Oracle® BPEL Process Manager for Non-Oracle Application Servers
Installation Guide
10g Release 3 (10.1.3.3) for UNIX and Microsoft Windows
E10538-01

September 2007
## Contents

### Preface

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audience</td>
<td>vii</td>
</tr>
<tr>
<td>Documentation Accessibility</td>
<td>vii</td>
</tr>
<tr>
<td>Related Documentation</td>
<td>viii</td>
</tr>
<tr>
<td>Conventions</td>
<td>viii</td>
</tr>
</tbody>
</table>

### 1 Installing Oracle BPEL Process Manager with the IBM WebSphere Application Server

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview</td>
<td>1-1</td>
</tr>
<tr>
<td>System and Database Requirements</td>
<td>1-2</td>
</tr>
<tr>
<td>Installation and Configuration</td>
<td>1-3</td>
</tr>
<tr>
<td>Step 1: Configure the Oracle Database</td>
<td>1-4</td>
</tr>
<tr>
<td>Step 2: Install Oracle BPEL Process Manager 10.1.3.1.0 for OC4J</td>
<td>1-4</td>
</tr>
<tr>
<td>Step 3: Create the Oracle BPEL Process Manager Schema in the Oracle Database</td>
<td>1-5</td>
</tr>
<tr>
<td>Step 4: Apply SOA Suite Patchset 10.1.3.3 on Oracle BPELPM Standalone 10.1.3.1.0</td>
<td>1-5</td>
</tr>
<tr>
<td>Step 5: Install and Configure IBM WebSphere Application Server Version 6.1.0</td>
<td>1-6</td>
</tr>
<tr>
<td>Upgrade from BPELPM Standalone 10.1.3.1 to 10.1.3.3 on WebSphere Application Server</td>
<td>1-9</td>
</tr>
<tr>
<td>Design-time Deployment Support for BPELPM 10.1.3.1 on WebSphere 6.1.0.3</td>
<td>1-11</td>
</tr>
<tr>
<td>From the BPELPM Developer Prompt Using Ant</td>
<td>1-11</td>
</tr>
<tr>
<td>Prerequisite Checks</td>
<td>1-11</td>
</tr>
<tr>
<td>Steps to Deploy Using the BPELPM Prompt</td>
<td>1-11</td>
</tr>
<tr>
<td>From JDeveloper</td>
<td>1-12</td>
</tr>
<tr>
<td>Prerequisite Checks</td>
<td>1-12</td>
</tr>
<tr>
<td>Steps to Deploy Using JDeveloper</td>
<td>1-13</td>
</tr>
<tr>
<td>Postinstallation Configuration of the IBM WebSphere Application Server</td>
<td>1-14</td>
</tr>
<tr>
<td>Using Messaging Feature</td>
<td>1-14</td>
</tr>
<tr>
<td>Using Application Security</td>
<td>1-15</td>
</tr>
<tr>
<td>Using High Availibility</td>
<td>1-16</td>
</tr>
<tr>
<td>Postinstallation Verification Tasks</td>
<td>1-16</td>
</tr>
<tr>
<td>Verifying Installation from the WebSphere Console</td>
<td>1-17</td>
</tr>
<tr>
<td>Verifying Oracle BPEL Process Manager Console</td>
<td>1-20</td>
</tr>
<tr>
<td>Verifying the SelectAllByTitle Sample for the Database Adapter</td>
<td>1-22</td>
</tr>
<tr>
<td>Verifying the OrderBooking Tutorial Sample</td>
<td>1-22</td>
</tr>
<tr>
<td>Running Adapter Samples</td>
<td>1-24</td>
</tr>
<tr>
<td>Deploying Samples Using Ant</td>
<td>1-24</td>
</tr>
</tbody>
</table>
2 Installing Oracle BPEL Process Manager with the BEA WebLogic Server

Overview .................................................................................................................. 2-1
System and Database Requirements .......................................................................... 2-2
Installation and Configuration ................................................................................ 2-3
   Step 1: Configure the Oracle Database................................................................ 2-3
   Step 2: Install Oracle BPEL Process Manager 10.1.3.1 for OC4J......................... 2-4
   Step 3: Create the Oracle BPEL Process Manager Schema in the Oracle Database 2-4
   Step 4: Apply SOA Suite Patchset 10.1.3.3 on Oracle BPELPM Standalone 10.1.3.1 2-5

Design-time Deployment Support for BPELPM 10.1.3.3 on WebLogic 9.2................. 2-10
   From the BPELPM Developer Prompt Using Ant ............................................. 2-10
      Prerequisite Checks ................................................................................. 2-10
   Steps to Deploy Using the BPELPM Prompt .................................................. 2-10
   From JDeveloper ....................................................................................... 2-11
      Prerequisite Checks ................................................................................. 2-11
   Steps to Deploy Using JDeveloper .............................................................. 2-12

Additional Configuration Steps of the BEA WebLogic Server ................................ 2-12
   Using Application Security ............................................................................. 2-13
   Using High Availability Setup ........................................................................ 2-15
      Prerequisite Checks ................................................................................. 2-15
   Steps to Configure HA for BPELPM ............................................................. 2-15

Postinstallation Verification Tasks ............................................................................ 2-16
   Verifying Installation from the BEA WebLogic Server Console ....................... 2-16
   Verifying Oracle BPEL Process Manager Console ........................................ 2-19
   Verifying the SelectAllByTitle Sample for the Database Adapter .................. 2-21
   Running Adapter Samples ........................................................................... 2-22
      Configuring Outbound Connection Pool for Adapters in Weblogic ............. 2-22
   Deploying Samples Using Ant ...................................................................... 2-23

Auto Loan Demo ................................................................................................... 2-24
   Prerequisites on JDeveloper Studio 10.1.3.3 ................................................. 2-24
   Auto Loan Demo Sample ................................................................................ 2-24
   Modelling Auto Loan Flow Process Using JDeveloper Studio ...................... 2-25
   Known Issues on non-Oracle Platforms ......................................................... 2-25
   Deploying J2EE Applications on WebLogic .................................................. 2-26
3 Installing Oracle BPEL Process Manager with JBoss Application Server

Overview ........................................................................................................................................ 3-1
System and Database Requirements ............................................................................................. 3-2
Installation and Configuration ...................................................................................................... 3-3
  Step 1: Configure the Oracle Database ...................................................................................... 3-3
  Step 2: Install Oracle BPEL Process Manager 10.1.3.1 for OC4J ............................................. 3-4
  Step 3: Create the Oracle BPEL Process Manager Schema in the Oracle Database ................ 3-4
  Step 4: Apply SOA Suite Patchset 10.1.3.3 on Oracle BPELPM Standalone 10.1.3.1 ............... 3-5
  Step 5: Install JBoss Application Server Version and Configure BPELPM Standalone for JBoss... 3-5
Design-time Deployment Support for BPELPM 10.1.3.3 on JBoss Application Server ............ 3-7
  From the BPELPM Developer Prompt Using Ant ........................................................................ 3-8
    Prerequisite Checks .................................................................................................................. 3-8
    Steps to Deploy Using the BPELPM Prompt ............................................................................. 3-8
  From JDeveloper ......................................................................................................................... 3-8
    Prerequisite Checks .................................................................................................................. 3-9
    Steps to Deploy Using JDeveloper .......................................................................................... 3-9
Additional Configuration Steps of the JBoss Application Server ............................................. 3-10
  Using LDAP ................................................................................................................................ 3-10
  Using High Availability Setup .................................................................................................... 3-11
    Prerequisite Checks .................................................................................................................. 3-11
    Steps to Configure HA for BPELPM ......................................................................................... 3-11
Postinstallation Verification Tasks ................................................................................................ 3-12
  Verifying Oracle BPEL Process Manager Console ................................................................. 3-12
  Verifying the SelectAllByTitle Sample for the Database Adapter ............................................ 3-13
  Running Adapter Samples ......................................................................................................... 3-14
    Configuring Outbound Connection Pool for Adapters in JBoss Application Server .... 3-14
  Deploying Samples Using Ant .................................................................................................... 3-15
Auto Loan Demo .......................................................................................................................... 3-15
  Prerequisites on JDeveloper Studio 10.1.3.3 .............................................................................. 3-16
  Auto Loan Demo Sample ............................................................................................................ 3-16
  Modelling Auto Loan Flow Process Using JDeveloper Studio .................................................. 3-17
  Known Issues on non-Oracle Platforms .................................................................................... 3-17
  Deploying J2EE Applications on JBoss ....................................................................................... 3-18
  Running the Sample .................................................................................................................... 3-18

A Configuring BPELPM on WebSphere for Multiple Federated Nodes

Install WebSphere ND 6.1 .............................................................................................................. A-1
BPELPM 10.1.3.3 Configuration on Federated Multi Node environment ..................................... A-2
This guide is the primary source of installation information for Oracle BPEL Process Manager.

This preface contains these topics:

- Audience
- Documentation Accessibility
- Related Documentation
- Conventions

### Audience

*Oracle BPEL Process Manager for Non-Oracle Application Servers Installation Guide* is intended for customers who want to install Oracle BPEL Process Manager.

### Documentation Accessibility

Our goal is to make Oracle products, services, and supporting documentation accessible, with good usability, to the disabled community. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Accessibility standards will continue to evolve over time, and Oracle is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For more information, visit the Oracle Accessibility Program Web site at


#### Accessibility of Code Examples in Documentation

Screen readers may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, some screen readers may not always read a line of text that consists solely of a bracket or brace.

#### Accessibility of Links to External Web Sites in Documentation

This documentation may contain links to Web sites of other companies or organizations that Oracle does not own or control. Oracle neither evaluates nor makes any representations regarding the accessibility of these Web sites.
TTY Access to Oracle Support Services

Oracle provides dedicated Text Telephone (TTY) access to Oracle Support Services within the United States of America 24 hours a day, seven days a week. For TTY support, call 800.446.2398.

Related Documentation

For more information, see these Oracle resources:

- Oracle Application Server Installation Guide for your platform
- Oracle Database Administrator’s Guide

In North America, printed documentation is available for sale in the Oracle Store at

http://oraclestore.oracle.com/

To download free release notes, installation documentation, white papers, or other collateral, please visit the Oracle Technology Network (OTN). You must register online before using OTN; registration is free and can be done at

http://www.oracle.com/technology/membership

If you already have a username and password for OTN, then you can go directly to the documentation section of the OTN Web site at

http://www.oracle.com/technology/documentation

Conventions

The following text conventions are used in this document:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>boldface</td>
<td>Boldface type indicates graphical user interface elements associated</td>
</tr>
<tr>
<td></td>
<td>with an action, or terms defined in text or the glossary.</td>
</tr>
<tr>
<td>italic</td>
<td>Italic type indicates book titles, emphasis, or placeholder variables</td>
</tr>
<tr>
<td></td>
<td>for which you supply particular values.</td>
</tr>
<tr>
<td>monospace</td>
<td>Monospace type indicates commands within a paragraph, URLs, code</td>
</tr>
<tr>
<td></td>
<td>in examples, text that appears on the screen, or text that you enter.</td>
</tr>
</tbody>
</table>
Installing Oracle BPEL Process Manager with the IBM WebSphere Application Server

This chapter provides the requirements and procedures for installing Oracle BPEL Process Manager with IBM WebSphere Application Server.

This chapter contains these topics:

- Overview
- System and Database Requirements
- Installation and Configuration
- Upgrade from BPELPM Standalone 10.1.3.1 to 10.1.3.3 on WebSphere Application Server
- Design-time Deployment Support for BPELPM 10.1.3.1 on WebSphere 6.1.0.3
- Postinstallation Configuration of the IBM WebSphere Application Server
- Postinstallation Verification Tasks
- Auto Loan Demo
- Limitations, Known Issues, Troubleshooting Tips

See Also: The following documentation after completing installation:

- Oracle BPEL Process Manager Quick Start Guide
- Oracle BPEL Process Manager Order Booking Tutorial
- Oracle BPEL Process Manager Developer’s Guide
- Oracle Application Server Adapter for Files, FTP, Databases, and Enterprise Messaging User’s Guide
- Oracle Application Server Adapter Concepts

Overview

You can install and use Oracle BPEL Process Manager with the IBM WebSphere Application Server.

The IBM WebSphere Application Server enables you to set up, operate, and integrate e-business applications across multiple computing platforms using Web technologies. The IBM WebSphere Application Server includes both the run-time components and the tools to develop and design applications.
Oracle BPEL Process Manager provides the infrastructure for creating standards-based business processes, which can span heterogeneous environments, include human intervention, and exhibit efficient asynchronous and synchronous behavior. A key enabler of Service-Oriented Architecture it also provides services that can be used for integration and notifications.

Oracle BPEL Console is the monitoring environment for Oracle BPEL Process Manager. You can run, manage, and test your deployed BPEL process using the Oracle BPEL Console. Oracle BPEL Console provides a Web-based interface for management, administration, and debugging of processes deployed to Oracle BPEL Server.

The Installation of Oracle BPEL Process Manager for IBM WebSphere Application Server consists broadly of the following steps:

- Create the Oracle BPEL Process Manager Schema in the Oracle Database
  This step involves installation of Oracle Database and creation of the required DB schemas for the Dehydration store for BPELPM on Oracle Database.

- Installation of the Oracle BPELPM Standalone 10.1.3.1 for OC4J
  This is the standalone version of BPELPM, which comes with an embedded OC4J J2EE container. Further steps will configure this BPELPM to work on top of the IBM WebSphere Application Server.

- Apply SOA Suite Patchset 10.1.3.3 on BPELPM Standalone 10.1.3.1
  This patchset upgrades the existing 10.1.3.1.0 installation to 10.1.3.3.0.

- Configure BPELPM Standalone on IBM WebSphere Application Server Version 6.1
  This step involves running a command-based script, which will configure the Oracle BPELPM Standalone installed earlier to run on IBM WebSphere Application Server. The script performs the following:
  - Creates application server - oracleBPELServer
  - Configures the oracleBPELServer shared library with Oracle BPELPM Binaries
  - Creates and configures the required dataSources/JMS resources.
  - Deploys the required J2EE applications for BPEL Console, BPEL Administration, and Human WorkFlow.

The above steps, which are further detailed in Section "Installation and Configuration", summarize the installation and configuration of BPELPM on WebSphere 6.1 platform.

System and Database Requirements

Table 1–1 describes the system requirements for using Oracle BPEL Process Manager with the IBM WebSphere Application Server.
Installation and Configuration

This section describes the steps involved in installing and configuring the Oracle Database, creating a schema in the Database, and installing and configuring IBM WebSphere Application Server.

This section contains the following topics:

- **Step 1: Configure the Oracle Database**
- **Step 2: Install Oracle BPEL Process Manager 10.1.3.1.0 for OC4J**
- **Step 3: Create the Oracle BPEL Process Manager Schema in the Oracle Database**
- **Step 4: Apply SOA Suite Patchset 10.1.3.3 on Oracle BPELPM Standalone 10.1.3.1**
- **Step 5: Install and Configure IBM WebSphere Application Server Version 6.1.0**
Step 1: Configure the Oracle Database

Follow these instructions to install Oracle Database 10g.

1. Install Oracle Database 10g 10.1.0.2.
2. Open SQL*Plus and log in as a user with the SYSDBA privilege.
3. Shut down the database:
   ```sql
   SQL> SHUTDOWN IMMEDIATE
   ```
4. Install the Oracle Database 10g 10.1.0.5 patch in the same Oracle home in which you installed Oracle Database 10g.
5. If using Linux only, then log in as the root user and run the following command from the operating system command prompt:
   ```bash
   /etc/init.d/init.cssd stop
   ```
6. Start the database in upgrade mode in SQL*Plus:
   ```sql
   SQL> STARTUP UPGRADE
   ```
7. Run the following script:
   ```sql
   SQL> @ORACLE_HOME/rdbms/admin/catpatch.sql;
   ```
8. Shut down the database:
   ```sql
   SQL> SHUTDOWN IMMEDIATE
   ```
9. Restart the database:
   ```sql
   SQL> STARTUP
   ```
10. Run the following script:
    ```sql
        SQL> @ORACLE_HOME/rdbms/admin/utlrp.sql;
    ```

Step 2: Install Oracle BPEL Process Manager 10.1.3.1.0 for OC4J

This is the standalone version of BPEL. Please note the basic SOA Suite installation cannot be used for this setup. You can download this standalone version of Oracle BPEL Process Manager 10.1.3.1.0 at

You need to install BPEL into its own directory outside of WebSphere. The WebSphere installation will refer to binaries and property files from this installation. This external installation will need to be there permanently, it's not a temporary staging area. Even though it also contains OC4J, you will not be starting and stopping it. This is an important prerequisite prior to the WAS install.

**WARNING:** Do not start Oracle BPEL Server from the Windows Start Menu or by running the Oracle Home\bpel\bin\startorabpel script. These actions are not supported.

### Step 3: Create the Oracle BPEL Process Manager Schema in the Oracle Database

**Note:** The scripts to configure Oracle BPEL Process Manager on the IBM WebSphere Application Server require that the `JAVA_HOME` environment parameter be set prior to running the script.

1. Navigate to the Disk1\install\soa_schemas\irca folder in the BPEL Installation Setup files directory.
2. Set `ORACLE_HOME` to point to the Oracle Database Installation location. For example,
   ```
   set ORACLE_HOME=c:\Oracle10g
   ```
3. Enter `irca bpel`.
   This runs the irca script packaged with the Oracle BPEL Process Manager installation.
4. Enter `sys` password when prompted.
   The `orabpel` schema is loaded on the Oracle Database.

