



# Sun Adapter for Oracle Tutorials



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# Sun Adapter for Oracle Tutorials

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The Sun Adapter for Oracle handles the communication details necessary to send and receive data between the Java CAPS environment and the Oracle Database, and can apply business logic defined within the collaboration rules or business processes to perform data identification, manipulation, and transformation operations.

The Sun Adapter for Oracle Tutorial provides two sample projects:

- **prjOracle\_BPEL Sample Project:** Demonstrates how to create a Sun Business Process Manager project that uses the Oracle Adapter. The prjOracle\_BPEL sample project uses input files to pass data into business process. There are four business processes that demonstrate the Insert, Update, Delete, and Select operations, and one process to demonstrate a Prepared Statement. Results are written out to an output file.

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**Note** – You must have the eInsight.sar file installed to use the Web Services interface.

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- **prjOracle\_JCD Sample Project:** Demonstrates how to create a Java Collaboration Definition (JCD)-based project that uses the Oracle Adapter. The prjOracle\_JCD sample project uses input files to pass data into Collaborations. There are four Collaborations that demonstrate the Insert, Update, Delete, and Table Select operations, and one Collaboration to demonstrate a Prepared Statement. Results are written out to an output file.

It is assumed that you are already familiar with Sun Enterprise Service Bus Suite terminology and concepts.

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**Note** – You can download the Sample Project files from <http://dscpreview.sfbay.sun.com/docs/javacaps/tutorials/index.jsp>

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## What You Need to Know

The following topics contain introductory and conceptual information for the Sun Adapter for Oracle Tutorial.

- [“About the Sun Adapter for Oracle Sample Projects” on page 7](#)
- [“About the Sun Business Process Manager Project” on page 9](#)
- [“About the Java Collaboration Definition Sample Project” on page 10](#)

### **What You Need to Do**

The following topics contain the step-by-step instructions for importing and building the Sun Adapter for Oracle sample projects.

- [“Importing Non-JBI Based Sample Projects” on page 10](#)
- [“Running the SQL Script” on page 11](#)

### **What You Need to Do for the Java Collaboration Definition Project**

The following topics contain the step-by-step instructions for importing and building the Sun Adapter for Oracle Java Collaboration Definition Project (JCD) sample project.

- [“Creating the Java Collaboration Definition-Based Project for the Sun Adapter for Oracle” on page 12](#)
  - [“Creating a New Project” on page 12](#)
  - [“Creating the OTDs” on page 13](#)
  - [“Creating the Collaboration Definitions \(Java\)” on page 16](#)
  - [“Using the Java Collaboration Editor to create Business Rules” on page 18](#)
  - [“Creating the Connectivity Maps ” on page 44](#)
  - [“Creating an Environment” on page 47](#)
  - [“Configuring the Adapter Properties” on page 47](#)
  - [“Creating the Deployment Profile” on page 51](#)
  - [“Building and Deploying the Project” on page 52](#)
  - [“Running the Project” on page 54](#)

### **What You Need to Do for the BPEL Project**

The following topics contain the step-by-step instructions for importing and building the Sun Adapter for Oracle BPEL Project sample project.

- [“Creating the BPEL-Based Project for the Sun Adapter for Oracle” on page 54](#)
  - [“Creating a New Project” on page 12](#)
  - [“Creating the OTDs” on page 13](#)
  - [“Creating the Business Processes” on page 55](#)
  - [“Using Business Process Designer to Create Business Rules” on page 61](#)
  - [“Creating the Connectivity Maps ” on page 44](#)
  - [“Creating an Environment” on page 47](#)
  - [“Configuring the Adapter Properties” on page 47](#)
  - [“Creating the Deployment Profile” on page 51](#)

- “Building and Deploying the Project” on page 52
- “Running the Project” on page 54

## About the Sun Adapter for Oracle Sample Projects

Topics covered in this section include:

- “Sample Input Trigger Files and Output Files” on page 7
- “Sample Project Data” on page 8
- “Operations Used in the Oracle Sample Projects” on page 8

The Sun Adapter for Oracle Sample Project Zip file contains two sample Projects, one that is Java Collaboration Definition (JCD)-based, and one that uses the Sun Business Process Manager (BPM).

Both the `prjOracle_JCD` and `prjOracle_BPEL` sample projects demonstrate how to:

- Select employee records from a database using a prepared statement.
- Select employee records from the `db_employee` table.
- Insert employee records into the `db_employee` table.
- Update an employee record in the `db_employee` table.
- Delete an employee record from the `db_employee` table.

## Sample Input Trigger Files and Output Files

In addition to the sample projects, the `Oracle.zip` file also includes six sample input trigger files and ten sample output files

Sample input files

- `TriggerInsert.in.~in` (for JCD projects only)
- `TriggerBpInsert.in.~in` (for BPM projects only)
- `TriggerDelete.in.~in`
- `TriggerUpdate.in.~in`
- `TriggerPsSelect.in.~in`
- `TriggerTableSelect.in.~in`

Sample output JCD files

- `JCD_Insert_output().dat`
- `JCD_Delete_output().dat`
- `JCD_Update_output().dat`
- `JCD_PsSelect_output().dat`
- `JCD_TableSelect_output().dat`

### Sample output BPM files

- BPEL\_Insert\_output().dat
- BPEL\_Delete\_output().dat
- BPEL\_Update\_output().dat
- BPEL\_TableSelect\_output().dat
- BPEL\_PsSelect\_output().dat

## Sample Project Data

Data used for the sample projects are contained within a table called db\_employee. The table has three columns, as follows:

TABLE 1 Sample Project Data - db\_employee Table

Column Name	Data Type	Data Length
emp_no	INTEGER	10
last_name	VARCHAR	30
first_name	VARCHAR	30
rate	FLOAT	15
last_update	TIMESTAMP	19

---

**Note** – Oracle databases do not accept table data with columns that include Boolean data types. For example, an Oracle server expects a literal “T” or “F” for True or False Boolean values, and does not accept Java primitive Boolean True or False values.

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## Operations Used in the Oracle Sample Projects

The following database operations are used in both the Java Collaboration Definition-based and Business Process Manager sample projects:

- Delete
- Insert
- Select Table
- Select Prepared Statement
- Update



# About the Sun Business Process Manager Project

The prjOracle\_BPEL sample project uses input files to pass data into business process. There are four business processes that demonstrate the Insert, Update, Delete, and Select operations, and one process to demonstrate a Prepared Statement. Results are written out to an output file.

This section contains the following topics

- [“Associating Business Process Manager Operators” on page 9](#)
- [“Deploying JCD- Based Operations in the Business Process Manager” on page 9](#)

## Associating Business Process Manager Operators

You can associate a Sun Business Process Manager Business Process Activity with the Sun Adapter for Oracle both during the system design phase and during runtime.

To make this association:

1. Select the desired receive or write operation under the adapter in the Enterprise Explorer.
2. Drag the operation onto the eInsight Business Process canvas.

The operation automatically changes to an Activity with an icon identifying the component that is the basis for the Activity.

The operator automatically changes to an Activity with an icon identifying the component that is the basis for the Activity.

At run time, the Sun Business Process Manager engine invokes each step in the order defined in the Business Process. Using the engine's Web Services interface, the Activity invokes the Sun Adapter for Batch.

## Deploying JCD- Based Operations in the Business Process Manager

You can deploy a Java Collaboration Definition-based component as an Activity in a Sun Business Process Manager Business Process. Once you associate the desired component with an Activity, Sun Business Process Manager invokes it using a Web Services interface. Sun Enterprise Service Bus components that can interface with Sun Business Process Manager include the following:

- Java Messaging Service (JMS)
- Object Type Definitions (OTDs)
- Adapters
- Collaborations

Using the NetBeans IDE and Sun Business Process Manager, you can add an Activity to a Business Process, then associate that Activity with Sun Enterprise Service Bus component, for example, an adapter. Then, when Sun Business Process Manager runs the Business Process, it automatically invokes that component using its Web Services interface.

## About the Java Collaboration Definition Sample Project

The prjOracle\_JCD sample Project uses input files to pass data into Collaborations. There are four Collaborations that demonstrate the Insert, Update, Delete, and Table Select operations, and one Collaboration to demonstrate a Prepared Statement. Results are written out to an output file.

### Assigning Operations in a Java Collaboration Definition-Based Project

Database operations are listed as methods in the JCD.

Perform the following steps to access these methods:

1. Create a Collaboration that contains an OTD using Oracle.
2. Right-click the OTD listed in your Collaboration and then select Select Method to Call from the popup menu.
3. Browse to and select a method to call.

## Importing Non-JBI Based Sample Projects

Sample projects are available for implementation and product training. You can import the sample project files from the Sun Java Caps Documentation web site at:  
<http://dscpreview.sfbay.sun.com/docs/javacaps/tutorials/index.jsp>.

### ▼ To Import a Non-JBI Based Sample Project

**Before You Begin** Make sure that the repository is running and that all necessary SAR files and components have been loaded. Save all unsaved work before proceeding.

- 1 **Open your browser and locate the [Sun Java CAPS Documentation web site](#).**
- 2 **Under the Documentation tab, click the Tutorials link.**
- 3 **Under Java CAPS Tutorials and Sample Projects, expand a tutorial list to expose the Sample Project Zip File link.**

- 4 **Click the [Sample Project Zip File](#) link and extract the sample project archive file to your computer.**  
Make note of where you saved the file.
- 5 **Start NetBeans IDE and connect to the running repository:**
  - a. **Select** Tools → CAPS Repository → Connect.
  - b. **Supply or accept values:** login name, password, etc.
  - c. **Click** Connect.
- 6 **From the NetBeans toolbar, select** Tools → CAPS Repository → Import Project.  
The Import Manager appears.
- 7 **In the Import Manager dialog box, browse to the location of the sample project archive file you extracted earlier, and select the ZIP file for the project you want to import.**
- 8 **In the Destination Project field, select** As Top-Level.
- 9 **When the sample project has successfully imported, click** Close.
- 10 **Click** Import. The new project appears in the Projects window.

**Next Steps** After you Import a project, there are several steps required to configure, deploy, and run the project.

See the following sections for directions to complete your imported project:

- [“Configuring the Adapter Properties” on page 47](#)
- [“Creating the Deployment Profile” on page 51](#)
- [“Building and Deploying the Project” on page 52](#)
- [“Running the Project” on page 54](#)

## Running the SQL Script

The data used for both the Java Collaboration Definition-based and Business Process Manager sample projects are contained within a table called `db_employee`. You create this table by running the SQL statement `Oracle_Sample_script.sql`, that is included in the sample Project. Note that you must use a database tool to run the script.

The SQL statement designed for the sample projects, is as follows:

```
drop table db_employee
go
create table db_employee (
  EMP_NO int,
  LAST_NAME varchar(30),
  FIRST_NAME varchar(30),
  RATE float,
  LAST_UPDATE datetime)
go
```

The sample Projects provided with the Sun Adapter for Oracle use input files to pass predefined data or conditions into the Collaboration or Business Process, which then transform the database contents, and deliver the ResultSet.

## Creating the Java Collaboration Definition-Based Project for the Sun Adapter for Oracle

The Java Collaboration Definition (JCD)-based project uses Business Rules defined within Java Collaborations that rely on Object Type Definitions. This section provides step-by-step instructions for manually creating the `prjOracle_JCD` sample Project.

The following steps are required to create the project:

- [“Creating a New Project” on page 12](#)
- [“Creating the OTDs” on page 13](#)
- [“Creating the Collaboration Definitions \(Java\)” on page 16](#)
- [“Using the Java Collaboration Editor to create Business Rules” on page 18](#)
- [“Creating the Connectivity Maps ” on page 44](#)
- [“Creating an Environment” on page 47](#)
- [“Configuring the Adapter Properties” on page 47](#)
- [“Creating the Deployment Profile” on page 51](#)
- [“Building and Deploying the Project” on page 52](#)
- [“Running the Project” on page 54](#)

## Creating a New Project

First, you create a new project in the NetBeans IDE

### ▼ Create a Project

- 1 Start the NetBeans IDE
- 2 Click the **New Project** icon, or select **File** → **New Project** to initiate the **New Project** wizard.

- 3 In Step 1 of the Wizard, select CAPS → ESB from the Categories column, CAPS Repository-Based Project from the Projects column, and click Next.**
- 4 In Step 2 of the Wizard, specify your project name (for this project, use `prjOracle_JCD` if you are creating the Java Collaboration-based project, or `prjOracle_BPEL` if you are creating the Business Process-based project), and click Finish.**

**Next Steps** For your next step, see [“Creating the OTDs” on page 13](#).

## Creating the OTDs

The Database OTD Wizard generates Object Type Definitions (OTDs) by connecting to external data sources and creating corresponding OTDs. The sample project requires three OTDs to interact with the Oracle Adapter.

These OTDs are:

- Oracle Database OTD
- Inbound DTD OTD
- Outbound DTD OTD

The sample project ZIP file includes DTDs used to create the inbound and outbound DTD OTDs.

### ▼ Create the Oracle Database OTD

- 1 Right-click your new Project in the Project window, and select New → Object Type Definition from the popup menu.**

The New Object Type Definition Wizard appears.

- 2 In Step 1 of the wizard, select the wizard type. In this case, select Oracle Database as the wizard type. Click Next.**

- 3 In Step 2 of the wizard, specify the database connection information.**

The connection information fields are:

- Host name
- Port
- Database
- User name
- Password

Once you have entered the correct information in the connection fields, click Next.

**4 In Step 3 of the wizard, select the types of database object you want to include in your project**

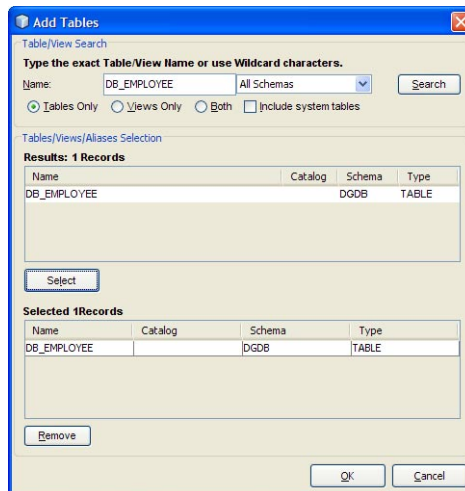
For this example, select the following:

- Tables/Views/Aliases
- Prepared Statements

Click Next.

