Oracle® BPEL Process Manager for Non-Oracle Application Servers

Installation Guide

10*g* Release 3 (10.1.3.3) for UNIX and Microsoft Windows

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

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Preface

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

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- *Oracle Database Administrator's Guide*

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Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1

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 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 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 Admininstration, 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.

Table 1–1 Oracle BPEL Process Manager System Requirements

Element	Requirement
IBM WebSphere Application Server	Version 6.1.0.3 Network Deployment with fix packs PK33090 Note: The Interim Fix pack - IFPK33090 is used to resolve a WebSphere Bug related to ServletFilters. A Web Container custom property needs to be set for this bug fix to take effect. This step has been detailed in Step 14 of Section 3 of the Installation guide. Fix Pack 3: *http://www-1.ibm.com/support/docview.wss?rs=180&uid=swg27004980#ver61* Interim Fix Pack IFPK33090: *http://www-1.ibm.com/support/docview.wss?uid=swg24014758*
Oracle BPEL Process Manager for OC4J	Apply SOA Suite patchset 10.1.3.3 on BPELPM Standalone 10.1.3.1 **Note**: Refer to Step 2: Install Oracle BPEL Process Manager 10.1.3.1.0 for OC4J for installing Oracle BPEL Process Manager for OC4J.
Web browsers	Internet Explorer 6.0 or Mozilla Firefox 2.0
Operation systems	Microsoft Windows XP, Microsoft Windows 2003, Red Hat Enterprise Linux release 3, and Red Hat Enterprise Linux release 4 **Note:** See the IBM Web site for additional details about using these operating systems with the IBM WebSphere Application Server.
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.

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

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 1: Configure the Oracle Database

Follow these instructions to install Oracle Database 10*g*.

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

For all other Database versions, refer to *http://www.oracle.com/technology/documentation/index.html*.

1. Install Oracle Database 10*g* 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 10*g* 10.1.0.5 patch in the same Oracle home in which you installed Oracle Database 10*g*.
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 10.1.3.1.0 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

http://www.oracle.com/technology/software/products/ias/bpel/index.html

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 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*. 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.

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

Step 5: Install and Configure IBM WebSphere Application Server Version 6.1.0

Note: These instructions assume that you have obtained IBM WebSphere Application Server version 6.1.0 and version 6.1.0.3 upgrade software.

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

   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
3. Download Oracle BPEL Process Manager 10.1.3.1 for IBM WebSphere Application Server (6.1.0.3) at

   http://www.oracle.com/technology/software/products/ias/htdocs/101310.html and unzip to the `Installables` folder.

   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:

For...	Run...
Windows XP	`WAS_HOME\profiles\<ProfileName>\bin\startNode.bat`
Linux	`WAS_HOME/profiles/<ProfileName>/bin/startNode.sh`

5. Modify the following mandatory installation properties in the *`Installables`*`\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.

Property	Description
WAS_HOME	The directory path in which IBM WebSphere Application Server is installed.
CELL_NAME	Name of the IBM WebSphere Application Server Cell (<host>Node01Cell).
NODE_NAME	Name of the IBM WebSphere Application Server Node (<host>Node01).
PROFILE_NAME	Name of the Profile (AppSrv01 by default).
BPEL_HOME	The directory path in which Oracle BPEL Process Manager is installed.
BPEL_INSTALL_ROOT	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.
SERVER_NAME	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.
ORACLE_JDBC_DRIVER_PATH	The JDBC driver path (ojdbc14.jar).
DRIVERTYPE	The JDBC driver type (thick or thin).
HOSTNAME	The name or IP address of the host on which Oracle Database 10*g* is installed.
PORTNUMBER	The port number of the host on which Oracle Database 10*g* is installed.
SID	The service name of Oracle Database 10*g*.
JAASAUTHUSERID	The user name for accessing the Oracle BPEL Process Manager schema.
JASAUTHPASSWD	The password of the user name for accessing the Oracle BPEL Process Manager schema.
VHPORTS1	The virtual host or HTTP port number.
VHPORTS2	The virtual host or HTTP port number.
ISEMBEDDED	The Boolean value to specify for the messaging type. True - WebSphere Default Messaging False - WebSphere MQ Messaging

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.

Property	Description
PROXYSET	Indicates whether a proxy server is being used (true or false).
PROXYHOST	The name or IP address of the host on which the proxy server is installed.
PROXYPORT	The port your host uses to access the proxy server.
NONPROXYHOSTS	The addresses for which the proxy server must be bypassed.
CLUSTER_NAME	Name of the WebSphere cluster for hosting BPEL Server.

7. If you are using MQ as the messaging middleware, then remove the comment tag and then specify values for the following properties:

> **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.

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

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:

For...	Run...
Windows XP	setup.bat install
Linux	`configureWebsphereAsRoot.sh install` as root user (WebSphere Install user)"
	`configureBPELAsOracleUser.sh install` as non-root Oracle BPELPM Install user
AIX/Solaris	`configureWebsphereAsRoot.sh install` as root user (WebSphere Install user)
	`configureBPELAsOracleUser.sh install` as non-root Oracle BPELPM Install user

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.
11. From IBM Admin console, add Webcontainer custom property "`com.ibm.ws.webcontainer.invokefilterscompatibility=true`" for oracleBPELServerApplication Servers > oracleBPELServer > Web Container > Custom Properties.

> **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*\bpel\bin\startorabpel script. These actions are not supported.

Upgrade from BPELPM Standalone 10.1.3.1 to 10.1.3.3 on WebSphere Application Server

The following steps are to be followed to upgrade an existing BPELPM 10.1.3.1 instance running on a WebSphere Node to BPELPM 10.1.3.3:

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 BPELPM 10.1.3.1 Standalone.

Note:

- Refer to section Step 4: Apply SOA Suite Patchset 10.1.3.3 on Oracle BPELPM Standalone 10.1.3.1 for PatchSet download instructions.
- Choose the path where BPELPM 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 BPELPM installation on the machine, then this PatchSet needs to be installed only once on BPELPM.
- This PatchSet installation upgrades the binaries under `BPEL_HOME`, which are referred from BPELPM 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:

For...	Run...
Windows XP	`setup.bat upgrade`
Linux	`configureWebsphereAsRoot.sh upgrade` as root user (WebSphere Install user)
	`configureBPELAsOracleUser.sh upgrade` as non-root Oracle BPELPM Install user

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 BPELPM 10.1.3.1 on WebSphere instance.
- If multiple WebSphere Nodes point to a single BPELPM 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.
7. Restart **oracleBPELServer** and **DecisionServer** from the IBM console (available at *http://hostname:9060/ibm/console*).

> **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

   For Windows - *http://www.oracle.com/technology/software/products/jdev/htdocs/soft10131.html*.
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\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.

   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.
6. Restart **oracleBPELServer** and **DecisionServer** from the IBM console (available at *http://hostname:9060/ibm/console*).

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 Avalilability

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:

If the Messaging Middleware is Changed From...	Go to the WebSphere Console and Perform the Following Tasks...
External MQ for JMS *to* Default	Delete the following: 1. **BPELInvokerQueueFactory**, **BPELWorkerQueueFactory**, **BPELTestQueueFactory**, and **BPELNotificationSenderQueueFactory** under **WebSphere MQ Queue Connection Factories**. 2. **BPELInvokerQueue**, **BPELWorkerQueue**, **BPELTestQueue**, and **BPELNotificationSenderQueue** under **WebSphere MQ Queue Destinations**. 3. **InvokerAS**, **WorkerBeanAS**, **TestAS**, and **NotificationSenderAS** from the **Activation Specifications**.

If the Messaging Middleware is Changed From...	Go to the WebSphere Console and Perform the Following Tasks...
Default *to* External MQ for JMS	Delete the following: 1. **BPELInvokerQueueFactory**, **BPELWorkerQueueFactory**, **BPELTestQueueFactory**, and **BPELNotificationSenderQueueFactory** under **WebSphere Queue Connection Factories**. 2. **BPELInvokerQueue**, **BPELWorkerQueue**, **BPELTestQueue**, and **BPELNotificationSenderQueue** under **WebSphere MQ Queue Destinations**. 3. **InvokerBeanPort**, **WorkerBeanPort**, **TestPort**, and **NotificationSenderPort** from the **listener ports**.