### Step 4: Apply SOA Suite Patchset 10.1.3.3 on Oracle BPELPM Standalone 10.1.3.1

You need to download the SOA Suite patchset 10.1.3.3 from MetaLink and then apply the patchset on BPELPM Standalone 10.1.3.1. Perform the following steps:

1. Log in to OracleMetaLink at [http://metalink.oracle.com](http://metalink.oracle.com). The OracleMetaLink home page is displayed.
2. Click **Patches & Updates**. The Patches & Updates page is displayed.
3. Click **Simple Search**.
4. In the **Search By** field, enter 6148874. The details of the patchset 6148874 are displayed.
5. Follow the instructions in the patchset to install the patchset on the BPELPM Standalone 10.1.3.1.
Step 5: Install and Configure IBM WebSphere Application Server Version 6.1.0

1. Install IBM WebSphere Application Server Network Deployment (ND) version 6.1.0. If installing on Windows, then ensure that you have administrative privileges.

   \textbf{Note:} If installing on Linux, then the WebSphere Application Server should be installed from the root user.

2. Upgrade IBM WebSphere Application Server ND to version 6.1.0.3 by downloading and applying the following fix pack from WebSphere Supplements:
   - Fixpack3 PK33090 (IFIX330906023) on 6.1.0 ND using the UpdateInstaller


   \textbf{Note:}
   - The directory to which you download the Oracle BPEL Process Manager should be the same host on which the IBM WebSphere Application Server ND is installed.
   - Unzip the Installables folder as a non-root user (same user as was used to install Oracle BPEL Process Manager 10.1.3.1.0 for OC4J). For example, Oracle.

4. Start Nodeagent as follows:

   \begin{tabular}{|l|l|}
   \hline
   For... & Run... \\
   \hline
   Windows XP & WAS_HOME\profiles\<ProfileName>\bin\startNode.bat \\
   Linux & WAS_HOME/profiles/<ProfileName>/bin/startNode.sh \\
   \hline
   \end{tabular}

5. Modify the following mandatory installation properties in the Installables\cfg\constants.properties file:

\textbf{Caution:} You should not start/restart the BPELPM instance after applying the patch.
Note: Mandatory properties cannot have a comment tag or contain blank values. Failure to follow this requirement results in errors during installation. Also, ensure that you enter the appropriate information for each of the fields. Any typo will cause errors during installation.

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WAS_HOME</td>
<td>The directory path in which IBM WebSphere Application Server is installed.</td>
</tr>
<tr>
<td>CELL_NAME</td>
<td>Name of the IBM WebSphere Application Server Cell (&lt;host&gt;Node01Cell).</td>
</tr>
<tr>
<td>NODE_NAME</td>
<td>Name of the IBM WebSphere Application Server Node (&lt;host&gt;Node01).</td>
</tr>
<tr>
<td>PROFILE_NAME</td>
<td>Name of the Profile (AppSrv01 by default).</td>
</tr>
<tr>
<td>BPEL_HOME</td>
<td>The directory path in which Oracle BPEL Process Manager is installed.</td>
</tr>
<tr>
<td>BPEL_INSTALL_ROOT</td>
<td>The directory containing the JDK of Oracle BPEL Process Manager. For example, if the Oracle BPEL Process Manager home directory is C:\product\10.1.3.1\OraBPEL_1\bpel, then BPEL_INSTALL_ROOT is typically C:\product.</td>
</tr>
<tr>
<td>SERVER_NAME</td>
<td>The name of the IBM WebSphere Application Server instance that runs Oracle BPEL Process Manager. The default value is oracleBPELServer, but this can be any valid name.</td>
</tr>
<tr>
<td>ORACLE_JDBC_DRIVER_PATH</td>
<td>The JDBC driver path (ojdbc14.jar).</td>
</tr>
<tr>
<td>DRIVER_TYPE</td>
<td>The JDBC driver type (thick or thin).</td>
</tr>
<tr>
<td>HOSTNAME</td>
<td>The name or IP address of the host on which Oracle Database 10g is installed.</td>
</tr>
<tr>
<td>PORTNUMBER</td>
<td>The port number of the host on which Oracle Database 10g is installed.</td>
</tr>
<tr>
<td>SID</td>
<td>The service name of Oracle Database 10g.</td>
</tr>
<tr>
<td>JAASAUTHUSERID</td>
<td>The user name for accessing the Oracle BPEL Process Manager schema.</td>
</tr>
<tr>
<td>JASAUTHPASSWD</td>
<td>The password of the user name for accessing the Oracle BPEL Process Manager schema.</td>
</tr>
<tr>
<td>VHPORTS1</td>
<td>The virtual host or HTTP port number.</td>
</tr>
<tr>
<td>VHPORTS2</td>
<td>The virtual host or HTTP port number.</td>
</tr>
<tr>
<td>ISEMBEDDED</td>
<td>The Boolean value to specify for the messaging type. True - WebSphere Default Messaging False - WebSphere MQ Messaging</td>
</tr>
</tbody>
</table>

6. If you want to use the following optional properties, remove the comment tag from the properties, and then specify values.

Note: Optional properties have the comment tag, by default. If you remove the comment tag for these properties, then they cannot contain blank values. Change the default values for the four properties. Failure to follow this requirement results in errors during installation.
7. If you are using MQ as the messaging middleware, then remove the comment tag and then specify values for the following properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROXYSET</td>
<td>Indicates whether a proxy server is being used (true or false).</td>
</tr>
<tr>
<td>PROXYHOST</td>
<td>The name or IP address of the host on which the proxy server is installed.</td>
</tr>
<tr>
<td>PROXYPOR T</td>
<td>The port your host uses to access the proxy server.</td>
</tr>
<tr>
<td>NONPROXYHOSTS</td>
<td>The addresses for which the proxy server must be bypassed.</td>
</tr>
<tr>
<td>CLUSTER_NAME</td>
<td>Name of the WebSphere cluster for hosting BPEL Server.</td>
</tr>
</tbody>
</table>

Note: MQ properties have a comment tag by default. If you remove the comment tag for these properties, then they cannot contain blank values. Failure to follow this requirement results in errors during installation.

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUEUEMANAGER</td>
<td>The name of the queue manager that provides access to the queues.</td>
</tr>
<tr>
<td>HOST</td>
<td>The name of the host on which the WebSphere MQ queue manager runs.</td>
</tr>
<tr>
<td>PORT</td>
<td>The TCP/IP port number used for connections to the WebSphere MQ queue manager.</td>
</tr>
<tr>
<td>CHANNEL</td>
<td>The name of the channel used for connections to the WebSphere MQ queue manager.</td>
</tr>
<tr>
<td>TRANSPORTTYPE</td>
<td>The communication channel to connect to the queue manager.</td>
</tr>
<tr>
<td>CCSID</td>
<td>The coded character set identifier for use with the WebSphere MQ queue manager.</td>
</tr>
<tr>
<td>INVOKERBASEQUEUENAME</td>
<td>The name of the invoker base queue to which messages are sent.</td>
</tr>
<tr>
<td>WORKERBASEQUEUENAME</td>
<td>The name of the worker base queue to which messages are sent.</td>
</tr>
<tr>
<td>TESTBASEQUEUENAME</td>
<td>The name of the test base queue to which messages are sent.</td>
</tr>
<tr>
<td>NOTIFICATIONBASEQUEUENAME</td>
<td>The name of the notification base queue to which messages are sent.</td>
</tr>
<tr>
<td>ALIAS</td>
<td>The name of the component-managed authentication alias.</td>
</tr>
<tr>
<td>USERNAME</td>
<td>The user name for accessing the queue.</td>
</tr>
<tr>
<td>PASSWORD</td>
<td>The password for the user name.</td>
</tr>
</tbody>
</table>

8. Navigate to Start, Programs, IBM WebSphere, Application Server Network Deployment V6.1, Profiles, Dmgr01, and Start the Deployment Manager to start Deployment Manager.

Deployment Manager is the default IBM WebSphere Application Server instance that runs the WebSphere Administrative Console. This server has to be started
before the user can access the WebSphere Administrative Console at the following URL:

http://hostname:9060/ibm/console

Remain in the Installables\bin directory.

9. Run the following script at the operating system command prompt:

<table>
<thead>
<tr>
<th>For...</th>
<th>Run...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows XP</td>
<td>setup.bat install</td>
</tr>
<tr>
<td>Linux</td>
<td>configureWebsphereAsRoot.sh install as root user (WebSphere Install user)</td>
</tr>
<tr>
<td></td>
<td>configureBPELAsOracleUser.sh install as non-root Oracle BPELPM Install user</td>
</tr>
<tr>
<td>AIX/Solaris</td>
<td>configureWebsphereAsRoot.sh install as root user (WebSphere Install user)</td>
</tr>
<tr>
<td></td>
<td>configureBPELAsOracleUser.sh install as non-root Oracle BPELPM Install user</td>
</tr>
</tbody>
</table>

This creates Oracle BPEL Server on the IBM WebSphere Application Server and configures the required applications, database connections, and adapters.

Installation progress is logged to the Installables\bin\logs\output.log file.

**Note:** Refer to Section , "Limitations, Known Issues, Troubleshooting Tips" for non root Installations of WebSphere Application Server

10. Start and Stop the NodeAgent after the script run is completed.


**Note:** This is required for the domain filter bug fix in IBM WebSphere Application Server.

12. Start Oracle BPEL Server (represented by the name oracleBPELServer) by following the startup instructions in the IBM WebSphere Application Server administration documentation.

**Note:** Do not start Oracle BPEL Server from the Windows Start Menu or by running the Oracle_Home\bipel\bin\startorabpel script. These actions are not supported.
1. Stop all servers (oracleBPELServer, DecisionServer, etc) that are running on the target WebSphere Node.

2. Download and Install SOA Suite PatchSet 10.1.3.3.0 on the BPELP PM 10.1.3.1 Standalone.

**Note:**

- Refer to section Step 4: Apply SOA Suite Patchset 10.1.3.3 on Oracle BPELP M Standalone 10.1.3.1 for PatchSet download instructions.
- Choose the path where BPELP M standalone 10.1.3.1 is installed on the machine as the ORA_HOME for the PatchSet installation.
- If multiple WebSphere Nodes point to a single BPELP M installation on the machine, then this PatchSet needs to be installed only once on BPELP M.
- This PatchSet installation upgrades the binaries under BPEL_HOME, which are referred from BPELP M on WebSphere from 10.1.3.1 to 10.1.3.3 level.

3. Download OraBPELPM_10133_Websphere.zip package for 10.1.3.3 release and extract the zip pack.

4. Update constants.properties at <unzip_path>/Installables/cfg.

5. Change directory to <unzip_path>/Installables/bin and run the script as follows:

<table>
<thead>
<tr>
<th>For</th>
<th>Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows XP</td>
<td>setup.bat upgrade</td>
</tr>
<tr>
<td>Linux</td>
<td>configureWebsphereAsRoot.sh upgrade</td>
</tr>
<tr>
<td></td>
<td>as root user (WebSphere Install user)</td>
</tr>
<tr>
<td></td>
<td>configureBPELAsOracleUser.sh upgrade</td>
</tr>
<tr>
<td></td>
<td>as non-root Oracle BPELP M Install user</td>
</tr>
</tbody>
</table>

6. Verify <unzip_path>/Installables/bin/logs for status.

**Note:**

- Ensure that the CELL_NAME, NODE_NAME, PROFILE_NAME, SERVER_NAME and other attributes in constants.properties point to the BPELP M 10.1.3.1 on WebSphere instance.
- If multiple WebSphere Nodes point to a single BPELP M installation on the machine, then the OraBPELPM_WebSphere's setup upgrade needs to be running for all the nodes.
- If the server oracleBPELServer is part of a WebSphere cluster, then the upgrade script cannot be run against the server. The target server should be removed from the cluster prior to running the script.
Design-time Deployment Support for BPELPM 10.1.3.1 on WebSphere 6.1.0.3

This section describes the various design-time support functions available on WebSphere 6.1.0.3, for the deployment of J2EE applications in JDeveloper. You can deploy BPELPM components on WebSphere 6.1.0.3 by using the following two methods:

- From the BPELPM Developer Prompt Using Ant
- From JDeveloper

From the BPELPM Developer Prompt Using Ant

You can use ant in the BPELPM developer prompt to deploy J2EE applications. This section contains the following topics:

- Prerequisite Checks
- Steps to Deploy Using the BPELPM Prompt

Prerequisite Checks

1. Ensure that bpelPlatform is set to WebSphere_5 in the bpel\system\config\collaxa-config.xml file.
2. Ensure that platform is set to WebSphere_5 in the bpel\utilities\ant-orabpel.properties file.
3. The admin.user property and admin.password property should point to a valid LDAP user if security is ON in the bpel\utilities\ant-orabpel.properties file.

Note: If the admin.user property is not set correctly, then the deployment may throw authentication errors.

Steps to Deploy Using the BPELPM Prompt

Follow these instructions to deploy BPELPM from the developer prompt using ant:

1. Open a BPELPM Developer prompt.
2. Run ant.sh/bat from the Oracle_Home/bpel\system\appserver\oc4j\ant\bin directory of the BPEL application. This runs the build.xml of the BPEL application and performs the following steps:
   a. Compiles and deploys the BPEL process to BPELPM.
   b. Compiles and generates Workflow form WAR files in public_html within the BPEL application directory, but does not deploy on WebSphere.
   c. Compiles and generates UI application EAR files (if any) in the bpel\system\appserver\oc4j\j2ee\home\applications directory, but does not deploy on WebSphere.
   d. Compiles and generates Decision Service (Business Rules) application EAR files in the decisionservices folder within the BPEL application directory, but does not deploy on WebSphere.
3. At the BPELPM Developer prompt, enter the following command:
cd bpel\bin\wsant

4. Follow Steps 5 - 6 for all the applications generated in Steps 2.b, 2.c and 2.d.

5. Edit and update the App.properties file in bpel\bin\wsant directory.

---

**Note:** The app.wsopt attribute should be set to deployws, if the EAR contains any Webservices that need deployment, for example, Decision Service applications. Otherwise, this value should be set to nodeployws.

The SERVER_NAME property should be set to DecisionServer for deploying Decision Service applications (Business Rules applications) and oracleBPELServer for UI or Workflow form Application.

---

6. Run ant.sh/bat from the bpel\bin\wsant directory. This would deploy the application mentioned in the App.properties file on WebSphere.


---

**Note:** Refer to Auto Loan Demo for more details.

---

From JDeveloper

You can also deploy J2EE applications from JDeveloper. This section contains the following topics:

- Prerequisite Checks
- Steps to Deploy Using JDeveloper

Prerequisite Checks

1. Download JDeveloper Studio 10.1.3.1 (jdevstudio10131.zip) from


2. Ensure that bpelPlatform is set to WebSphere_5 in the bpel\system\config\collaxa-config.xml file.

3. Ensure that platform is set to WebSphere_5 in the bpel\utilities\ant-orabpel.properties file.

4. Copy bpm-services.jar from Installables/lib to <jdev_home>\integration\lib.

---

**Note:** The bpm-services.jar contains changes to java-wsdl-mapping and DecisionServiceInfoTemplate, which are required for DecisionServices to run on WebSphere.

---

5. The admin.user property and admin.password property should point to a valid LDAP user if security is ON in the bpel\utilities\ant-orabpel.properties file.

6. Create an application server connection of the Standalone OC4J 10.1.3 type.
7. Create an Integration Server connection to **hostname:9700**.

**Steps to Deploy Using JDeveloper**

Follow these instructions to deploy BPELPM from the developer prompt using ant:

1. From JDeveloper, right-click and deploy the BPEL application into the required domain. This runs the build.xml file of the BPEL application and performs the following steps:
   a. Compiles and deploys the BPEL process to BPELPM.
   b. Compiles and generates Workflow form WAR files in `public_html` within the BPEL application directory but does not deploy on WebSphere.
   c. Compiles and generates UI application EAR files (if any) in the `bpel\system\apps\oc4j\j2ee\home\applications` directory but does not deploy on WebSphere.
   d. Compiles and generates Decision Service (Business Rules) application EAR files in the `decisionservices` folder within the BPEL application directory but does not deploy on WebSphere.

   **Note:** This EAR file contains an `application.xml` file, with a `<description>` tag. This tag is not supported by WebSphere, which may lead to deployment errors. As a workaround for this issue, ensure to remove the `<description>` tag from the `application.xml` file manually before deploying it into WebSphere.

   Oracle is working to provide a fix in a future patch, which will be available from MetaLink.

2. Import the following files from `bpel\bin\wsant` into the Resources section of the JDeveloper project.

3. Follow Steps 4 - 5 for all the applications generated in Steps 1.b, 1.c and 1.d.

4. Edit and update the `App.properties` file in the `bpel\bin\wsant` directory.

   **Note:** The `app.wsopt` attribute should be set to `deployws`, if the EAR contains any Web services that need deployment, for example, Decision Service applications. Otherwise, this value should be set to `nodeployws`.

   The `SERVER_NAME` should be set to `DecisionServer` for deploying Decision Service Applications (Business Rules Applications) and `oracleBPELServer` for UI or Workflow form Application.

5. Right-click and run the `bpel\bin\wsant\build.xml` file. This would deploy the application mentioned in the `App.properties` file on WebSphere.

Postinstallation Configuration of the IBM WebSphere Application Server

You can perform the following postinstallation steps for configuring IBM WebSphere Application Server:

- Using Messaging Feature
- Using Application Security
- Using High Availability

Using Messaging Feature

While configuring Oracle BPEL Process Manager on the IBM WebSphere Application Server, you can use either the default messaging feature of WebSphere or the external MQ for JMS feature:

- To use default messaging, set the `ISEMBEDDED` property to `true` in the `constants.properties` configuration file. The queue connection factories and queues required for Oracle BPEL Process Manager are created under Queue Connection Factories in the WebSphere Administrative Console.

- To use external MQ for JMS, set the `ISEMBEDDED` property to `false` in the `constants.properties` configuration file. The queue connection factories and queues required for Oracle BPEL Process Manager are created under Queue Connection Factories in the WebSphere Administrative Console.

If you change the `ISEMBEDDED` setting after running the setup script, then you must manually delete several configuration properties.