**5 In Step 4 of the wizard, select the table for the project. Click Add. The Add Tables dialog box appears.**

**6 From the Add Tables dialog box, search for or enter the name of the database. For this example, use the DB\_EMPLOYEE table. When the database appears in the Results selection frame, click Select, and click OK to close the Add Table dialog box.**

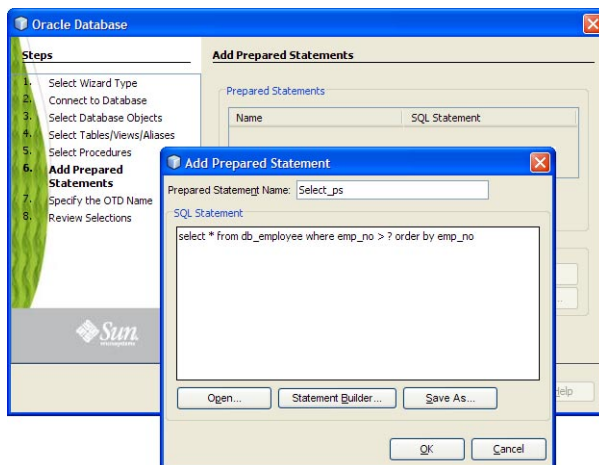


**7 Click Next. The wizard proceeds to Step 6, Add Prepared Statements. Click Add.**

The Add Prepared Statement dialog box appears.

**8 In the Add Prepared Statements dialog box, enter Select\_ps as the Prepared Statement Name, and enter the following as the SQL Statement:**

```
select * from db_employee where emp_no > ? order by emp_no
```



**Note** – In this example, the SQL statement includes the ? placeholder for input. This placeholder represents the Where Clause.

- 9 Click **OK** to close the **Add Prepared Statement** dialog box, and then click **Next**.
- 10 In **Step 7** of the wizard, enter a name for the OTD. In this example, use `otdOracle`. Click **Next**.
- 11 In **Step 8** of the wizard, review your settings, then click **Finish** to create the OTD.

## ▼ Create the Inbound and Outbound DTD OTDs

- 1 To create the inbound DTD OTD, right-click your project in the NetBeans Projects window, and select **New** → **Object Type Definition** from the popup menu.  
The New Object Type Definition Wizard appears.
- 2 Select **DTD** as the wizard type, and click **Next**.
- 3 Browse to and select the `otdInputDTD.dtd` file that was extracted with the sample project. Click **Select**, and click **Next**.
- 4 In **Step 3** of the wizard, select the `otdInputDTD_DBemployees` document element, and click **Next**.

- 5 In Step 4 of the wizard, accept the default option settings, and click Finish.**

The new OTD, `otdInputDTD_DBemployees`, now appears under your project's `otdALL` node, in the Projects window.

- 6 To create the `otdOutputDTD_DBemployees` OTD, repeat steps 1–5 above, substituting `otdOutputDTD.dtd` for the DTD in step 3.**

When you're finished, the project's `otdALL` folder now contains three OTDs: `otdOracle`, `otdInputDTD_DBemployees`, and `otdOutputDTD_DBemployees`.

**Next Steps** For your next step, see:

- [“Creating the Collaboration Definitions \(Java\)” on page 16](#) if you are creating the `prjOracle_JCD` Project.
- [“Creating the Business Processes” on page 55](#) if you are creating the `prjOracle_BPEL` Project.

## Creating the Collaboration Definitions (Java)

The sample project uses five Java Collaboration Definitions. Once these Collaborations are created you can write the Business Rules for each using the Collaboration Editor.

### ▼ Create the `jcdDelete` Collaboration Definition

- 1 Right-click your new Project in the Project window, and select `New → Collaboration Definition (Java)` from the popup menu.**

The Collaboration Definition Wizard (Java) appears.

- 2 Enter the name of the Collaboration (for this Collaboration enter `jcdDelete`) and click Next.**

- 3 In Step 2 of the wizard, double-click `CAPS Components Library → Adapters → File → FileClient → receive` to add the File Adapter's `receive web service operation`. Click Next.**

- 4 In Step 3 of the wizard, double-click `prjOracle_JCD → otdALL → otdOracle`. The `otdOracle` OTD is added to the Selected OTDs field.**

- 5 Click the `Up One Level` button to return to Projects level, then select `CAPS Components Library → Adapters → File → FileClient` to add the File Adapter's `FileClient` OTD to the Collaboration.**

- 6 Click Finish. The new Collaboration is added to your project's `jcdALL` node, in the Projects window.**



**7 Create the other four Collaborations using the Collaboration Definition Wizard, similar to the way you created the jcdDelete Collaboration, but using the following parameters:**

Collaboration Names	Web Service Operation to Implement	Selected OTDs
jcdInsert	receive (CAPS Components Library → Adapters → File → FileClient → receive)	otdOracle (prjOracle_JCD → otdALL → otdOracle)
		otdInputDTD_DBemployees (prjOracle_JCD → otdALL → otdInputDTD_DBemployees)
		FileClient (CAPS Components Library → Adapters → File → FileClient)
jcdPsSelect	receive (CAPS Components Library → Adapters → File → FileClient → receive)	otdOracle (prjOracle_JCD → otdALL → otdOracle)
		otdOutputDTD_DBemployees (prjOracle_JCD → otdALL → otdOutputDTD_DBemployees)
		FileClient (CAPS Components Library → Adapters → File → FileClient)
jcdTableSelect	receive (CAPS Components Library → Adapters → File → FileClient → receive)	otdOracle (prjOracle_JCD → otdALL → otdOracle)
		otdOutputDTD_DBemployees (prjOracle_JCD → otdALL → otdOutputDTD_DBemployees)
		FileClient (CAPS Components Library → Adapters → File → FileClient)
jcdUpdate	receive (CAPS Components Library → Adapters → File → FileClient → receive)	otdOracle (prjOracle_JCD → otdALL → otdOracle)
		FileClient (CAPS Components Library → Adapters → File → FileClient)

**Next Steps** For your next step, see [“Using the Java Collaboration Editor to create Business Rules” on page 18.](#)

## Using the Java Collaboration Editor to create Business Rules

The prjOracle\_JCD Project uses five Java Collaborations you created previously. To complete the Collaborations, use the Java Collaboration Editor's Business Rules Designer to create the business rules.

The Java Collaboration Editor also allows you to enter Java code to create business rules. The Java Source code is provided at the end of each Collaboration section, and can be copied into the Collaboration Editor's Java Source Editor to create the Collaboration.

This section contains the following topics:

- [“Creating the Business Rules for the jcdDelete Collaboration” on page 18](#)
- [“Creating the Business Rules for the jcdInsert Collaboration” on page 22](#)
- [“Creating the Business Rules for the jcdPsSelect Collaboration” on page 30](#)
- [“Creating the Business Rules for the jcdTableSelect Collaboration” on page 33](#)
- [“Creating the Business Rules for the jcdUpdate Collaboration” on page 39](#)

### Creating the Business Rules for the jcdDelete Collaboration

The jcdDelete Collaboration implements the Input Web Service Operation to read the TriggerDelete.in file and then delete the record emp\_no = 500. The Collaboration also writes a message to JCD\_Delete\_output0.dat to confirm a deleted record.

---

**Note** – The where clause in the business rule reads the trigger value as a placeholder for input. This permits you to modify the query to select a specific record. Also note that all records are selected from the database when the TriggerDelete.in file is empty.

---

#### ▼ Create the jcdDelete Collaboration Business Rules

- 1 **From the Project window, double-click the jcdDelete Collaboration under your project's jcdALL node.**

The Java Collaboration Editor opens to the jcdDelete Collaboration.

- 2 **Create the Copy "Deleting record....." to FileClient\_1.Text rule.**

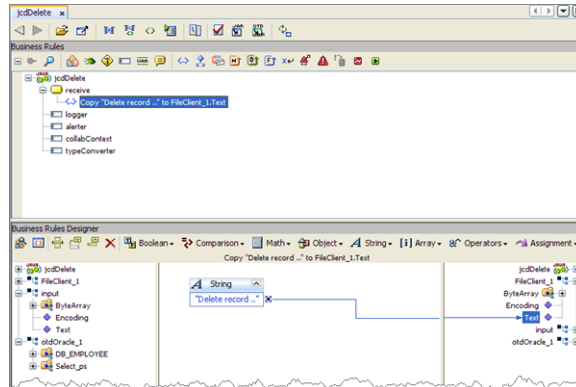
- a. **From the Business Rules Designer toolbar's String menu, select Literal String.**

A *String* method box is added to the Business Rules Designer canvas.

- b. **Double-click the value field of the *String* method box and enter Deleting record..... as the value.**

- c. **Map the output node of the *String* method box, to Text, under FileClient\_1 in the right pane of the Business Rules Designer. To do this, click on the output node of the *String* method box, and drag your cursor to the Text node, under FileClient\_1 in the right pane of the Business Rules Designer.**

A visible link now connects the output node of the *String* method box and the Text node. The Business Rules tree now displays the new rule: Copy "Deleting record....." to FileClient\_1.Text.



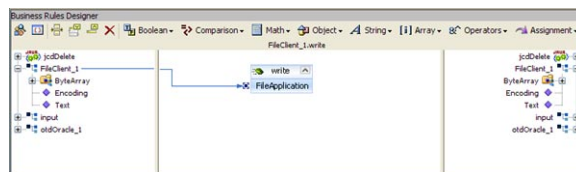
### 3 Create the FileClient\_1.write rule.

- a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**
- b. **Right-click the FileClient\_1 node in the left pane of the Business Rules Designer, and choose Select method to call from the popup menu.**

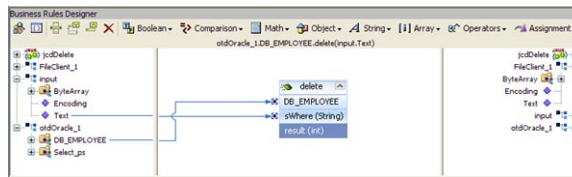
The method selection window appears.

- c. **Select and double-click write() from the method selection window.**

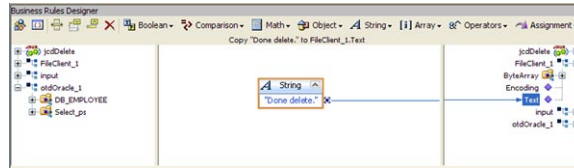
The *write* method box appears in the Business Rules Designer canvas. The FileClient\_1.write rule is added to the Business Rules tree.



- 4 **Create the `otdOracle_1.Db_employee.delete(input.Text)` rule.**
  - a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**
  - b. **Right-click `Db_employee` under the `otdOracle_1` node in the left pane of the Business Rules Designer, and choose `Select` method to call from the popup menu.**  
The method selection window appears.
  - c. **Select `delete(StringsWhere)` from the method selection window.**  
The `delete` method box appears in the Business Rules Designer canvas, and a link connects the `Db_employee` node in the left pane of the Business Rules Designer to the `Db_employee` input node of the `delete` method box.
  - d. **Map `Text` under the `input` node in the left pane of the Business Rules Designer, to the `where (String)` input node of the `delete` method box.**



- 5 **Create the Copy "Delete Done." to `FileClient_1.Text` rule.**
  - a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**
  - b. **From the Business Rules Designer toolbar's `String` menu, select `Literal String`.**  
A `String` method box is added to the Business Rules Designer canvas.
  - c. **Double-click the value field of the `String` method box and enter `Delete Done` as the value.**
  - d. **Map the output node of the `String` method box, to `Text`, under `FileClient_1` in the right pane of the Business Rules Designer.**



## 6 Create the FileClient\_1.write rule.

- a. Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.
- b. Right-click the FileClient\_1 node in the left pane of the Business Rules Designer, and choose Select method to call from the popup menu.

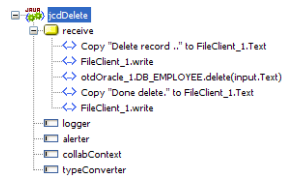
The method selection window appears.

- c. Select and double-click write() from the method selection window.

The write method box appears in the Business Rules Designer canvas. The FileClient\_1.write rule is added to the Business Rules tree.

## 7 Click Save All to save your current changes.

The completed jcdDelete Collaboration definition appears as follows:



## jcdDelete Collaboration Java Code

The completed Java source code for the jcdDelete Collaboration appears as follows:

```
package prjOracle_JCD;

public class jcdDelete
{

    public com.stc.codegen.logger.Logger logger;

    public com.stc.codegen.alerter.Alerter alerter;

    public com.stc.codegen.util.CollaborationContext collabContext;
```

```

public com.stc.codegen.util.TypeConverter typeConverter;

public void receive( com.stc.connector.appconn.file.FileTextMessage input,
otdOracle.OtdOracleOTD otdOracle_1, com.stc.connector.appconn.file.FileApplication FileClient_1 )
    throws Throwable
{
    FileClient_1.setText( "Delete record .." );
    FileClient_1.write();
    otdOracle_1.getDB_EMPLOYEE().delete( input.getText() );
    FileClient_1.setText( "Done delete." );
    FileClient_1.write();
}
}

```

---

**Note** – The above code has been wrapped for display purposes.

---

## Creating the Business Rules for the jcdInsert Collaboration

The jcdInsert Collaboration implements the Input Web Service Operation to read the TriggerInsert.in. file. It then unmarshals data from the input data into the otdInputDTD\_DBEmployees OTD, calls the otdOracle OTD, and inserts records into the database via a For Loop. The Collaboration also writes a message to JCD\_Insert\_output0.dat to confirm an inserted record.

### ▼ Create the jcdInsert Collaboration Business Rules

- 1 **From the Project window, double-click the jcdInsert Collaboration under your project's jcdALL node.**

The Java Collaboration Editor opens to the jcdInsert Collaboration.

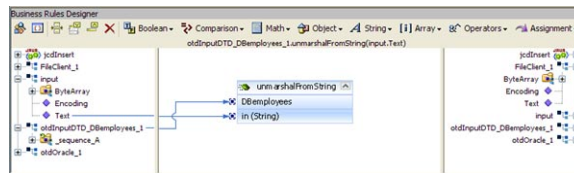
- 2 **Create the Copy "Inserting records in to db\_employee table....." to FileClient\_1.Text rule.**

- a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**

- b. **From the Business Rules Designer toolbar's String menu, select Literal String.**  
A *String* method box is added to the Business Rules Designer canvas.

- c. **Double-click the value field of the *String* method box and enter Inserting records in to db\_employee table..... as the value.**

- d. Map the output node of the *String* method box, to Text, under *FileClient\_1* in the right pane of the Business Rules Designer.
- 3 Create the *FileClient\_1.write* rule.
    - a. Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.
    - b. Right-click the *FileClient\_1* node in the left pane of the Business Rules Designer, and choose **Select method to call from the popup menu**.  
The method selection window appears.
    - c. Select and double-click *write()* from the method selection window.  
The *write* method box appears in the Business Rules Designer canvas. The *FileClient\_1.write* rule is added to the Business Rules tree.
  - 4 Create the *otdInputDTD\_DB\_Employee\_1.unmarshalFromString(input.Text)* rule.
    - a. Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.
    - b. Right-click *otdInputDTD\_DB\_Employee\_1* in the left pane of the Business Rules Designer, and choose **Select method to call from the popup menu**.  
The method selection window appears.
    - c. Select *unmarshalFromString(String in)* from the method selection window.  
The *unmarshalFromString* method box appears in the Business Rules Designer canvas, and a link connects the *otdInputDTD\_DB\_Employee\_1* node in the left pane of the Business Rules Designer to the *Db\_employee* input node of the *unmarshalFromString* method box.
    - d. Map Text under the *input* node in the left pane of the Business Rules Designer, to the *in (String)* input node of the *unmarshalFromString* method box.



