Informatica® ActiveVOS
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Server Installation, Configuration, and Deployment

Informatica ActiveVOS Server Installation, Configuration, and Deployment
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Preface

This module contains information on how to install, configure, and deploy a server for Informatica ActiveVOS. You can use Apache Tomcat, Oracle Weblogic, IBM Websphere, or JBOSS.

CHAPTER 1

Apache Tomcat

This chapter includes the following topics:

General Information

The Process Server Setup Wizard lets you install a new server or update an existing one.

1. Download and obtain a license for Process Server.

2. Download and run the Process Server installation.

3. To configure and deploy a server, open `quickstart_server.html`, which directs you to the file you are reading now.

4. Review the Prerequisites and Release Notes for Process Server by selecting the links in the navigation bar on the right.

Note: If the Setup Wizard detects an existing installation, it lets you either update the existing installation or install the server in a different directory. When you update an existing installation, the Wizard replaces any file that a previous Wizard had installed. All other files in your server's install directory remain as they were.

Quick Start

Preconfiguration

1. Create a database (or *tablespace*) for Process Server. Select the **Configuration** link in the navigation bar for details.

2. Process Server needs to be granted the following permissions on your schema:
   `GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES, INDEX, ALTER, CREATE TEMPORARY TABLES, LOCK TABLES, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROUTINE, ALTER ROUTINE`

   If Process Server does not have the permissions it needs, you will see an error message that begins as follows: `Failed to get version info from the AeMetaInfo table`.

3. Collect the following information that you will be prompted for during configuration:

   - Host, port number, and database name where you are deploying Process Server

   - The full path to a supported JDBC database driver

- Driver implementation class name

- Database username and password
  Hints and examples of this information are provided in the appropriate page of the Configuration utility's online Help.

4. For an upgrade installation of Process Server, manually install the database schema. For a new installation, you can automatically install the database schema during configuration.

5. Ensure that the `JAVA_HOME` environment variable is set.
   Note for Tomcat and JBoss: To avoid issues with multiple JDKs, we recommend that you set `JAVA_HOME` in the application server startup file instead of in the system environment.

6. Ensure that your JVM memory settings in your application server match the recommendations described in .

7. **MultiSite Installations Only:** To configure MultiSite clustering, be sure to review the instructions in **Process Server MultiSite Configuration**. Access the instructions from the **Configuration** link in the navigation bar on the right.

8. **Unix Platform Only:** After installing any version of the Process Server on any UNIX OS, you may receive an error when starting the server such as `cannot write to temp location [/temp]`. This is due to an OS restriction on the number of files that can be created. To avoid this error, before installing the server edit your UNIX security configuration file directly to allow a larger number of files to be opened. In UNIX the parameter NOFILE sets the maximum number of files that can be opened by a single process. For example, in the file `/etc/security/limits.conf` you could add the line `- nofile 10240` to raise the limit from the default 1024 value. 10240 should be large enough. If you are unsure, setting "unlimited" can be considered.

Configuration and Deployment

1. In your `ActiveVOS` installation folder, locate the `[server]-config>bin` folder, and select the `config-deploy` utility.

2. Complete the configuration and deployment. Use the online Help as needed.

3. Use your server container's documentation for help in starting the Process Server.

Note: When you are deploying Process Server to a Tomcat server, `activebpel-cert.war` is not deployed. You must copy it from `{installation_directory}\server-enterprise\tomcat_config\webapps` to `{Tomcat_Home}\webapps` directory when deploying an SSO configuration

Add Your License

1. You will need access to your Process Server license.

2. Open the Process Console in a browser:
   `http://[host]:[port]/activevos`

3. Add your license on the License page. Select the Admin menu item of the Process Console and then select License. Select **Add** and copy and paste all of the Process Server license into the dialog. Then select the Server Status navigation menu item and select **Start Server** to start the Process Server.

Prerequisites

Process Server relies on a valid license and third party software components. Ensure that your application server environment meets the requirements before beginning the configuration procedure.

Process Server Licensing

A valid license is required to run Process Server. You enter the license information after you've configured Process Server. Do this as follows:

1. Start Process Console.

2. Select **Admin | License**. (**Admin** is in the toolbar; **License** is about a third of the way down on the left.)

3. Press the **Add License** button, copy and paste all of the Process Server license into the dialog, and then press the **Add License** button.

4. Select the Server Status link near the ver top of the left area press the **Start Server** button to start the Process Server

Obtaining a License Key

If you did not receive your license prior to receiving the software, contact the Informatica sales department.

Our sales support staff can assist you with licensing questions.

Hardware Requirements

Application Server Hardware

Process Server runs within different server containers, and the hardware requirements of the server are superseded by the requirements of the container.

Database Hardware

Process Server application supports multiple database servers and has no additional requirements besides those of your selected database server.