1. If the message middleware type changes as described below, then perform the following changes:

<table>
<thead>
<tr>
<th>If the Messaging Middleware is Changed From...</th>
<th>Go to the WebSphere Console and Perform the Following Tasks...</th>
</tr>
</thead>
<tbody>
<tr>
<td>External MQ for JMS to Default</td>
<td>Delete the following:</td>
</tr>
<tr>
<td></td>
<td>1. BPELInvokerQueueFactory, BPELWorkerQueueFactory, BPELTstQueueFactory, and BPELNotificationSenderQueueFactory under WebSphere MQ Queue Connection Factories.</td>
</tr>
<tr>
<td></td>
<td>2. BPELInvokerQueue, BPELWorkerQueue, BPELTstQueue, and BPELNotificationSenderQueue under WebSphere MQ Queue Destinations.</td>
</tr>
</tbody>
</table>
2. If you manually install any new adapters, add the directory path of the adapter JAR file to the shared libraries classpath in the WebSphere Administrative Console under Environment, Shared Libraries, and orabpel_sl.

You must perform this action only for adapters you intend to use with Oracle BPEL Process Manager.

3. Change the default values configured by the setup script for the adapter J2C connection factories to values suitable to your environment in the WebSphere Administrative Console under Resources, Resource Adapters, adapter_type, and J2C Connection Factories.

The J2C connection factories are created for the resource adapters. These adapters are created and configured as follows:

- Resource adapters (file, FTP, and so on) are created using the JACL script.
- J2C connection factories are created for each resource adapter.

To connect to the suitable resource, the server uses the J2C connection factories. For example, you create a J2C connection factory with the following attributes for the database adapter:

- Name of BPELSamples
- JNDI name of eis\DB\BPELSamples
- Connection string of jdbc:oracle:thin:@localhost:1521:orcl

This connection string is automatically configured to use the default values as mentioned earlier. You must change the string to point to a proper database (if it is different from the default value) under Resources, Resource Adapters, adapter_type, J2C Connection Factories before using the database adapter.

4. Change the default value of none for the adapter J2C connection factories authentication alias to a value suitable to your environment.

### Using Application Security

This section describes different methods to set up Application Security using External LDAP Store for WebSphere Application Server ND. The various methods used to set up Application Security are:

- Using Script
Edit SecConfig.properties and the values of the following mandatory fields:
LDAPServerId
LDAPPassword
LDAPServerType
LDAPHostName
LDAPPort
LDAPBaseDN
LDAPBindDN
LDAPBindPassword
LDAPPrimaryAdminId

Run the setupSecurity.bat/sh from <INSTALL_HOME>.

This script enables the application and administrative security for WebSphere and configures the provided LDAP store as the User Registry for authentication.

This script logs its errors at <INSTALL_HOME>/logs/security.log

Manually using WebSphere Security Configuration Wizard

- Select Enable Security, and then Click Next.
- Select Standalone LDAP Registry, and then click Next.
- Provide all required LDAP server and bootstrap user information, and then click Next.
- Review summary information, and then click Finish.
- Restart Deployment Manager and OracleBPELServer.
- After restart the IBM Admin console would require a valid LDAP user name/password for login.

Using High Availilability

Refer to Appendix A, "Configuring BPELP on WebSphere for Multiple Federated Nodes".

Postinstallation Verification Tasks

This section describes the postinstallation verification tasks to be performed, and it contains the following topics:

- Verifying Installation from the WebSphere Console
- Verifying Oracle BPEL Process Manager Console
- Verifying the SelectAllByTitle Sample for the Database Adapter
- Verifying the OrderBooking Tutorial Sample
- Running Adapter Samples
- Deploying Samples Using Ant
Verifying Installation from the WebSphere Console

1. Log in to the WebSphere Console and verify that oracleBPELServer is installed under Servers, Application Servers.

2. Verify that the orabpel_sl shared library has been created under Environment, Shared Libraries.
3. Verify that BPELDataSourceProvider and BPELXADataSourceProvider are created for oracleBPELServer under Resources, JDBC, JDBC Providers.
4. Test the database connectivity of the created data sources under Resources, JDBC, Data Sources, BPELDataSourceProvider and Resources, JDBC Providers, BPELXADataSourceProvider.
5. Verify that the CollaxaWebApplications and BPELServices application enterprise archives (EARs) are installed under Applications, Enterprise Applications.

Verifying Oracle BPEL Process Manager Console

Perform the following steps to check if the Oracle BPEL Process Manager Console has started:

1. Navigate to http://localhost:9700/BPELConsole/ (Or to the location where the software is installed, for example, http://<machine-name>:9700/BPELConsole/. The Oracle BPEL Process Manager Console window is displayed.
2. Log in using the user-id as configured in the security settings step in "Using Application Security".
Verifying the SelectAllByTitle Sample for the Database Adapter

1. Log in to the database and start SQL*Plus.
2. Run the setup.sql script:

   SQL> @Oracle_Home/samples/tutorials/122.DBAdapter/sql/setup.sql;

   This script creates and populates the movies table in the database.
3. Point the database adapter to your database in the WebSphere Console under Resources, Resource Adapters, DB Adapter, J2C Connection Factories, BPEL Samples, Custom Properties, Connection String.
4. Select Start, All Programs, Oracle - Oracle_Home, Oracle BPEL Process Manager, Developer Prompt.
5. Change to the following directory:

   tutorials\122.DBAdapter\SelectAllByTitle
6. Run the following command:

   ant

   This compiles and deploys all projects dependent on this tutorial. Projects are deployed into Oracle_Home\bpel\domains\domain_name\deploy.
7. Select Start, All Programs, Oracle - Oracle_Home, Oracle BPEL Process Manager, BPEL Console.
8. Click SelectAllByTitle in the Deployed BPEL Processes list.
9. Enter the movie title on the Initiate page.
10. Click Post XML Message.
11. View the results and inspect the instance.

Verifying the OrderBooking Tutorial Sample

The Web application DTD link in the web.xml files included with Oracle BPEL Process Manager must be modified before deployment to the IBM WebSphere Application Server.

1. Search for the web.xml files in the Oracle_Home\bpel\samples directory.
2. Make the following change in each web.xml file related to the sample to run:

   Change:

   http://java.sun.com/j2ee/dtds/web-app_2_3.dtd

   To:

   http://java.sun.com/dtd/web-app_2_3.dtd
3. Select Start, All Programs, Oracle - Oracle_Home, Oracle BPEL Process Manager, Developer Prompt.
4. Change directories to the following:

   tutorials\127.OrderBookingTutorial
5. Start SQL*Plus and run the following script:

   SQL> @PracticeFiles/insertTable.sql;
This creates the required sample tables in the database.

6. Run the following command:
   
   ```
   ant
   ```

   This compiles and deploys all projects dependent upon this tutorial. Projects are deployed into `Oracle_Home\bpe\domains\domain_name\deploy`.

   However, EAR files for CreateOrderBookingUI and SelectManufacturingUI must be manually deployed into the IBM WebSphere Application Server.

7. Change to the `PriceQuote\CreateOrderBookingUI` directory.

8. Note the `CreateOrderBookingUI.ear` file that was created when you ran `ant` in Step 6.

9. Select **Install Application** in the WebSphere Administrative Console to deploy the `CreateOrderBookingUI.ear` file to the IBM WebSphere Application Server.

Access the WebSphere Administrative Console at the following URL:

   ```
   http://hostname:9060/ibm/console
   ```

10. Select **oracleBPELServer** as the deployment target.

11. Repeat Steps 8 through 10 for the `war` or `ear` file.

12. Run the following OrderBooking Tutorial steps:

   a. You can use the BatchOrderProcessing process to trigger the process using the File Read adapter. Copy the practicefiles\OrderBookingPO_*.xml to `\temp` and observe the File Read adapter trigger the process.

   b. Open the console in audit or flow mode. Follow the steps that appear on the console and click task links to complete the task.

   **Note:** The process halts in the parallel flow, awaiting input from a manual pricequote from one of the vendors. To access the vendor UI page, open the following URL in a browser:

   ```
   http://localhost:9700/SelectManufacturingUI.
   ```

   c. After the process moves beyond supplier selection, the human workflow is added, for manual user approval (or rejection). This process has a timeout of 5 minutes and defaults to order status is rejected. Follow this step by opening the worklist URL at

   ```
   http://localhost:9700/integration/worklistapp/Login
   ```

   d. Log in as jcooper/welcome, and you will be presented with a list of tasks. Acquire the task first, then view it, and approve or reject the task. Then, logout of the jcooper page.

   Log in as jstein/welcome and you will be presented with a list of Approved tasks only. View it, and approve or reject it. Then, logout of the jstein page. This completes the human workflow part of the process. You can return to main process to audit the process.

   e. To run the process in batch mode with file read, copy the provided practice files\OrderBookingPO_*.xml in the `\temp` directory, and observe the batch process read the file and process it.
13. Restart oracleBPELSERVER from the IBM console.

Running Adapter Samples

Ensure that the J2C connection factory properties shown in Table 1–2 are modified.

| Table 1–2  J2C Connection Factory Properties |
|-------------|------------------|
| Adapter Type | Properties              |
| Database     | ■ driverClassName   |
|              | ■ connectionString  |
| FTP          | ■ host              |
|              | ■ port              |
| Note: A new authentication alias must be created for connecting to the FTP server. |
| Applications | ■ connectionString  |
|              | ■ userName          |
|              | ■ password          |
| AQ           | ■ connectionString  |
|              | ■ userName          |
|              | ■ password          |
| JMS          | ■ connectionFactoryLocation |
|              | ■ isTopic           |
|              | ■ isTransacted      |
| Note: The isTopic property must be set to false for queues. The isTransacted property must be set to false for the JMS samples to run. |
| MQ           | ■ channelName       |
|              | ■ portNumber        |
|              | ■ queueManagerName  |
|              | ■ hostName          |

Deploying Samples Using Ant

Ensure that admin.user and admin.password in BPEL_HOME\bpel\utilities\ant-orabpel.properties are updated with the credentials of a valid user from the authentication store setup for authentication.

Samples can be deployed from the developer prompt using the ant script following the above step.

The samples containing only BPEL processes can be fully deployed using the ant script.

Samples containing additional components such as Decision Service applications, workflow forms, and UI applications need to be deployed in the following manner.

1. Use the ant script to deploy the BPEL process of the sample.
2. For each Decision Service application, manually edit the jsps and the decisionservice.xml file to replace the variables for domain, host the port as required. Generate the war or ear file, and deploy into DecisionServer. Start the application.
3. For each workflow form application, generate the war or ear file, and deploy into oracleBPELServer. Start the Application.

4. For each UI Application, manually edit the doApply.jsp to replace the variables for domain, host the port as required. Generate the war or ear file, and deploy into oracleBPELServer. Start the application.

Auto Loan Demo

This section describes how to run Auto Loan Demo on BPELPM 10.1.3.3 on WebSphere 6.1. It contains these sections:

- Prerequisites on JDeveloper Studio 10.1.3.3
- Auto Loan Demo Sample
- Modelling Auto Loan Flow Process Using JDeveloper Studio
- Known Issues on non-Oracle Platforms
- Deploying J2EE Applications on WebSphere
- Running the Sample

Prerequisites on JDeveloper Studio 10.1.3.3

The following one-time changes should be performed on JDeveloper:

1. Replace the bpm-services.jar within JDeveloper at jdev\integration\lib with the updated jar from BPEL_HOME\system\services\lib

2. Replace the orabpel-ant.jar within JDeveloper at jdev\integration\lib with the updated jar from BPEL_HOME\lib.

3. Modify the following properties in jdev\integration\bpel\utilities\ant-orabpel.properties file:
   - Platform to websphere_5
   - admin.user to a valid user in WebSphere realm
   - admin.password to the password of the above user
   - jndi.url to iiop://<hostname>:@<Boot_strap_port>

   **Note:** The Boot Strap_port to use above can be obtained from IBM admin console under oracleBPELServer -> Ports -> BOOTSTRAP_ADDRESS.

   jndi.InitialContextFactory to com.ibm.websphere.naming.WsnInitialContextFactory

4. On JDeveloper, create an Application Server connection of type “Standalone OC4J 10.1.3”.

5. On JDeveloper, create an Integration Server connection to "<hostname>:9700"

   **Note:** Ignore errors during test connection regarding Mediator at this stage.
Auto Loan Demo Sample

The Auto Loan Flow sample has the following components:

- **BPEL Process: AutoLoanFlow BPEL Process <bpel jar>**
- **Decision Service Applications (Business Rules Applications)**
  - CreditRatingAgent <ear>
  - LoanAdvisorAgent <ear>
- **UI Application: AutoLoanFlowUI <ear>**
- **HWF Tform application: AutoLoanflow LoanApproval <ear>**

Since the AutoLoanFlow sample that is bundled with BPELPM standalone is written for OC4J Application Server, it cannot be run as is on WebSphere Application Server. Specifically, the Decision Service applications need to be regenerated for WebSphere platform, using JDeveloper, as the java-wsdl-mapping file needs WebSphere specific modifications.

The next section describes the steps to regenerate the Decision Services Applications in Auto Loan Flow for WebSphere.

Modelling Auto Loan Flow Process Using JDeveloper Studio

Perform the following steps to modify the AutoLoanFlow sample for WebSphere:

1. Delete the following file from the filesystem:
   ```
   BPEL_HOME\samples\demos\AutoLoanDemo\AutoLoanFlow\bpel\decisionservices.decs
   ```
2. Open the AutoLoanFlow sample from JDeveloper Studio as a JDeveloper project using the following file:
   ```
   BPEL_HOME\samples\demos\AutoLoanDemo\AutoLoanFlow\AutoLoanFlow.jpr
   ```
3. Open the **AutoLoanFlow.bpel** file from the Applications Navigator (found within the AutoLoanFlow project).
4. From the Services swim lane of **AutoLoanFlow.bpel**, delete the following decision service partnerlinks:
   - CreditRatingAgent
   - LoanAdvisorAgent
5. Follow the steps II, III, IV and V of "Modelling Auto Loan Broker Process" from
   ```
   BPEL_HOME\samples\demos\AutoLoanDemo\AutoLoanBroker.pdf
   ```
   to recreate the two Decision Service applications.

Modifying Partnerlink Target URLs

Since the Decision Service applications will be deployed on DecisionServer and it runs on a port (9701 by default) different from oracleBPELServer, the partnerlink bindings to Decision Service from the BPEL Process should be changed to point to the right location.

6. Modify the following in
   ```
   BPEL_HOME\samples\demos\AutoLoanDemo\AutoLoanFlow\bpel\bpel.xml
   ```
   file.
Change the port number to 9701 (or the DecisionServer port) in `decisionServiceDetails` and `wslRuntimeLocation` property values for `CreditRatingAgentPL` and `LoanAdvisorAgentPL` bindings.

**Known Issues on non-Oracle Platforms**

The AutoLoanFlow BPEL process has two Decision Service applications as partnerlinks (CreditRatingAgent and LoanAdvisorAgent). By default, the context-root generated for both these J2EE applications are same with the value `/rules/${domain_id}/${process_id}/${process_revision}`.

The `${}` attributes are replaced by actual values during the build and deploy of the Auto Loan Flow. However, as the context-root is not unique for these two applications, these cannot be deployed on WebSphere. When the second application is deployed/started on WebSphere it would complain that the context-root is already in use.

This is an issue on non-Oracle application servers when a BPEL process references more than one Decision Service partnerlinks generated from JDeveloper Studio. As a workaround, after generating the Decision Service applications on JDeveloper and before doing a build and deploy, perform the following:

7. Modify the `AutoLoanFlow\decisionservices\CreditRatingAgent\ear\META-INF\application.xml` file. Change `<context-root>/rules/${domain_id}/${process_id}/${process_revision}</context-root>` to `<context-root>/rules/${domain_id}/${process_id}/${process_revision}/CreditRatingAgent</context-root>`.

8. Modify the `AutoLoanFlow\decisionservices\CreditRatingAgent\war\WEB-INF\web.xml` file. Change `<url-pattern>CreditRatingAgent</url-pattern>` to `<url-pattern>/</url-pattern>`.

9. Finally, build and deploy the Auto Loan Flow using the Integration Server Connection. In the application navigator, right-click the BPEL project and select Deploy.

This would automatically deploy the BPEL process into BPEL engine running at the Integration Server connection.

The following J2EE applications should be manually deployed into WebSphere using the WebSphere Admin console:

- CreditRatingAgent.ear
- LoanAdvisorAgent.ear
- AutoLoanFlowUI.ear
- `<domain>_AutoLoanFlow_<version>_LoanApproval.ear`

**Deploying J2EE Applications on WebSphere**

Perform the following steps to deploy the applications to WebSphere:

2. Select **Install Enterprise Application**.
3. Navigate to the directory where the target ear file is located on the file system, and select the ear file.
4. In the Select Installation Options page, select the **Deploy Webservices** option.
5. On the Map Modules to Servers page, choose **oracleBPELServer** as the target server when installing AutoLoanFlowUI.ear and LoanApproval.ear.
6. Choose **DecisionLServer** as the target server when installing CreditRatingAgent.ear and LoanAdvisorAgent.ear.
7. Complete deployment with other default values.
8. Start the deployed applications from list of deployments.

**Running the Sample**

When the process is deployed, perform the following steps to test the sample:
1. Open the AutoLoanFlow UI at http://<hostname>:9700/AutoLoanFlowUI.
2. Click the **Initiate New BPEL Loan Flow** link.
3. Accept the default payload and click **Submit Loan Application**.
4. Log in to the worklist at http://<hostname>:9700/integration/worklistapp using jstein/welcome1 as the username and password.
5. Click the Task title (Loan Approval for Irving Stone).
6. Examine the task payload, the credit rating for that loan should be 500 with "Medium" risk and a Credit Max Amount of 50000.0.
   The provider for the Loan Offer should be "Premium Bank" with an APR of 4.0
7. Approve the task.
8. Verify the AutoLoanFlow instance.