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
  - Navigate to **WebSphere Admin console**, **Security**, **Secure administration, applications, and infrastructure**, **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 Avalilability

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

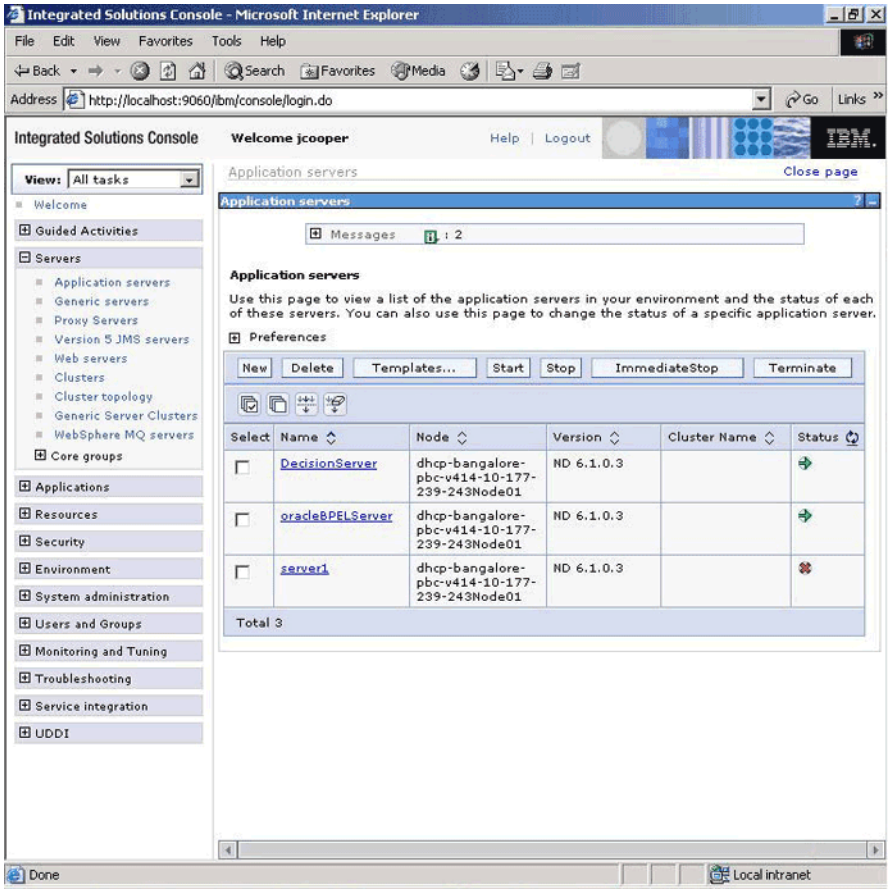
Postinstallation Verification Tasks

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

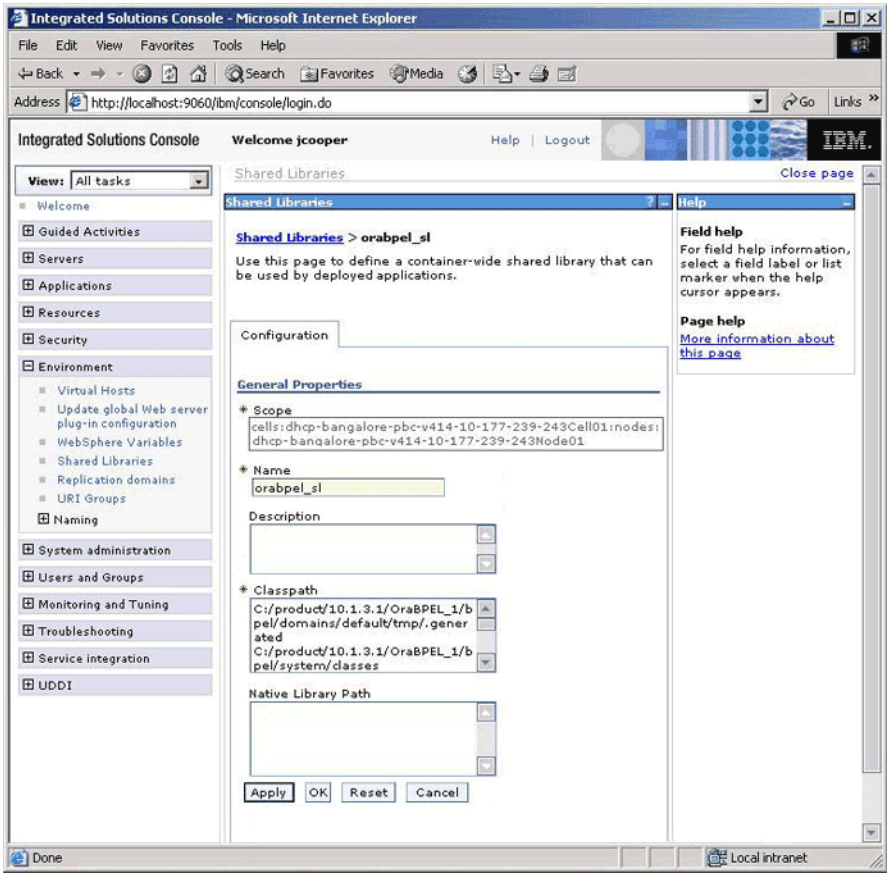
- Verifying Installation from the WebSphere Console
- Verifying Oracle BPEL Process Manager Console
- Verifying the SelectAllByTitle Sample for the Database Adapter
- Verifying the OrderBooking Tutorial Sample
- Running Adapter Samples
- Deploying Samples Using Ant

Verifying Installation from the WebSphere Console

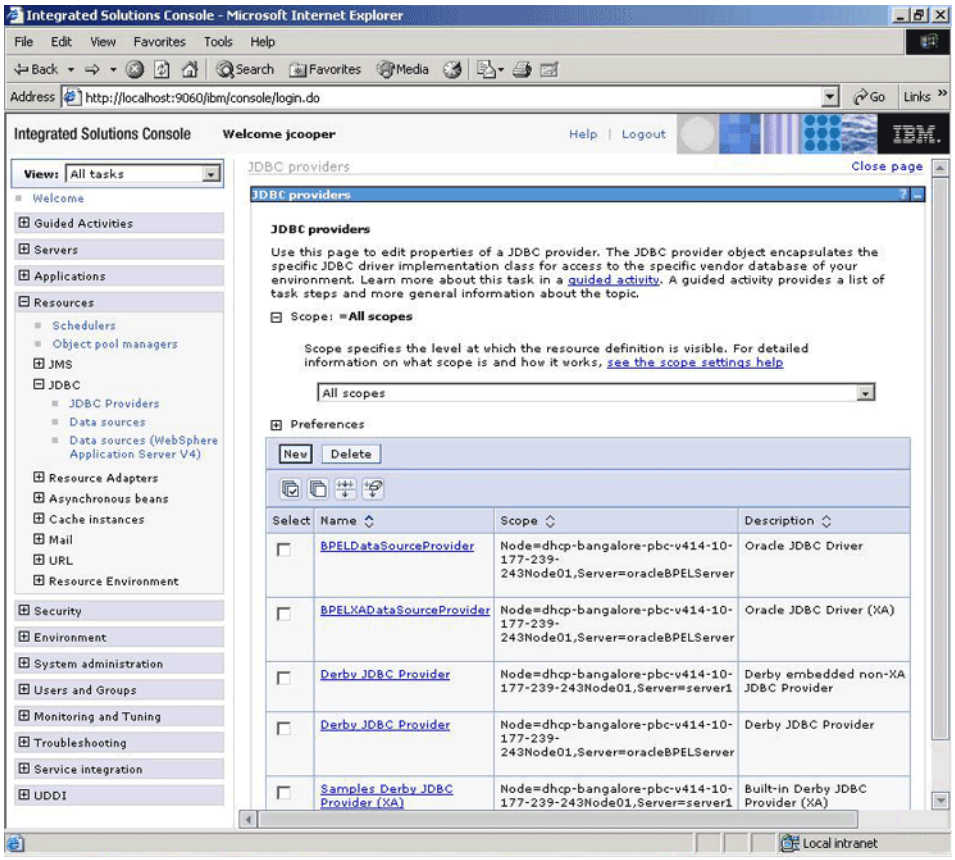
1. Log in to the WebSphere Console and verify that **oracleBPELServer** is installed under **Servers**, **Application Servers**.