Note: For maximum performance, we recommend that you run Process Server and its database schema on separate servers.

JVM Memory Requirements

We strongly recommend that you run your application server with at least the following memory settings:

```
-Xms256m -Xmx1024m -XX:MaxPermSize=384m
```

where Xms is starting memory, Xmx is maximum memory, and $MaxPermSize$ is the amount of memory set aside for loading class files.

Disk Space Requirements

At least 1 GB of disk space is required to install the Process Server application.

Note: Considerably more disk space is required to run your applications. The amount is dependent on several factors including logging levels you select, number of processes you run, and size of processes.

Software Requirements

Specific versions of Eclipse, client and server operating systems, application and database servers are supported. Support means that Informatica will assist customers with the installation and operation of Business Process Manager products on these 3rd party product versions.

Also certified are specific combinations of 3rd party products. Use of Certified Systems described here will reduce the risk of problems as a result of extensive testing of Business Process Manager with these specific versions. Database connectivity is required for Process Server persistence and version control of deployed processes. It is recommended that the database resides on a dedicated server.

The following software is supported for use with Process Server:

Operating Systems

- Microsoft Windows 2003/2008 Server
- Linux operating system versions that support the JVM, application and selected database servers supported by Informatica for use by Process Server.
- Solaris 10 (x86/Sparc)
- HP-UX 11i v3 (on Itanium processor)
- AIX 5.3 and 6.1
- Mac OS 10.6 64-bit or higher

Web Browser

- Any browser. A browser is required to view the Release Notes and run the Process Server consoles. Review the `activevos.com` certified system support page for details.
- There are specific requirements for Screenflow execution in the Screenflow product.

Application Servers

- Apache Tomcat 7.x
- JBoss AS
- Oracle WebLogic 12.1.1
- IBM WebSphere Server 8.5

Note: Other releases of these servers should work. However, they have not been tested.

JAVA Environment

If you are running a Linux distribution and you are using the US ASCII codeset, you will need to add the following startup parameter to your JVM:

```
-Dfile.encoding=UTF-8 encoding
```

Application Server	JVM	Comment
Tomcat	Sun JDK	To avoid issues with multiple JDKs, we recommend that you set JAVA_HOME in the application server startup file instead of in the system environment.
JBoss	Sun JDK	To avoid issues with multiple JDKs, we recommend that you set JAVA_HOME in the application server startup file instead of in the system environment.
WebLogic	Sun JDK	
WebSphere	IBM J9 VM build 2.4, J2RE 1.6.0	

Setting JAVA_OPTS for DOM Processing

If you are using a Java server and the DOM being produced is incorrect, you should add the following definitions to the definition of JAVA_OPTS in your server startup script

```
set JAVA_OPTS=%JAVA_OPTS%
    -
Dorg.apache.xerces.xni.parser.XMLParserConfiguration=org.apache.xerces.parsers.XIncludePa
rserConfiguration
    -
Djavax.xml.transform.TransformerFactory=org.apache.xalan.processor.TransformerFactoryImpl
```

Note: If this is not set, the classloader must search through the classpath to locate the appropriate class. Depending on the size of the classpath, this operation can degrade performance.

Database Servers

Process Server uses standard database servers as the persistent storage mechanism. You must have access to one of the supported database servers with the proper privileges to create databases and tables as well as privileges to update, insert and delete into those tables.

Supported Databases

- MySQL 5.5
- MySQL 5.1.x (For more information, see the *MySQL Configuration Note* below.)
- Microsoft SQL Server 2005, 2008, 2008 R2, 2012
- Oracle Database 10g, 11g
- IBM DB2 9.7

Certified JDBC Database Drivers

A JDBC database driver is required. For certain configurations, you will be asked to provide the location of driver during configuration. For other configurations, you will be instructed to use your application server administration console to configure the database.

Note: For a clustered environment, you must install the driver to each node in the cluster.

Database Server	JDBC Driver
MySQL	`mysql-connector-java-5.1.6-bin.jar`
Microsoft SQL Server	`sqljdbc.jar (1.2)`, `sqljdbc4.jar`. JBoss 7.x requires sqljdbc4.jar
Oracle	`ojdbc6.jar`
DB2 9.7	`db2jcc_license_cu.jar`, `db2jcc.jar`.JBoss 7.x requires db2jcc4.jar

Process Server

Process Server supports 64-bit Java Virtual Machines (JVM) for the Windows and Linux systems listed above. When installing Process Server on a 64-bit server, the 64-bit JVM supported for a given application server is required.

Process Developer

Process Developer embeds Eclipse 3.7.2 and a 32-bit version of JRE 7 for Windows systems allowing it to run on both 32-bit and 64-bit Windows operating systems and hardware environments. The Linux distribution of Process Developer does not embed the required 32-bit version of JRE 7. Users must install JRE 7 separately. Users wishing to use a 64-bit version of Eclipse must download the 64-bit version of Eclipse for RCP and RAP Developers, and then use the Process Developer Plugin installation.