**Limitations, Known Issues, Troubleshooting Tips**

This section describes the limitations, known issues, and troubleshooting tips for Oracle BPEL Process Manager 10.1.3.1 on IBM WebSphere Application Server version 6.1.0.3.

**Limitations**

Note the following limitations:

- Decision Service applications should be deployed on the DecisionServer application server that has been created by the setup scripts.

Alternatively, to deploy Decision Service applications on any other application server, ensure that the server references the shared library decsvr_s1 that has been created for DecisionServer.

---

**Note:** Decision Service applications cannot be deployed on **oracleBPELServer** due to JWSiDL incompatibilities between BPELPM and WebSphere.
The BPEL Test page, which runs the JUnit test cases for the BPEL process, cannot run multiple concurrent instances. This is due to the fact that threads that are spawned from JSP pages are unable to access JNDI resources in WebSphere.

**Known Issues**

Note the following known issues:

- The following exception occurs in the SystemOut.log file when starting BPEL processes:

  ```java
  ```

  This can be ignored because it does not affect any functionality.

**Troubleshooting Tips**

The following list explains the errors encountered while installing Oracle BPEL Process Manager with the IBM WebSphere Application Server, and their resolutions:

**Proxy Settings**

When you initiate a BPEL process, you could encounter the WSDL not found error. To resolve this error, ensure that the proxy settings have been configured correctly, as follows:

1. Log in to the IBM Admin console window.
2. Navigate to **Servers, Application Servers**. The Application Servers page is displayed.
3. Click **Java and Process Management, Process Definition, Java Virtual Machine, and Custom Properties**.
4. Verify the values for the following custom properties
   - `http.proxySet`: Set to true if using a proxy server, else false
   - `http.proxyHost`: URL of the proxy server
   - `http.proxyPort`: Port of the proxy server
   - `http.nonProxyHosts`: Pipe(|) separated list of addresses for which proxy will be bypassed.
5. Restart the **oracleBPELServer**, if you change any of these properties.

**Sudo Access (Linux only)**

IBM WebSphere Application Server 6.1.0.3 should be installed as root (using sudo access).

Also, the sudo password should be provided, when prompted, while you run the `Installables\bin\setup.sh` file.

**J_security Servlet Not Found**

When you log in to BPELConsole, you may encounter the J_security servlet not found error. This indicates that the application security has not been enabled for form-based authentication.

To enable security, follow these steps:

1. Log in to the IBM Admin console window.
2. Navigate to **Servers**, and **Secure administration, applications, and infrastructure**. The Secure, administration, applications, and infrastructure page is displayed.

3. Click the **Security Configuration Wizard** button, and then follow the steps in the wizard.

If security is not required, then directly access the BPEL Console dashboard using: 

http://hostname:9700/BPELConsole/default/index.jsp

**Business Rules Applications (Decision Service Applications)**

Some Decision Service applications with the Deploy Web services option may fail to install on IBM WebSphere Application Server. This is mainly due to the differences in the JAX-RPC java-wsdl mapping file expected by IBM WebSphere Application Server.

The **java-wsdl** mapping file may need to be regenerated using the **java2wsdl** emitter in IBM WebSphere Application Server.

**Note:** Refer to


**Deployment of BPEL Processes Using Ant/Obant Scripts**

If the deployment of BPEL processes fail, then verify the following attributes set in the `bpel\utilities\ant-orabpel.properties` file:

- **Platform**: This should be set to `websphere_5`.
- **admin.user, admin.password**: These should be the credentials of a valid user from the User Account Repository(this applies only if Application security is enabled in IBM WebSphere Application Server).

**Note:** The `ant-orabpel.properties` file is the **BPEL_HOME\OraBPEL_1\bpel\utilities** directory.

**Handling Null Pointer Exceptions in JMS Adapter When Using MCF Attributes**

When running any adapter process ensure to remove the ManagedConnectionFactory (MCF) and other associated MCF attributes (within jca:address) from the inbound and outbound service wsdl. These attributes are generated by JDeveloper and are to be used only on OC4J.

If you retain the MCF attributes, it can cause null pointer exception in JMS adapter on MQ. You will encounter similar errors with other adapters too. Hence, it is best practice to remove these MCF attributes when running on WebSphere.

**Installing on Non-root Installations of WebSphere Application Server**

The `configureWebsphereAsRoot.sh` script assumes that WebSphere Application Server is installed as the root user and displays the message - "This script must be executed as ‘root’ user", and exits.

If WebSphere Application Server is installed as a different user, for example `wasUser`, then the script should be modified to remove the check for root user and should be run as `wasUser`.

---

1-30  Oracle BPEL Process Manager for Non-Oracle Application Servers Installation Guide
Perform the following steps to install on non-root installations of WebSphere Application Server:

1. Edit configureWebsphereAsRoot.sh as follows:

```bash
use # to comment out the 'exit' statement after 'echo "This script must be executed as 'root' user."' as shown below

if [ $(whoami) = "root" ]
then
    echo "Executing the script as 'root' user"
else
    echo "This script must be executed as 'root' user."
    #exit
fi
```

2. Run the configureWebsphereAsRoot.sh script as the wasUser user.
Installing Oracle BPEL Process Manager with the BEA WebLogic Server

This chapter provides the requirements and procedures for installing Oracle BPEL Process Manager with BEA WebLogic Server.

This chapter contains these topics:

- **Overview**
- **System and Database Requirements**
- **Installation and Configuration**
- **Design-time Deployment Support for BPELPM 10.1.3.3 on WebLogic 9.2**
- **Additional Configuration Steps of the BEA WebLogic Server**
- **Postinstallation Verification Tasks**
- **Auto Loan Demo**
- **Limitations, Known Issues, Troubleshooting Tips**

**See Also:** The following documentation after completing installation:

- Oracle BPEL Process Manager Quick Start Guide
- Oracle BPEL Process Manager Order Booking Tutorial
- Oracle BPEL Process Manager Developer’s Guide
- Oracle Application Server Adapter for Files, FTP, Databases, and Enterprise Messaging User’s Guide
- Oracle Application Server Adapter Concepts

**Overview**

You can install and use Oracle BPEL Process Manager with the BEA WebLogic Server. The BEA WebLogic Server enables you to set up, operate, and integrate e-business applications across multiple computing platforms using Web technologies. The BEA WebLogic Server includes both the run-time components and the tools to develop and design applications.

Oracle BPEL Process Manager provides the infrastructure for creating standards-based business processes, which can span heterogenous environments, include human intervention, and exhibit efficient asynchronous and synchronous behavior. A key
enabler of Service-Oriented Architecture it also provides services that can be used for integration and notifications.

Oracle BPEL Console is the monitoring environment for Oracle BPEL Process Manager. You can run, manage, and test your deployed BPEL process using the Oracle BPEL Console. Oracle BPEL Console provides a Web-based interface for management, administration, and debugging of processes deployed to Oracle BPEL Server.

The installation of Oracle BPEL Process Manager for WebLogic consists of the following high-level steps:

1. Create the Oracle BPEL Process Manager Schema in the Oracle Database
   This step involves installing Oracle Database and creating the required Database schemas for the Dehydration store for BPELPM on Oracle Database.

2. Installation of the Oracle BPELPM Standalone 10.1.3.1 for OC4J
   This is the standalone version of BPELPM, which comes with an embedded OC4J J2EE container. Further steps will configure this BPELPM to work on WebLogic Application Server.

3. Apply SOA Suite Patchset 10.1.3.3 on BPELPM Standalone 10.1.3.1
   This patchset upgrades the existing 10.1.3.1.0 installation to 10.1.3.3.0

4. Configure BPELPM Standalone on BEA WebLogic Server Version 9.2
   This step involves running a command-based script, which will configure the Oracle BPELPM Standalone installed earlier to run on BEA WebLogic 9.2 server. The script performs the following steps:
   - Create a Weblogic domain called BPELDomain
   - Create an application server called oracleBPELServer within BPELDomain
   - Configure the oracleBPELServer classpath with Oracle BPELPM Binaries
   - Create and configure required DataSources/JMS Resources etc.
   - Deploy the required Applications for BPEL Console, BPEL Administration etc.

   The above steps, which are further detailed in the "Installation and Configuration" section, summarize the installation and configuration of BPELPM on WebLogic 9.2 platform.

### System and Database Requirements

Table 2–1 describes the system requirements for using Oracle BPEL Process Manager with the BEA WebLogic Server.

<table>
<thead>
<tr>
<th>Element</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEA WebLogic Server</td>
<td>Version 9.2</td>
</tr>
<tr>
<td>Oracle BPEL Process Manager for OC4J</td>
<td>Version 10.1.3.1</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Refer to Step 2: Install Oracle BPEL Process Manager 10.1.3.1 for OC4J for installing Oracle BPEL Process Manager for OC4J. Apply SOA Suite patchset 10.1.3.3 on BPELPM Standalone 10.1.3.1.</td>
</tr>
<tr>
<td>Web browsers</td>
<td>Internet Explorer 6.0 or Mozilla Firefox 2.0</td>
</tr>
</tbody>
</table>
Installation and Configuration

This section describes the steps involved in installing and configuring the Oracle Database, creating a schema in the Database, and installing and configuring BEA WebLogic Server.

This section contains the following topics:

- Step 1: Configure the Oracle Database
- Step 2: Install Oracle BPEL Process Manager 10.1.3.1 for OC4J
- Step 3: Create the Oracle BPEL Process Manager Schema in the Oracle Database
- Step 4: Apply SOA Suite Patchset 10.1.3.3 on Oracle BPELPM Standalone 10.1.3.1
- Step 5: Install BEA WebLogic Server Version 9.2 and Configure BPELPM Standalone for WebLogic

**Step 1: Configure the Oracle Database**

Follow these instructions to install Oracle Database 10g.

---

### Table 2–1  (Cont.) Oracle BPEL Process Manager System Requirements

<table>
<thead>
<tr>
<th>Element</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation systems</td>
<td>Microsoft Windows XP, Microsoft Windows 2003, Red Hat Enterprise Linux release 3, and Red Hat Enterprise Linux release 4</td>
</tr>
<tr>
<td>Dehydration store database</td>
<td>Oracle9i (9.2.0.8) or higher</td>
</tr>
<tr>
<td></td>
<td>Oracle Database 10g (10.1.0.5) or higher</td>
</tr>
<tr>
<td></td>
<td>Oracle Database 10g (10.2.0.2) or higher</td>
</tr>
<tr>
<td></td>
<td>Oracle Database 10g Express Edition 10.2.0.1</td>
</tr>
<tr>
<td></td>
<td>Oracle Database 10.1.2.2</td>
</tr>
</tbody>
</table>

**Note:** This certification matrix reflects the Oracle BPELPM certification on Oracle Application Server, and may vary with the application server being used. Confirm the certification matrix of the application server with Oracle Database version.

---

**Note:** Oracle Database Lite is automatically installed with the Oracle BPEL Process Manager for Developers install type described in this chapter. However, you cannot use Oracle Database Lite as the dehydration store.

**Note:** These instructions assume that you have obtained Oracle Database 10g version 10.1.0.2 and Oracle Database 10g Patch version 10.1.0.5.


1. Install Oracle Database 10g 10.1.0.2.
2. Open SQL*Plus and log in as a user with the SYSDBA privilege.
3. Shut down the database:
   
   SQL> SHUTDOWN IMMEDIATE

4. Install the Oracle Database 10g 10.1.0.5 patch in the same Oracle home in which you installed Oracle Database 10g.

5. If using Linux only, then log in as the root user and run the following command from the operating system command prompt:
   
   /etc/init.d/init.cssd stop

6. Start the database in upgrade mode in SQL*Plus:
   
   SQL> STARTUP UPGRADE

7. Run the following script:
   
   SQL> @ORACLE_HOME/rdbms/admin/catpatch.sql;

8. Shut down the database:

   SQL> SHUTDOWN IMMEDIATE

9. Restart the database:

   SQL> STARTUP

10. Run the following script:

    SQL> @ORACLE_HOME/rdbms/admin/utlrp.sql;

Step 2: Install Oracle BPEL Process Manager 10.1.3.1 for OC4J

This is the standalone version of BPEL. Please note the basic SOA Suite installation cannot be used for this setup. You can download this standalone version of Oracle BPEL Process Manager 10.1.3.1 at


---

**Note:** The file names start with soa although it really is a BPEL download file. For example, the name of the Windows download file for Oracle BPEL Process Manager 10.1.3.1 for OC4J appears as soa_windows_x86_bpel_101310.zip.

---

You need to install BPEL into its own directory outside of WebLogic. The WebLogic installation will refer to binaries and property files from this installation. This external installation will need to be there permanently, it's not a temporary staging area. Even though it also contains OC4J, you will not be starting and stopping it. This is an important prerequisite prior to the WebLogic install.

Step 3: Create the Oracle BPEL Process Manager Schema in the Oracle Database

---

**Note:** The scripts to configure Oracle BPEL Process Manager on the BEA WebLogic Server require that the JAVA_HOME environment parameter be set prior to running the script.
1. Navigate to the Disk1\install\soa_schemas\irca folder in the BPEL Installation Setup files directory.

2. Set ORACLE_HOME to point to the Oracle Database Installation location. For example,
   set ORACLE_HOME=c:\Oracle10g

3. Enter irca bpel.
   This runs the irca script packaged with the Oracle BPEL Process Manager installation.

4. Enter sys password when prompted.
   The orabpel schema is loaded on the Oracle Database.

---

**Step 4: Apply SOA Suite Patchset 10.1.3.3 on Oracle BPELPM Standalone 10.1.3.1**

You need to download the SOA Suite patchset 10.1.3.3 from MetaLink and then apply the patchset on BPELPM Standalone 10.1.3.1. Perform the following steps:


2. Click Patches & Updates. The Patches & Updates page is displayed.

3. Click Simple Search.

4. In the Search By field, enter 6148874. The details of the patchset 6148874 are displayed.

5. Follow the instructions in the patchset to install the patchset on the BPELPM Standalone 10.1.3.1.

---

**Caution:** You should not start/restart the BPELPM instance after applying the patch.

---

**Step 5: Install BEA WebLogic Server Version 9.2 and Configure BPELPM Standalone for WebLogic**

**Note:** These instructions assume that you have obtained BEA WebLogic Server version 9.2.

---

1. Install BEA WebLogic Server version 9.2.

**Note:** If installing on Linux, then change the permissions using the command chmod a+x platform921_linux32.bin. Then, run the ./platform921_linux32.bin command.

---

### Note:
- The directory to which you download the Oracle BPEL Process Manager should be the same host on which the BEA WebLogic Server is installed.
- Unzip the `orabpel_10133_weblogic` folder as a non-root user (same user as used to install Oracle BPEL Process Manager 10.1.3.1 for OC4J). For example, `Oracle`.

3. Modify the following mandatory installation properties in the `orabpel_10133_weblogic\bpelDomain.properties` file:

### Note: Mandatory properties cannot have a comment tag or contain blank values. Failure to follow this requirement results in errors during installation. Also, ensure that you enter the appropriate information for each of the fields. Any typo will cause errors during installation.

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEA_HOME</td>
<td>The directory path in which BEA WebLogic Server is installed.</td>
</tr>
<tr>
<td></td>
<td>For example, BEA_HOME=C:\bea.</td>
</tr>
<tr>
<td>BPEL_HOME</td>
<td>The directory path in which Oracle BPEL Process Manager is installed.</td>
</tr>
<tr>
<td></td>
<td>For example, BPEL_HOME=C:\product\10.1.3.1\OraBPEL_1\bpel</td>
</tr>
<tr>
<td>JAVA_HOME</td>
<td>JAVA path of WebLogic.</td>
</tr>
<tr>
<td></td>
<td>For example, JAVA_HOME=C:\bea\jdk150_06</td>
</tr>
<tr>
<td>DOMAIN_HOME</td>
<td>The path for a new WebLogic domain called BPELDomain.</td>
</tr>
<tr>
<td></td>
<td>For example, DOMAIN_HOME=C:\bea\user_projects\domains</td>
</tr>
<tr>
<td>APPS_HOME</td>
<td>The path where applications and adapters will be deployed from.</td>
</tr>
<tr>
<td></td>
<td>For example, APPS_HOME=C:\bea\user_projects\apps</td>
</tr>
<tr>
<td>DRIVER_TYPE</td>
<td>The datasource class that the installable utilizes to create datasources for the oracleBPELServer manager server.</td>
</tr>
<tr>
<td></td>
<td>For example, DRIVER_TYPE=oracle.jdbc.xa.client.OracleXADatasource</td>
</tr>
<tr>
<td>DB_URL</td>
<td>The is the URL to connect to ORABPEL schema.</td>
</tr>
<tr>
<td></td>
<td>For example, DB_URL=jdbc:oracle:thin:stbbn10.us.oracle.com:1521:orcl</td>
</tr>
<tr>
<td>DB_USER</td>
<td>The user Id for ORABPEL schema in database.</td>
</tr>
<tr>
<td></td>
<td>For example, DB_USER=ORABPEL</td>
</tr>
<tr>
<td>DB_PASSWORD</td>
<td>The password for orabpel schema in database.</td>
</tr>
<tr>
<td></td>
<td>For example, DB_PASSWORD=ORABPEL</td>
</tr>
<tr>
<td>BPEL_SERVER_NAME</td>
<td>The server which is created under BPELDomain.</td>
</tr>
<tr>
<td></td>
<td>For example, BPEL_SERVER_NAME=oracleBPELServer</td>
</tr>
<tr>
<td>PROXY_HOST</td>
<td>The Host name of the proxy server.</td>
</tr>
<tr>
<td></td>
<td>For example, PROXY_HOST=www-proxy.us.oracle.com</td>
</tr>
<tr>
<td>PROXY_PORT</td>
<td>The Port where the proxy server is running.</td>
</tr>
<tr>
<td></td>
<td>For example, PROXY_PORT=80</td>
</tr>
</tbody>
</table>
4. Run the following script from orabpel_10133_WebLogic folder at the operating system command prompt:

<table>
<thead>
<tr>
<th>For...</th>
<th>Run...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows XP</td>
<td>setup.bat</td>
</tr>
<tr>
<td>Linux</td>
<td>setup.sh</td>
</tr>
</tbody>
</table>

This script creates the domain folder called BPELDomain in the BEA_HOME\user_projects\domains\ directory, which contains the Admin Server (AdminServer) and Oracle BPEL Server managed server (oracleBPELServer). This configures the required applications, database connections, and adapters.