**5 Create the `otdOracleotdOracle_1.Db_employee.insert` rule.**

- a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**
- b. **Right-click `Db_employee` under the `otdOracle_1` node in the left pane of the Business Rules Designer, and choose `Select` method to call from the popup menu.**

The method selection window appears.

- c. **Select `insert()` from the method selection window.**

The *insert* method box appears in the Business Rules Designer canvas, and a link connects the `db_employee` node in the left pane of the Business Rules Designer to the `Db_employee` input node of the *insert* method box.

**6 Create the For Loop: `i1` is less than count of `otdInputDTD_DB_Employee_1.X_sequence_A` rule.**

- a. **Click the For Loop icon on the Business Rules toolbar to add a For Loop to the Business Rules tree.**
- b. **Right-click `counter initialization` node under the For Loop, and select `Local Variable` from the popup menu.**

The Create Variable dialog box appears.

- c. **In the Create Variable dialog box, enter `i1` as the name and select `Primitive: int` as the type, and click OK.**

The `i1` variable is added to the Business Rules Designer.

- d. **Select `condition: ?` under the For Loop on the Business Rules tree.**
- e. **Right-click `i1` variable node in the left pane of the Business Rules Designer, and choose `Select` method to call from the popup menu.**
- f. **Select `Less Than` from the method selection window.**

The *Less Than* method box appears in the Business Rules Designer canvas, and a link connects the `i1` variable node in the left pane of the Business Rules Designer to the `number1` input node of the *i1* method box.

- g. **Right-click `otdInputDTD_DB_Employee_1` node in the left pane of the Business Rules Designer, and choose `Select` method to call from the popup menu.**

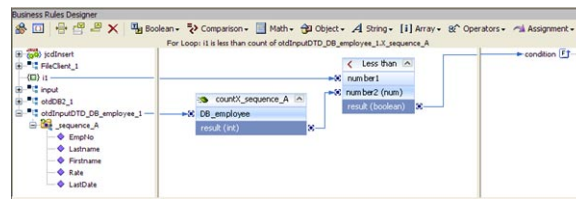


**h. Select `countX_sequence_A()` from the method selection window.**

The `countX_sequence_A` method box appears in the Business Rules Designer canvas, and a link connects the `otdInputDTD_DB_Employee_1` node in the left pane of the Business Rules Designer to the `Db_Employee` input node of the `countX_sequence_A` method box.

**i. Map the `result (int)` output node of the `countX_sequence_A` method box, to the `number2 (num)` input node of the `Less Than` method box.**

**j. Map the `result (boolean)` output node of the `Less Than` method box, to the `For Loop` condition node in the right pane of the Business Rules Designer.**



**7 Create the `Copy i1 + 1 to i1` rule beneath the `For Loop` → `Steps` node.**

**a. Select the `Steps` node under the `For Loop` and click the `rule` icon on the `Business Rules` toolbar to add a new rule.**

**b. Right-click the `i1` variable node in the left pane of the `Business Rules Designer`, and choose `Select method to call` from the popup menu.**

The method selection window appears.

**c. Select `Add` from the method selection window.**

The `Add` method box appears in the Business Rules Designer canvas, and a link connects the `i1` node in the left pane of the Business Rules Designer to the `value1` input node of the `insert` method box.

**d. Double-click the `value2` field and enter `1` as the value.**

**e. Map the `result` output node of the `Add` method box, to the `i1` variable node in the right pane of the `Business Rules Designer`.**

**8 Create the `Copy new BigDecimal(otdInputDTD_DBEmployees_1.X_sequence_A[i1].EmpNo)` to `otdOracle_1.DB_EMPLOYEE.EMP_NO` rule beneath the `For Loop` → `rules` node.**

**a. Select the `rules` node under the `For Loop` in the `Business Rules tree`, and click the `rule` icon on the `Business Rules toolbar` to add a new rule.**

- b. From the Business Rules Designer toolbar, click Class Browser.

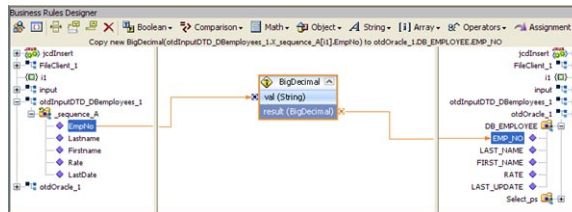
The Class Browser appears.

- c. From the Class Browser, select `BigDecimal` as the class, and `BigDecimal(String val)` as the (constructor) method. Click Select.

The *BigDecimal* method box is added to the Business Rules Designer canvas.

- d. Map the `EmpNo` node, under `otdInputDTD_DBEmployee_1` → `sequence_A` in the left pane of the Business Rules Designer, to the `val (String)` input node of the *BigDecimal* method box.

- e. Map the result (`BigDecimal`) output node of the *BigDecimal* method box, to `EMP_NO` node, under `otdOracle_1` `otdOracle_1` → `DB_EMPLOYEE` in the right pane of the Business Rules Designer.



- 9 Create the Copy `otdInputDTD_DBEmployee_1.X_sequence_A[i1].Lastname` to `otdOracle_1.DB_EMPLOYEE.LAST_NAME` rule under the last rule.

- a. Click the rule icon on the Business Rules toolbar to add a new rule.

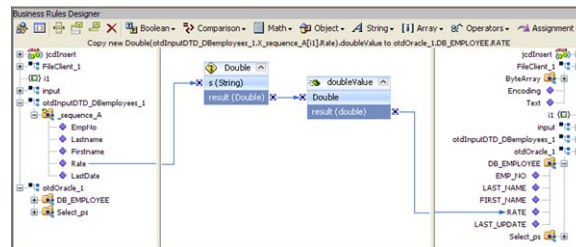
- b. Map the `Lastname` node, under `otdInputDTD_DBEmployee_1` → `sequence_A` in the left pane of the Business Rules Designer, to the `LAST_NAME` node, under `otdOracle_1` `otdOracle_1` → `DB_EMPLOYEE` in the right pane of the Business Rules Designer.

- 10 Create the Copy `otdInputDTD_DBEmployee_1.X_sequence_A[i1].Firstname` to `otdOracle_1.DB_EMPLOYEE.FIRST_NAME` rule under the last rule.

- a. Click the rule icon on the Business Rules toolbar to add a new rule.

- b. Map the `Firstname` node, under `otdInputDTD_DBEmployee_1` → `sequence_A` in the left pane of the Business Rules Designer, to the `FIRST_NAME` node, under `otdOracle_1` `otdOracle_1` → `DB_EMPLOYEE` in the right pane of the Business Rules Designer.

- 11 Create the Copy new**  
**Double(otdInputDTD\_DBEmployees\_1.X\_sequence\_A[i1].Rate).doubleValue to**  
**otdOracle\_1.DB\_EMPLOYEE.RATE rule beneath the For Loop → rules node.**
- Select the rules node under the For Loop in the Business Rules tree, and click the rule icon on the Business Rules toolbar to add a new rule.**
  - From the Business Rules Designer toolbar, click Class Browser.**  
 The Class Browser appears.
  - From the Class Browser, select Double as the class, and Double(String s) as the (constructor) method. Click Select.**  
 The *Double* method box is added to the Business Rules Designer canvas.
  - Right-click the result (Double) output node of the *Double* method box and select Browse this type from the popup menu.**  
 The Class Browser appears.
  - From the Class Browser, select Double as the class, and doubleValue() as the method. Click Select.**  
 The *doubleValue* method box is added to the Business Rules Designer canvas.
  - Map the Rate node, under otdInputDTD\_DBEmployee\_1 → sequence\_A in the left pane of the Business Rules Designer, to the s (String) input node of the *Double* method box.**
  - Map the result (Double) output node of the *Double* method box, to the the Double input node of the *doubleValue* method box.**
  - Map the result (double) output node of the *doubleValue* method box, to RATE node, under otdOracle\_1 → DB\_EMPLOYEE in the right pane of the Business Rules Designer.**



- 12 **Create the `Copy Date.valueOf(otdInputDTD_DBEmployee_1.X_sequence_A[i1].LastDate)` to `otdOracle_1.DB_EMPLOYEE.LAST_UPDATE` rule under the last rule.**
  - a. **From the Business Rules Designer toolbar, click the Class Browser button.**
  - b. **From the Class Browser dialog box, select `Date` as the class, and select the `valueOf(String s)` as the method. Click `Select`**

A `Date.valueOf` method box appears in the Business Rules Designer Canvas.
  - c. **Map the `LastDate` node, under `otdInputDTD_DBEmployee_1` → `sequence_A` in the left pane of the Business Rules Designer, to the `s (String)` input node of the `Date.valueOf` method box.**
  - d. **Map the `result (Date)` output node of the `Date.valueOf` method box to the `LAST_UPDATE` node, under `otdOracle_1 otdOracle_1` → `DB_EMPLOYEE` in the right pane of the Business Rules Designer.**
- 13 **Create the `otdOracle_1.DB_EMPLOYEE.insertRow` rule under the last rule.**
  - a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**
  - b. **Right-click `DB_EMPLOYEE` under the `otdOracle_1` node in the left pane of the Business Rules Designer, and choose `Select` method to call from the popup menu.**

The method selection window appears.
  - c. **Select `insertRow()` from the method selection window.**

The `insertRow` method box appears in the Business Rules Designer canvas, and a link connects the `DB_EMPLOYEE` node in the left pane of the Business Rules Designer to the `DB_EMPLOYEE` input node of the `insertRow` method box.
- 14 **Create the `Copy "Insert Done." to FileClient_1.Text` rule under the completed `For LOOP`.**
  - a. **From the Business Rules tree, select the `For Loop`, then click the rule icon on the Business Rules toolbar to add a new rule.**

A new rule is added to the main trunk of the Business Rules tree.
  - b. **From the Business Rules Designer toolbar's `String` menu, select `Literal String`.**

A `String` method box is added to the Business Rules Designer canvas.
  - c. **Double-click the value field of the `String` method box and enter `Insert Done.` as the value.**

d. Map the output node of the *String* method box, to Text, under FileClient\_1 in the right pane of the Business Rules Designer.

15 Create the FileClient\_1.write rule.

a. Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.

b. Right-click the FileClient\_1 node in the left pane of the Business Rules Designer, and choose Select method to call from the popup menu.

The method selection window appears.

c. Select and double-click write() from the method selection window.

The write method box appears in the Business Rules Designer canvas. The FileClient\_1.write rule is added to the Business Rules tree.

16 Click Save All to save your current changes.

The completed Collaboration definition appears as follows:



## jcdInsert Collaboration Java Code

The completed Java source code for the jcdInsert Collaboration appears as follows:

```
package prjOracle_JCD;

public class jcdInsert
{
    public com.stc.codegen.logger.Logger logger;

    public com.stc.codegen.alerter.Alerter alerter;
}
```

```

public com.stc.codegen.util.CollaborationContext collabContext;

public com.stc.codegen.util.TypeConverter typeConverter;

public void receive( com.stc.connector.appconn.file.FileTextMessage input, dtd.
otdInputDTD129034179.DBEmployees otdInputDTD_DBEmployees_1, otdOracle.
OtdOracleOTD otdOracle_1, com.stc.connector.appconn.file.FileApplication FileClient_1 )
    throws Throwable
{
    FileClient_1.setText( "Inserting records into db_employee table .." );
    FileClient_1.write();
    otdInputDTD_DBEmployees_1.unmarshalFromString( input.getText() );
    otdOracle_1.getDB_EMPLOYEE().insert();
    for (int i1 = 0; i1 < otdInputDTD_DBEmployees_1.countX_sequence_A(); i1 += 1) {
        otdOracle_1.getDB_EMPLOYEE().setEMP_NO( new java.math.BigDecimal( otdInputDTD_DBEmployees_1.getX_sequence_A( i1 ).getSequence() );
        otdOracle_1.getDB_EMPLOYEE().setLAST_NAME( otdInputDTD_DBEmployees_1.getX_sequence_A( i1 ).getSequence() );
        otdOracle_1.getDB_EMPLOYEE().setFIRST_NAME( otdInputDTD_DBEmployees_1.getX_sequence_A( i1 ).getSequence() );
        otdOracle_1.getDB_EMPLOYEE().setRATE( (new Double( otdInputDTD_DBEmployees_1.getX_sequence_A( i1 ).getSequence() );
        otdOracle_1.getDB_EMPLOYEE().setLAST_UPDATE( java.sql.Date.valueOf( otdInputDTD_DBEmployees_1.getX_sequence_A( i1 ).getSequence() );
        otdOracle_1.getDB_EMPLOYEE().insertRow();
    }
    FileClient_1.setText( "Done Insert." );
    FileClient_1.write();
}
}
}

```

---

**Note** – The above code has been wrapped for display purposes.

---

## Creating the Business Rules for the jcdPsSelect Collaboration

The jcdPsSelect Collaboration implements the Input Web Service Operation to read the TriggerPsSelect.in file. It then copies the database resultset (as noted in the prepared statement query) into the otdInputDTD\_DBEmployee OTD and selects all available records from the database. The Collaboration also writes a message to JCD\_PsSelect\_output0.dat to confirm when records are selected, or when no records are available.

### Using the Collaboration Editor's Java Source Editor

To create the third Java Collaboration, jcdPsSelect, we will use the Java Source Editor. The Java Source Editor allows you to write your business rules in the editor, or copy code into the Collaboration Editor that you have written with another tool.

## jcdPsSelect Collaboration Java Code

The completed Java source code for the jcdPsSelect Collaboration appears as follows:

```

package prjOracle_JCD;

public class jcdPsSelect
{
    public com.stc.codegen.logger.Logger logger;

    public com.stc.codegen.alerter.Alerter alerter;

    public com.stc.codegen.util.CollaborationContext collabContext;

    public com.stc.codegen.util.TypeConverter typeConverter;

    public void receive( com.stc.connector.appconn.file.FileTextMessage input,
otdOracle.OtdOracleOTD otdOracle_1, dtd.otdOutputDTD1007064608.
DBEmployee otdOutputDTD_DBEmployee_1, com.stc.connector.appconn.file.FileApplication
FileClient_1 )
        throws Throwable
    {
        FileClient_1.setText( "Selecting record(s) from db_employee table via Prepared
Statement select .." );
        FileClient_1.write();
        otdOracle_1.getSelect_ps().setEmpno( new java.math.BigDecimal( "0" ) );
        otdOracle_1.getSelect_ps().executeQuery();
        if (otdOracle_1.getSelect_ps().resultsAvailable()) {
            while (otdOracle_1.getSelect_ps().get$Select_psResults().next()) {
                otdOutputDTD_DBEmployee_1.setEmpNo( otdOracle_1.getSelect_ps().get$Select_psResults().getEMP_NO() );
                otdOutputDTD_DBEmployee_1.setLastname( otdOracle_1.getSelect_ps().get$Select_psResults().getLAST_NAME() );
                otdOutputDTD_DBEmployee_1.setFirstname( otdOracle_1.getSelect_ps().get$Select_psResults().getFIRST_NAME() );
                otdOutputDTD_DBEmployee_1.setRate( Double.toString( otdOracle_1.getSelect_ps().get$Select_psResults().getRATE() ) );
                otdOutputDTD_DBEmployee_1.setLastDate( otdOracle_1.getSelect_ps().get$Select_psResults().getLAST_DATE() );
                FileClient_1.setText( otdOutputDTD_DBEmployee_1.marshallToString() );
                FileClient_1.write();
            }
        } else {
            FileClient_1.setText( "No record found!" );
            FileClient_1.write();
        }
        FileClient_1.setText( "Done Select." );
        FileClient_1.write();
    }
}

```

---

**Note** – The above code has been wrapped for display purposes.

---

## ▼ **Create the jcdPsSelect Collaboration Business Rules**

- 1 From the Project window, double-click the `jcdPsSelect Collaboration` under your project's `jcdALL` node.**

The Java Collaboration Editor opens to the `jcdPsSelect Collaboration`.