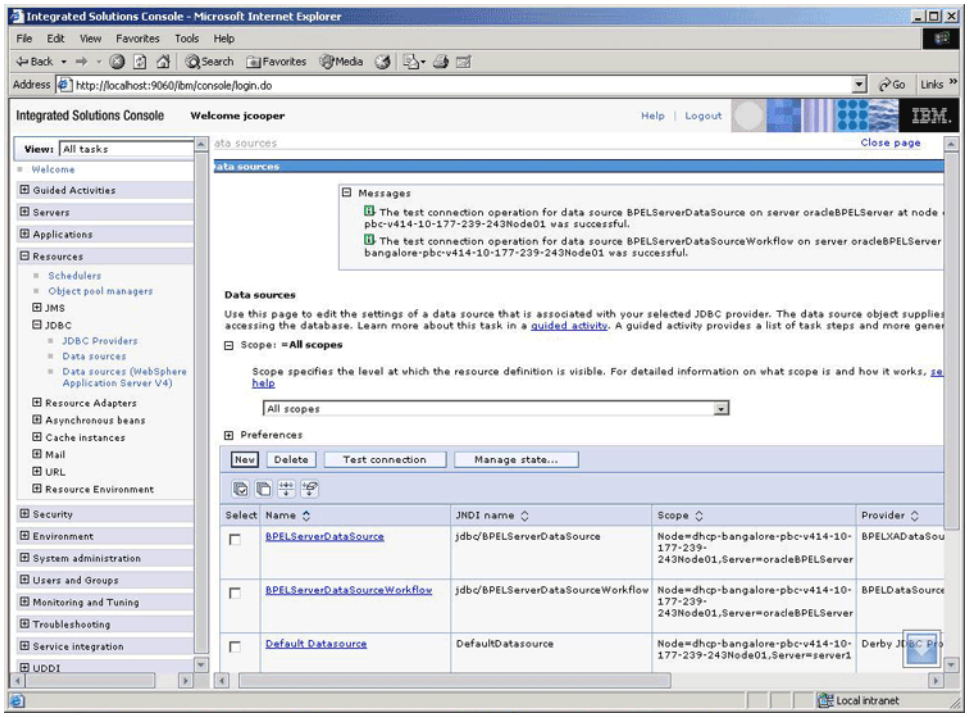
2. Verify that the **orabpel_sl** shared library has been created under **Environment**, **Shared Libraries**.



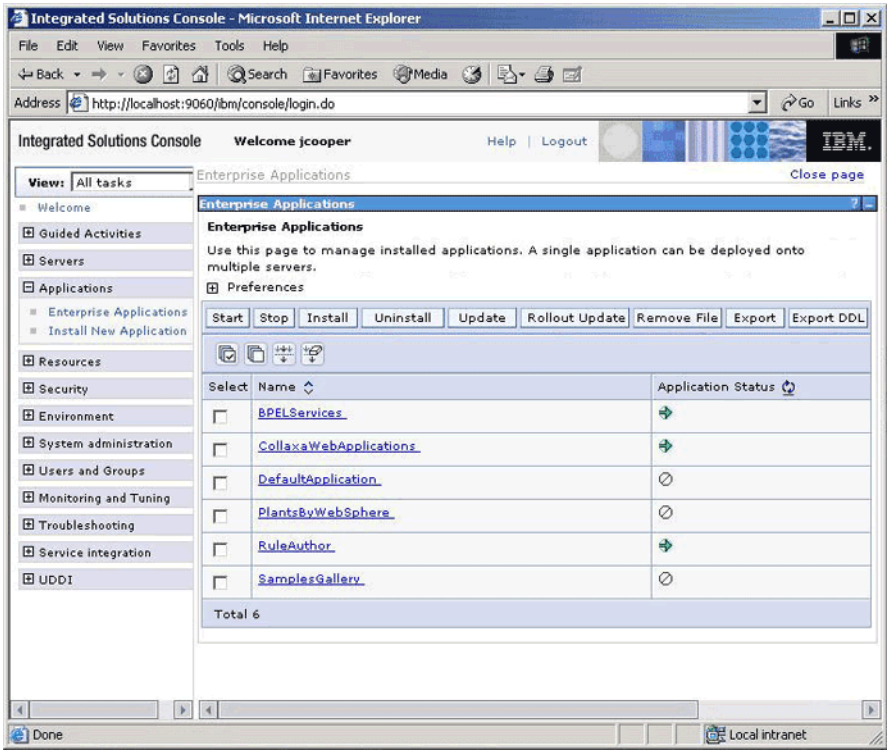
3. Verify that **BPELDataSourceProvider** and **BPELXADataSourceProvider** are created for oracleBPELServer under **Resources**, **JDBC**, **JDBC Providers**.



4. Test the database connectivity of the created data sources under **Resources**, **JDBC**, **Data Sources**, **BPELDataSourceProvider** and **Resources**, **JDBC Providers**, **BPELXADataSourceProvider**.



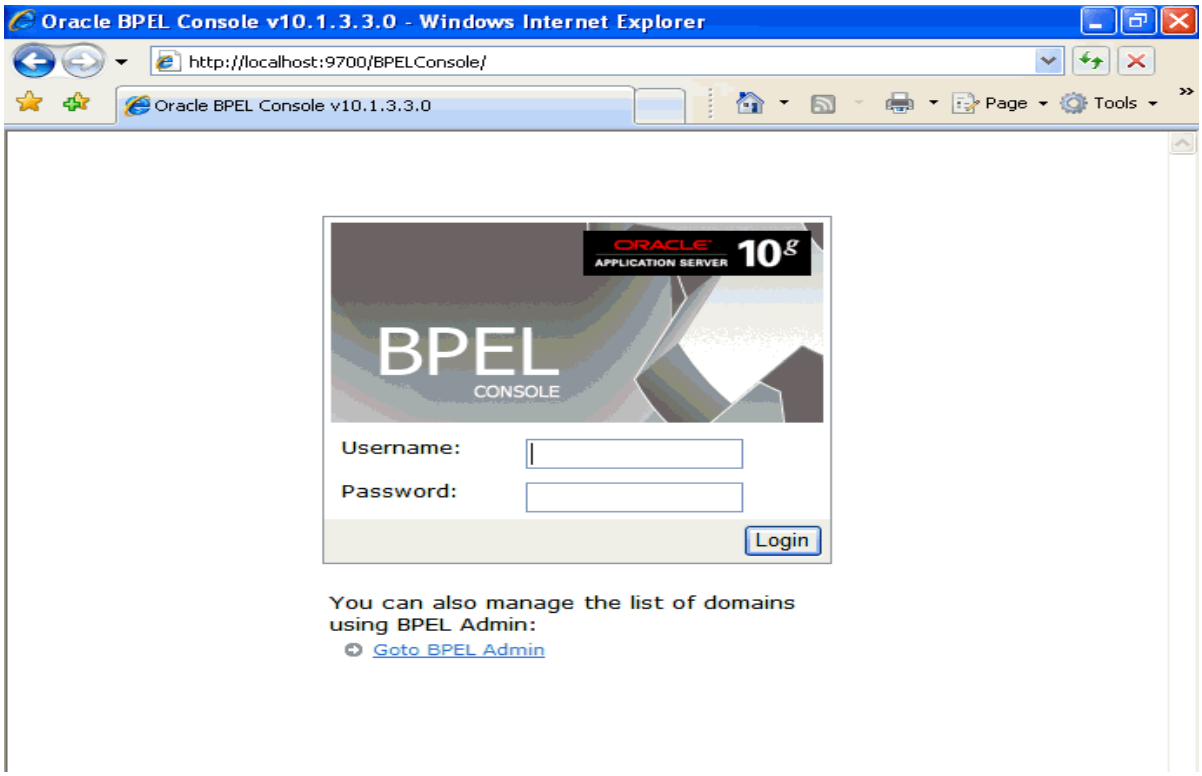
5. Verify that the **CollaxaWebApplications** and **BPELServices** application enterprise archives (EARs) are installed under **Applications**, **Enterprise Applications**.