Note:

- While running the setup.bat or setup.sh file, set the environment variable BEA_HOME to bea folder. For example, C:\bea in Microsoft Windows or \home\userfolder\bea in Linux.

- Based on the BEA_HOME variable value, the setup script assumes the jdk folder name to bejdk150_06 and appends this value to BEA_HOME, sets it to the JAVA_HOME variable, and checks for the path existence in the file structure. For example, JAVA_HOME=BEA_HOME/jdk150_06.

  If JAVA_HOME path does not exist, then setup file throws a message asking to set the JAVA_HOME before running the setup file.

- Based on the BEA_HOME variable value, the setup file assumes the WebLogic folder name is weblogic92 and appends this value to BEA_HOME, sets it to the variable WL_HOME, and checks for the path existence in the file structure. For example, WL_HOME=BEA_HOME\weblogic92.

  If WL_HOME path does not exist, then setup file throws a message asking to set the WL_HOME before running the setup file.

- Setting WL_HOME as environment variable sets the variable WL_JAR_PATH, which contains the following value: WL_HOME\server\lib\weblogic.jar.

  The WL_JAR_PATH is used to load the WebLogic ant task class weblogic.ant.taskdefs.management.WLSTTask.

  The setup script assumes that weblogic.jar is available at WL_HOME\server\lib folder.

5. Start NodeManager as follows:
When you start the node manager, it creates a mapping to the BPEL docmain, which enables you to start and stop `oracleBPELServer` remotely using admin console. You can also start and stop the node manager from the Windows Services by running the `installNodeMngrSvc.cmd` from the `BEA_HOME/weblogic92/server/bin` directory.

6. Start BEA WebLogic Server as follows:

<table>
<thead>
<tr>
<th>For...</th>
<th>Run...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows XP</td>
<td><code>BEA_HOME\user_projects\domains\BPEL_Domain\bin\startWebLogic.cmd</code></td>
</tr>
<tr>
<td>Linux</td>
<td><code>BEA_HOME/user_projects/domains/BPEL_Domain/bin/startWebLogic.sh &amp;</code></td>
</tr>
</tbody>
</table>

This server has to be started before the user can access the BPEL Domain Administrative Console at the following URL:

http://localhost:8001/console

Installation progress is logged to the `WL_Installables\bin\logs\output.log` file.

7. Start the `oracleBPELServer` managed server by following the startup instructions as follows:

a. Log in to `http://localhost:8001/console`, using `weblogic` as the username and password. The BEA WebLogic Server Administrative Console window is displayed.

b. Select **Environment** -> **Servers** -> `oracleBPELServer`. The Settings of `oracleBPELServer` General page is displayed.
c. Click the **Control** tab. The Settings of OracleBPELServer Control page is displayed.

d. In the Server Status pane, select **oracleBPELServer** and click **Start**. The Server Life Cycle Assistant page is displayed.
e. Click Yes. The oracleBPELServer status shows RUNNING in the Server Status pane.

**Note:** Do not start Oracle BPEL Server from the Windows Start Menu or by running the `BPEL_HOME\bpel\bin\startorabpel` script. These actions are not supported.

8. Log in to the BPEL Console at the following URL, using `weblogic` as the username and password:

   `http://localhost:9700/BPELConsole`

### Design-time Deployment Support for BPELPM 10.1.3.3 on WebLogic 9.2

This section describes the various design-time support functions available on BEA WebLogic Server, for the deployment of J2EE applications in JDeveloper. You can deploy BPELPM components on BEA WebLogic Server by using the following two methods:

- From the BPELPM Developer Prompt Using Ant
- From JDeveloper

**From the BPELPM Developer Prompt Using Ant**

You can use `ant` in the BPELPM developer prompt to deploy J2EE applications. This section contains the following topics:

- Prerequisite Checks
- Steps to Deploy Using the BPELPM Prompt

**Prerequisite Checks**

1. Ensure that `bpelPlatform` is set to `weblogic_8` in the `BPEL_HOME\bpel\system\config\collaxa-config.xml` file.

2. Ensure that the following properties are set in `BPEL_HOME\bpel\utilities\ant-orabpel.properties` file:
   - `platform` to `weblogic_8`
   - `admin.user` to valid user in WebLogic realm
   - `admin.password` to the password of the above user
   - `jndi.url` to `t3://<hostname>:9700`
   - `jndi.InitialContextFactory` to `weblogic.jndi.WLInitialContextFactory`

**Note:** If the `admin.user` property is not set correctly, then the deployment may throw authentication errors.

**Steps to Deploy Using the BPELPM Prompt**

Follow these instructions to deploy BPELPM from the developer prompt using `ant`:

1. Open a BPELPM Developer prompt.
2. Run `ant.sh/bat` from the `BPEL_HOME\bpel\system\appserver\oc4j\ant\bin` directory of the BPEL application.

**Note:** For more information, refer to C:\product\10.1.3.1\OraBPEL_OC4J\bpel\GETTING_STARTED.html.

The only exceptions to be noted are as follows:

- If the BPEL Process contains any Decision Service applications, UI applications, or Work Flow applications, then these applications will not be automatically deployed in WebLogic Server by the `ant` script.

- The corresponding EAR/WAR files is custom built for WebLogic platform but need to be manually deployed on the target server `oracleBPELServer`.

- Use Weblogic Admin console (http://<hostname>:8001/console) to deploy the EAR/WAR files to `oracleBPELServer`.

**Note:** Refer to Auto Loan Demo for more details.

**From JDeveloper**

You can also deploy J2EE applications from JDeveloper. This section contains the following topics:

- Prerequisite Checks
- Steps to Deploy Using JDeveloper

**Prerequisite Checks**


2. Copy the `bpm-services.jar` file from the `BPEL_HOME\system\services\lib` directory to `JDEV_HOME\integration\lib` directory.

3. Copy the `orabpel-ant.jar` file from the `BPEL_HOME\lib` directory to the `JDEV_HOME\integration\lib` directory.

4. Ensure that the following properties are set in in `BPEL_HOME\bpel\utilities\ant-orabpel.properties` file: Ensure that `bpelPlatform` is set to `weblogic_8` in the `BPEL_HOME\bpel\system\config\collaxa-config.xml` file.

   - `platform` to `weblogic_8`
   - `admin.user` to valid user in WebLogic realm
   - `admin.password` to the password of the above user
   - `jndi.url` to `t3://<hostname>:9700`
   - `jndi.InitialContextFactory` to `weblogic.jndi.WLInitialContextFactory`
5. In JDeveloper, create an application server connection of the Standalone OC4J 10.1.3 type.

6. In JDeveloper, create an Integration Server connection to **localhost:9700**.

**Steps to Deploy Using JDeveloper**

Follow these instructions to deploy BPELPM from the developer prompt using JDeveloper:

1. From JDeveloper, right-click and deploy the BPEL application into the required domain.

The only exceptions to be noted are as follows:

- If the BPEL Process contains any Decision Service applications, UI applications, or Work Flow applications, then these applications will not be automatically deployed in WebLogic Server by JDeveloper.

- The corresponding EAR/WAR files is custom built for WebLogic platform but need to be manually deployed on the target server **oracleBPELServer** in WebLogic.

- Use Weblogic Admin console (http://<hostname>:8001/console) to deploy the EAR/WAR files to **oracleBPELServer**.

**Note:** Refer to Auto Loan Demo for more details.

**Additional Configuration Steps of the BEA WebLogic Server**

The configuration steps mentioned in this section are optional and you can perform these only if there is a need:

- **Using Application Security**
Using High Availability Setup

Using Application Security
This section describes the following steps to set up application security by using external LDAP store for BEA WebLogic Server 9.2:

- Step 1: Create an Authentication Provider
- Step 2: Configuring LDAP in BEA WebLogic Server

Step 1: Create an Authentication Provider
1. Log in to http://localhost:8001/console, using weblogic as the username and password.
3. Click the Lock & Edit button in the Change Centre pane to activate all the buttons on this page.
4. Click New to create a new authentication provider, for example, LDAP Authenticator. The Create a New Authentication Provider page is displayed.
5. Enter a name of the authentication provider in the Name field (for example, LDAP_1) and select LDAPAuthenticator in the Type drop-down.
6. Click OK. The Authentication Providers table displays the name of the LDAP provider that you created.

Step 2: Configuring LDAP in BEA WebLogic Server
BEA WebLogic Server does not support or certify any particular LDAP server. Any LDAP v2 or v3 compliant LDAP server should work with BEA WebLogic Server. The LDAP authentication providers, in this release of WebLogic Server (v9.2), are configured to work with the SunONE (iPlanet), Active Directory, Open LDAP, and Novell NDS LDAP servers.

You can use an LDAP authentication provider to access other types of LDAP servers. Choose either the LDAP Authentication provider (LDAPAuthenticator) or the existing LDAP provider that most closely matches the new LDAP server and customize the existing configuration to match the directory schema and other attributes for your LDAP server. The server comes with the following authentication providers, which help to configure different LDAP servers:

- iPlanet authentication provider
- Active Directory authentication provider
- Open LDAP authentication provider
- Novell authentication provider
- Generic LDAP authentication provider

If you select the LDAP authentication provider, then every LDAP authentication provider has the following attributes:

- Enable communication between the LDAP server and the LDAP Authentication provider. For a more secure deployment, BEA recommends using the SSL protocol to protect communications between the LDAP server and WebLogic Server. Enable SSL with the SSLEnabled attribute only if the SSL is enabled for LDAP server. This is referenced by the Hostname and Port (default: 389) attributes.
Configure options that control how the LDAP Authentication provider searches the LDAP directory. This is referenced by User name attribute and the Static Group User name attribute.

Specify where in the LDAP directory structure users are located. This is referenced by the User Base DN (Distinguished Name) attribute.

Specify where in the LDAP directory structure groups are located. This is referenced by the Group Base DN attribute.

Define how members of a group are located.

Perform the following steps to configure LDAP in BEA WebLogic Server:

1. Edit the provider-specific attributes of the LDAP authentication provider through the Administration Console.
   a. Log in to http://localhost:8001/console, using weblogic as the username and password.
   b. Select Security Realms -> myrealm -> Providers -> LDAP_1. The Settings of LDAP_1 page is displayed.
   c. Click Provider Specific.
   d. Click the Lock & Edit button in the Change Centre pane to activate all the buttons on this page.
   e. Edit the required attributes in the Provider Specific page.
   f. Click Save.

2. Edit performance options that control the cache for the LDAP server.
   a. Click the Performance tab.
   b. Edit Max Group Hierarchies in Cache. The maximum size of the LRU cache for holding group membership hierarchies if caching is enabled. The default is 100.
   c. Edit Group Hierarchy Cache TTL. The maximum number of seconds a group membership hierarchy entry is valid in the LRU cache. The default is 60.
   d. Click Save.

Failover

You can configure an LDAP provider to work with multiple LDAP servers and enable failover, if one LDAP server is not available. To enable failover, change the Host attribute in the security_realm > Providers > provider_specific page, to contain a list of hostnames and ports, for example, hostname1:389, hostname2:389. When using failover, the Parallel Connect Delay and Connect Timeout attributes have to be set for the LDAP authentication provider:

- **Parallel Connect Delay**: Specifies the number of seconds to delay when making concurrent attempts to connect to multiple servers. An attempt is made to connect to the first server in the list. The next entry in the list is tried only if the attempt to connect to the current host fails. This setting might cause your application to block for an unacceptably long time, if a host is down. If the value is greater than 0, then another connection setup thread is started after the specified number of delay seconds has passed. If the value is 0, then connection attempts are serialized.

- **Connection Timeout**: Specifies the maximum number of seconds to wait for the connection to the LDAP server to be established. If the value is 0, there is no maximum time limit and WebLogic Server waits until the TCP/IP layer times out.
to return a connection failure. Set to a value over 60 seconds depending upon the configuration of TCP/IP.

---

**Note:** After you create the LDAP authentication provider, perform the following changes and restart the servers that are running under BPELDomain:

- Select Security Realms > myrealm > Providers > DefaultAuthenticator and change the Control Flag to SUFFICIENT.
- Select Security Realms > myrealm > Providers > yourLDAPAuthenticator and change the Control Flag to SUFFICIENT.

Users in LDAP server must be inside a BpelGroup group in the LDAP directory. (You should create a BpelGroup group in the LDAP directory and add the desired users to that group, otherwise the LDAP users cannot access applications inside the BPELDomain).

Ensure that admin.user and admin.password in BPEL_HOME\bpel\utilities\ant-orabpel.properties are updated with the credentials of a valid user from the LDAP Authenticator.

For more information, refer to http://e-docs.bea.com/wls/docs92/secmanage/atn.html#wp1198953

---

### Using High Availability Setup

This section describes the High Availability (HA) support available for BPELPM 10.1.3.3 on BEA WebLogic Server 9.2. This section contains the following topics:

- Prerequisite Checks
- Steps to Configure HA for BPELPM

**Prerequisite Checks**

Ensure that HA setup of BPELPM is configured on two nodes on two machines. Let’s assume the hostnames of the two nodes as hostname01 and hostname02. Also, the load balancing URL as http:\<loadbalancer>:9800.

**Steps to Configure HA for BPELPM**

Follow these instructions to configure HA for BPELPM on BEA WebLogic Server:

1. Configure BPELPM on BEA WebLogic Server on hostname01 and hostname02 separately.

---

**Note:**

- To configure BPELPM on BEA WebLogic Server on a hostname, refer to "Installation and Configuration".
- While configuring ensure that DB_URL property points to the same database in orabpel_10133_ WebLogic\bpelDomain.properties for both the nodes.
2. Install any load balancing software on one of the hosts (hostname01 or hostname02) or some other host, and point http://hostname01:9700 and http://hostname02:9700 using the common load balancing URL (http://<loadbalancer>:9800).

3. Modify the BPEL_HOME\bpel\system\config\collaxa-config.xml on both hostname01 and hostname02.
   - Update soapCallbackUrl property in the collaxa-config.xml file to http://<loadbalancer>:9800 so that the soapCallbackUrl property points to the load balancer URL.

4. Start oracleBPELServer on both the hostname01 and hostname02 hosts.


Postinstallation Verification Tasks
This section describes the postinstallation verification tasks to be performed, and it contains the following topics:

- Verifying Installation from the BEA WebLogic Server Console
- Verifying Oracle BPEL Process Manager Console
- Verifying the SelectAllByTitle Sample for the Database Adapter
- Running Adapter Samples
- Deploying Samples Using Ant

Verifying Installation from the BEA WebLogic Server Console
Perform the following steps to check if the BEA Admin Console has started:


   Log in using weblogic as the username and password.

2. Verify that you can view the oracleBPELServer Home page by selecting Environment -> Servers -> oracleBPELServer -> Configuration -> General.
3. Verify that you can view the oracleBPELServer startup properties page by selecting **Environment** -> **Servers** -> **oracleBPELServer** -> **Configuration** -> **Server Start**. You can also add or modify the server startup properties such as Class Path, Arguments as a BPEL Domain admin.

4. Verify that the BPELJMSServer is installed under **Services** -> **Messaging** -> **JMS Servers**.
5. Verify that the summaries of the JMS resources that have been created for the JMS System module are displayed under Services -> Messaging -> JMS Modules -> bpelJMSModule -> Configuration.
6. Verify that the BPELServerDataSource and BPELServerDataSourceWorkflow are the two JDBC data sources that are created under Services -> JDBC -> Data Sources.

Verifying Oracle BPEL Process Manager Console

Perform the following steps to check if the Oracle BPEL Process Manager Console has started:

1. Navigate to http://localhost:9700/BPELConsole (Or to the location where the software is installed, for example, http://<machine-name>:9700/BPELConsole/). The Oracle BPEL Process Manager Console window is displayed.
2. Log in using the user-id as configured in the security settings step in "Using Application Security".
Verifying the SelectAllByTitle Sample for the Database Adapter

1. Log in to the database and start SQL*Plus.
2. Run the `setup.sql` script:
   ```sql
   SQL> @Oracle_Home/samples/tutorials/122.DBAdapter/sql/setup.sql;
   ```
   This script creates and populates the `movies` table in the database.
3. Point the database adapter to your database in the BEA WebLogic Server Console under Deployments, DB Adapter, Configuration, Outbound Connection Pools, eis/DB/BPELSamples, Properties.

   **Note:** Refer to Section, "Running Adapter Samples" for more information.

4. Select Start, All Programs, Oracle - Oracle_Home, Oracle BPEL Process Manager, Developer Prompt.
5. Change to the following directory:
   ```bash
tutorials\122.DBAdapter\SelectAllByTitle
   ```
6. Run the following command:
   ```bash
   ant
   ```
This compiles and deploys all projects dependent on this tutorial. Projects are deployed into \$BPEL_HOME\bpel\domains\domain_name\deploy.

7. Select Start, All Programs, Oracle - Oracle Home, Oracle BPEL Process Manager, BPEL Console.
8. Click SelectAllByTitle in the Deployed BPEL Processes list.
9. Enter the movie title on the Initiate page.
10. Click Post XML Message.
11. View the results and inspect the instance.

**Running Adapter Samples**

Ensure that the outbound connection pool properties shown in Table 2–2 are modified.