- 2 From the Collaboration Editor toolbar, select the `Source Code Mode` button.**

The Collaboration displays the Business Rules window and the Java Source Editor window.

- 3 Copy the code above and paste it into the Java Source Editor, replacing the current code. The above code was wrapped in 10 places for display purposes. Correct the wrapped lines of code (the wrapped lines contain no left margin) by placing your cursor at the beginning of the line and hitting backspace (or the equivalent)**

- 4 Once you have corrected the code, click the `Commit changes` button on the Java Source Editor toolbar.**

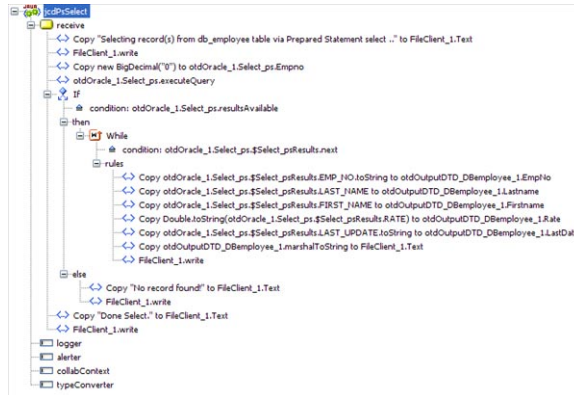
If the code contains any errors they will be listed for you in the Validation window at the bottom of the NetBeans IDE. Correct these errors if necessary, and click the `Commit changes` button again.

- 5 Expand the business rules in the Business Rules window to see the completed Collaboration. Click the `Advanced Mode` button in the Collaboration Editor toolbar to open the Business Rules Designer window. Double click on a line of code in the Java Source Editor, and that rule is displayed graphically in the Business Rule Designer.**

- 6 Click `Save All` to save your current changes.**

The completed Collaboration definition appears as follows:





## Creating the Business Rules for the jcdTableSelect Collaboration

The jcdTableSelect Collaboration implements the Input Web Service Operation to read the TriggerTableSelect.in file. It then copies the database resultset into the oldInputDTD\_DBEmployee OTD and selects all available records from the database that meet the criteria emp\_no = 100. The Collaboration also writes a message to JCD\_TableSelect\_output0.dat to confirm when records are selected, or when no records are available.

---

**Note** – The where clause in the business rule reads the trigger value as a placeholder for input. This permits you to modify the query to select a specific record. Also note that all records are selected from the database when the TriggerTableSelect.in file is empty.

---

### ▼ Create the jcdTableSelect Collaboration Business Rules

You can create the jcdTableSelect Java Collaboration business rules by following the steps below, or by copying the “[jcdTableSelect Collaboration Java Code](#)” on page 38 into the Collaboration Editor’s Java Source Editor as described in “[Using the Collaboration Editor’s Java Source Editor](#)” on page 30.

- 1 **From the Project window, double-click the jcdTableSelect Collaboration under your project's jcdALL node.**

The Java Collaboration Editor opens to the jcdTableSelect Collaboration.

- 2 **Create the Copy "Selectiong records from db\_employee table via Table Select....." to FileClient\_1.Text rule.**
  - a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**
  - b. **From the Business Rules Designer toolbar's String menu, select Literal String.**  
A *String* method box is added to the Business Rules Designer canvas.
  - c. **Double-click the value field of the *String* method box and enter Selectiong records from db\_employee table via Table Select..... as the value.**
  - d. **Map the output node of the *String* method box, to Text, under FileClient\_1 in the right pane of the Business Rules Designer.**
- 3 **Create the FileClient\_1.write rule.**
  - a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**
  - b. **Right-click the FileClient\_1 node in the left pane of the Business Rules Designer, and choose Select method to call from the popup menu.**  
The method selection window appears.
  - c. **Select and double-click write() from the method selection window.**  
The *write* method box appears in the Business Rules Designer canvas. The FileClient\_1.write rule is added to the Business Rules tree.
- 4 **Create the otdInputDTD\_DB\_Employee\_1.unmarshalFromString(input.Text) rule.**
  - a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**
  - b. **Right-click DB\_EMPLOYEE under otdOracle\_1 in the left pane of the Business Rules Designer, and choose Select method to call from the popup menu.**  
The method selection window appears.
  - c. **Select select(String where) from the method selection window.**  
The *select* method box appears in the Business Rules Designer canvas, and a link connects the DB\_EMPLOYEE node in the left pane of the Business Rules Designer to the DB\_EMPLOYEE input node of the *select* method box.

- d. **Map Text under the `input` node in the left pane of the Business Rules Designer, to the `where (String)` input node of the `select` method box.**
- 5 **Add a `While` statement and create the condition: `otdOracle_1.DB_EMPLOYEE.next` rule.**
    - a. **Click the `While` icon on the Business Rules toolbar to add a `While` statement to the Business Rules tree.**
    - b. **Right-click `DB_EMPLOYEE` under `otdOracle_1` in the left pane of the Business Rules Designer, and choose `Select method` to call from the popup menu.**  
The method selection window appears.
    - c. **Select `next()` from the method selection window.**  
The `next` method box appears in the Business Rules Designer canvas, and a link connects the `DB_EMPLOYEE` node in the left pane of the Business Rules Designer to the `DB_EMPLOYEE` input node of the `next` method box.
    - d. **Map the `result (boolean)` output node of the `next` method box, to the `While` condition in the right pane of the Business Rules Designer.**
  - 6 **Create the `Copy otdOracle_1.DB_EMPLOYEE.EMP_NO.toString` to `otdOutputDTD_DBEmployee_1.EmpNo` rule beneath the `While` → rules node.**
    - a. **Select the rules node under the `While` statement on the Business Rules tree, and click the rule icon on the Business Rules toolbar to add a new rule.**
    - b. **Map the `EmpNo` node, under `otdOracle_1` → `DB_EMPLOYEE` in the left pane of the Business Rules Designer, to `Emp_No` node, under `otdOutputDTD_DBEmployee_1` in the right pane of the Business Rules Designer.**  
The Business Rules Designer adds the necessary code for `shortToString` type conversion.
  - 7 **Create the `Copy otdOracle_1.DB_EMPLOYEE.LAST_NAME` to `otdOutputDTD_DBEmployee_1.Lastname` rule under the last rule.**
    - a. **Click the rule icon on the Business Rules toolbar to add a new rule.**
    - b. **Map the `LAST_NAME` node, under `otdOracle_1` → `DB_EMPLOYEE` in the left pane of the Business Rules Designer, to the `Lastname` node, under `otdOutputDTD_DBEmployee_1` in the right pane of the Business Rules Designer.**
  - 8 **Create the `Copy otdOracle_1.DB_EMPLOYEE.FIRST_NAME` to `otdOutputDTD_DBEmployee_1.Firstname` rule under the last rule.**
    - a. **Click the rule icon on the Business Rules toolbar to add a new rule.**

**b. Map the FIRST\_NAME node, under otdOracle\_1 → DB\_EMPLOYEE in the left pane of the Business Rules Designer, to the Firstname node, under otdOutputDTD\_DBEmployee\_1 in the right pane of the Business Rules Designer.**

**9 Create the Copy Double.toString(otdOracle\_1.DB\_EMPLOYEE.RATE) to otdOutputDTD\_DBEmployee\_1.Rate rule under the last rule.**

**a. Click the rule icon on the Business Rules toolbar to add a new rule.**

**b. Map the RATE node, under otdOracle\_1 → DB\_EMPLOYEE in the left pane of the Business Rules Designer, to the Rate node, under otdOutputDTD\_DBEmployee\_1 in the right pane of the Business Rules Designer.**

The Business Rules Designer adds the necessary code to create the business rule..

**10 Create the Copy otdOracle\_1.DB\_EMPLOYEE.LAST\_UPDATE.toString to otdOutputDTD\_DBEmployee\_1.LastDate rule.**

**a. Click the rule icon on the Business Rules toolbar to add a new rule.**

**b. Right-click LAST\_UPDATE under otdOracle\_1 → DB\_EMPLOYEE in the left pane of the Business Rules Designer, and choose Select method to call from the popup menu.**

The method selection window appears.

**c. Select toString() from the method selection window.**

The *toString* method box appears in the Business Rules Designer canvas.

**d. Map LAST\_UPDATE under otdOracle\_1 → DB\_EMPLOYEE in the left pane of the Business Rules Designer, to the Date input node of the *toString* method box.**

**e. Map the result (String) output node of the *toString* method box, to LastDate under otdOutputDTD\_DBEmployee\_1 in the right pane of the Business Rules Designer.**

**11 Create the Copy otdOutputDTD\_DBEmployee\_1.marshallToString to FileClient\_1.Text rule under the last rule.**

**a. Click the rule icon on the Business Rules toolbar to add a new rule.**

**b. Right-click otdOutputDTD\_DBEmployee\_1 in the left pane of the Business Rules Designer, and choose Select method to call from the popup menu.**

The method selection window appears.

- c. **Select `marshalToString()` from the method selection window.**

The *marshalToString* method box appears in the Business Rules Designer canvas, and a link connects `otdOutputDTD_DBEmployee_1` in the left pane of the Business Rules Designer to the `DBEmployee` input node of the *marshalToString* method box.

- d. **Map the `result (String)` output node of the *marshalToString* method box to the `Text` node, under `FileClient_1` in the right pane of the Business Rules Designer.**

- 12 **Create the `FileClient_1.write` rule.**

- a. **Click the `rule` icon on the Business Rules toolbar to add a new rule.**

- b. **Right-click the `FileClient_1` node in the left pane of the Business Rules Designer, and choose `Select method to call from the popup menu`.**

The method selection window appears.

- c. **Select and double-click `write()` from the method selection window.**

The *write* method box appears in the Business Rules Designer canvas. The `FileClient_1.write` rule is added to the Business Rules tree.

- 13 **Create the `Copy "Table Select Done."` to `FileClient_1.Text` rule.**

- a. **From the Business Rules tree, select the `While` statement, then click the `rule` icon on the Business Rules toolbar to add a new rule.**

A new rule is added to the main trunk of the Business Rules tree.

- b. **From the Business Rules Designer toolbar's `String` menu, select `Literal String`.**

A *String* method box is added to the Business Rules Designer canvas.

- c. **Double-click the value field of the *String* method box and enter `Table Select Done.` as the value.**

- d. **Map the output node of the *String* method box, to `Text`, under `FileClient_1` in the right pane of the Business Rules Designer.**

- 14 **Create the `FileClient_1.write` rule.**

- a. **Click the `rule` icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**

- b. **Right-click the `FileClient_1` node in the left pane of the Business Rules Designer, and choose `Select method to call from the popup menu`.**

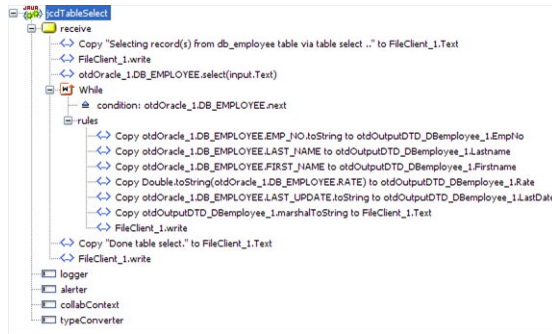
The method selection window appears.

**c. Select and double-click `write()` from the method selection window.**

The *write* method box appears in the Business Rules Designer canvas. The `FileClient_1.write` rule is added to the Business Rules tree.

**15 Click Save All to save your current changes.**

The completed `jcdTableSelect` Collaboration definition appears as follows:



## **jcdTableSelect Collaboration Java Code**

The completed Java source code for the `jcdTableSelect` Collaboration appears as follows:

```
package prjOracle_JCD;

public class jcdTableSelect
{
    public com.stc.codegen.logger.Logger logger;

    public com.stc.codegen.alerter.Alerter alerter;

    public com.stc.codegen.util.CollaborationContext collabContext;

    public com.stc.codegen.util.TypeConverter typeConverter;

    public void receive( com.stc.connector.appconn.file.FileTextMessage input, dtd.
    otdOutputDTD1007064608.DBEmployee otdOutputDTD_DBEmployee_1, otdOracle.OtdOracleOTD
    otdOracle_1, com.stc.connector.appconn.file.FileApplication FileClient_1 )
        throws Throwable
    {
        FileClient_1.setText( "Selecting record(s) from db_employee table via table
    select .." );
        FileClient_1.write();
        otdOracle_1.getDB_EMPLOYEE().select( input.getText() );
    }
}
```

```

while (otdOracle_1.getDB_EMPLOYEE().next()) {
    otdOutputDTD_DBEmployee_1.setEmpNo( otdOracle_1.getDB_EMPLOYEE().getEMP_NO().toString() );
    otdOutputDTD_DBEmployee_1.setLastname( otdOracle_1.getDB_EMPLOYEE().getLAST_NAME() );
    otdOutputDTD_DBEmployee_1.setFirstname( otdOracle_1.getDB_EMPLOYEE().getFIRST_NAME() );
    otdOutputDTD_DBEmployee_1.setRate( Double.toString( otdOracle_1.getDB_EMPLOYEE().getRATE() ) );
    otdOutputDTD_DBEmployee_1.setLastDate( otdOracle_1.getDB_EMPLOYEE().getLAST_UPDATE().toString() );
    FileClient_1.setText( otdOutputDTD_DBEmployee_1.marshallToString() );
    FileClient_1.write();
}
FileClient_1.setText( "Done table select." );
FileClient_1.write();
}
}

```

---

**Note** – The above code has been wrapped for display purposes.

---

## Creating the Business Rules for the jcdUpdate Collaboration

The jcdUpdate Collaboration implements the Input Web Service Operation to read the TriggerUpdate.in. file and then update the record emp\_no = 300. The Collaboration also writes a message to JCD\_Update\_output0.dat to confirm an updated record.