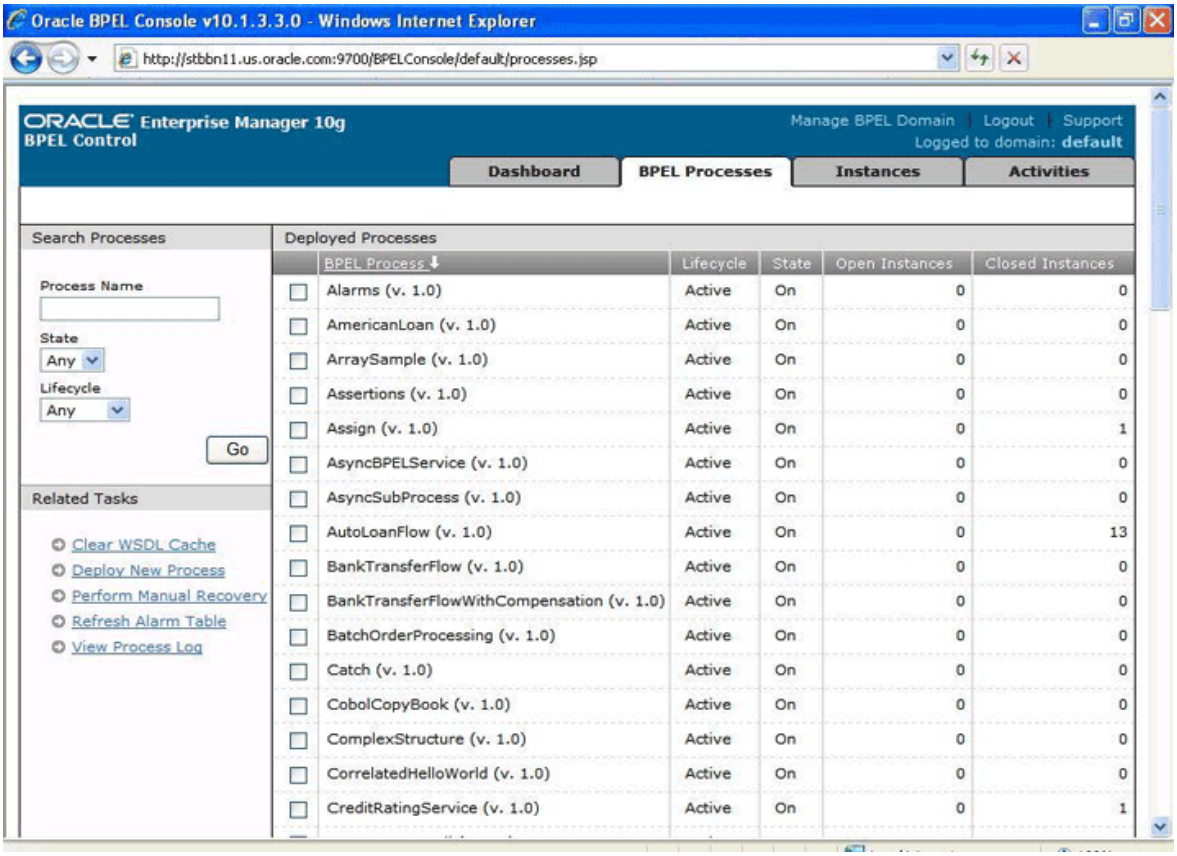
Verifying Oracle BPEL Process Manager Console

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*\bpel\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\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.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 `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 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 pProcess 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:

1. Start the WebSphere Administrative Console at *http://<hostname>:<port>/ibm/console*.

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. Ppen 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_sl` that has been created for DecisionServer.

  Note: Decision Service applications cannot be deployed on **oracleBPELServer** due to JWSDL 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:

  ```
  "javax.ejb.RemoveException: com.ibm.ejs.container.BeanNotReentrantException:
  METHOD_READY: Tx != null"
  ```

  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. Verfiy 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 `http://publib.boulder.ibm.com/infocenter/wasinfo/v6r1/index.jsp?topic=/com.ibm.websphere.express.doc/info/exp/ae/rwbs_java2wsdl.html` for **wsdl2java** and **java-wsdl** mapping file details.

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-orabepl.properties` file is the `BPEL_HOME\OraBPEL_1\bpel\util`ities 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 wsdls. 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`.

Perform the following steps to install on non-root installations of WebSphere Application Server:

1. Edit `configureWebsphereAsRoot.sh` as follows:

   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.

2

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 Admininstration 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 2–1 Oracle BPEL Process Manager System Requirements

Element	Requirement
BEA WebLogic Server	Version 9.2
Oracle BPEL Process Manager for OC4J	Version 10.1.3.1 **Note**: 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.
Web browsers	Internet Explorer 6.0 or Mozilla Firefox 2.0

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

Element	Requirement
Operation systems	Microsoft Windows XP, Microsoft Windows 2003, Red Hat Enterprise Linux release 3, and Red Hat Enterprise Linux release 4
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.

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

> **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 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 10*g*.

> **Note:** These instructions assume that you have obtained Oracle Database 10*g* version 10.1.0.2 and Oracle Database 10*g* Patch version 10.1.0.5.
>
> For all other Database versions, refer to *http://www.oracle.com/technology/documentation/index.html*.

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

http://www.oracle.com/technology/software/products/ias/bpel/index.html

---

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 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:

1. Log in to Oracle*MetaLink* at *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.

> **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.

2. Download the `Orabpel_10133_WebLogic.zip` file, which enables you to port Oracle BPEL Process Manager in BEA WebLogic Server 9.2 at

   http://www.oracle.com/technology/software/products/ias/htdocs/101310.html and unzip to the `Orabpel_10133_WebLogic` folder.

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.

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

Property	Description
NON_PROXY_HOST	The list of non proxy hosts that are divided by a | symbol. For example, NON_PROXY_ HOST=*.oracle.com|*.oraclecorp.com|localhost|127.0.0.1|10.177.251.61 |rajeshc-pc|rajeshc-pc.idc.oracle.com

4. Run the following script from orabpel_10133_WebLogic folder at the operating system command prompt:

For...	Run...
Windows XP	setup.bat
Linux	setup.sh

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 evironment 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:

For...	Run...
Windows XP	`BEA_HOME\weblogic92\server\bin\startNodeManager.cmd`
Linux	`BEA_HOME/weblogic92/server/bin/startNodeManager.sh &`

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 manger from the Windows Services by running the `installNodeMgrSvc.cmd` from the `BEA_HOME\weblogic92\server\bin\` directory.

6. Start BEA WebLogic Server as follows:

For...	Run...
Windows XP	`BEA_HOME\user_projects\domains\BPEL_Domain\bin\startWebLogic.cmd`
Linux	`BEA_HOME/user_projects/domains/BPEL_Domain/bin/startWebLogic.sh &`