Before You Configure and Deploy Process Server

Third party software components are required to be installed prior to configuring and deploying Process Server.

Application Server must be Installed

An application server provides Process Server a framework within which to run. Install the appropriate supported server container according to software vendor's documentation on each machine intended to run Process Server.

Note: Set up clustering according to your software vendor's documentation. Once clustering is set up on the application server, follow our documentation for configuring clustering.

Database Server must be Installed

Process Server requires only one database server per any number of application servers running in a cluster.

All databases require a user with administrative rights to the computer in order to install them. Process Server also requires a connection to your database server. This user needs the proper privileges to connect to the Process Server database, update, insert and delete records within that database.

MySQL Configuration Note

A BPEL process can send and receive variables with attachments such as images or documents. Attachments may be large or numerous, causing database connection errors.

To avoid connection errors to MySQL Server, you may need to configure MySQL with more allocated memory than the default of 1MB.

To configure MySQL:

1.   Open MySQL Administrator. (If unavailable, see the note below.)

2.   Select Startup Variables.

3.   Select Advanced Networking.

4.   In the Data/Memory Size panel, enable Max Packet Size.

5.   Set the packet size higher than the default of 1MB. The size depends on the attachment sizes you expect.

6.   Apply changes.

Note: If MySQL Administrator is not available, refer to the MySQL documentation regarding how to set the `max_allowed_packet` setting for your environment.

About the Process Server Database Schema

Process Server provides database schema definition files for all supported databases. Before you start the configuration and deploy utility, refer to Configuration topic in this help for specific recommendations on how to install the schema for your database.

Installation Folders

Download and extract the installation folders as described in *Quick Start.* The following describes the contents of the Process Server installation:

`{install_dir}/server-enterprise`

> `quickstart_server.html`. Open this file for quick start and complete details for configuration and deployment.

`{install_dir}/server-enterprise/tomcat_config/bin`

> Configuration and deployment tool

`{install_dir}/server-enterprise/tomcat_config/conf`

> Configuration files needed by the configuration and deploy utility

`{install_dir}/server-enterprise/tomcat_config/ddls`

> Database schema to be installed automatically (recommended) or manually, as described in *Configuration*

```
{install_dir}/server-enterprise/tomcat_config/doc/html/config
```

Copies of the Configuration utility's online help files. These files are accessible from the Help button within the utility.

```
{install_dir}/server-enterprise/tomcat_config/shared
```

Files that will be automatically copied to your deployed Process Server

```
{install_dir}/server-enterprise/tomcat_config/webapps
```

Files that will be automatically copied to your deployed Process Server

Process Server and Resource Configuration

This topic leads you through configuration of the resources required for Process Server. You must configure your database, Apache Tomcat Server and Process Server before deploying and running Process Server. The sections below provide information for completing the configuration.

Configuration Instructions

Before running the Configuration utility, perform the following pre-configuration steps:

- Create a database (or tablespace) where Process Server persistence information will be stored
- Create a default user with administrative rights to the computer and database for use by Process Server
- Note both the database name and port number, which you will be asked for during configuration.
- Process Server requires a JDBC driver to connect to your database. During configuration, you will be prompted for:
  - The full path to a supported JDBC database driver
  - The driver implementation class name

  Note that the Microsoft SQL Server 2005 JDBC Driver 1.2 driver, or the JDTS-1.2.jar drivers are supported. Version 1.1 of the Microsoft SQL Server will not function as it does not include all required functionality.

First Time or New Install

If you are performing a clean installation, that is, a first-time install or a new database, you can use the Configuration utility to automatically install the database schema.

Manual Install or Update of Database Schema

It is strongly recommended that you automatically install the database schema; however, you can manually install it. Customers migrating from an earlier version should follow the instructions below.

Migrating from ActiveVOS to Process Developer

If you are migrating from ActiveVOS, perform the following steps:

- Manually update the Process Server database schema using the DDL patches provided in `{install_dir}/server/tomcat_config/ddls/updates`
- Run the *Configuration utility*
- Review the Release Notes for late breaking migration information
- Review the Process Developer help topic, Migrating from Earlier Versions

Process Server can be configured to use an RDBMS database.

Relational Database Schemas

These instructions are generalized to make sure they can be followed for each database. When creating the database schema for Process Server, you can either create a new database definition or upgrade an existing definition.

- Refer to the install a new database schema section for a new installation.
- Refer to upgrade a database schema when performing a version upgrade.