---

**Note** – The where clause in the business rule reads the trigger value as a placeholder for input. This permits you to modify the query to select a specific record. Also note that all records are selected from the database when the TriggerTableSelect.in file is empty.

---

### ▼ Create the jcdUpdate Collaboration Business Rules

You can create the jcdTableSelect Java Collaboration business rules by following the steps below, or by copying the [“jcdUpdate Collaboration Java Code”](#) on page 43 into the Collaboration Editor's Java Source Editor as described in [“Using the Collaboration Editor's Java Source Editor”](#) on page 30.

- 1 **From the Project window, double-click the jcdUpdate Collaboration under your project's jcdALL node.**

The Java Collaboration Editor opens to the jcdUpdate Collaboration.

- 2 **Create the Copy "Updating the Rate and Last\_update fields .. " to FileClient\_1.Text rule.**
  - a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**
  - b. **From the Business Rules Designer toolbar's String menu, select Literal String.**

A *String* method box is added to the Business Rules Designer canvas.
  - c. **Double-click the value field of the *String* method box and enter Updating the Rate and Last\_update fields .. as the value.**
  - d. **Map the output node of the *String* method box, to Text, under FileClient\_1 in the right pane of the Business Rules Designer.**
- 3 **Create the FileClient\_1.write rule.**
  - a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**
  - b. **Right-click the FileClient\_1 node in the left pane of the Business Rules Designer, and choose Select method to call from the popup menu.**

The method selection window appears.
  - c. **Select and double-click write() from the method selection window.**

The *write* method box appears in the Business Rules Designer canvas. The FileClient\_1.write rule is added to the Business Rules tree.
- 4 **Create the otdOracle\_1.DB\_EMPLOYEE.update(input.Text) rule.**
  - a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**
  - b. **Right-click DB\_EMPLOYEE under otdOracle\_1 in the left pane of the Business Rules Designer, and choose Select method to call from the popup menu.**

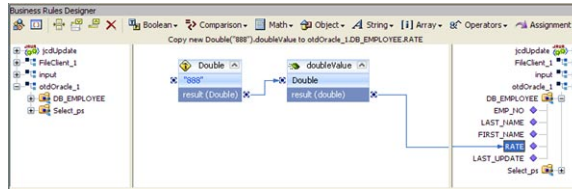
The method selection window appears.
  - c. **Select update(String sWhere) from the method selection window.**

The *update* method box appears in the Business Rules Designer canvas, and a link connects the DB\_EMPLOYEE node in the left pane of the Business Rules Designer to the DB\_EMPLOYEE input node of the *update* method box.



- d. **Map Text under the `input` node in the left pane of the Business Rules Designer, to the `sWhere (String)` input node of the `update` method box.**
- 5 **Add a `While` statement and create the condition: `otdOracle_1.DB_EMPLOYEE.next` rule.**
    - a. **Click the `While` icon on the Business Rules toolbar to add a `While` statement to the Business Rules tree.**
    - b. **Right-click `DB_EMPLOYEE` under `otdOracle_1` in the left pane of the Business Rules Designer, and choose `Select` method to call from the popup menu.**  
The method selection window appears.
    - c. **Select `next()` from the method selection window.**  
The `next` method box appears in the Business Rules Designer canvas, and a link connects the `DB_EMPLOYEE` node in the left pane of the Business Rules Designer to the `DB_EMPLOYEE` input node of the `next` method box.
    - d. **Map the `result (boolean)` output node of the `next` method box, to the `While` condition in the right pane of the Business Rules Designer.**
  - 6 **Create the `Copy new Double("888").doubleValue` to `otdOracle_1.DB_EMPLOYEE.RATE` rule beneath the `While` → rules node.**
    - a. **Select the `rules` node under the `While` statement in the Business Rules tree, and click the `rule` icon on the Business Rules toolbar to add a new rule.**
    - b. **From the Business Rules Designer toolbar, click `Class Browser`.**  
The Class Browser appears.
    - c. **From the Class Browser, select `Double` as the class, and `Double(String s)` as the (constructor) method. Click `Select`.**  
The `Double` method box is added to the Business Rules Designer canvas.
    - d. **Double-click the `s (String)` field of the `Double` method box, and enter a value of `888`.**
    - e. **Right-click the `result (Double)` output node of the `Double` method box and select `Browse this type` from the popup menu.**  
The Class Browser appears.
    - f. **From the Class Browser, select `Double` as the class, and `doubleValue()` as the method. Click `Select`.**  
The `doubleValue` method box is added to the Business Rules Designer canvas.

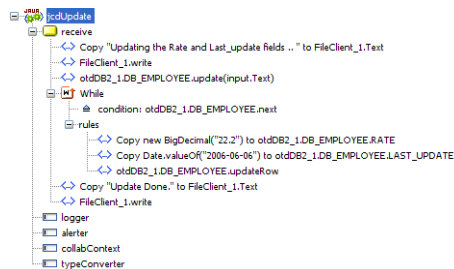
- g. **Map the result (Double) output node of the *Double* method box, to the the Double input node of the *doubleValue* method box.**
- h. **Map the result (double) output node of the *doubleValue* method box, to RATE node, under otdOracle\_1 → DB\_EMPLOYEE in the right pane of the Business Rules Designer.**



- 7 **Create the `Copy Date.valueOf("2006-06-06")` to `otdOracle_1.DB_EMPLOYEE.LAST_UPDATE` rule under the last rule.**
  - a. **Click the rule icon on the Business Rules toolbar to add a new rule under your last rule.**
  - b. **From the Business Rules Designer toolbar, click the Class Browser button.**
  - c. **From the ClassBrowser, select `Date` as the class, select the `valueOf(String s)` method, and click Select.**  
The `Date.valueOf` method box appears.
  - d. **Double-click the `s (String)` field of the `Date.valueOf` method box and enter today's date as the value.**
  - e. **Map the result (Date) output node of the `Date.valueOf` method box to the `LAST_UPDATE` node, under `otdOracle_1 → DB_EMPLOYEE` in the right pane of the Business Rules Designer.**
- 8 **Create the `otdOracle_1.DB_EMPLOYEE.updateRow` rule under the last rule.**
  - a. **Click the rule icon on the Business Rules toolbar to add a new rule.**
  - b. **Right-click `DB_EMPLOYEE` in the left pane of the Business Rules Designer, and choose `Select` method to call from the popup menu.**  
The method selection window appears.
  - c. **Select `updateRow()` from the method selection window.**  
The `updateRow` method box appears in the Business Rules Designer canvas, and a link connects the `DB_EMPLOYEE` node in the left pane of the Business Rules Designer to the `DB_EMPLOYEE` input node of the `updateRow` method box.

- 9 **Create the Copy "Update Done." to FileClient\_1.Text rule.**
  - a. **From the Business Rules tree, select the While statement, then click the rule icon on the Business Rules toolbar to add a new rule.**  
A new rule is added to the main trunk of the Business Rules tree.
  - b. **From the Business Rules Designer toolbar's String menu, select Literal String.**  
A *String* method box is added to the Business Rules Designer canvas.
  - c. **Double-click the value field of the *String* method box and enter Update Done . as the value.**
  - d. **Map the output node of the *String* method box, to Text, under FileClient\_1 in the right pane of the Business Rules Designer.**
- 10 **Create the FileClient\_1.write rule.**
  - a. **Click the rule icon on the Business Rules toolbar to add a new rule in the Business Rules pane.**
  - b. **Right-click the FileClient\_1 node in the left pane of the Business Rules Designer, and choose Select method to call from the popup menu.**  
The method selection window appears.
  - c. **Select and double-click write() from the method selection window.**  
The *write* method box appears in the Business Rules Designer canvas. The FileClient\_1.write rule is added to the Business Rules tree.
- 11 **Click Save All to save your current changes.**

The completed jcdUpdate Collaboration definition appears as follows:



## jcdUpdate Collaboration Java Code

The completed Java source code for the jcdUpdate Collaboration appears as follows:

```
package prjOracle_JCD;

public class jcdUpdate
{
    public com.stc.codegen.logger.Logger logger;

    public com.stc.codegen.alerter.Alerter alerter;

    public com.stc.codegen.util.CollaborationContext collabContext;

    public com.stc.codegen.util.TypeConverter typeConverter;

    public void receive( com.stc.connector.appconn.file.FileTextMessage input, otdOracle.OtdOracleOTD otdOracle_1, com.
        throws Throwable
    {
        FileClient_1.setText( "Update the Rate and Last_update fields .. " );
        FileClient_1.write();
        otdOracle_1.getDB_EMPLOYEE().update( input.getText() );
        while (otdOracle_1.getDB_EMPLOYEE().next()) {
            otdOracle_1.getDB_EMPLOYEE().setRATE( (new Double( "888" )).doubleValue() );
            otdOracle_1.getDB_EMPLOYEE().setLAST_UPDATE( java.sql.Date.valueOf( "2008-08-08" ) );
            otdOracle_1.getDB_EMPLOYEE().updateRow();
        }
        FileClient_1.setText( "Done Update." );
        FileClient_1.write();
    }
}
```

---

**Note** – The above code has been wrapped for display purposes.

---

## Next Steps

For your next step, see [“Creating the Connectivity Maps”](#) on page 44.

# Creating the Connectivity Maps

Connectivity Maps provide the canvas for assembling and configuring a Project's components. The Sun Adapter for Oracle Projects use five Connectivity Maps, one for each Collaboration.

Creating a Connectivity Map involves three processes:

- Adding Connectivity Maps to a Project
- Populating the Connectivity map with the required components

- Binding the Connectivity Map Collaboration or BPEL Process to the External Applications

The Connectivity Map Designer includes a Connectivity Map Generator. The Connectivity Map Generator can read the Collaboration Definition or Business Process, and can automatically populate the Connectivity map with the necessary components, and bind the components. We will use the Connectivity Map Generator for this sample project.

This section contains the following topics:

- [“Adding Connectivity Maps to a Project” on page 45](#)
- [“Populating and Binding the Connectivity Maps using the Connectivity Map Generator” on page 45](#)

## Adding Connectivity Maps to a Project

The Oracle Project uses five Connectivity Maps.

### ▼ Add the Connectivity Maps to the Project

- 1 From the NetBeans IDE Projects window, right-click your project and select **New** → **Connectivity Map** from the popup menu.

The new Connectivity Map appears and adds a node on the Project tree labeled CMap1.

- 2 Rename the new Connectivity Map to `cmDelete`.
- 3 Repeat this process to create the other four Connectivity Maps for your project substituting the following names:
  - `cmInsert`
  - `cmPsSelect`
  - `cmTableSelect`
  - `cmUpdate`

## Populating and Binding the Connectivity Maps using the Connectivity Map Generator

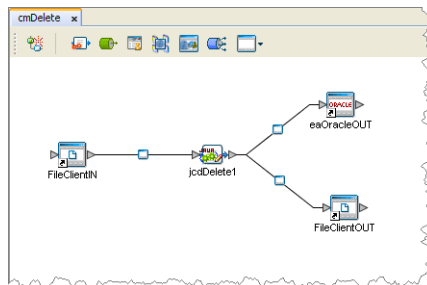
In a Connectivity Map, Adapters are associated with External Applications. For example, to establish a connection to an external Oracle server, you must first select the `OracleExternal` Application to use in the Connectivity Map. Along with the External Applications, Connectivity Maps also contain Services, Queues, Topics, Web Service External Applications, and so forth. Once the Connectivity Map contains the Collaboration or Business Process and the other components, you can bind the components to create the appropriate connections.

This process can be done manually by dragging the necessary components to the Connectivity Map canvas and binding the components, or you can use the Connectivity Map Generator. The connectivity Map Generator uses the information contained in the Java Collaboration Definition or Business Process, and assembles the Connectivity Map automatically.

**Note** – The following steps walk you through populating the Connectivity Maps for the the prjOracle\_JCD Project. These steps are the same for the prjOracle\_BPEL Project. Simply substitute the appropriate Business Processes with the corresponding Java Collaborations, such as *bpDelete* for *jcdDelete*.

### ▼ Populate the Connectivity Maps using the Connectivity Map Generator.

- 1 From the Project tree, double-click the cmDelete node to open the cmDelete Connectivity Map.
- 2 Drag the jcdDelete Java Collaboration onto the Connectivity Map canvas.
- 3 From the Connectivity Map toolbar, click the Connectivity Map Generation button.  
The Connectivity Map Generator assembles the Connectivity Map.



In the Connectivity Map, the nodes in the connections between the Collaboration and the External Applications represent the application adapters. The adapters are highlighted in red in the new Connectivity Map to indicate that the Connectivity Map properties have not been set.

- 4 Save your current changes and click the X on the cmDelete tab to close the cmDelete Connectivity Map.
- 5 Repeat these steps to populate and bind the other four Connectivity Maps as follows:
  - Generate the cmInsert using the jcdInsert Collaboration
  - Generate the cmPsSelect using the jcdPsSelect Collaboration
  - Generate the cmTableSelect using the jcdTableSelect Collaboration
  - Generate the cmUpdate using the jcdUpdate Collaboration

**Next Steps** For your next step, see [“Creating an Environment” on page 47](#).

## Creating an Environment

Environments include the External Systems, Logical Hosts, Application Servers, and Message Servers used by a project and contain the configuration information for these components.

### ▼ Create the Environment

- 1 From the NetBeans IDE Services window, right-click Caps Environment and select New Environment from the popup menu. Rename the new Environment to envOracleProj.**  
A new environment is added to the Services tree.
- 2 Rename the new Environment to envOracleProj.**
- 3 Right-click envOracleProj and select New → Oracle External System. Name the Oracle External System esOracle.**
- 4 Right-click envOracleProj and select New → File External System. Name the File External System esFileClient.**
- 5 Right-click envOracleProj and select New → Logical Host.**  
LogicalHost1 is added to the Services tree.
- 6 Right-click LogicalHost1 and select New → Sun Java System Application Server.**  
A new Application Server is added to the tree under LogicalHost1 .
- 7 Save your changes.**

**Next Steps** For your next step, see [“Configuring the Adapter Properties” on page 47](#).

## Configuring the Adapter Properties

The Oracle sample Project contains several Adapters, each represented in the Connectivity Maps as a node between an External Application and a Service. The Adapters facilitate the communication and movement of data between external applications and the Sun Enterprise Service Bus system. These Adapters must be configured for your system.

Adapter properties must be configured in both the Connectivity Maps and the Environment.

- “Configuring the Connectivity Map Properties” on page 48
- “Configuring the Environment Properties” on page 49

## Configuring the Connectivity Map Properties

Connectivity Map properties are configured from each of the Connectivity Maps. These properties are specific to each of the configured Adapters, unlike the Environment properties which contain common properties for each Adapter type.

### ▼ Configure the Connectivity Map Properties

- 1 **Open a Connectivity Map, and double-click the adapter to open the Properties Editor to that adapter's property sheet. For example, open the cmDelete Connectivity Map and double-click the inbound File Adapter (the node between the File1 External Application and the cmDelete\_jcdDelete1 service).**

The Properties Editor open to the selected Adapter's property sheet.