### Configuring Outbound Connection Pool for Adapters in Weblogic

You should create the required outbound connection pools that are used by BPEL Process Partnerlinks before deploying BPEL Processes using Adapters. Perform the following steps to create the required outbound connection pools:

1. Log in to \http://localhost:8001/console\, using weblogic as the username and password.
2. Select Deployments, <adapter_name>, Configuration, and Outbound Connection Pools. The Outbound Connection Pool Configuration Table is displayed.
3. Click Lock & Edit.
4. Click New. The Create a New Outbound Connection page is displayed.
5. Select the outbound connection displayed in the Outbound Connection Group.
6. Click Next. The JNDI Name for Outbound Connection Instance page is displayed.
7. Enter the required JNDI name as referenced by the partnerlink WSDL of the BPEL process under jca:address location.
8. Click Finish. The Save Deployment Plan Assistant page is displayed.
9. Select a deployment plan location in the Location field, and click Finish. The Settings for <adapter_name> page is displayed.
10. Return to the Outbound Connection Pools page and select the outbound connection pool that you created under the Groups and Instances column. The Outbound Connection Properties page is displayed.
11. Click the respective property value column to update the properties.
12. Click Save.
13. Click the Activate Changes button to activate the changes you have made.

<table>
<thead>
<tr>
<th><strong>Table 2–2</strong> Outbound Connection Pool Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adapter Type</strong></td>
</tr>
</tbody>
</table>
| Database | ■ driverClassName  
| | ■ connectionString |
Deploying Samples Using Ant

Ensure that admin.user and admin.password in `BPEL_HOME\bpel\utilities\ant-orabpel.properties` are updated with the credentials of a valid user from the authentication store setup for authentication.

Samples can be deployed from the developer prompt using the `ant` script following the above step.

The samples containing only BPEL processes can be fully deployed using the `ant` script.

Samples containing additional components such as Decision Service applications, workflow forms, and UI applications need to be deployed in the following manner.

1. Use the `ant` script to deploy the BPEL process of the sample.
2. For each Decision Service application, manually edit the jsp files and the `decisionservice.xml` file to replace the variables for domain, host the port as required. Generate the `war` or `ear` file, and deploy into `DecisionServer`. Start the application.
3. For each workflow form application, generate the `war` or `ear` file, and deploy into `oracleBPELServer`. Start the Application.
4. For each UI Application, manually edit the `doApply.jsp` to replace the variables for domain, host the port as required. Generate the `war` or `ear` file, and deploy into `oracleBPELServer`. Start the application.
Auto Loan Demo

This appendix describes how to run Auto Loan Demo on BPELPM 10.1.3.3 on WebLogic 9.2 application server. It contains these sections:

- Prerequisites on JDeveloper Studio 10.1.3.3
- Auto Loan Demo Sample
- Modelling Auto Loan Flow Process Using JDeveloper Studio
- Known Issues on non-Oracle Platforms
- Deploying J2EE Applications on WebLogic
- Running the Sample

Prerequisites on JDeveloper Studio 10.1.3.3

The following one-time changes should be performed on JDeveloper:

1. Replace the `bpm-services.jar` within JDeveloper at `jdev\integration\lib` with the updated jar from `BPEL_HOME\system\services\lib`.
2. Replace the `orabpel-ant.jar` within JDeveloper at `jdev\integration\lib` with the updated jar from `BPEL_HOME\lib`.
3. Modify the following properties in `jdev\integration\bpel\utilities\ant-orabpel.properties` file:
   - Platform to `weblogic_8`
   - `admin.user` to a valid user in weblogic realm
   - `admin.password` to the password of the above user
   - JNDI URL to `t3://<hostname>:9700`
   - JNDI InitialContextFactory to `weblogic.jndi.WLInitialContextFactory`
4. On JDeveloper, create an Application Server connection of type "Standalone OC4J 10.1.3."
5. On JDeveloper, create an Integration Server connection to "<hostname>:9700"

---

Note: Ignore errors during test connection regarding Mediator at this stage.

Auto Loan Demo Sample

The Auto Loan Flow sample has the following components:

- BPEL Process: AutoLoanFlow BPEL Process `<bpel jar>`
- Decision Service Applications (Business Rules Applications)
  - CreditRatingAgent `<ear>`
  - LoanAdvisorAgent `<ear>`
- UI Application: AutoLoanFlowUI `<ear>`
- HWF Tform application: AutoLoanFlow LoanApproval `<ear>`

Since the AutoLoanFlow sample that is bundled with BPELPM standalone is written for OC4J Application Server, it cannot be run as is on WebLogic 9.2 Application.
Server. Specifically, the Decision Service applications need to be regenerated for WebLogic platform, using JDeveloper. Weblogic requires that the following mandatory deployment descriptor files be present in the application that serves Webservices:

- `weblogic.xml`
- `weblogic-webservices.xml`
- `weblogic-webservices-policy.xml`

Also the java-wsdl-mapping file needs WebLogic specific modifications.

The next section describes the steps to regenerate the Decision Services Applications in Auto Loan Flow for WebLogic.

### Modelling Auto Loan Flow Process Using JDeveloper Studio

Perform the following steps to modify the AutoLoanFlow sample for WebLogic:

1. Delete the following file from the filesystem:
   
   ```plaintext
   BPEL_HOME/samples/demos/AutoLoadDemo/AutoLoanFlow/bpel/decisionservices.decs
   ```

2. Open the AutoLoanFlow sample from JDeveloper Studio as a JDeveloper project using the following file:
   
   ```plaintext
   BPEL_HOME/samples/demos/AutoLoanDemo/AutoLoanFlow/AutoLoanFlow.jpr
   ```

3. Open the `AutoLoanFlow.bpel` file from the Applications Navigator (found within the AutoLoanFlow project).

4. From the Services swim lane of `AutoLoanFlow.bpel`, delete the following decision service partnerlinks:
   
   - CreditRatingAgent
   - LoanAdvisorAgent

5. Follow the steps II, III, IV and V of "Modelling Auto Loan Broker Process" from `BPEL_HOME/samples/demos/AutoLoanDemo/AutoLoanBroker.pdf` to recreate the two Decision Service applications.

### Known Issues on non-Oracle Platforms

The AutoLoanFlow BPEL process has two Decision Service applications as partnerlinks (CreditRatingAgent and LoanAdvisorAgent). By default, the context-root generated for both these J2EE applications are same with the value -

```
/rules/${domain_id}/${process_id}/${process_revision}
```

The ${} attributes are replaced by actual values during the build and deploy of the Auto Loan Flow. However, as the context-root is not unique for these two applications, these cannot be deployed on WebLogic. When the second application is deployed/started on WebLogic it would complain that the context-root is already in use.

This is an issue on non-Oracle application servers when a BPEL process references more than one Decision Service partnerlinks generated from JDeveloper Studio. As a workaround, after generating the Decision Service applications on JDeveloper and before doing a build and deploy, perform the following:
Modify the
AutoLoanFlow\decisionservices\CreditRatingAgent\ear\META-INF\application.xml file.

Change \textless context-root\textgreater \$\{domain_id\}\$\{process_id\}\$\{process_revision\}\textless /context-root\textgreater to \textless context-root\textgreater \$\{domain_id\}\$\{process_id\}\$\{process_revision\}\CreditRatingAgent\textless /context-root\textgreater

Modify the
AutoLoanFlow\decisionservices\CreditRatingAgent\war\WEB-INF\web.xml file.

Change \textless url-pattern\textgreater CreditRatingAgent\textless /url-pattern\textgreater to \textless /url-pattern\textgreater

Finally, build and deploy the Auto Loan Flow using the Integration Server Connection. In the application navigator, right-click the BPEL project and select Deploy.

This would automatically deploy the BPEL process into BPEL engine running at the Integration Server connection.

The following J2EE applications should be manually deployed into WebLogic using the WebLogic Admin console:

- CreditRatingAgent.ear
- LoanAdvisorAgent.ear
- AutoLoanFlowUI.ear
- \textless domain\textgreater\_AutoLoanFlow\_\textless version\textgreater\_LoanApproval.ear

**Deploying J2EE Applications on WebLogic**

Perform the following steps to deploy the applications to WebLogic:

1. Start the Weblogic server using the \texttt{startWeblogic.cmd/sh} command.
2. Log in to WebLogic Admin console using \texttt{http://\textless hostname\textgreater:8001/console}.
3. Select Deployments.
4. Click Lock & Edit.
5. Navigate to the directory where the target ear file is located on the file system.
6. Select the ear file and choose Deploy.
7. Choose \texttt{oracleBPELServer} as the target server, and select "I will provide the deployment in this directory" option.
8. Click Finish Deployment.
9. Click Activate Changes.
10. Start the deployed application from list of deployments.

**Running the Sample**

When the process is deployed, perform the following steps to test the sample:

1. Open the AutoLoanFlow UI at \texttt{http://\textless hostname\textgreater:9700/AutoLoanFlowUI}.
2. Click the Initiate New BPEL Loan Flow link.
3. Accept the default payload and click **Submit Loan Application**.

4. Log in to the worklist at `http://<hostname>:9700/integration/worklistapp` using jstein/welcome1 as the username and password.

5. Click the Task title (Loan Approval for Irving Stone).

6. Examine the task payload, the credit rating for that loan should be 500 with "Medium" risk and a Credit Max Amount of 50000.0.
   
   The provider for the Loan Offer should be "Premium Bank" with an APR of 4.0

7. Approve the task.

8. Verify the AutoLoanFlow instance.

**Limitations, Known Issues, Troubleshooting Tips**

This section describes the limitations, known issues, and troubleshooting tips for Oracle BPEL Process Manager 10.1.3.3 on BEA WebLogic Server version 9.2.

**Limitations**

Note the following limitations:

- BEA WebLogic Server 9.2 and Oracle BPEL Process Manager 10.1.3.1 should be installed as the same user on Linux and the user should not be a root user.

  **Note:** If you install BEA WebLogic Server 9.2 and BPELPM 10.1.3.1 as different users, then the file permissions and ownership for files under the following directories should be verified and changed to BPELPM install user:

  - `BPEL_HOME\lib`
  - `BPEL_HOME\lib\rules`
  - `BPEL_HOME\system\appserver\oc4j\webservices\lib`
  - `BPEL_HOME\system\services\lib`
  - `BPEL_HOME\system\config`
  - `BPEL_HOME\utilities`

**Known Issues**

Note the following known issues:

**JMS Adapter**

- JMS Adapter throws the following NullPointerException during initialization on non-Oracle platforms:

  ```java
  JmsConnectionFactory: Unable to set connectionparameters for OracleConnectionManager
  java.lang.NullPointerException
  at oracle.tip.adapter.jms.JmsConnectionFactory.<init>(JmsConnectionFactory.java:91)
  at oracle.tip.adapter.jms.JmsManagedConnectionFactory.createConnectionFactory
  (JmsManagedConnectionFactory.java:80)
  ```
This is a benign error and does not stop the JMS connection factory from initializing.

**Decision Services**

- The following data type binding warnings and errors are displayed during deployment and start of Decision Service (Business Rules) Applications. These errors and warnings can be ignored.

```xml
<WS data binding error>could not find schema type '{http://www.w3.org/2001/XMLSchema}NCName
<WS data binding error>could not find schema type '{http://websphere.ibm.com/webservices/}SOAPElement
java.lang.IllegalStateException
at weblogic.wsee.bind.runtime.internal.AnonymousTypeFinder$GlobalElementNode.
getSchemaProperty(AnonymousTypeFinder.java:253)
at
weblogic.wsee.bind.runtime.internal.AnonymousTypeFinder.getHiddenArrayElement
ComponentTypeNamed(AnonymousTypeFinder.java:104)
<WS data binding error>could not find schema type '{http://www.w3.org/2001/XMLSchema}long
<WS data binding error>could not find schema type '{http://xml.apache.org/xml-soap}Element
<WS data binding error>could not find schema type '{http://www.w3.org/2001/XMLSchema}anyType
<WS data binding error>could not find schema type '{http://www.w3.org/2001/XMLSchema}string
<WS data binding error>could not identify anonymous schema type named
'http://xmlns.oracle.com/AutoLoanFlow/CreditRatingAgent:tProperty[0,unbounded]', ignoring
<WS data binding error>While processing <exception-mapping> for
wadlMessageName='http://xmlns.oracle.com/AutoLoanFlow/CreditRatingAgent:decisionServiceError',
wadlMessagePartElement='http://xmlns.oracle.com/AutoLoanFlow/CreditRatingAgent:decisionServiceError'. Unable to find a BindingType in the binding file for
javaTypeName='oracle.bpel.services.rules.DecisionServiceError',
xmlTypeName='e=errorInfo@http://xmlns.oracle.com/AutoLoanFlow/CreditRatingAgent'. The cause of this error is likely because an <exception-mapping> specified for
(http://xmlns.oracle.com/AutoLoanFlow/CreditRatingAgent)decisionServiceError requires that a <java-xml-type-mapping> exist for java
type='oracle.bpel.services.rules.DecisionServiceError',
xmlTypeName='e=errorInfo@http://xmlns.oracle.com/AutoLoanFlow/CreditRatingAgent'
', with a <root-type-qname> of
(http://xmlns.oracle.com/AutoLoanFlow/CreditRatingAgent)errorInfo
<WS data binding error>oracle.bpel.services.rules.DecisionServiceError is not understood because there is no type mapping for exception class
```

**Troubleshooting Tips**

The following list explains the troubleshooting tips encountered while installing Oracle BPEL Process Manager with the BEA WebLogic Server, and their resolutions:

**Using Server Start Up Options**

For any class path and security permission errors that you encounter while configuring Oracle BPEL Process Manager on the BEA WebLogic Server, perform the following steps to correct the class path and security policy file options:
1. Log in to http://localhost:8001/console, using weblogic as the username and password.

2. Select Environment -> Servers -> oracleBPELServer. The Settings of oracleBPELServer page is displayed.

3. Click the Server Start tab.

4. Edit the following properties:
   - Class Path: Contains the path on the machine running Node Manager, which is used to start the oracleBPELServer. You can append a class path value to the class path mentioned in this field.
   - Arguments: Contains the arguments, which is used to start the oracleBPELServer. You can add arguments to the existing argument list that are required to start the server.
   - Security Policy File: Contains the security policy file, which is used to start the oracleBPELServer. You can also add your own policy file in this location. To do, you need to add the following line inside the grant scope of the policy file:

     permission com.collaxa.security.ServerPermission "server", "read";
Installing Oracle BPEL Process Manager with JBoss Application Server

This chapter provides the requirements and procedures for installing Oracle BPEL Process Manager with JBoss Application Server.

This chapter contains these topics:

- **Overview**
- **System and Database Requirements**
- **Installation and Configuration**
- **Design-time Deployment Support for BPELPM 10.1.3.3 on JBoss Application Server**
- **Additional Configuration Steps of the JBoss Application Server**
- **Postinstallation Verification Tasks**
- **Auto Loan Demo**

**See Also:** The following documentation after completing installation:

- Oracle BPEL Process Manager Quick Start Guide
- Oracle BPEL Process Manager Order Booking Tutorial
- Oracle BPEL Process Manager Developer’s Guide
- Oracle Application Server Adapter for Files, FTP, Databases, and Enterprise Messaging User’s Guide
- Oracle Application Server Adapter Concepts

**Overview**

You can install and use Oracle BPEL Process Manager with the JBoss Application Server.

The JBoss enables you to set up, operate, and integrate e-business applications across multiple computing platforms using Web technologies. The JBoss includes both the run-time components and the tools to develop and design applications.

Oracle BPEL Process Manager provides the infrastructure for creating standards-based business processes, which can span heterogenous environments, include human intervention, and exhibit efficient asynchronous and synchronous behavior. A key
enabler of Service-Oriented Architecture it also provides services that can be used for integration and notifications.

Oracle BPEL Console is the monitoring environment for Oracle BPEL Process Manager. You can run, manage, and test your deployed BPEL process using the Oracle BPEL Console. Oracle BPEL Console provides a Web-based interface for management, administration, and debugging of processes deployed to Oracle BPEL Server.

The installation of Oracle BPEL Process Manager for JBoss Application Server consists of the following high-level steps:

1. Create the Oracle BPEL Process Manager Schema in the Oracle Database
   This step involves installing Oracle Database and creating the required Database schemas for the Dehydration store for BPELPM on Oracle Database.

2. Installation of the Oracle BPELPM Standalone 10.1.3.1 for OC4J
   This is the standalone version of BPELPM, which comes with an embedded OC4J J2EE container. Further steps will configure this BPELPM to work on JBoss Application Server.

3. Apply SOA Suite Patchset 10.1.3.3 on BPELPM Standalone 10.1.3.1
   This patchset upgrades the existing 10.1.3.1.0 installation to 10.1.3.3.0

4. Configure BPELPM Standalone on JBoss Application Server
   This step involves running a command-based script, which will configure the Oracle BPELPM Standalone installed earlier to run on JBoss Application Server. The script performs the following steps:
   - Create a JBoss domain called BPELDomain
   - Create an application server called oracleBPELServer
   - Configure the oracleBPELServer classpath with Oracle BPELPM Binaries
   - Create and configure required DataSources/JMS Resources etc.
   - Deploy the required Applications for BPEL Console, BPEL Administration etc.

   The above steps, which are further detailed in the "Installation and Configuration" section, summarize the installation and configuration of BPELPM on JBoss Application Server platform.

### System and Database Requirements

Table 3–1 describes the system requirements for using Oracle BPEL Process Manager with the JBoss.

