priority, event status) UALUES (0.pkey, 'WbidemoCustomerBG', 'Delete', 1, 0); 0 rows inserted/updated/deleted

____6. From command window, create a record in the CUSTOMER Table.

_____a. Type these into command window. This will add three entries to the CUSTOMER table by typing in values for PKEY, LNAME, FNAME, and CCODE. Specify key (10, 20, 30) LNAME (Johnson, Smith, Walker), FNAME (Jerry, John, Jane), and CCODE (Office, Office, Office) respectively.

```
INSERT INTO CUSTOMER VALUES
 (`10', `Johnson', `Jerry', `Office');
INSERT INTO CUSTOMER VALUES
 (`20', `Smith', `John', `Office');
INSERT INTO CUSTOMER VALUES
 (`30', `Walker', `Jane', `Office');
```



- __ b. Verify that the WBIA_JDBC_EVENTSTORE now has same number of event records for customer records that have just created.
- ____ c. Disconnect and exit the ij command window

ij> disconnect; ij> exit; C:\IBM\WID61\beta0918\runtimes\bi_v61\derby\bin\embedded>

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, 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\jdbcinbound\ for your workspace and click OK

🚯 Workspace Launcher 🛛 🔀						
Select a w	Select a workspace					
	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\jdbcinbound					
?	OK Cancel					

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

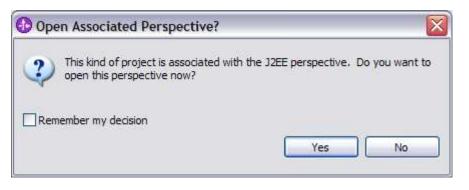
	Busin	ess Integ	ration -	IBM W	ebSph	ere Integr	ation	Develop	oer 6.1	- C:\IBM\WIDProjects\workspace\JDBC\jdbci
File	Edit	Navigate	Search	Project	Data	ClearCase	Run	Window	Help	
0	Welco	me 🛛								🙆 🗢 🗢 🖶 🖻
	We	ebSphere	Inte	egrati	on D	evelop	er			Go to the Business Integration perspective
			χ							

- 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	(J)
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: Use External Service wizard to generate business objects and other artifacts

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

NOTE: If you are using a remote test environment on z/OS, you will 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 through 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)

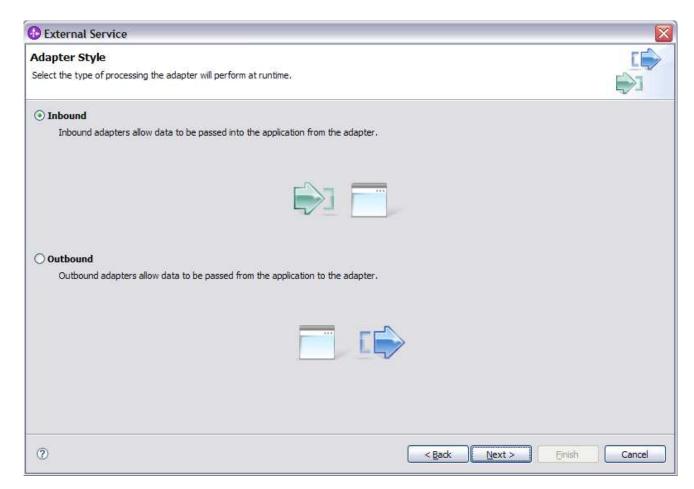
2. Add any external dependencies your adapter has to the imported project. These are dependencies that the adapter can have on the JDBC applications (adapter–specific).

____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 Inbound and click Next



- 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:	
 ⇒ OB2 UDB ⇒ OB2 UDB iSeries ⇒ OB2 UDB ZSeries ⇒ Oracle ⇒ Oracle ⇒ SQL Server ⇒ Generic JDBC ⇒ 1.0 	JDBC driver type: Database: Host name: Port number: JDBC driver classname: Database URL: Additional JDBC driver connection properties	Other
User name: * WBIdemo Password: * ******** Prefix for business object names:		

__c. Click NEXT

5. Complete the **Discover Objects and Services** panel

____a. Select the **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.

Note: Select the **Edit Query** ... button to see the available options, however, do not change any of the defaults for this lab exercise.