- 2 **From the Properties Editor, edit the values of the appropriate properties for your system.**
- 3 **Once you are done editing the property values for that Adapter, click OK to save the current properties.**
- 4 **Repeat this procedure to edit all of your Connectivity Map properties.**

### File1 Inbound Adapter Properties

Enter the following values for the File1 Adapters.

Connectivity Map	Property Name	Required Value
cmDelete	Input file name	TriggerDelete.in
cmInsert	Input file name	TriggerBpInsert.in
cmPsSelect	Input file name	TriggerPsSelect.in
cmTableSelect	Input file name	TriggerTableSelect.in
cmUpdate	Input file name	TriggerUpdate.in

### File2 Outbound Adapter Properties

Enter the following values for the outbound File2 Adapters.



Connectivity Map	Property Name	Required Value
cmDelete	Output file name	JCD_Delete_output%d.dat (for JCD Sample)
		BPEL_Delete_output%d.dat (for BPEL Sample)
cmInsert	Output file name	JCD_Insert_output%d.dat (for JCD Sample)
		BPEL_Insert_output%d.dat (for BPEL Sample)
cmPsSelect	Output file name	JCD_PsSelect_output%d.dat (JCD Sample)
		BPEL_PsSelect_output%d.dat (for BPEL Sample)
cmTableSelect	Output file name	JCD_TableSelect_output%d.dat.in (for JCD Sample)
		BPEL_TableSelect_output%d.dat.in (for BPEL Sample)
cmUpdate	Output file name	JCD_Update_output%d.dat (for JCD Sample)
		BPEL_Update_output%d.dat (for BPEL Sample)

## Oracle1 Outbound Adapter Properties

When you double-click the Oracle1 Outbound Adapter, the Adapter Connections dialog box appears. Choose an Adapter connection for your project (for this sample select Outbound Oracle Adapter). When the Properties Editor for the Oracle1 Outbound Adapter opens, click OK to save the default settings.

## Configuring the Environment Properties

Environment properties are configured from the Services tree of the NetBeans IDE Services window.

### ▼ Configure the Environment Properties

- 1 From the Services tree in the NetBeans IDE Services window, expand the CAPS Environments → envOracleProj nodes
- 2 Double-click an Adapter to open the Properties Editor to the Adapter's Environment properties sheet.
- 3 Edit the property values for your system. Once you are done, click OK to save the current properties.
- 4 Repeat this procedure to edit all of your Environment properties.

## File Adapter Environment Properties

Enter the following values for the File Adapters.

Section	Property Name	Required Value
Configuration → Inbound File Adapter → Parameter Settings	Directory	Enter the directory that contains the input files (trigger files included in the sample Project). Trigger files: <ul style="list-style-type: none"> <li>▪ TriggerDelete.in.~in</li> <li>▪ TriggerInsert.in.~in</li> <li>▪ TriggerPsSelect.in.~in</li> <li>▪ TriggerTableSelect.in.~in</li> <li>▪ TriggerUpdate.in.~in</li> </ul>
Configuration → Outbound File Adapter → Parameter Settings	Directory	Enter the directory where output files are written. For the JCD sample Project, the output files are: <ul style="list-style-type: none"> <li>▪ JCD_Delete_output0.dat</li> <li>▪ JCD_Insert_output0.dat</li> <li>▪ JCD_PsSelect_output0.dat</li> <li>▪ JCD_TableSelect_output0.dat</li> <li>▪ JCD_Update_output0.dat</li> </ul> For the BPEL sample Project, the output files are: <ul style="list-style-type: none"> <li>▪ BPEL_Delete_output0.dat</li> <li>▪ BPEL_Insert_output0.dat</li> <li>▪ BPEL_PsSelect_output0.dat</li> <li>▪ BPEL_TableSelect_output0.dat</li> <li>▪ BPEL_Update_output0.dat</li> </ul>

## Oracle Adapter Environment Properties

Enter the following values for the outbound Oracle Adapters.

Section	Property Name	Required Value
Configuration → Outbound Oracle Adapter → JDBC Connector settings.	ServerName	Enter the host name of the database server being used.
	DatabaseName	Enter the name of the particular database that is being used on the server.
	User	Enter the user account name for the database.
	Password	Enter the user account password for the database.

## What's the Next Step?

For your next step, see [“Creating the Deployment Profile” on page 51.](#)

# Creating the Deployment Profile

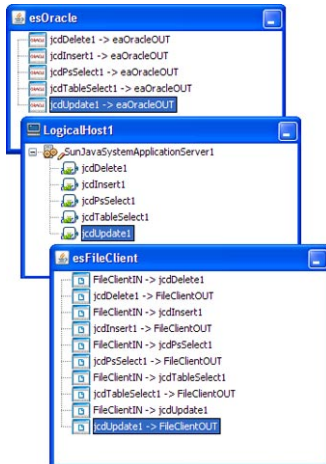
A Deployment Profile is used to assign Collaborations or Business Processes and message destinations to the Sun Java System Application (GlassFish) Server and message server. Deployment Profiles are created using the Deployment Editor.

## ▼ Create the Deployment Profile

- 1 From the NetBeans IDE Projects window, right-click the project and select New → Deployment Profile from the popup menu.**
- 2 Enter a name for the Deployment Profile (dpOracleJCD for the JCD project, or dpOracleBPEL for the BPEL project). Click OK.**  
The Deployment Editor opens.
- 3 From the Deployment Editor, click the Automap button.**  
The Project's components are automatically mapped to their respective system windows.

**Note** – If any of your Project components do not successfully map to an external system, open each of your Adapter's configuration properties (Connectivity Map and Environment) and click OK to close and save the current configuration, then click Automap again.

The image below displays the Deployment Profile for the JCD sample Project.



#### 4 Save your project.

**Next Steps** For your next step, see “Building and Deploying the Project” on page 52.

## Building and Deploying the Project

The Build process compiles and validates the Project's Java files and creates the project EAR file.

This section contains the following topics:

- “Building the Project” on page 52
- “Deploying the Project from NetBeans” on page 53

## Building the Project

You can build the project from the NeBeans IDE or from the Command Line. For this example we are building the project from the Java CAPS Deployment Editor in NetBeans. For more information on building a project, see [Building an Application File](#)

## ▼ Build the Project

- 1 **From the Projects window, double-click your project's Deployment file.**  
The Deployment Editor opens to your project.
- 2 **From the Deployment Editor toolbar, click the `Build` button.**
- 3 **If there are any validation errors, they are displayed in the Validation window at the bottom of the NetBeans IDE. If there are any errors, make corrections to the project, save the project, and click the `Build` button again.**
- 4 **When the build succeeds, save your project.**

## Deploying the Project from NetBeans

You can deploy a Java CAPS project to the Sun Java System Application Server (GlassFish) using NetBeans IDE, Admin Console, Enterprise Manager, or the Command Line. For more information on deploying projects see [Deploying Java CAPS Projects](#).

For this example we will deploy the project from the Java CAPS Deployment Editor in NetBeans.

---

**Note** – When you deploy your project from the NetBeans IDE, you cannot specify a server instance. Therefore, if the domain has multiple server instances, the application is deployed to all of the instances.

---

## ▼ Deploy the Project

- 1 **Open your project in the Deployment Editor.**
- 2 **Ensure that the application server is running.**
- 3 **In the toolbar of the Deployment Profile Editor, click `Deploy`.**

**Next Steps** For your next step, see [“Running the Project” on page 54](#).

## Running the Project

When the project is running, the File Adapter polls the directory every five seconds for the input file name, as defined in the inbound File Adapter properties. The Java Collaboration or Business Process then transforms the data, and the File Adapter sends the output to an output file, as defined in the outbound File Adapter properties. See [“About the Sun Adapter for Oracle Sample Projects” on page 7](#) for more details on the types of output files used in this sample Project.

### ▼ Run the project

- 1 **Rename one of the trigger files included with the sample, from *filename.in.~in* to *filename.in* in the target file, to run the corresponding operation. For example, rename `TriggerDelete.in.~in` to `TriggerDelete.in` to run the *delete file* operation.**

The Where Clause defined in the business rule recognizes the trigger as a placeholder for input, allowing a set condition, such as `emp_no = 100`, to determine the type of output data.

You can modify the following input files to view different output.

- `TriggerTableSelect.in`
- `TriggerDelete.in`
- `TriggerUpdate.in`

Having no content in these files causes the operation to read all records.

- 2 **Verify the output data by viewing the sample output files. The output files may change depending on the number of times you execute the sample Project, the input file, and also the content of your database table.**

## Creating the BPEL-Based Project for the Sun Adapter for Oracle

The BPEL-based project uses Business Processes that rely on Business Process Execution Language (BPEL). This section provides step-by-step instructions for manually creating the `prjOracle_BPEL` sample Project.

The following steps are required to create the project:

- [“Creating a New Project” on page 12](#)
- [“Creating the OTDs” on page 13](#)
- [“Creating the Business Processes” on page 55](#)
- [“Using Business Process Designer to Create Business Rules” on page 61](#)
- [“Creating the Connectivity Maps” on page 44](#)
- [“Creating an Environment” on page 47](#)

- “Configuring the Adapter Properties” on page 47
- “Creating the Deployment Profile” on page 51
- “Building and Deploying the Project” on page 52
- “Running the Project” on page 54

### Next Steps

For your next step, see “Creating a New Project” on page 12.

## Creating the Business Processes

The business process flow contains all the BPEL elements that make up a business process.

This section walks you through creating the project’s five business processes:

- “Create the bpDelete Business Process” on page 55
- “Create the bpInsert Business Process” on page 56
- “Create the bpPsSelect Business Process” on page 57
- “Create the bpTableSelect Business Process” on page 59
- “Create the bpUpdate Business Process” on page 60

### ▼ Create the bpDelete Business Process

- 1 **From the Projects window, right-click your new project and select New → Business Process from the shortcut menu.**

The Business Process Designer opens and BusinessProcess1 is added to the Project Explorer tree.

- 2 **Rename BusinessProcess1 to bpDelete.**
- 3 **From the Projects window, expand CAPS Components Library → Adapters → File → FileClient. Select and drag the FileClient.receive activity from the project tree to the BPEL Designer canvas.**
- 4 **As in step 3, drag the FileClient.write activity from the CAPS Components Library → Adapters → File → FileClient directory to the BPEL Designer canvas, and then drag another FileClient.write activity to the canvas, so that you have two FileClient.write activities in your BPEL process.**
- 5 **From the Projects window, expand prjOracle\_BPEL → otdALL → otdOracle. Select and drag the otdOracle.DB\_EMPLOYEEDelete activity from the project tree to the BPEL Designer canvas.**

6 **Connect the activities in the bpDelete BPEL canvas by dragging your cursor from the output node of one activity to the input node of the next activity, as follows: (See image below for details)**

- Start → FileClient.receive
- FileClient.receive → FileClient.write
- FileClient.write → otdOracle.DB\_EMPLOYEEDelete
- otdOracle.DB\_EMPLOYEEDelete → FileClient.write
- FileClient.write → End



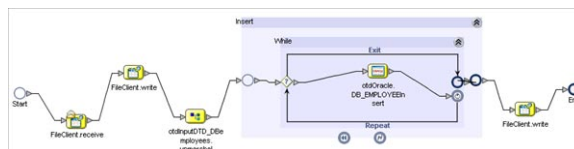
7 **Click Save All to save the latest changes to your project.**

## ▼ Create the bpInsert Business Process

- 1 **From the Projects window, right-click your new project and select New → Business Process from the shortcut menu.**
- 2 **Rename your new business process to bpInsert.**
- 3 **From the Projects window, expand CAPS Components Library → Adapters → File → FileClient. Select and drag the FileClient.receive activity from the project tree to the BPEL Designer canvas.**
- 4 **As in step 3, drag the FileClient.write activity from the CAPS Components Library → Adapters → File → FileClient directory to the BPEL Designer canvas, and then drag another FileClient.write activity to the canvas, so that you have two FileClient.write activities in your BPEL process.**
- 5 **From the Projects window, expand prjOracle\_BPEL → otdALL → otdInputDTD\_DB\_employee. Select and drag the unmarshal activity from the project tree to the BPEL Designer canvas.**
- 6 **Connect the following activities:**
  - Start → FileClient.receive
  - FileClient.receive → FileClient.write
  - FileClient.write → otdInputDTD\_DB\_employee.unmarshal



- 7 Create the Insert Scope with a While statement.
  - a. From the Business Process Designer toolbar, select a Scope element and drag it to the canvas. Double-click the Scope element to expand the element.
  - b. Rename the Scope element to Insert.
  - c. From the Business Process Designer toolbar, select a While element and drag it into the expanded Scope element box on the canvas. Double-click the While element to expand the element.
  - d. From the Projects window, expand prjOracle\_BPEL → otdALL → otdOracle. Select and drag the otdOracle.DB\_EMPLOYEEInsert activity from the project tree into the expanded While element box on the BPEL Designer canvas.
  - e. Connect the following elements: (See image below for details)
    - otdInputDTD\_DB\_employee.unmarshal → Scope element input node
    - Scope element input node → While element input node
    - While element input node → otdOracle.DB\_EMPLOYEEInsert
    - otdOracle.DB\_EMPLOYEEInsert → While element output node
    - While element output node → Scope element output node
    - Scope element output node → FileClient.write
    - FileClient.write → End



- 8 Click Save All to save the latest changes to your project.