<table>
<thead>
<tr>
<th>Element</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>JBoss</td>
<td>Version 4.0.5 + jbossws-1.2.1</td>
</tr>
<tr>
<td>Oracle BPEL Process Manager for OC4J</td>
<td>Version 10.1.3.1</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> Refer to Step 2: Install Oracle BPEL Process Manager 10.1.3.1 for OC4J for installing Oracle BPEL Process Manager for OC4J. Apply SOA Suite patchset 10.1.3.3 on BPELPM Standalone 10.1.3.1.</td>
</tr>
<tr>
<td>Web browsers</td>
<td>Internet Explorer 6.0 or Mozilla Firefox 2.0</td>
</tr>
</tbody>
</table>
This section describes the steps involved in installing and configuring the Oracle Database, creating a schema in the Database, and installing and configuring JBoss. This section contains the following topics:

- **Step 1: Configure the Oracle Database**
- **Step 2: Install Oracle BPEL Process Manager 10.1.3.1 for OC4J**
- **Step 3: Create the Oracle BPEL Process Manager Schema in the Oracle Database**
- **Step 4: Apply SOA Suite Patchset 10.1.3.3 on Oracle BPELPM Standalone 10.1.3.1**

**Note:** Oracle Database Lite is automatically installed with the Oracle BPEL Process Manager for Developers install type described in this chapter. However, you cannot use Oracle Database Lite as the dehydration store.

**Step 5: Install JBoss Application Server Version and Configure BPELPM Standalone for JBoss**

### Step 1: Configure the Oracle Database

Follow these instructions to install Oracle Database 10g.

**Note:** These instructions assume that you have obtained Oracle Database 10g version 10.1.0.2 and Oracle Database 10g Patch version 10.1.0.5.


1. Install Oracle Database 10g 10.1.0.2.
2. Open SQL*Plus and log in as a user with the **SYSDBA** privilege.
3. Shut down the database:

---

**Table 3–1 (Cont.) Oracle BPEL Process Manager System Requirements**

<table>
<thead>
<tr>
<th>Element</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation systems</td>
<td>Microsoft Windows XP, Microsoft Windows 2003, Red Hat Enterprise Linux release 3, and Red Hat Enterprise Linux release 4</td>
</tr>
</tbody>
</table>
| Dehydration store database | Oracle9i (9.2.0.8) or higher
|                       | Oracle Database 10g (10.1.0.5) or higher
|                       | Oracle Database 10g (10.2.0.2) or higher
|                       | Oracle Database 10g Express Edition 10.2.0.1
|                       | Oracle Database 10.1.2.2

**Note:** This certification matrix reflects the Oracle BPELPM certification on Oracle Application Server, and may vary with the application server being used. Confirm the certification matrix of the application server with Oracle Database version.
SQL> SHUTDOWN IMMEDIATE

4. Install the Oracle Database 10g 10.1.0.5 patch in the same Oracle home in which you installed Oracle Database 10g.

5. If using Linux only, then log in as the root user and run the following command from the operating system command prompt:

   /etc/init.d/init.cssd stop

6. Start the database in upgrade mode in SQL*Plus:

   SQL> STARTUP UPGRADE

7. Run the following script:

   SQL> @ORACLE_HOME/rdbms/admin/catpatch.sql;

8. Shut down the database:

   SQL> SHUTDOWN IMMEDIATE

9. Restart the database:

   SQL> STARTUP

10. Run the following script:

    SQL> @ORACLE_HOME/rdbms/admin/utlrp.sql;

Step 2: Install Oracle BPEL Process Manager 10.1.3.1 for OC4J

This is the standalone version of BPEL. Please note the basic SOA Suite installation cannot be used for this setup. You can download this standalone version of Oracle BPEL Process Manager 10.1.3.1 at


---

**Note:** The file names start with soa although it really is a BPEL download file. For example, the name of the Windows download file for Oracle BPEL Process Manager 10.1.3.1 for OC4J appears as soa_windows_x86_bpel_101310.zip.

---

You need to install BPEL into it's own directory outside of JBoss. The JBoss installation will refer to binaries and property files from this installation. This external installation will need to be there permanently, it's not a temporary staging area. Even though it also contains OC4J, you will not be starting and stopping it. This is an important prerequisite prior to the JBoss install.

Step 3: Create the Oracle BPEL Process Manager Schema in the Oracle Database

---

**Note:** The scripts to configure Oracle BPEL Process Manager on the JBoss require that the JAVA_HOME environment parameter be set prior to running the script.

---

1. Navigate to the Disk1\install\soa_schemas\ira folder in the BPEL Installation Setup files directory.
2. Set ORACLE_HOME to point to the Oracle Database Installation location. For example,
   set ORACLE_HOME=c:\Oracle10g

3. Enter irca bpel. This runs the irca script packaged with the Oracle BPEL Process Manager installation.

4. Enter sys password when prompted. The orabpel schema is loaded on the Oracle Database.

Step 4: Apply SOA Suite Patchset 10.1.3.3 on Oracle BPELPM Standalone 10.1.3.1
You need to download the SOA Suite patchset 10.1.3.3 from MetaLink and then apply the patchset on BPELPM Standalone 10.1.3.1. Perform the following steps:

2. Click Patches & Updates. The Patches & Updates page is displayed.
3. Click Simple Search.
4. In the Search By field, enter 6148874. The details of the patchset 6148874 are displayed.
5. Follow the instructions in the patchset to install the patchset on the BPELPM Standalone 10.1.3.1.

Caution: You should not start/restart the BPELPM instance after applying the patch.

Step 5: Install JBoss Application Server Version and Configure BPELPM Standalone for JBoss

Note: These instructions assume that you have obtained JBoss Application Server.

1. Install JBoss Application Server.

Note:
- The directory to which you download the Oracle BPEL Process Manager should be the same host on which the JBoss Application Server is installed.
- Unzip the orabpel_10133_Jboss folder as a non-root user (same user as used to install Oracle BPEL Process Manager 10.1.3.1 for OC4J). For example, Oracle.
3. Modify the following mandatory installation properties in the `orabpel_10133_Jboss\cfg\constants.properties` file:

**Note:** Mandatory properties cannot have a comment tag or contain blank values. Failure to follow this requirement results in errors during installation. Also, ensure that you enter the appropriate information for each of the fields. Any typo will cause errors during installation.

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JBOSS_HOME</td>
<td>The directory path in which JBoss Application Server is installed. For example, JBOSS_HOME=C:\jboss-4.0.5.GA.</td>
</tr>
<tr>
<td>BPEL_HOME</td>
<td>The directory path in which Oracle BPEL Process Manager is installed. For example, BPEL_HOME=C:\product\10.1.3.1\OraBPELP_1\bpel</td>
</tr>
<tr>
<td>BPEL_INSTALL_ROOT</td>
<td>The directory containing the JDK of Oracle BPEL Process Manager. For example, if the Oracle BPEL Process Manager home directory is C:\OraBPELP_1\integration\orabpel, then BPEL_INSTALL_ROOT is typically C:\OraBPELP_1.</td>
</tr>
<tr>
<td>DRIVER_TYPE</td>
<td>The JDBC driver type (thick or thin). For example, DRIVER_TYPE=thin.</td>
</tr>
<tr>
<td>HOSTNAME</td>
<td>The name or IP address of the host on which Oracle Database 10g is installed. For example, HOSTNAME=stda.us.oracle.com.</td>
</tr>
<tr>
<td>PORTNUMBER</td>
<td>The port number of the host on which Oracle Database 10g is installed. For example, PORT_NUMBER=1087.</td>
</tr>
<tr>
<td>SID</td>
<td>The service name of Oracle Database 10g. For example, SID=ORCL.</td>
</tr>
<tr>
<td>JAASAUTHUSERID</td>
<td>The user name for accessing the Oracle BPEL Process Manager schema. For example, JAASAUTHUSERID=orabpel</td>
</tr>
<tr>
<td>JASAUTHPASSWD</td>
<td>The Host name of the proxy server. For example, JASAUTHPASSWD=orabpel</td>
</tr>
<tr>
<td>PROXYSET</td>
<td>Indicates if a proxy server is being used (true or false) For example, PROXYSET=true.</td>
</tr>
<tr>
<td>PROXYHOST</td>
<td>The Host name of the proxy server. For example, PROXY_HOST=www-proxy.us.oracle.com.</td>
</tr>
<tr>
<td>PROXYPORT</td>
<td>The Port where the proxy server is running. For example, PROXY_PORT=80.</td>
</tr>
<tr>
<td>NON_PROXY_HOST</td>
<td>The addresses for which the proxy server must be bypassed that are divided by a</td>
</tr>
</tbody>
</table>
4. Run the following script from `orabpel_10133_Jboss` folder at the operating system command prompt:

<table>
<thead>
<tr>
<th>For...</th>
<th>Run...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows XP</td>
<td><code>setup.bat</code></td>
</tr>
<tr>
<td>Linux</td>
<td><code>setup.sh</code></td>
</tr>
</tbody>
</table>

This script creates the following servers Oracle BPEL Server (`oracleBPELServer`) and Decision Server (`decisionServer`). The script also configures the required applications, Queues, database connections, adapters, and JCA's.

Installation progress is logged to the `Jboss_Installables\bin\logs\output.log` file.

5. Apply the `jbossws-1.2.1` patch.

By default, Jboss4.0.5 comes with the webservice deployer 1.0.4 (`jbossws-1.0.4`), there are issues while running webservices using this deployer, hence you need to upgrade to `jbossws1.2.1`.

You can download `jbossws-1.2.1.GA.zip` at [http://labs.jboss.com/jbossws/downloads](http://labs.jboss.com/jbossws/downloads)

After the download, follow the instructions given in Install.txt file, and apply the patch to the already configured `oracleBPELServer`.

6. Start the `oracleBPELServer` as follows:

<table>
<thead>
<tr>
<th>For...</th>
<th>Run...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows XP</td>
<td><code>JBOSS_HOME\bin\startServer.bat -c oracleBPELServer</code></td>
</tr>
<tr>
<td>Linux</td>
<td><code>JBOSS_HOME/bin/startServer.sh -c oracleBPELServer</code></td>
</tr>
</tbody>
</table>

7. Start the `decisionServer` as follows:

<table>
<thead>
<tr>
<th>For...</th>
<th>Run...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows XP</td>
<td><code>JBOSS_HOME\bin\startServer.bat -c decisionServer</code></td>
</tr>
<tr>
<td>Linux</td>
<td><code>JBOSS_HOME/bin/startServer.sh -c decisionServer</code></td>
</tr>
</tbody>
</table>

8. Log in to the BPEL Console at the following URL, using `Jboss` as the username and password:

   `http://localhost:9700/BPELConsole`

---

**Design-time Deployment Support for BPELPM 10.1.3.3 on JBoss Application Server**

This section describes the various design-time support functions available on JBoss Application Server, for the deployment of J2EE applications in JDeveloper. You can deploy BPELPM components on JBoss Application Server by using the following two methods:

- From the BPELPM Developer Prompt Using Ant
- From JDeveloper
From the BPELPM Developer Prompt Using Ant

You can use ant in the BPELPM developer prompt to deploy J2EE applications. This section contains the following topics:

- Prerequisite Checks
- Steps to Deploy Using the BPELPM Prompt

Prerequisite Checks

1. Ensure that `bpelPlatform` is set to `jboss_3` in the `BPEL_HOME\bpel\system\config\collaxa-config.xml` file.
2. Ensure that the following properties are set in `BPEL_HOME\bpel\utilities\ant-orabpel.properties` file:
   - `platform` to `jboss_3`
   - `admin.user` to valid user in JBoss realm
   - `admin.password` to the password of the above user
   - `jndi.url` to `jnp://localhost:9099`
   - `jndi.InitialContextFactory` to `org.jnp.interfaces.NamingContextFactory`

**Note:** If the `admin.user` property is not set correctly, then the deployment may throw authentication errors.

Steps to Deploy Using the BPELPM Prompt

Follow these instructions to deploy BPELPM from the developer prompt using ant:

1. Open a BPELPM Developer prompt.
2. Run `ant.sh/bat` from the `BPEL_HOME\bpel\system\appserver\oc4j\ant\bin` directory of the BPEL application.

**Note:** For more information, refer to `C:\product\10.1.3.1\OraBPEL_OC4J\bpel\GETTING_STARTED.html`.

The only exceptions to be noted are as follows:

- If the BPEL Process contains any Decision Service applications, UI applications, or Work Flow applications, then these applications will not be automatically deployed in JBoss by the `ant` script.
- The corresponding EAR/WAR files is custom built for JBoss platform but need to be manually deployed on the target server.

**Note:** Refer to Auto Loan Demo for more details.

From JDeveloper

You can also deploy J2EE applications from JDeveloper. This section contains the following topics:
Prerequisite Checks

Steps to Deploy Using JDeveloper

Prerequisite Checks

1. Download JDeveloper Studio 10.1.3.3 (jdevstudio10133.zip) from
   For Windows -

2. Copy the bpm-services.jar file from the BPEL_HOME\system\services\lib directory to JDEV_HOME\integration\lib directory.

3. Copy the orabpel-ant.jar file from the BPEL_HOME\lib directory to the JDEV_HOME\integration\lib directory.

4. Ensure that the following properties are set in BPEL_HOME\bpel\utilities\ant-orabpel.properties file: Ensure that bpelPlatform is set to jboss_3 in the BPEL_HOME\bpel\system\config\collaxa-config.xml file.

   ■ platform to jboss_3
   ■ admin.user to valid user in JBoss realm
   ■ admin.password to the password of the above user
   ■ jndi.url to jnp://localhost:9099
   ■ jndi.InitialContextFactory to org.jnp.interfaces.NamingContextFactory

5. In JDeveloper, create an application server connection of the Standalone OC4J 10.1.3 type.

6. In JDeveloper, create an Integration Server connection to localhost:9700.

Steps to Deploy Using JDeveloper

Follow these instructions to deploy BPELPM from the developer prompt using JDeveloper:

1. From JDeveloper, right-click and deploy the BPEL application into the required domain.
The only exceptions to be noted are as follows:

- If the BPEL Process contains any Decision Service applications, UI applications, or Work Flow applications, then these applications will not be automatically deployed in JBoss by JDeveloper.
- The corresponding EAR/WAR files is custom built for JBoss platform but need to be manually deployed on the target server `oracleBPELServer` in JBoss Application Server.

**Note:** Refer to Auto Loan Demo for more details.

### Additional Configuration Steps of the JBoss Application Server

The configuration steps mentioned in this section are optional and you can perform these only if there is a need:

- Using LDAP
- Using High Availability Setup

#### Using LDAP

This section describes the following steps to configure LDAP in JBoss and to enable LDAP authentication for `oracleBPELServer`:

1. Navigate to `login-config.xml` under `JBOSS_HOME/server/oracleBPELServer/conf`
2. Comment out the "UsersRolesLoginModule" for application-policy "BPELAuthentication".
3. Uncomment the "LdapLoginModule" (by default the "LdapLoginModule" is commented)

4. Save the changes.

5. Restart oracleBPELServer.

The above step disables the default file-based authentication and enables external LDAP authentication.

Note: The LdapLoginModule contains default values. Ensure to change them to customer specific environment values.

Using High Availability Setup

This section describes the High Availability (HA) support available for BPELPM 10.1.3.3 on JBoss. This section contains the following topics:

- Prerequisite Checks
- Steps to Configure HA for BPELPM

Prerequisite Checks

Ensure that HA setup of BPELPM is configured on two nodes on two machines. Let’s assume the hostnames of the two nodes as hostname01 and hostname02. Also, the load balancing URL as http://\<loadbalancer>:9800.

Steps to Configure HA for BPELPM

Follow these instructions to configure HA for BPELPM on JBoss:

1. Configure BPELPM on JBoss on hostname01 and hostname02 separately.

Note:

- To configure BPELPM on JBoss on a hostname, refer to "Installation and Configuration".
- While configuring ensure that DB_URL property points to the same database in orabpel_10133_jboss\bpelDomain.properties for both the nodes.

2. Install any load balancing software on one of the hosts (hostname01 or hostname02) or some other host, and point http://hostname01:9700 and http://hostname02:9700 using the common load balancing URL (http://\<loadbalancer>:9800).

3. Modify the BPEL_HOME\bpel\system\config\collaxa-config.xml on both hostname01 and hostname02.

   - Update soapCallbackUrl property in the collaxa-config.xml file to http://\<loadbalancer>:9800 so that the soapCallbackUrl property points to the load balancer URL.

4. Start oracleBPELServer on both the hostname01 and hostname02 hosts.

5. Log in to the BPEL Process Manager Console at http://\<loadbalancer>:9800/BPELConsole.
Postinstallation Verification Tasks

This section describes the postinstallation verification tasks to be performed, and it contains the following topics:

- Verifying Oracle BPEL Process Manager Console
- Verifying the SelectAllByTitle Sample for the Database Adapter
- Running Adapter Samples
- Deploying Samples Using Ant

Verifying Oracle BPEL Process Manager Console

Perform the following steps to check if the Oracle BPEL Process Manager Console has started:

1. Navigate to http://localhost:9700/BPELConsole (Or to the location where the software is installed, for example, http://<machine-name>:9700/BPELConsole/). The Oracle BPEL Process Manager Console window is displayed.

2. Log in using the user-id as configured in the security settings step in "Using LDAP".

![Oracle BPEL Console](image-url)
Verifying the SelectAllByTitle Sample for the Database Adapter

1. Log in to the database and start SQL*Plus.
2. Run the setup.sql script:
   
   SQL> @Oracle_Home/samples/tutorials/122.DBAdapter/sql/setup.sql;
   
   This script creates and populates the movies table in the database.
3. Point the database adapter to your database in the JBoss Console under Deployments, DB Adapter, Configuration, Outbound Connection Pools, eis/DB/BPELSamples, Properties.

   **Note:** Refer to Section, "Running Adapter Samples" for more information.

4. Select Start, All Programs, Oracle - Oracle_Home, Oracle BPEL Process Manager, Developer Prompt.
5. Change to the following directory:
   
   tutorials\122.DBAdapter\SelectAllByTitle
   
6. Run the following command:
   
   ant
This compiles and deploys all projects dependent on this tutorial. Projects are deployed into BPEL_HOME\bpel\domains\domain_name\deploy.