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

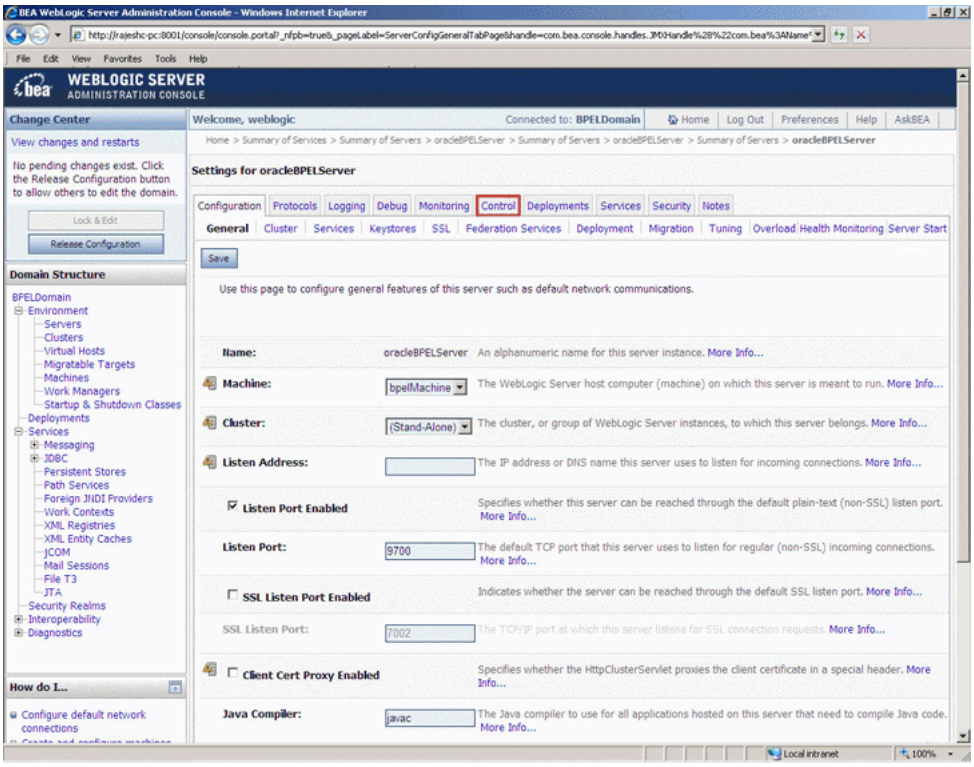
`http://`*`localhost`*`:8001/console`

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

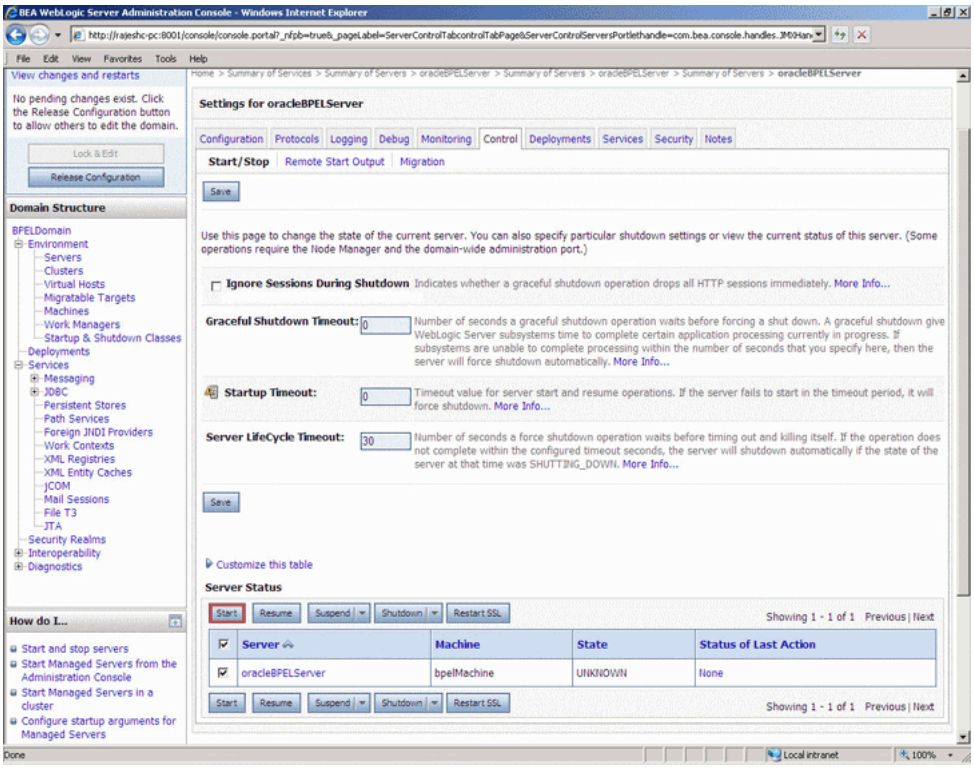
7. Start the **oracleBPELServer** managed server by following the startup instructions as follows:

   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

1. Download JDeveloper Studio 10.1.3.3 (`jdevstudio10133.zip`) from

   For Windows - *http://www.oracle.com/technology/software/products/jdev/htdocs/soft10133.html*.

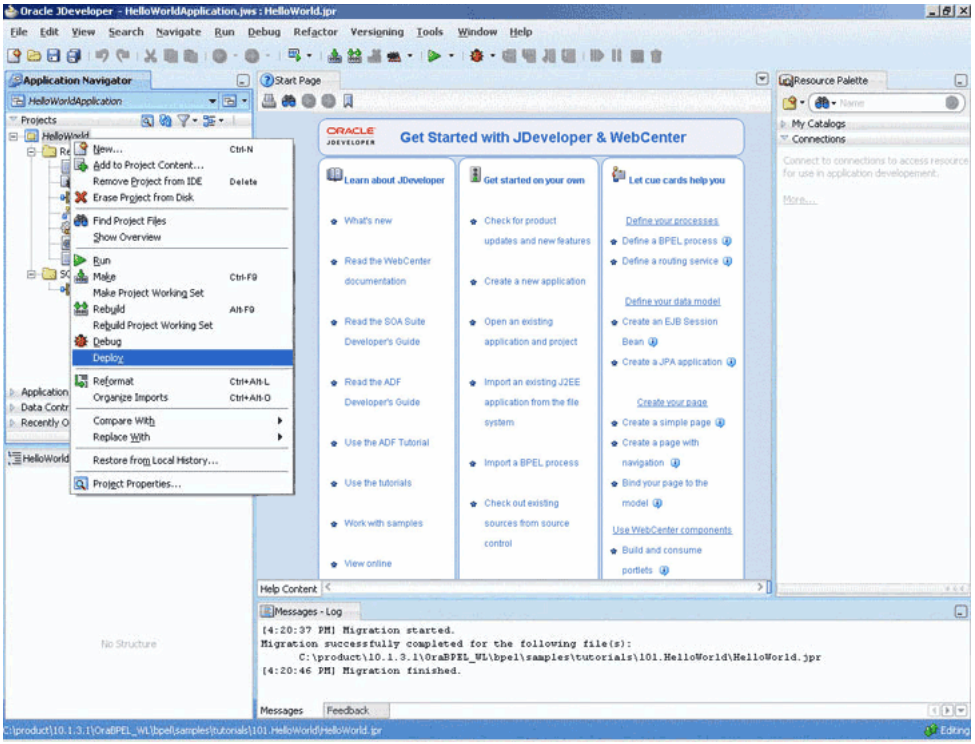
2. Copy the `bpm-services.jar` file from the `BPEL_HOME\system\services\lib` directory to `JDEV_HOME\integration\lib` directory.
3. Copy the `orabpel-ant.jar` file from the `BPEL_HOME\lib` directory to the `JDEV_HOME\integration\lib` directory.
4. Ensure that the following properties are set in in *`BPEL_HOME`*`\bpel\utilities\ant-orabpel.properties` 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: Confirguring 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.
2. Select **Security Realms** -> **myrealm** -> **Providers** -> **Authentication**.
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: Confirguring 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` propertypoints 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.
5. Log in to the BPEL Process Manager Console at *http://<loadbalancer>:9800/BPELConsole*.

Postinstallation Verification Tasks

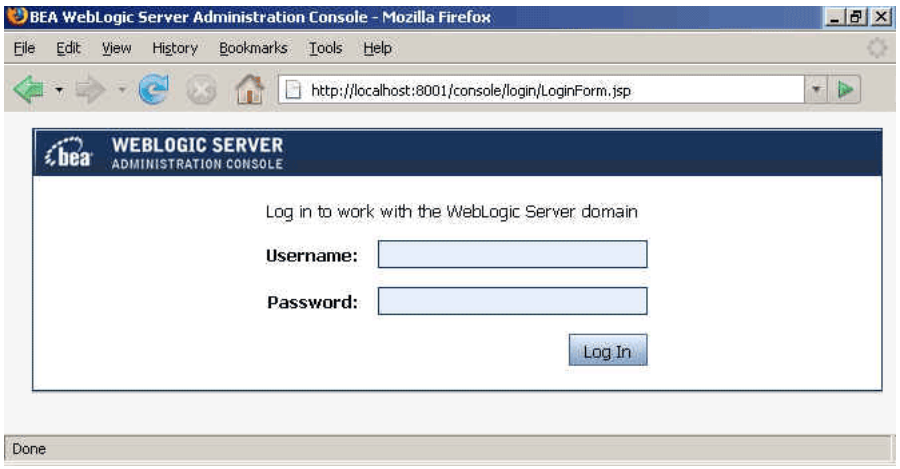
This section describes the postinstallation verification tasks to be performed, and it contains the following topics:

- Verifying 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

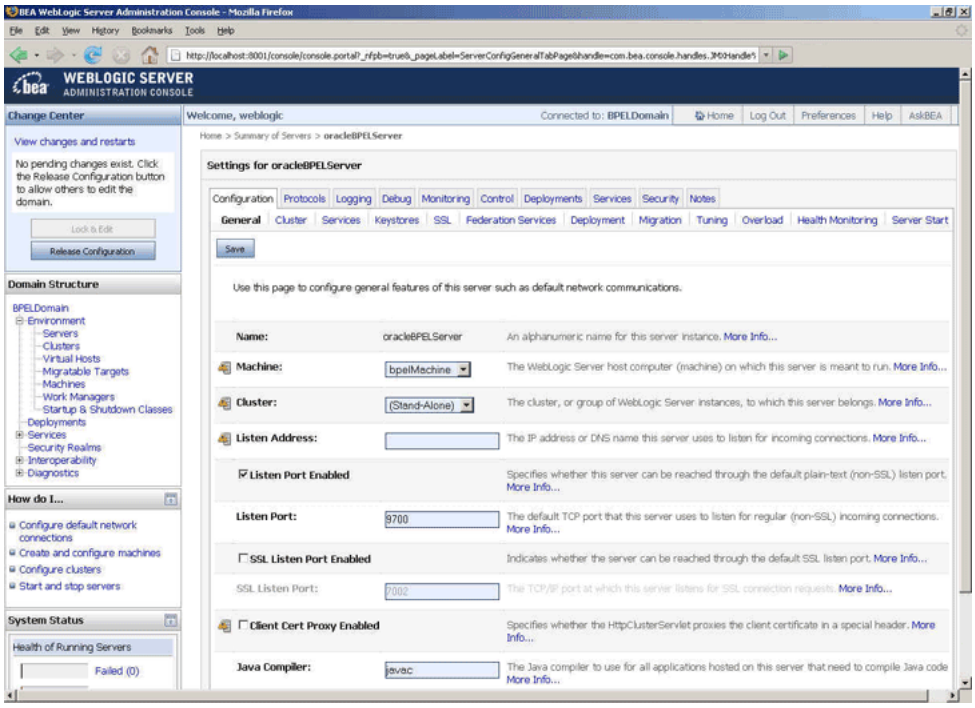
Verifying Installation from the BEA WebLogic Server Console