## ▼ Create the bpPsSelect Business Process

- 1 From the Projects window, right-click your new project and select New → Business Process from the shortcut menu.
- 2 Rename your new business process to bpPsSelect.
- 3 Add the following activities to the bpPsSelect Business Process canvas.
  - FileClient.Receive (CAPS Components Library → Adapters → File → FileClient)

- FileClient.Write
- FileClient.Write
- Select\_psPSSelectAll (prjOracle\_BPEL → otdALL → otdOracle)

**4 Connect the following activities:**

- Start → FileClient.receive
- FileClient.receive → FileClient.write
- FileClient.write → otdOracle.Select\_psPSSelectAll

**5 Create the Decision.**

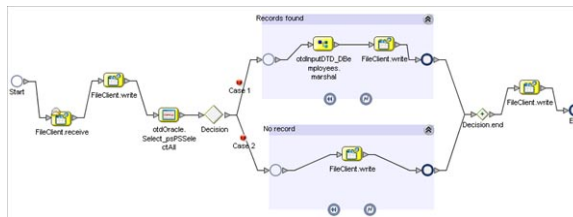
- a. **From the Business Process Designer toolbar, select a Branching Activity → Decision element and drag it to the canvas. This adds a Decision and Decision.end element to the canvas.**
- b. **From the Business Process Designer toolbar, select a Scope element and drag it to the canvas. Double-click the Scope element to expand the element.**
- c. **Rename the Scope element to Records found.**
- d. **From the Projects window, expand prjOracle\_BPEL → otdALL → otdInputDTD\_DB\_employee. Select and drag the marshal activity from the project tree into the expanded Records found element box on the BPEL Designer canvas.**
- e. **From the Projects window, select and drag the FileClient.write activity from the project tree into the expanded Records found element box on the BPEL Designer canvas.**
- f. **Connect the following elements: (See image below for details)**
  - otdOracle.Select\_psPSSelectAll → Decision element input node
  - Decision element → Records found input node
  - Records element input node → otdInputDTD\_DB\_employee.marshal
  - otdInputDTD\_DB\_employee.marshal → FileClient.write
  - FileClient.write → Records found element output node
  - Records found element output node → Decision.end
- g. **From the Business Process Designer toolbar, select another Scope element and drag it to the canvas. Double-click the Scope element to expand the element.**
- h. **Rename the Scope element to No Record.**
- i. **From the Projects window, select and drag the FileClient.write activity from the project tree into the expanded No Record element box on the BPEL Designer canvas.**

**j. Connect the following elements: (See image below for details)**

- otdOracle.Select\_psPSSelectAll → Decision element input node
- Decision element → No Record input node
- No Record input node → FileClient.write
- FileClient.write → No Record element output node
- No Record element output node → Decision.end

**6 Connect the following elements:**

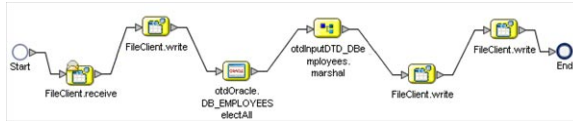
- Decision.end → FileClient.write
- FileClient.write → End



## ▼ Create the bpTableSelect Business Process

- 1 From the Projects window, right-click your new project and select New → Business Process from the shortcut menu.
- 2 Rename your new business process to bpTableSelect.
- 3 Add the following activities to the bpTableSelect Business Process canvas.
  - FileClient.Receive (CAPS Components Library → Adapters → File → FileClient)
  - FileClient.Write
  - FileClient.Write
  - FileClient.Write
  - DB\_EMPLOYEESelectAll (prjOracle\_BPEL → otdALL → otdOracle)
  - marshal (prjOracle\_BPEL → otdALL → otdInputDTD\_DB\_employee)
- 4 Connect the following activities: (See image below for details)
  - Start → FileClient.receive
  - FileClient.receive → FileClient.write
  - FileClient.write → otdOracle.DB\_EMPLOYEESelectAll
  - otdOracle.DB\_EMPLOYEESelectAll → otdInputDTD\_DB\_employee.marshall
  - otdInputDTD\_DB\_employee.marshall → FileClient.write

- FileClient.write → FileClient.write
- FileClient.write → End



## ▼ Create the bpUpdate Business Process

- 1 From the Projects window, right-click your new project and select New → Business Process from the shortcut menu.
- 2 Rename your new business process to bpUpdate.
- 3 Add the following activities to the bpTableSelect Business Process canvas.
  - FileClient.Receive (CAPS Components Library → Adapters → File → FileClient)
  - FileClient.Write
  - FileClient.Write
  - DB\_EMPLOYEUpdate (prjOracle\_BPEL → otdALL → otdOracle)
- 4 Connect the following activities: (See image below for details)
  - Start → FileClient.receive
  - FileClient.receive → FileClient.write
  - FileClient.write → otdOracle.DB\_EMPLOYEUpdate
  - otdOracle.DB\_EMPLOYEUpdate → FileClient.write
  - FileClient.write → End



- 5 Save your project.

**Next Steps** For your next step, see “Using Business Process Designer to Create Business Rules” on page 61.

# Using Business Process Designer to Create Business Rules

Business Rules, created between the Business Process Activities, allow you to configure the relationships between the input and output Attributes of the Activities using the Business Process Designer's Business Rule Designer.

This section walks you through creating the project's five business processes:

- “Creating the bpDelete Business Rules” on page 61
- “Creating the bpInsert Business Rules” on page 63
- “Creating the bpPsSelect Business Rules” on page 67
- “Creating the bpTableSelect Business Rules” on page 71
- “Creating the bpUpdate Business Rules” on page 73

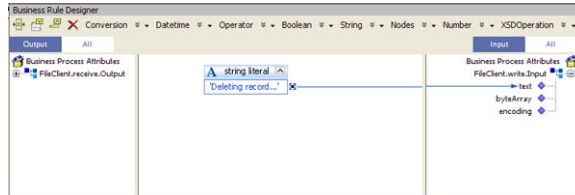
## Creating the bpDelete Business Rules

The bpDelete business process describes how to delete a record in the Oracle database using the Business Process Designer.

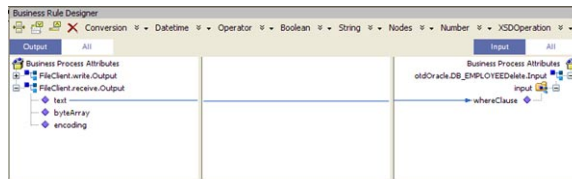
### ▼ Create the bpDelete Business Rules

- 1 **Double-click bpDelete in the Projects window to open the Business Process Designer to the bpDelete Business Process.**
- 2 **Create the bpDelete FileClient.receive → FileClient.write rule.**
  - a. **Right-click the link between FileClient.receive and FileClient.write and select Add Business Rule from the popup menu.**  
A Business Rule icon is added to the link.
  - b. **Double-click the Business Rule icon.**  
The Business Rule Designer opens to the new Business Rule.
  - c. **From the Business Rule Designer toolbar String menu, select string literal.**  
A *string literal* method box is added to the Business Rule Designer canvas.
  - d. **Double-click the *string literal* method box value field, and enter Deleting record... as the value.**
  - e. **Map the Deleting record... output node of the *string literal* method box, to text under FileClient.write.Input in the Input pane (right pane) of the Business Rule Designer. To**

**do this, click on the Deleting record... output node of the *string literal* method box, and drag your cursor to the text node under FileClient.write.Input in the Input pane of the Business Rule Designer.**



- 3 **Create the bpDelete FileClient.write → otdOracle.DB\_EMPLOYEEDelete rule.**
  - a. **Add a Business Rule to the link between FileClient.write and otdOracle.DB\_EMPLOYEEDelete and double-click the new Business Rule icon.**  
The Business Rule Designer opens to the new Business Rule.
  - b. **Map text under FileClient.receive.Output in the Output pane of the Business Rule Designer, to whereClause under otdOracle.DB\_EMPLOYEEDelete.Input → input in the Input pane of the Business Rule Designer.**  
A visible link now connects the two nodes in the Business Rule Designer.



- 4 **Create the otdOracle.DB\_EMPLOYEEDelete → bpDelete FileClient.write rule.**
  - a. **Add a Business Rule to the link between otdOracle.DB\_EMPLOYEEDelete and bpDelete FileClient.write and double-click the new Business Rule icon.**  
The Business Rule Designer opens to the new Business Rule.
  - b. **From the Business Rule Designer toolbar String menu, select string literal.**  
A *string literal* method box is added to the Business Rule Designer canvas.
  - c. **Double-click the *string literal* method box value field, and enter Delete done... as the value.**
  - d. **Map the Delete done... output node of the *string literal* method box, to text under FileClient.write.Input1 in the Input pane of the Business Rule Designer.**

- 5 Save your project.

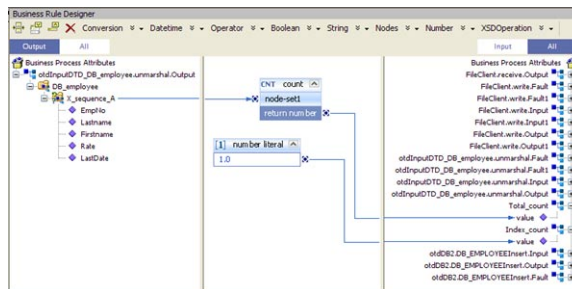
## Creating the bpInsert Business Rules

The bpInsert Business Process implements the Input Operation to read the TriggerInsert.in file. It then unmarshals data from the input data into the otdInputDTD\_DBEmployees OTD, calls the otdOracle, and inserts records into the database, and writes a message to confirm an inserted record.

### ▼ Create the bpInsert Business Rules

- 1 Double-click bpInsert in the Projects window to open the Business Process Designer to the bpInsert Business Process.
- 2 Create the bpInsert FileClient.receive → FileClient.write rule.
  - a. Add a Business Rule to the link between FileClient.receive and FileClient.write and double-click the new Business Rule icon to open the Business Rule Designer.
  - b. From the Business Rule Designer toolbar String menu, select string literal.
  - c. Enter Inserting records into db\_employee table. . as the String value in the string literal method box.
  - d. Map the Inserting records into db\_employee table. . output node of the string literal method box, to text under FileClient.write.input in the Input pane (right pane) of the Business Rule Designer.
- 3 Create the bpDelete FileClient.write → otdInputDTD\_DB\_employee.unmarshal rule.
  - a. Add a Business Rule to the link between FileClient.write and otdInputDTD\_DB\_employee.unmarshal and double-click the new Business Rule icon. The Business Rule Designer opens to the new Business Rule.
  - b. Map text under FileClient.receive.Output in the Output pane of the Business Rule Designer, to contents under otdInputDTD\_DB\_employee.unmarshal.Input in the Input pane of the Business Rule Designer.
- 4 Create the otdInputDTD\_DB\_employee.unmarshal → Insert (Scope) element rule.
  - a. Add a Business Rule to the link between otdInputDTD\_DB\_employee.unmarshal and the Insert (Scope) element and double-click the new Business Rule icon. The Business Rule Designer opens to the new Business Rule.

- b. From the Business Rule Designer toolbar Nodes menu, select `count`.  
A `count` method box is added to the Business Rule Designer canvas.
- c. Map the `X_sequence_A` under `otdInputDTD_DB_employee.unmarshal.Output` → `DB_employee` in the Output pane of the Business Rule Designer, to the node-`set1` input node of the `count` method box.
- d. Map the `return number` output node of the `count` method box, to `value` under `Total_count` in the Input pane of the Business Rule Designer.
- e. From the Business Rule Designer toolbar Number menu, select `number literal`.  
A `number literal` method box is added to the Business Rule Designer canvas.
- f. Double-click the `number literal` method box `value` field, and enter `1.0` as the value.
- g. Map the `1.0` output node of the `number literal` method box, to `value` under `Index_count` in the Input pane of the Business Rule Designer.



## 5 Create the

`X_sequence_A[number(getContainerData('Index_count'. 'value'. '/value'))]` predicate for the DTD.

- a. Right-click `otdInputDTD_DB_employee.unmarshal.Output` → `DB_employee` → `x_sequence_A`, and select **New Predicate** from the popup menu.  
The Predicate window appears
- b. From the Predicate window's Number menu, select `number`.  
A `number` method box is added to the Predicate window canvas.
- c. Map `value` under `Index_count` in the Business Process Attributes pane of the Predicate window, to the `object1?` input node of the `number` method box.



d. **Map the Return Number output node of the *number* method box, to Result in the right pane of the Predicate window.**

e. **Click OK.**

The `X_sequence_A[number(getContainerData('Index_count'. 'value'. '/value'))]` predicate is added to the Output pane of the Business Rule Designer under `otdInputDTD_DB_employee.unmarshal.Output → DB_employee`.

6 **Create the `While → otdOracle.DB_EMPLOYEEInsert` rule.**

a. **Add a Business Rule to the link between `While` input node and the `otdOracle.DB_EMPLOYEEInsert` and double-click the new Business Rule icon.**

b. **From the Business Rule Designer toolbar Number menu, select Settings.**  
The Method Palette appears.

c. **From the Method Palette, click the Number tab and select the `number` option. Click Close.**  
The `number` option is added to the Number menu.

d. **From the Business Rule Designer toolbar Number menu, select `number`.**  
A *number* method box is added to the canvas.

e. **Map `EmpNo` under `otdInputDTD_DB_employee.unmarshal.Output → DB_employee → X_sequence_A[number(getContainerData('Index_count'. 'value'. '/value'))]` in the Output pane of the Business Rule Designer, to the `object1?` input node of the *number* method box.**

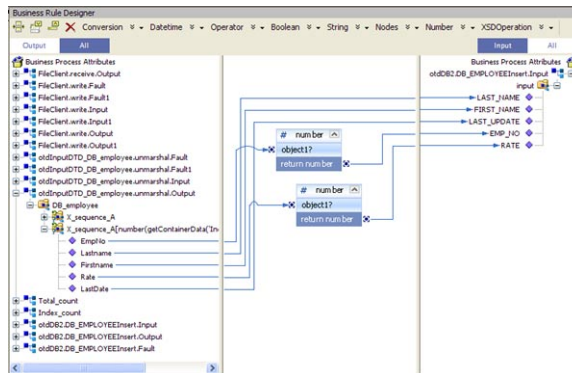
f. **Map the return number output node of the *number* method box, to `EMP_NO` under `otdOracle.DB_EMPLOYEEInsert.Input → input` in the Input pane of the Business Rule Designer.**

g. **From the Business Rule Designer toolbar Number menu, select `number` to add another *number* method box.**

h. **Map `Rate` under `otdInputDTD_DB_employee.unmarshal.Output → DB_employee → X_sequence_A[number(getContainerData('Index_count'. 'value'. '/value'))]` in the Output pane of the Business Rule Designer, to the `object1?` input node of the *number* method box.**

i. **Map the return number output node of the *number* method box, to `RATE` under `otdOracle.DB_EMPLOYEEInsert.Input → input` in the Input pane of the Business Rule Designer.**

- j. **Map** Lastname **under** `otdInputDTD_DB_employee.unmarshal.Output → DB_employee → X_sequence_A[number(getContainerData('Index_count'.value.'/value'))]` **in the Output pane of the Business Rule Designer, to** LAST\_NAME **under** `otdOracle.DB_EMPLOYEEInsert.Input → input` **in the Input pane of the Business Rule Designer.**
- k. **Map** Firstname **under** `otdInputDTD_DB_employee.unmarshal.Output → DB_employee → X_sequence_A[number(getContainerData('Index_count'.value.'/value'))]` **in the Output pane of the Business Rule Designer, to** FIRST\_NAME **under** `otdOracle.DB_EMPLOYEEInsert.Input → input` **in the Input pane of the Business Rule Designer.**
- l. **Map** LastDate **under** `otdInputDTD_DB_employee.unmarshal.Output → DB_employee → X_sequence_A[number(getContainerData('Index_count'.value.'/value'))]` **in the Output pane of the Business Rule Designer, to** LAST\_UPDATE **under** `otdOracle.DB_EMPLOYEEInsert.Input → input` **in the Input pane of the Business Rule Designer.**



- 7 Create the `otdOracle.DB_EMPLOYEEInsert → While` rule.
- Add a Business Rule to the link between the `otdOracle.DB_EMPLOYEEInsert` activity and the `While` output node and double-click the new Business Rule icon.
  - From the Business Rule Designer toolbar Operator menu, select addition.  
An *addition* method box is added to the canvas.
  - Map value under `Index_count` in the Output pane of the Business Rule Designer, to the `number1` input node of the *addition* method box.
  - Double-click the `number2` field of the *addition* method box and enter a value of `1.0`

- e. **Map the return number output node of the *addition* method box, to value under Index-count in the Input pane of the Business Rule Designer.**
- 8 **Create the Insert → FileClient.write rule.**
    - a. **Add a Business Rule to the link between the Insert output node and FileClient.write and double-click the new Business Rule icon.**
    - b. **From the Business Rule Designer toolbar String menu, select string literal.**
    - c. **Enter Insert Done as the String value.**
    - d. **Map the Insert Done output node of the *string literal* method box, to text under FileClient.write.Input1 in the Input pane of the Business Rule Designer.**

## Creating the bpPsSelect Business Rules

The bpPsSelect business process describes how to use a Prepared Statement query to select all records in the Oracle database via the Business Process Designer.