_____b. Expand the schema named **WBIDEMO**, expand **Tables**, highlight **CUSTOMER**, click on button. **CUSTOMER** now appears in the **Objects to be imported** window. Click **Next**

External Service		
Discover Objects and Services To discover objects on the enterprise system, create a query by pressin	g "Edit Query" and then press "Run Query".	B.O.
Query: SchemaFilterLabel=null; Schema name pattern=null; Supported Run Query Objects discovered by query:	database object types=Tables,Views,Stored Pro Objects to be imported:	cedures,Synonyms - I Edit Query
⇒ 2 □□ ⊕ ② SYSCAT ⊕ ③ SYSCS_DIAG		
CUSTOMER WBIA_JDBC_EVENTSTORE Views		
⊕ _@ Stored Procedures ⊕ _@ Synonyms - Nick Names	v	
0	< <u>B</u> ack Next >	Einish Cancel

- 6. Complete the **Configure Objects** panel
 - ____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 are generated. By default, the property is checked.

D External Service		
Configure Objects		
Specify the properties for the objects that will be imported by the discovery agent.		
Operations for selected business objects		
Operations for these functions will be added to the service interface:*		
Create		Add
Update Delete		Remove
		(centere
Business object namespace: http://www.ibm.com/xmlns/prod/websphere/j2ca/jdbc		
Specify the relative folder for generated business objects		
Folder:		
Generate a business graph for each business object		
(?)	< Back Next >	Finish

___ c. Click Next.

- ____7. Complete the Publishing Object Configuration Properties
 - ____a. Leave the default "With module for use by single application" option 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.

- ____ b. Uncheck the JAAS Alias security credential as you are going to specify the JNDI data source name instead.
- ____ c. 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 Deplo Specify properties for generating the se		5	Q)
Service operations If you want to modify the names, to be generated in the interface fil			Edit Operation	ns)
Deployment properties	., p. coo u.c. c			
Specify a Java Authentication a	nd Authorizati	ion Services (JAAS) alias security	credential.	
J2C Authentication Data Entry:				
Deploy connector project:	With module fo	or use by single application	•	~
Specify the settings used to connect to JDBC at runtime:				
Connection properties:	Specify connect	ction properties		-
Connection properties				
Database system connect	on information	n		
Database URL:	* :rby:C:\I	BM\WID61\beta2\runtimes\bi_v6	il\derby\databases\JDBC	TEST
JDBC driver classnam	e:* org.apac	he.derby.jdbc.EmbeddedDriver		
Database vendor:	* OTHER			~
Advanced >>				
?	(< <u>B</u> ack <u>N</u> ext >	Einish Cano	el

- _____d. Click on **Advanced** button for additional properties options
- ____e. Expand Event delivery configuration
 - 1) Verify the Ensure once-only event delivery is checked
- ____f. Expand Advanced connection configuration and enter this following value
 - Data Source JNDI Name: jdbc/Derby XA for JDBC
- ____g. Expand Event Configuration
 - 1) Event Order By: event_time, event_priority
 - 2) Event Table Name: WBIA_JDBC_EventStore

Note 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.

 Event delivery configuration 	on		
Type of delivery:	ORDERED		~
Ensure once-only ever	Ensure once-only event delivery (may reduce performance)		
Do not process event	s that have a tin	nestamp in the future	
Event types to process:			
Number of connections fo	r event deliver)	/	
Minimum:	1		
Maximum:	1		
 Advanced connection con 	figuration		
Datasource JNDI name:	- -		_
Additional JDBC driver connection properties [name:value;name:value]]:		
SQL query to verify the connection:			
Query timeout (seconds):			
Return business object er stored procedure result s		false	~
Event configuration			
Event order by:		event_time, event_priority	
Event table name:	*	WBIA_JDBC_EventStore	
Stored procedure to run l	pefore poll:		
Stored procedure to run a	after poll:		
Event query type for pro	cessing events:	Standard	~
User-defined event query	13		
User-defined update que	ry:		
User-defined delete quer	y:		

___h. Click Next

8. Complete **Publishing Properties** panel

___ a. A Business Integration Module has not yet been created, select the **New...** button and enter in the name **JDBCTestInbound** for the Module Name.

____ b. Leave the default JDBCInboundInterface for the Name value.

🕑 External Service 🛛 🔀			
Publishing Prop	erties		
Specify the propert	ies for publishing.		
December for our			
Properties for serv			
Module:	JDBCTestInbound	New	
Namespace:	http://JDBCTestInbound/JDBCInboundInterface]	
	✓ Use default namespace		
Folder:		Browse	
Name: *	JDBCInboundInterface		
	Save Business Objects to a library		
Library:		New	
Description:			
		d	
0	< <u>B</u> ack <u>N</u> ext > <u>F</u> inish	Cancel	

___ c. Click Finish

- 9. Use the Assembly Diagram to wire the **JDBCTestInbound** Interface to a Java Component.
 - ____a. Expand the **JDBCTestInBound** folder.
 - ____b. From the **Business Integration** view, double click the **JDBCTestInBound** module. This will open the module in the Assembly Diagram. You will see a message that there is one new element added to the module.