Perform the following steps to check if the BEA Admin Console has started:

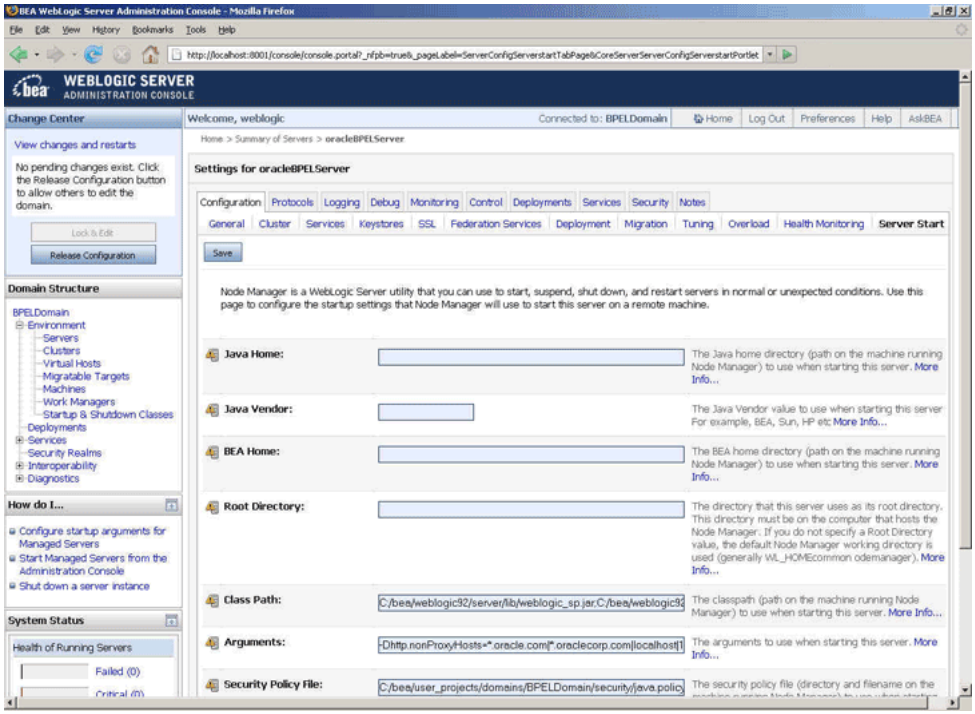
1. Navigate to *http://localhost:8001/Console*. The Oracle BEA WebLogic Server Admin Console window is displayed.



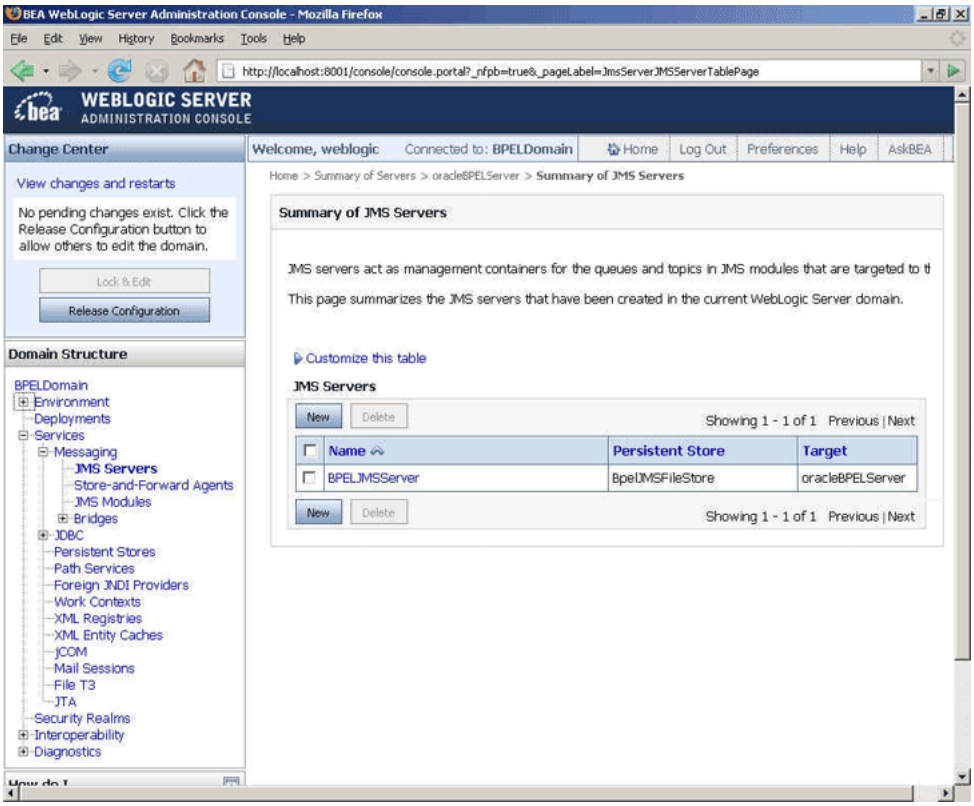
   Log in using `weblogic` as the username and password.
2. Verify that you can view the oracleBPELServer Home page by selecting **Environment** -> **Servers** -> **oracleBPELServer** -> **Configuration** -> **General**.



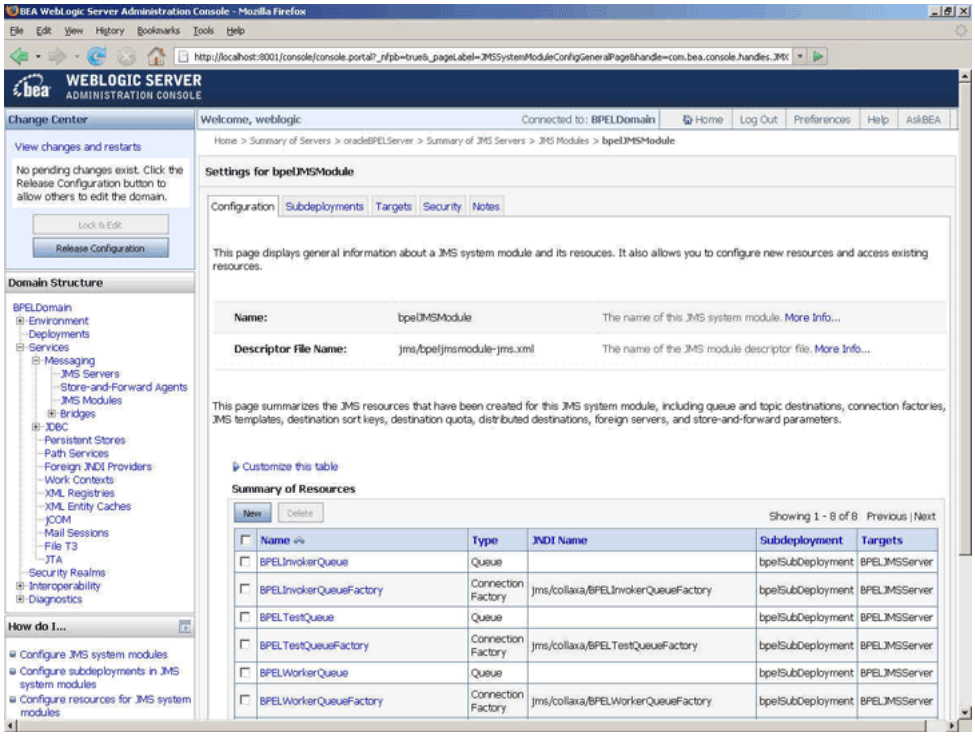
3. Verify that you can view the oracleBPELServer startup properties page by selecting **Environment** -> **Servers** -> **oracleBPELServer** -> **Configuration** -> **Server Start**. You can also add or modify the server startup properties such as Class Path, Arguments as a BPEL Domain admin.