7. Select Start, All Programs, Oracle - Oracle_Home, Oracle BPEL Process Manager, BPEL Console.
8. Click SelectAllByTitle in the Deployed BPEL Processes list.
9. Enter the movie title on the Initiate page.
10. Click Post XML Message.
11. View the results and inspect the instance.

Running Adapter Samples
Ensure that the outbound connection pool properties shown in Table 3–2 are modified.

Configuring Outbound Connection Pool for Adapters in JBoss Application Server
You should create the required outbound connection pools that are used by BPEL Process Partnerlinks before deploying BPEL Processes using Adapters. Perform the following steps to create the required outbound connection pools:
1. Log in to http://localhost:8001/console, using jboss as the username and password.
2. Select Deployments, <adapter_name>, Configuration, and Outbound Connection Pools. The Outbound Connection Pool Configuration Table is displayed.
3. Click Lock & Edit.
4. Click New. The Create a New Outbound Connection page is displayed.
5. Select the outbound connection displayed in the Outbound Connection Group.
6. Click Next. The JNDI Name for Outbound Connection Instance page is displayed.
7. Enter the required JNDI name as referenced by the partnerlink WSDL of the BPEL process under jca:address location.
8. Click Finish. The Save Deployment Plan Assistant page is displayed.
9. Select a deployment plan location in the Location field, and click Finish. The Settings for <adapter_name> page is displayed.
10. Return to the Outbound Connection Pools page and select the outbound connection pool that you created under the Groups and Instances column. The Outbound Connection Properties page is displayed.
11. Click the respective property value column to update the properties.
12. Click Save.
13. Click the Activate Changes button to activate the changes you have made.

<table>
<thead>
<tr>
<th>Table 3–2 Outbound Connection Pool Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adapter Type</strong></td>
</tr>
</tbody>
</table>
| Database | ■ driverClassName  
| | ■ connectionString  
| FTP | ■ host  
| | ■ port  
| **Note:** A new authentication alias must be created for connecting to the FTP server. |
Deploying Samples Using Ant

Ensure that admin.user and admin.password in BPEL_HOME\bpel\utilities\ant-orabpel.properties are updated with the credentials of a valid user from the authentication store setup for authentication.

Samples can be deployed from the developer prompt using the ant script following the above step.

The samples containing only BPEL processes can be fully deployed using the ant script.

Samples containing additional components such as Decision Service applications, workflow forms, and UI applications need to be deployed in the following manner.

1. Use the ant script to deploy the BPEL process of the sample.
2. For each Decision Service application, manually edit the jsps and the decisionservice.xml file to replace the variables for domain, host the port as required. Generate the war or ear file, and deploy into DecisionServer. Start the application.
3. For each workflow form application, generate the war or ear file, and deploy into oracleBPELServer. Start the Application.
4. For each UI Application, manually edit the doApply.jsp to replace the variables for domain, host the port as required. Generate the war or ear file, and deploy into oracleBPELServer. Start the application.

Auto Loan Demo

This appendix describes how to run Auto Loan Demo on BPELPM 10.1.3.3 on JBoss Application Server 4.0.5. It contains these sections:

- Prerequisites on JDeveloper Studio 10.1.3.3

<table>
<thead>
<tr>
<th>Adapter Type</th>
<th>Properties</th>
</tr>
</thead>
</table>
| Applications | connectionString
|              | userName   |
|              | password   |
| AQ           | connectionString
|              | userName   |
|              | password   |
| JMS          | connectionFactoryLocation
|              | isTopic    |
|              | isTransacted |

Note: The isTopic property must be set to false for queues. The isTransacted property must be set to false for the JMS samples to run.

| MQ            | channelName |
|              | portNumber  |
|              | queueManagerName |
|              | hostName    |
Prerequisites on JDeveloper Studio 10.1.3.3

The following One-time changes should be performed on JDeveloper:

1. Replace the `bpm-services.jar` within JDeveloper at `jdev\integration\lib` with the updated jar from `BPEL_HOME\system\services\lib`
2. Replace the `orabpel-ant.jar` within JDeveloper at `jdev\integration\lib` with the updated jar from `BPEL_HOME\lib`.
3. Modify the following properties in `jdev\integration\bpel\utilities\ant-orabpel.properties` file:
   - Platform to `jboss_3`
   - admin.user to a valid user in JBoss realm
   - admin.password to the password of the above user
   - jndi.url to `jnp://<hostname>:\<bootstrap_JNP_service_port>`

   **Note:** The `bootstrap_JNP_service_port` to use above can be obtained from `jboss-service.xml` under `JBoss_HOME/server/oracleBPELServer`. The value to be looked for: `<attribute name="Port">`. By default the value of `bootstrap_JNP_service_port` is 9099.

4. On JDeveloper, create an Application Server connection of type “Standalone OC4J 10.1.3”.
5. On JDeveloper, create an Integration Server connection to “<hostname>:9700”.

   **Note:** Ignore errors during test connection regarding ESB at this stage.

Auto Loan Demo Sample

The Auto Loan Flow sample has the following components:

- BPEL Process: AutoLoanFlow BPEL Process `<bpel jar>`
- Decision Service Applications (Business Rules Applications)
  - CreditRatingAgent `<ear>`
  - LoanAdvisorAgent `<ear>`
- UI Application: AutoLoanFlowUI `<ear>`
- HWF Tform application: AutoLoanflow LoanApproval `<ear>`
Since the AutoLoanFlow sample that is bundled with BPELPM standalone is written for OC4J Application Server, it cannot be run as is on JBoss Application Server. Specifically, the Decision Service applications need to be regenerated for Jboss platform, using JDeveloper as the java-wsdl-mapping file needs Jboss-specific modifications.

The next section describes the steps to regenerate the Decision Services Applications in Auto Loan Flow for JBoss.

Modelling Auto Loan Flow Process Using JDeveloper Studio

Perform the following steps to modify the AutoLoanFlow sample for JBoss:

1. Delete the following file from the filesystem:
   ```
   BPEL_HOME\samples\demos\AutoLoadDemo\AutoLoanFlow\bpel\decisionservices.decs
   ```

2. Open the AutoLoanFlow sample from JDeveloper Studio as a JDeveloper project using the following file:
   ```
   BPEL_HOME\samples\demos\AutoLoanDemo\AutoLoanFlow\AutoLoanFlow.jpr
   ```

3. Open the `AutoLoanFlow.bpmel` file from the Applications Navigator (found within the AutoLoanFlow project).

4. From the Services swim lane of `AutoLoanFlow.bpmel` delete the following decision service partnerlinks:
   - CreditRatingAgent
   - LoanAdvisorAgent

5. Follow the steps II, III, IV and V of "Modelling Auto Loan Broker Process" from `BPEL_HOME\samples\demos\AutoLoanDemo\AutoLoanFlow\AutoLoanBroker.pdf` to recreate the two Decision Service applications.

Modifying Partnerlink Target URLs

Since the Decision Service applications will be deployed on decisionServer and it runs on a port (9701 by default) different from oracleBPELServer, the partnerlink bindings to Decision Service from the BPEL Process should be changed to point to the right location.

6. Modify the following in `BPEL_HOME\samples\demos\AutoLoanDemo\AutoLoanFlow\bpel\bpel.xml` file.

   ```
   Change the port number to 9701 (or the DecisionServer port) in decisionServiceDetails and wsdlRuntimeLocation property values for CreditRatingAgentPL and LoanAdvisorAgentPL bindings.
   ```

Known Issues on non-Oracle Platforms

The AutoLoanFlow BPEL process has two Decision Service applications as partnerlinks (CreditRatingAgent and LoanAdvisorAgent). By default, the context-root generated for both these J2EE applications are same with the value `/rules/${domain_id}/${process_id}/${process_revision}`
The ${()} attributes are replaced by actual values during the build and deploy of the Auto Loan Flow. However, as the context-root is not unique for these two applications, these cannot be deployed on JBoss. When the second application is deployed/started on JBoss it would complain that the context-root is already in use.

This is an issue on non-Oracle application servers when a BPEL Process references more than one Decision Service partnerlinks generated from JDeveloper Studio. As a workaround, after generating the Decision Service applications on JDeveloper and before doing a build and deploy, perform the following:

- Modify the
  AutoLoanFlow\decisionservices\CreditRatingAgent\ear\META-INF\application.xml file.

  Change `<context-root>/rules/${domain_id}/${process_id}/${process_revision}</context-root>` to
  `<context-root>/rules/${domain_id}/${process_id}/${process_revision}/CreditRatingAgent</context-root>`

- Modify the
  AutoLoanFlow\decisionservices\CreditRatingAgent\war\WEB-INF\web.xml file.

  Change `<url-pattern>CreditRatingAgent</url-pattern>` to
  `<url-pattern>/</url-pattern>`

- Finally, build and deploy the Auto Loan Flow using the Integration Server Connection. In the application navigator, right-click the BPEL project and select Deploy.

  This would automatically deploy the BPEL process into BPEL engine running at the Integration Server connection.

The following J2EE applications should be manually deployed into JBoss:

- CreditRatingAgent.ear
- LoanAdvisorAgent.ear
- AutoLoanFlowUI.ear
- <domain>_AutoLoanFlow_<version>_LoanApproval.ear

### Deploying J2EE Applications on JBoss

Perform the following steps to deploy the applications to JBoss:

1. J2ee Apps can be deployed into Jboss by copying the files into JBOSS_HOME\server\SERVER_NAME\deploy directory.

   In case of AutoLoanDemo, the server to be deployed is decisionServer. JBOSS_HOME\server\decisionServer\deploy directory. After copying, JBoss automatically deploys the applications.

### Running the Sample

When the process is deployed, perform the following steps to test the sample:

1. Open the AutoLoanFlow UI at http://<hostname>:9700/AutoLoanFlowUI.
2. Click the Initiate New BPEL Loan Flow hyperlink.
3. Accept the default payload and click Submit Loan Application.
4. Log in to the worklist at http://<hostname>:9700/integration/worklistapp using jstein/welcome1 as the username and password.

5. Click the Task title (Loan Approval for Irving Stone).

6. Examine the task payload, the credit rating for that loan should be 500 with "Medium" risk and a Credit Max Amount of 50000.0.
   The provider for the Loan Offer should be "Premium Bank" with an APR of 4.0

7. Approve the task.

8. Verify the AutoLoanFlow instance.
This appendix describes the steps to be followed to configure BPELPM 10.1.3.3 in a Multiple Federated Node environment of WebSphere 6.1 ND and preparing the multiple instances of BPELPM as a HA setup.

- Install WebSphere ND 6.1
- BPELPM 10.1.3.3 Configuration on Federated Multi Node environment

**Install WebSphere ND 6.1**

Perform the following steps to install WebSphere ND 6.1 on Node01 and Node02:

**Node01**

1. Launch the WebSphere 6.1 ND Installation wizard.
2. Select **Cell (Deployment Manager and a Managed Node)** as the environment and complete the installation.
   
   This creates the following:
   - 2 Profiles: DMgr01 and AppSrv01
   - 1 Cell: for example, Cell01
   - 2 Nodes: CellManager01 and Node01

   By Default in this environment, the Node01 is federated with Cell01

3. Run `startManager` from DMgr01/bin.
4. Run `startNode` from AppSrv01/bin.

**Note:** Check for the actual soap connector port from the WC_adminhost attribute in `serverindex.xml` of CellManager01.

**Node02**

1. Launch the Profile Management Tool and create a new profile.
2. Select **Custom profile** as the environment.
3. Select the `<hostname>` and `<soap connector port>` of the Deployment Manager with which this new node should be federated.
4. Complete creating the profile.
   This creates the following:
   1 Profile: Custom01
   1 Node: for example, Node02, which is federated to Cell01

5. Run startNode from Custom01/bin.

BPELPM 10.1.3.3 Configuration on Federated Multi Node environment

The steps to configure BPELPM 10.1.3.3 on WebSphere 6.1 for Federated multi Node environment are by and large the same as for a single single Node environment. The differences are mentioned below:

Ensure that the Deployment Manager and both the NodeAgents (Node01 and Node02) are running. In case of federated multi node environment, the setup scripts should be run individually on each node.

Running the setup.bat/sh for Node01

Select the following values in constants.properties:

- CELL_NAME= Cell01
- NODE_NAME= Node01
- PROFILE_NAME= AppSrv01
- BPEL_HOME= [The directory path in which Oracle BPEL Process Manager is installed on the same host as this Node.]

Other attribute values are unambiguous.

After successful execution of setup.sh/bat, the following would be created:

- OracleBPELServer on Node01 configured to run on port 9700
  This can be verified from IBM admin console under oracleBPELServer -> Ports -> WC_defaulthost.

- DecisionServer on Node01 configured to run on port 9701
  This can be verified from IBM admin console under DecisionServer -> Ports -> WC_defaulthost.

Running the setup.bat/sh for Node02

Select the following values in constants.properties:

- CELL_NAME= Cell01
- NODE_NAME= Node01
- PROFILE_NAME= Custom01

Other attribute values are unambiguous.
After successful execution of `setup.sh/bat`, the following would be created:

- **OracleBPELServer** on Node02 configured to run on port 9700
  
  If Node02 and Node01 are created on the same host then due to port clash, then both the oracleBPEL Servers cannot be started together. This port should be changed manually to a different value, for example, 9702.

  This can be modified from IBM admin console under oracleBPELServers -> Ports -> WC_defaulthost.

- **DecisionServer** on Node02 configured to run on port 9701
  
  If Node02 and Node01 are created on the same host then due to port clash, then both the DecisionServers cannot be started together. This port should be changed manually to a different value, for example, 9703.

  This can be modified from IBM admin console under DecisionServer -> Ports -> WC_defaulthost.

**Virtual Hosts**

Also ensure that the new ports are added to the list of Virtual Hosts. This can be done from the IBM admin console under Virtual Hosts -> default_host -> Host Aliases.

The IBM Admin console would display the following servers under Application Servers after the above steps.

<table>
<thead>
<tr>
<th>Table A–1 Server Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>DecisionServer</td>
</tr>
<tr>
<td>DecisionServer</td>
</tr>
<tr>
<td>oracleBPELServers</td>
</tr>
<tr>
<td>oracleBPELServers</td>
</tr>
</tbody>
</table>

**Configuring BPELP for 2 Nodes for HA**

Use a software Load Balancer, which maps the 2 BPELPM Node instances to a single Load Balancing URL, as follows:

- `http://<hostname>:load_bal_port/`
  
  - `http://<hostname>:9700`
  
  - `http://<hostname>:9702`

Modify the `soapCallbackURL` to `http://<hostname>:load_bal_port/` in `<BPEL_HOME>/system/config/collaxa-config.xml`.

Then, restart `oracleBPELServers` on both Node01 and Node02.
Index

A
auto loan demo, 1-25, 2-24, 3-15

B
BEA WebLogic Application Server
auto loan demo, 2-24
installing, 2-1, 2-3
known issues, 2-27, 2-28
limitations, 2-27
postinstallation tasks, 2-12
postinstallation verification tasks, 2-16
system requirements, 2-2
troubleshooting tips, 2-28
workarounds, limitations, and unsupported features, 2-27
BEA WebLogic Application Server with Oracle BPEL Process Manager, 2-24

I
IBM WebSphere Application Server
auto loan demo, 1-25
installing, 1-1, 1-3, 3-1, 3-3
known issues, 1-29
limitations, 1-28
postinstallation tasks, 1-14
postinstallation verification tasks, 1-16
system requirements, 1-2
troubleshooting tips, 1-29, 1-30
workarounds, limitations, and unsupported features, 1-28
IBM WebSphere Application Server with Oracle BPEL Process Manager, 1-25
installation
BEA WebLogic Application Server, 2-3
IBM WebSphere Application Server, 1-1, 1-3, 2-1, 3-1, 3-3
Integration Repository Creation Assistant usage, 1-25, 2-24, 3-15

J
JBoss Application Server
auto loan demo, 3-15
postinstallation tasks, 3-10
postinstallation verification tasks, 3-12
system requirements, 3-2
JBoss Application Server with Oracle BPEL Process Manager, 3-15

K
known issues
BEA WebLogic Application Server
decision services, 2-28
JMS adapter, 2-27
BEA WebLogic Application Server with Oracle BPEL Process Manager, 2-27
IBM WebSphere Application Server with Oracle BPEL Process Manager, 1-29

L
limitations
BEA WebLogic Application Server with Oracle BPEL Process Manager, 2-27
IBM WebSphere Application Server with Oracle BPEL Process Manager, 1-28

P
postinstallation tasks
BEA WebLogic Application Server with Oracle BPEL Process Manager, 2-12
IBM WebSphere Application Server with Oracle BPEL Process Manager, 1-14
JBoss Application Server with Oracle BPEL Process Manager, 3-10
postinstallation verification tasks
BEA WebLogic Application Server with Oracle BPEL Process Manager, 2-16
IBM WebSphere Application Server with Oracle BPEL Process Manager, 1-16
JBoss Application Server with Oracle BPEL Process Manager, 3-12

S
system requirements
BEA WebLogic Application Server with Oracle BPEL Process Manager, 2-2
troubleshooting tips

BEA WebLogic Application Server
  using server start up options, 2-28

BEA WebLogic Application Server with Oracle BPEL Process Manager, 2-28

IBM WebSphere Application Server
  business rules applications, 1-30
  deployment of BPEL processes using ant/obant script, 1-30
  handling null poineer exceptions, 1-30
  installing on non-root installations of WebSphere Application Server, 1-30
  j-security servlet not found, 1-29
  proxy settings, 1-29
  sudo access, 1-29

IBM WebSphere Application Server with Oracle BPEL Process Manager, 1-29

workarounds, limitations, and unsupported features

BEA WebLogic Application Server with Oracle BPEL Process Manager, 2-27

IBM WebSphere Application Server with Oracle BPEL Process Manager, 1-28