Palette		(1) There is a new element that has been added to your module. Σ
	(B)	
- Favorites	W.	
Components		
Lintyped Component		
🗊 Human Task		
🛃 Java		
Process		
Rule Group		
🕆 State Machine		
⇒ Import		
と Export		
References		
ද්, Interface Map		
Selector		

____ c. From the palette, expand **Component**, then select the **Java Component** and drop it on the Assembly Diagram.

😕 JDBCTestInbound - Assembly Diagram 🔀	- D
JDBCTestinbound/sca.module	$\textcircled{1}$ There is a new element that has been added to your module. \bigotimes
Co Favorites	
🔁 Components 🔱 🕼 JDBCInboundInterface	
Lintyped Component	
(目 Human Task) W Java	
2 Process	
E Rule Group	
😝 Import	
🖄 Export	
References	
念 Interface Map 愛 Selector	

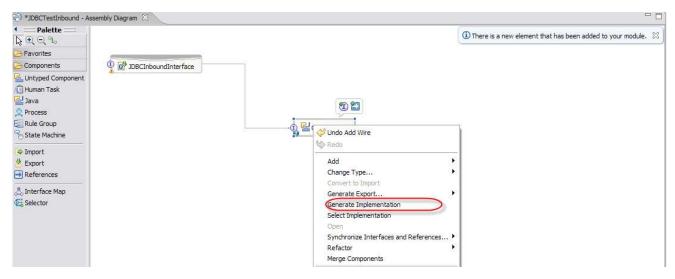
____d. Wire the **JDBCInboundInterface** to the **Java Component.** At the Add Wire popup window, select **OK** in response:

🔂 Ad	d Wire	×
?		ervice to be used in other modules. The t will be added to the target. Do you want to
🗌 Alw	vays create without prompt	
		OK Cancel

____e. The Assembly Diagram now looks as follows:

JDBCTestInbound/sca.modu 많	5		(i) There is a new element that has been added to your module. $\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$
Lintyped Component			
🛱 Human Task			
🛃 Java		400 APR	
2 Process		۲ ۲	
Rule Group		Component1	
😤 State Machine		Componenta	
⇒ Import			
🖄 Export			
References			
🖧 Interface Map			
Selector			

_____ 10. Generate the implementation for the Java Component



____a. Right click the Java Component1, select Generate Implementation from the menu

b. Highlight the com.test.data package and select OK (Click New Package and create the com.test.data package if it does not already exist.)

Generate Implementation	_ 🗆 🔀
Select the package where the Java implement	ation will be generated:
(default package)	
New Package	
0	K Cancel

____ c. The Java Editor will open with the Component1Impl.java file.

NOTE: For your convenience, these code snippets can be found in <LAB_FILES>\JDBC\snippets\Component1Impl.txt

_____d. Scroll down and locate the createWbidemoCustomerBG(Object createWbidemoCustomerBGInput) method that needs to be implemented. Paste this code into the method so the complete method looks as follows:

```
public void createWbidemoCustomerBG(Object createWbidemoCustomerBGInput) {
```

```
System.out.println("CREATE customer");
DataObject bg=(DataObject)createWbidemoCustomerBGInput;
DataObject bo=bg.getDataObject("WbidemoCustomer");
System.out.println("CUSTOMER KEY is: "+bo.getString("pkey"));
System.out.println("CUSTOMER LAST NAME is: "+bo.getString("lname"));
System.out.println("CUSTOMER FIRST NAME is: "+bo.getString("fname"));
System.out.println("CUSTOMER CODE is: "+bo.getString("ccode"));
System.out.println("CREATE end");
}
```

```
_____e. Scroll down and locate the updateWbidemoCustomerBG (Object
updateWbidemoCustomerBGInput) method that needs to be implemented. Paste this code
into the method so the complete method looks as follows:
```

```
public void updateWbidemoCustomerBG(Object updateWbidemoCustomerBGInput) {
  System.out.println("UPDATE customer");
  DataObject bg=(DataObject)updateWbidemoCustomerBGInput;
  DataObject bo=bg.getDataObject("WbidemoCustomer");
  System.out.println("CUSTOMER KEY is: "+bo.getString("pkey"));
  System.out.println("CUSTOMER LAST NAME is: "+bo.getString("lname"));
  System.out.println("CUSTOMER FIRST NAME is: "+bo.getString("fname"));
  System.out.println("CUSTOMER CODE is: "+bo.getString("ccode"));
  System.out.println("UPDATE end");
```