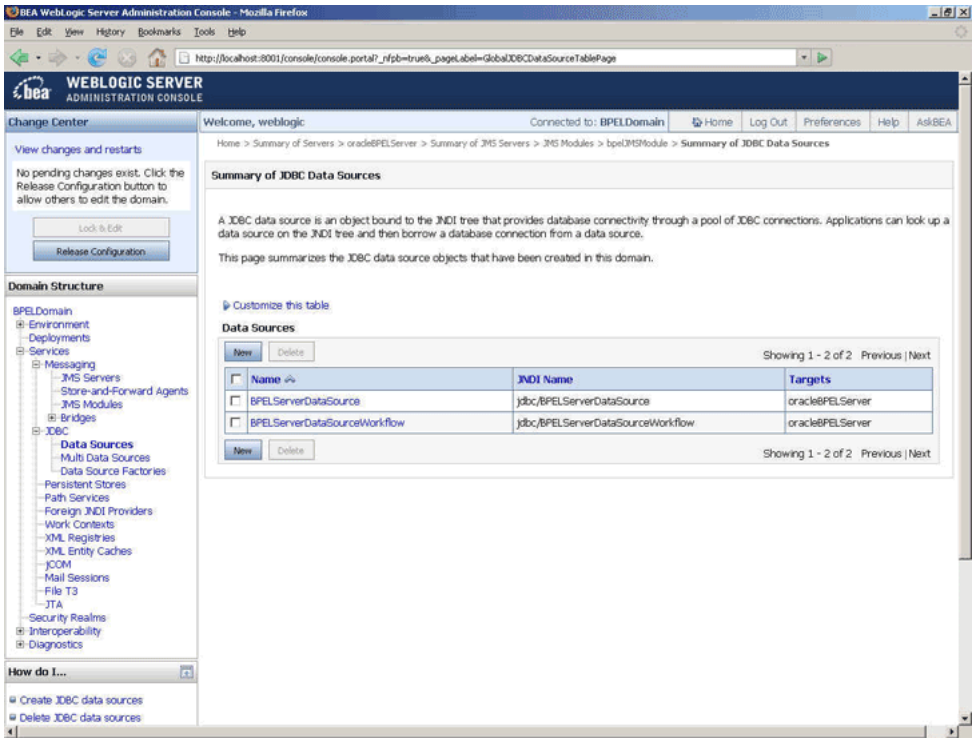
4. Verify that the BPELJMSServer is installed under **Services** -> **Messaging** -> **JMS Servers**.



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**.

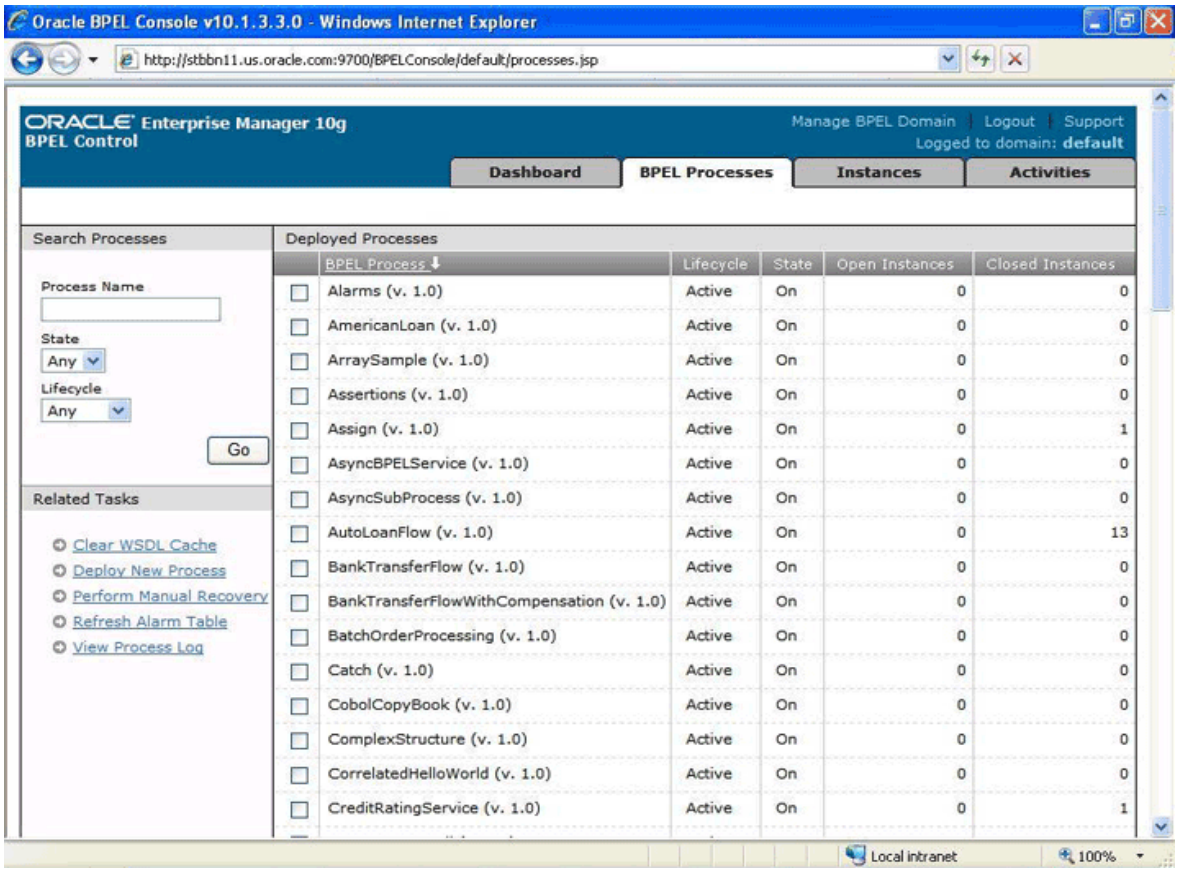


Verifying Oracle BPEL Process Manager Console

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> @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:

   ```
   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 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 dispalyed.
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 2–2 Outbound Connection Pool Properties

Adapter Type	Properties
Database	▪ `driverClassName` ▪ `connectionString`

Table 2–2 (Cont.) Outbound Connection Pool Properties

Adapter Type	Properties
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 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:

   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.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 pProcess 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 WebLogic using the WebLogic Admin console:

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

Deploying J2EE Applications on WebLogic

Perform the following steps to deploy the applications to WebLogic:

1. Start the Weblogic server using the `startWeblogic.cmd/sh` command.
2. Log in to WebLogic Admin console using *http://<hostname>: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 **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 *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 10.1.3.3 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:

```
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.

```
<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
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
wsdlMessageName='{http://xmlns.oracle.com/AutoLoanFlow/CreditRatingAgent}decis
ionServiceError',
wsdlMessagePartElement='{http://xmlns.oracle.com/AutoLoanFlow/CreditRatingAgen
t}errorInfo'.  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}decisionServiceErrorreq
uires 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";
     ```

3

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 Admininstration 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 3–1 Oracle BPEL Process Manager System Requirements

Element	Requirement
JBoss	Version 4.0.5 + jbossws-1.2.1
Oracle BPEL Process Manager for OC4J	Version 10.1.3.1 **Note**: 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.
Web browsers	Internet Explorer 6.0 or Mozilla Firefox 2.0

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

Element	Requirement
Operation systems	Microsoft Windows XP, Microsoft Windows 2003, Red Hat Enterprise Linux release 3, and Red Hat Enterprise Linux release 4
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.

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 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 10*g*.

> **Note:** These instructions assume that you have obtained Oracle Database 10*g* version 10.1.0.2 and Oracle Database 10*g* Patch version 10.1.0.5.
>
> For all other Database versions, refer to *http://www.oracle.com/technology/documentation/index.html*.

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

http://www.oracle.com/technology/software/products/ias/bpel/index.html

> **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\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 Oracle*MetaLink* at *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.

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.
2. Download the `Orabpel_10133_Jboss.zip` file, which enables you to port Oracle BPEL Process Manager in JBoss Application Server at *http://www.oracle.com/technology/software/products/ias/htdocs/101310.html* and unzip to the `orabpel_10133_Jboss` folder.

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.

Property	Description
JBOSS_HOME	The directory path in which JBoss Application Server is installed. For example, JBOSS_HOME=C:\jboss-4.0.5.GA.
BPEL_HOME	The directory path in which Oracle BPEL Process Manager is installed. For example, BPEL_HOME=C:\product\10.1.3.1\OraBPEL_1\bpel
BPEL_INSTALL_ROOT	The directory containing the JDK of Oracle BPEL Process Manager. For example, if the Oracle BPEL Process Manager home directory is C:\OraBPELPM_1\integration\orabpel, then BPEL_INSTALL_ROOT is typically C:\OraBPELPM_1.
DRIVER_TYPE	The JDBC driver type (thick or thin). For example, DRIVER_TYPE=thin.
HOSTNAME	The name or IP address of the host on which Oracle Database 10g is installed. For example, HOSTNAME=stda.us.oracle.com.
PORTNUMBER	The port number of the host on which Oracle Database 10g is installed For example, PORT_NUMBER=1087.
SID	The service name of Oracle Database 10g. For example, SID=ORCL.
JAASAUTHUSERID	The user name for accessing the Oracle BPEL Process Manager schema. For example, JAASAUTHUSERID=orabpel
JASAUTHPASSWD	The Host name of the proxy server. For example, JASAUTHPASSWD=orabpel
PROXYSET	Indicates if a proxy server is being used (true or false) For example, PROXYSET=true.
PROXYHOST	The Host name of the proxy server.
PROXYHOST	The name or IP address of the host on which the proxy server is installed. For example, PROXY_HOST=www-proxy.us.oracle.com.
PROXY_PORT	The Port where the proxy server is running. For example, PROXY_PORT=80
NON_PROXY_HOST	The addresses for which the proxy server must be bypassed that are divided by a | symbol. For example, NON_PROXY_HOST=*.oracle.com|*.oraclecorp.com|localhost|127.0.0.1|10.177.251.61|rajeshc-pc|rajeshc-pc.idc.oracle.com

4. Run the following script from `orabpel_10133_Jboss` folder at the operating system command prompt:

For...	Run...
Windows XP	`setup.bat`
Linux	`setup.sh`

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*

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:

For...	Run...
Windows XP	*`JBOSS_HOME`*`\bin\startServer.bat -c oracleBPELServer`
Linux	*`JBOSS_HOME`*`/bin/startServer.sh -c oracleBPELServer`

7. Start the **decisionServer** as follows:

For...	Run...
Windows XP	*`JBOSS_HOME`*`\bin\startServer.bat -c decisionServer`
Linux	*`JBOSS_HOME`*`/bin/startServer.sh -c decisionServer`

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 - *http://www.oracle.com/technology/software/products/jdev/htdocs/soft10133.html*.

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 **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**

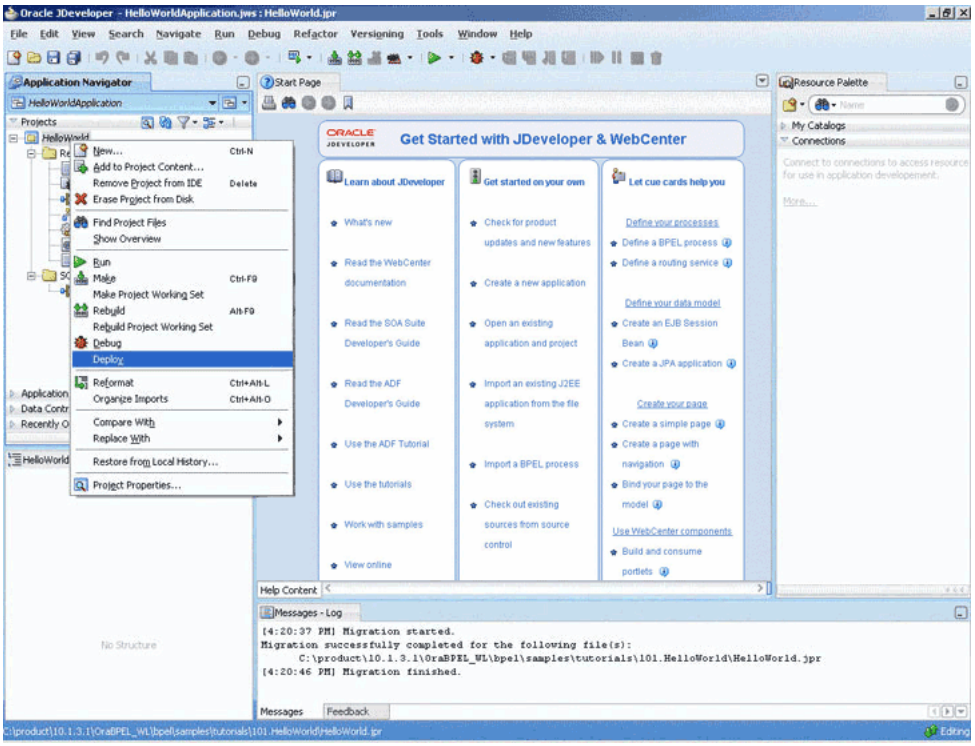
5. In JDeveloper, create an application server connection of the Standalone OC4J 10.1.3 type.

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 disbales 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` propertypoints 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:

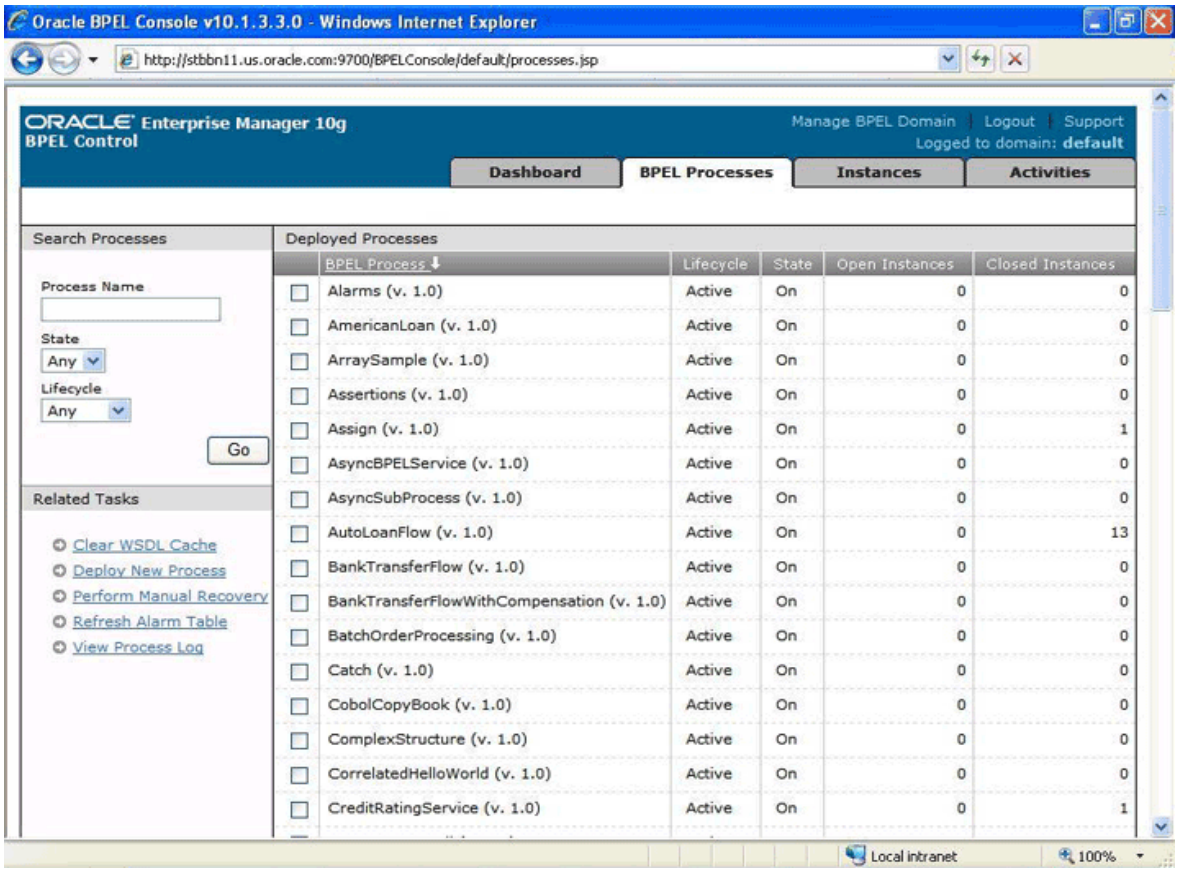
- Verifying Oracle BPEL Process Manager Console
- Verifying the SelectAllByTitle Sample for the Database Adapter
- Running Adapter Samples
- Deploying Samples Using Ant

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".



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 dispalyed.
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 3–2 Outbound Connection Pool Properties

Adapter Type	Properties
Database	▪ `driverClassName` ▪ `connectionString`
FTP	▪ `host` ▪ `port` **Note:** A new authentication alias must be created for connecting to the FTP server.

Table 3–2 (Cont.) Outbound Connection Pool Properties

Adapter Type	Properties
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 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

- Auto Loan Demo Sample
- Modelling Auto Loan Flow Process Using JDeveloper Studio
- Known Issues on non-Oracle Platforms
- Deploying J2EE Applications on JBoss
- 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 **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.

   - jndi.InitialContextFactory to **org.jnp.interfaces.NamingContextFactory**
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.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 `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 AutoLoamDemo, 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.

A

Configuring BPELPM on WebSphere for Multiple Federated Nodes

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`.
5. Access IBM Console from *http://<hostname>:<port>/ibm/console*.

> **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.

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

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 oracleBPELServers 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 oracleBPELServer -> 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 A–1 Server Details

Name	Node	Version
DecisionServer	sraghura-pcNode05	ND 6.1.0.3
DecisionServer	sraghura-pcNode03	ND 6.1.0.3
oracleBPELServer	sraghura-pcNode05	ND 6.1.0.3
oracleBPELServer	sraghura-pcNode03	ND 6.1.0.3

Configuring BPELPM on 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 `oracleBPELServer` on both `Node01` and `Node02`.

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