### ▼ Create the bpPsSelect Business Rules

- 1 **Double-click bpPsSelect in the Projects window to open the Business Process Designer to the bpPsSelect Business Process.**
- 2 **Create the bpPsSelect FileClient.receive → FileClient.write rule.**
  - a. **Add a Business Rule to the link between FileClient.receive and FileClient.write and double-click the new Business Rule icon to open the Business Rule Designer.**
  - b. **From the Business Rule Designer toolbar String menu, select string literal.**
  - c. **Enter Selecting record(s) from db\_employee table via Prepared Statement select... as the String value in the *string literal* method box.**
  - d. **Map the Selecting record(s) from db\_employee table via Prepared Statement select... output node of the *string literal* method box, to text under FileClient.write.input in the Input pane (right pane) of the Business Rule Designer.**

- 3 **Create the `FileClient.write → otdOracle.Select_psPSSelectAll` rule.**

  - a. **Add a Business Rule to the link between `FileClient.write` and `otdOracle.Select_psPSSelectAll` and double-click the new Business Rule icon to open the Business Rule Designer.**
  - b. **From the Business Rule Designer toolbar Number menu, select `number literal`.**
  - c. **Enter `0.0` as the number value.**
  - d. **Map the `0.0` output node of the *number literal* method box, to `EMP_NO` under `otdOracle.Select_psPSSelectAll.Input → input` in the Input pane of the Business Rule Designer.**

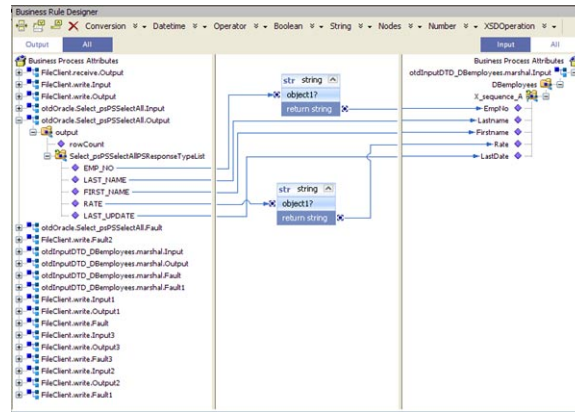
- 4 **Create the `Records found → otdInputDTD_DBemployees.marshal` rule in Case 1 of the Decision branching activity.**

  - a. **Add a Business Rule to the link between the `Records found` input node and `otdInputDTD_DBemployees.marshal` and double-click the new Business Rule icon to open the Business Rule Designer.**
  - b. **From the Business Rule Designer String menu, select `String`.**

If `String` is not available from the String menu, click `Settings` on the String menu to open the Method Palette, and select `String` as an option from the String tab. This will add `String` to the String menu
  - c. **Map `EMP_NO` under `otdOracle.Select_psPSSelectAll.Output → output → Select_psPSSelectAllPSResponseTypeList` in the Output pane of the Business Rule Designer, to the `object1?` input node of the *String* method box.**
  - d. **Map the `return string` output node of the *String* method box, to `EmpNo` under `otdInputDTD_DBemployees.marshal.Input → DBemployees → X_sequence_A` in the Input pane of the Business Rule Designer**
  - e. **From the Business Rule Designer String menu, select `String` to add another *String* method box.**
  - f. **Map `RATE` under `otdOracle.Select_psPSSelectAll.Output → output → Select_psPSSelectAllPSResponseTypeList` in the Output pane of the Business Rule Designer, to the `object1?` input node of the *String* method box.**
  - g. **Map the `return string` output node of the *String* method box, to `Rate` under `otdInputDTD_DBemployees.marshal.Input → DBemployees → X_sequence_A` in the Input pane of the Business Rule Designer**

h. Map the nodes in the Output pane of the Business Rule Designer, to their corresponding nodes under `otdInputDTD_DBEmployees.marshal.Input` → `DBEmployees` → `X_sequence_A` in the Input pane, as follows:

- `LAST_NAME` → Lastname
- `FIRST_NAME` → Firstname
- `LAST_UPDATE` → LastDate



- 5 Create the `otdInputDTD_DBEmployees.marshal` → `FileClient.write` rule in Case 1 of the Decision branching activity.
  - a. Add a Business Rule to the link between `otdInputDTD_DBEmployees.marshal` and `FileClient.write` within the Records found element, and double-click the new Business Rule icon to open the Business Rule Designer.
  - b. Map contents under `otdInputDTD_DBEmployee.marshal.Output`, in the Output pane of the Business Rule Designer, to text under `FileClient.write.Input3` in the Input pane of the Business Rule Designer.
- 6 Create the `Norecord` → `FileClient.write` rule in Case 2 of the Decision branching activity.
  - a. Add a Business Rule to the link between `No record input node` and `FileClient.write` within the Records found element, and double-click the new Business Rule icon to open the Business Rule Designer.
  - b. From the Business Rule Designer toolbar String menu, select `string literal`.
  - c. Enter `Records Not Found` as the String value in the *string literal* method box.

- d. **Map the Records Not Found output node of the *string literal* method box, to text under `FileClient.write.Input2` in the Input pane (right pane) of the Business Rule Designer.**

## 7 Create the Decision Gate Properties for the Decision Case 1 and Case 2.

- a. **Double-click the red Case 1 icon between Decision input node and Records found input node.**

The Decision Gate Properties Editor appears.

- b. **From the Decision Gate Properties Editor toolbar Operator menu, select Settings.**

The Method Palette appears.

- c. **From the Method Palette, click the Operator tab and select the `greater than` option (for Case 1) and select the `lessor or equal` option (for case 2). Click Close.**

The new options are added to the Operator menu.

- d. **From the Decision Gate Properties Editor toolbar Operator menu, select `greater than`.**

The *greater than* method box is added to the editor's canvas.

- e. **Map `rowCount` under `otdOracle.Select_psPSselectAll.Output` → output in the left pane of the Decision Gate Properties Editor, to the `number1` input node of the *greater than* method box.**

- f. **Double-click the `number2` field of the *greater than* method box, and change the value to `0.0`.**

- g. **Map `00` output node of the *greater than* method box, to the Result node in the right pane of the Decision Gate Properties Editor.**

- h. **From the Order of Execution field, select Case 2.**

- i. **From the Decision Gate Properties Editor toolbar Operator menu, select `lessor or equal`.**

The *lessor or equal* method box is added to the editor's canvas.

- j. **Map `rowCount` under `otdOracle.Select_psPSselectAll.Output` → output in the left pane of the Decision Gate Properties Editor, to the `number1` input node of the *lessor or equal* method box.**

- k. **Double-click the `number2` field of the *lessor or equal* method box, and change the value to `0.0`.**

- l. **Map `00` output node of the *lessor or equal* method box, to the Result node in the right pane of the Decision Gate Properties Editor.**

**m. Click OK to close the Decision Gate Properties Editor.**

The Case 1 and 2 icons change from red to green to indicate that the properties have been set.

**8 Create the `Decision.end` → `FileClient.write` rule.**

**a. Add a Business Rule to the link between the `Decision.end` element and `FileClient.write`, and double-click the new Business Rule icon to open the Business Rule Designer.**

**b. From the Business Rule Designer toolbar String menu, select `string literal`.**

**c. Enter `Select Done` as the String value in the *string literal* method box.**

**d. Map the `Select Done` output node of the *string literal* method box, to text under `FileClient.write.Input3` in the Input pane of the Business Rule Designer.**

**9 Save your project.**

## Creating the `bpTableSelect` Business Rules

The `bpTableSelect` business process describes how to select all records the Oracle database using the Business Process Designer.

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**Note** – The where clause in the business rule reads the trigger value as a placeholder for input. This permits you to modify the query to select a specific record. Also note that all records are selected from the database when the `TriggerTableSelect.in` file is empty.

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### ▼ Create the `bpTableSelect` Business Rules

**1 Double-click `bpTableSelect` in the Projects window to open the Business Process Designer to the `bpTableSelect` Business Process.**

**2 Create the `bpTableSelect` `FileClient.receive` → `FileClient.write` rule.**

**a. Add a Business Rule to the link between `FileClient.receive` and `FileClient.write` and double-click the new Business Rule icon to open the Business Rule Designer.**

**b. Create a `string literal` and enter `Selecting record(s) from db_employee table via table select...` as the String value.**

- c. **Map the** `Selecting record(s) from db_employee table via table select...` **output node of the *string literal* method box, to text under `FileClient.write.input` in the Input pane (right pane) of the Business Rule Designer.**
- 3 **Create the `FileClient.write → otOracle.DB_EMPLOYEESelectAll` rule.**
  - a. **Add a Business Rule to the link between `FileClient.write` and `otOracle.DB_EMPLOYEESelectAll` and double-click the new Business Rule icon to open the Business Rule Designer.**
  - b. **Map text under `FileClient.receive.Output` in the Output pane of the Business Rule Designer, to the `whereClause` under `otOracle.DB_EMPLOYEESelectAll.Input` in the Input pane.**
- 4 **Create the `otOracle.DB_EMPLOYEESelectAll → otInputDTD_DBemployees.marshal` rule.**
  - a. **Add a Business Rule to the link between `otOracle.DB_EMPLOYEESelectAll` and `otInputDTD_DBemployees.marshal` and double-click the new Business Rule icon to open the Business Rule Designer.**
  - b. **From the Business Rule Designer String menu, select String.**

If String is not available from the String menu, click Settings on the String menu to open the Method Palette, and select String as an option from the String tab. This will add String to the String menu
  - c. **Map `EMP_NO` under `otOracle.Select_psPSSelectAll.Output → output → DB_EMPLOYEESelectAllTableResponseTypeList` in the Output pane of the Business Rule Designer, to the `object1?` input node of the *String* method box.**
  - d. **Map the `return string` output node of the *String* method box, to `EmpNo` under `otInputDTD_DBemployees.marshal.Input → DBemployees → X_sequence_A` in the Input pane of the Business Rule Designer**
  - e. **From the Business Rule Designer String menu, select String to add another *String* method box.**
  - f. **Map `RATE` under `otOracle.Select_psPSSelectAll.Output → output → DB_EMPLOYEESelectAllTableResponseTypeList` in the Output pane of the Business Rule Designer, to the `object1?` input node of the *String* method box.**
  - g. **Map the `return string` output node of the *String* method box, to `Rate` under `otInputDTD_DBemployees.marshal.Input → DBemployees → X_sequence_A` in the Input pane of the Business Rule Designer**



- h. Map nodes under `otdOracle.Select_psPSSelectAll.Output` → `output` → `DB_EMPLOYEESelectAllTableResponseTypeList` in the **Output pane of the Business Rule Designer**, to the corresponding nodes under `otdInputDTD_DBEmployees.marshal.Input` → `DBEmployees` → `X_sequence_A` in the **Input pane of the Business Rule Designer**, as follows:**
- `LAST_NAME` → `Lastname`
  - `FIRST_NAME` → `Firstname`
  - `LAST_UPDATE` → `LastDate`
- 5 Create the `otdInputDTD_DBEmployees.marshal` → `FileClient.write` rule.**
- a. Add a Business Rule to the link between `otdInputDTD_DBEmployees.marshal` and `FileClient.write`, and double-click the new Business Rule icon to open the Business Rule Designer.**
  - b. Map text under `otdInputDTD_DBEmployees.marshal.Output` in the **Output pane of the Business Rule Designer**, to text under `FileClient.write.Input1` in the **Input pane**.**
- 6 Create the `FileClient.write` → `FileClient.write` rule.**
- a. Add a Business Rule to the link between `FileClient.write` element and `FileClient.write`, and double-click the new Business Rule icon to open the Business Rule Designer.**
  - b. Create a string literal and enter `TableSelect Done...` as the String value.**
  - c. Map the `TableSelect Done...` output node of the *string literal* method box, to text under `FileClient.write.input2` in the **Input pane (right pane) of the Business Rule Designer**.**

## Creating the bpUpdate Business Rules

The bpTableSelect business process describes how to select all records the Oracle database using the Business Process Designer.

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**Note** – The where clause in the business rule reads the trigger value as a placeholder for input. This permits you to modify the query to select a specific record. Also note that all records are selected from the database when the `TriggerTableSelect.in` file is empty.

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## ▼ Create the bpUpdate Business Rules

- 1 **Double-click bpUpdate in the Projects window to open the Business Process Designer to the bpUpdate Business Process.**
- 2 **Create the bpUpdate FileClient.receive → FileClient.write rule.**
  - a. **Add a Business Rule to the link between FileClient.receive and FileClient.write and double-click the new Business Rule icon to open the Business Rule Designer.**
  - b. **Create a string literal and enter Update the Rate and Last\_update fields... as the String value.**
  - c. **Map the Update the Rate and Last\_update fields... output node of the string literal method box, to text under FileClient.write.input in the Input pane (right pane) of the Business Rule Designer.**
- 3 **Create the FileClient.write → otdOracle.DB\_EMPLOYEEUpdate rule.**
  - a. **Add a Business Rule to the link between FileClient.write and otdOracle.DB\_EMPLOYEEUpdate and double-click the new Business Rule icon to open the Business Rule Designer.**
  - b. **Create a string literal and enter today's date as the String value.**
  - c. **Map the today's date output node of the string literal method box, to LAST\_UPDATE under otdOracle.DB\_EMPLOYEEUpdate.Input → insert in the Input pane (right pane) of the Business Rule Designer.**
  - d. **Create another string literal and enter 888as the String value.**
  - e. **Map the 888 output node of the string literal method box, to RATE under otdOracle.DB\_EMPLOYEEUpdate.Input → insert in the Input pane (right pane) of the Business Rule Designer.**
  - f. **Map the text under FileClient.receive.Output1 in the Output pane of the Business Rule Designer, to whereClause under otdOracle.DB\_EMPLOYEEUpdate.Input → insert in the Input pane (right pane) of the Business Rule Designer.**
- 4 **Create the otdOracle.DB\_EMPLOYEEUpdate → FileClient.write rule.**
  - a. **Create a string literal and enter Update Doneas the String value.**

**b. Map the Update Done output node of the *string literal* method box, to text under `FileClient.write.Input1` in the Input pane of the Business Rule Designer.**

**5 Save your Project.**

**Next Steps** For your next step, see [“Creating the Connectivity Maps”](#) on page 44.