____ f. Scroll down and locate the deleteWbidemoCustomerBG (Object deleteWbidemoCustomerBGInput) method that needs to be implemented. Paste this code into the method so the complete method looks as follows:

```
public void deleteWbidemoCustomerBG(Object deleteWbidemoCustomerBGInput) {
  System.out.println("DELETE customer");
  DataObject bg=(DataObject)deleteWbidemoCustomerBGInput;
  DataObject bo=bg.getDataObject("WbidemoCustomer");
  System.out.println("CUSTOMER KEY is: "+bo.getString("pkey"));
  System.out.println("DELETE end");
}
```

- ____g. Save your work by selecting File -> Save from the top menu, or using the shortcut key sequence Ctrl + S. Close the file.
- ___ h. Wait for the workspace to complete building. Close the Assembly Diagram.
- 11. 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 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.

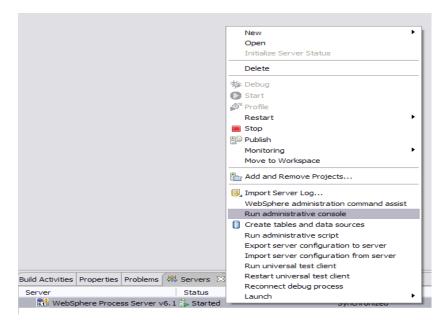
- ____a. In server view, stop the server by right click on **WebSphere Process Server V6.1** and select **Stop**
- ____b. From the top menu bar, select **File > Switch Workspace** and select the same workspace from which you have been working.

Part 4: Create the authentication alias and configure the data source

Note: If you've already completed this section in any of JDBC Outbound labs, you can skip this and proceed to Part 5.

In this part, the authentication alias needs to be set since the data source uses the username/password set in the authentication alias to connect to the database. This data source connects to the database and is used later when generating the artifacts for the module. Here are the steps to set the authentication alias in WebSphere Process Server administrative console.

- 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.

e application serving environment is completely secured when administration pports the administration and applications also are secured.	n is restricted. The applications and the infrastructur
	iguration Report
Administrative security Administrative security Administrative User Roles Enable administrative security Administrative Group Roles	Authentication Use domain-qualified user names Web security
Application security ✓ Enable application security	RMI/IIOP security Java Authentication and Authorization Service Application logins
Java 2 security Use Java 2 security to restrict application access to local resources 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	 <u>External authorization providers</u> <u>Custom properties</u>
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

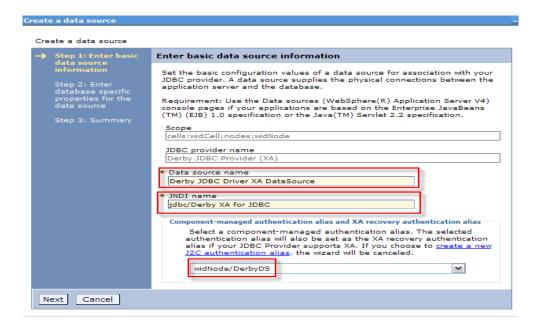
- 3. Create a JDBC Provider to which is used to create data source
 - ____a. From administrative console, click on Resources \rightarrow JDBC \rightarrow JDBC Providers
 - ____b. On the right, click on **New** and choose these following values
 - 1) Database type: **Derby**
 - 2) Provider type: **Derby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

3) Implementation type: XA data source

Create a new JDBC Provider	
Create a new JDBC Provide	ar
→ 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 M * 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**.

JDBC providers

Create a data source					
Step 1: Enter basic data source	Enter database specific properties for the data source				
 → Step 2: Enter database specific properties for the data source 	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\JDBQ				
Step 3: Summary	Use this data source in container managed persistence (CMP)				

- _____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

BC providers								
Use thi your ap list of t I Pref	is page to edit the setting pplication with connections task steps and more gene ferences	Provider (XA) > Data source is of a data source that is for accessing the databas aral information about the ection Manage sta	associated with your selec se. Learn more about this topic.					
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.			

- _____6. Release the connection to the Derby database by using **Switch Workspace** again
 - ____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

In this part you will use the WebSphere Test Environment to test the SCA application event processing by starting the application. Verifying that it polls for and picks up the Create event already waiting in the WBIA_JDBC_EVENTSTORE Table.

- 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 ...

Build Activities	Properties	Problems	해 Servers	×	Console		
Server			Status				State
👬 WebSp	phere Proce	ss Server vi	6. 1 🛼 Starte	ed 📖			Synchronized
					New		•
					Open		I
					Initialize	Server Status	
					Delete		
				参	Debug		
					Start		I
				ja 🖉	Profile		
					Restart		•
					Stop		
				2 0	Publish		
					Monitori	ng	•
					Move to	Workspace	
				R-	Add and	Remove Projec	cts

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

🚯 Add and Remove Projects 🛛 🔀					
Add and Remove Projects Modify the projects that are configur	ed on the server				
Move projects to the right to configu	ire them on the server				
<u>Available projects:</u>		Configured projects:			
		🗉 🛅 JDBCTestInb	oundApp		
	Add >				
	< <u>R</u> emove				
	Add All >>				
	<< Remove All				
0	< <u>B</u> ack <u>N</u> ext >	<u>F</u> inish	Cancel		

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

____e. Wait for the project to be added. In the Console view, you will see messages that the application has successfully started and has received and processed the inbound Create events. (These messages are also reflected in the <WPS_HOME>\profileName\logs\server1\Systemout.log).

[10/14/07	21:00:44:843	CDT]	00000044	SystemOut	0	CREATE customer
[10/14/07	21:00:44:843	CDT]	00000044	SystemOut	0	Customer Key is: 10
[10/14/07	21:00:44:843	CDT]	00000044	SystemOut	0	Customer LAST NAME is:
Johnson						
[10/14/07	21:00:44:843	CDT]	00000044	SystemOut	0	Customer FIRST NAME
is: John						
[10/14/07	21:00:44:843	CDT]	00000044	SystemOut	0	Customer CODE is:
Office						
[10/14/07	21:00:44:843	CDT]	00000044	SystemOut	0	CREATE end
[10/14/07	21:00:44:859	CDT]	00000042	SystemOut	0	Customer Key is: 30
[10/14/07	21:00:44:859	CDT]	00000042	SystemOut	0	Customer LAST NAME is:
Walker						
[10/14/07	21:00:44:859	CDT]	00000042	SystemOut	0	Customer FIRST NAME
is: Jane						
[10/14/07	21:00:44:859	CDT]	00000042	SystemOut	0	Customer CODE is:
Office						
[10/14/07	21:00:44:859	CDT]	00000042	SystemOut	0	CREATE end

If you like to try other events, such as an update or delete, you will need to first stop the server to release its connection to the JDBCTEST database. Then, start the ij.bat GUI to add, delete or update records to the database. Once completed, exit the IJ GUI, and then restart the server for the events to be processed.

____ f. Repeat steps a through c to remove the project from the server.

What you did in this exercise

In this exercise, you learned how to install and deploy the WebSphere Adapter for JDBC. You also were introduced to inbound event processing.

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	🔚 Stopped	Republish
	New Frojects	ver

- ____ 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 Set Choose the type of se		
	mvsxxx.rtp.raleigh.ibm.com	~
Select the server typ	: Don't see your server liste	12 Click here
WebSph	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	
	View By: Vendor	~
	vice projects on the WebSphere Process v6.1 Serve	
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.

WebSphere Server S	ettings	
Input settings for the new \	VebSphere server.	
WebSphere profile name:		~
Server connection type a	nd admin port	
\bigcirc <u>R</u> MI (Designed to improve	ove communication with the server)	
ORB bootstrap port:	2809	
• SOAP (Designed to be	more firewall compatible)	
SOAP connector port:	8880	
Current active authent User <u>I</u> D:	ssadmin	
User <u>I</u> D:	ssadmin	
Pa <u>s</u> sword:	•••••	
Server na <u>m</u> e:	sssr011	
Server type		
	anaged Network Deployment server	
O Network Deployment s		
Network Deployment		
	de name>/ <server name=""> st/localhost/server1. In a cluster environment, the form of:</server>	
Detect Click this b	utton to detect the server type.	
(?)	< Back Next > Finish	Cancel

___ 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	🛅 Stopped	Republish
🔀 WebSphere Process v6.1 Server @ mvsxxx.rtp.raleigh.ibm.com	🛅 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