Install a new database schema

1. Identify your DDL. Use the information provided in the table below to locate the correct DDL file.

Database Server	DDL File Name and Location	Notes
MYSQL	`{install_dir}/server/ tomcat_config/ddls/ ActiveBPEL_Enterprise-MYSQL.SQL`	The default database name, ActiveVOS is defined within the DDL file. If you edit this name, ensure that you do not replace ActiveVOS Enterprise, a name that is inserted into the `AeMetaInfo` table.
MS SQL SERVER	`{install_dir}/server / tomcat_config/ddls/ ActiveBPEL_Enterprise-MYSQL.SQL`	The default database name, ActiveVOS is defined within the DDL file. If you edit this name, ensure that you do not replace ActiveVOS Enterprise, a name that is inserted into the `AeMetaInfo` table.
ORACLE	`{install_dir}/server/ tomcat_config/ddls/ ActiveBPEL_Enterprise- ORACLE.SQL`	Create a tablespace prior to running the DDL.
DB2	`{install_dir}/server/ tomcat_config/ddls/ ActiveBPEL_Enterprise- DB2.SQL`	

2. Copy the DDL file from above, and rename it.
   Note: The original files must remain unchanged for the Configuration utility to work properly

3. (Optional) Modify the database name. Be sure to see the notes above.

4. Execute the DDL script.

5. Permissions must be set for Process Server to access your schema. For example, `GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES, INDEX, ALTER, CREATE TEMPORARY TABLES, LOCK TABLES, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROUTINE, ALTER ROUTINE`
   If Process Server does not have the permissions it needs, you will see an error message that begins as follows: `Failed to get version info from the AeMetaInfo table.`

Each database server provides its own mechanism or utility for executing a DDL script file. Execute the DDL script file using the appropriate utility. For example, if you are using Oracle, the utility to execute the DDL script file would be SQL Plus.

Upgrade an existing database schema

To upgrade your existing Process Server database to be compatible with the new version of software, follow the instructions below:

1. Shutdown Process Server before executing a database upgrade.

2. Make a backup copy of your database.

3. Identify your current running version of Process Server. Database upgrades are provided to upgrade from one version back at a time. This means that more than one upgrade script may need to be applied to

your database. For example, if you are running ActiveVOS version 8.0.x, you must go to the **updates** folder, and apply all patch scripts with higher numbers, starting with `[database name]-Patch-9.0.sql`. Be sure to run the patch scripts in *ascending* order. Do not run any upgrade script with a version number equal to or less than your current running version.

4. For each upgrade that needs to be applied perform the following:

   a. Identify your DDL. Use the information provided in the table below to locate the correct DDL file. Note: The updates must be applied in ascending order.
   MYSQL

   > Tomcat: {install_dir}/server/tomcat_config/ddls/updates/enterprise/ActiveBPEL_Enterprise-MYSQL-PATCH-{patch number}.SQL

   MS SQL SERVER

   > Tomcat: {install_dir}/server/tomcat_config/ddls/updates/enterprise/ActiveBPEL_Enterprise-SQLSERVER-PATCH-{patch number}.SQL

   ORACLE

   > Tomcat: {install_dir}/server/tomcat_config/ddls/updates/enterprise/ActiveBPEL_Enterprise-ORACLE-PATCH-{patch number}.SQL

   DB2

   > Tomcat: {install_dir}/server/tomcat_config/ddls/updates/enterprise/ActiveBPEL_Enterprise-DB2-PATCH-{patch number}.SQL

   b. Execute the DDL script.
   Each database server provides its own mechanism or utility for executing a DDL script file. Execute the DDL upgrade script file using the appropriate utility. For example, if you are using Oracle, the utility to execute the DDL script file would be SQL Plus.

Multisite Configuration

For details, see *Process Server MultiSite Configuration*.

Tomcat Security Configuration

You can find details on configuring Process Server security roles in Process Developer Help or in the Infocenter.

Configuration for Headless Mode

Process Server relies on GUI components from the Java's SWT package, such as fonts. If you are running on a headless server (that is, the server does not have a graphic subsystem), you may see one of the following errors in the stack trace:

- java.lang.NoClassDefFoundError: sun/awt/X11GraphicsEnvironment
- Can't connect to X11 window server using ':0.0' as the value of the DISPLAY variable
- org.eclipse.birt.report.service.api.ReportServiceException

Use one of the following techniques to correct the errors:

- Configure the JVM system property `java.awt.headless=true` and at the command line, start the JVM with the argument: `-Djava.awt.headless=true`
- Run a X-windows virtual frame buffer (Xvfb)

In a Linux environment that uses Azul Zulu JDK, when you run the ActiveVOS installer, the following error appears:

`java.lang.Error: Probable fatal error:No fonts found...`

Workaround: To install the missing fonts, run the following command:

```
sudo yum install fontconfig dejavu-sans-fonts dejavu-serif-fonts
```

Using the Configuration Utility

The Configuration utility walks through the steps required to provide the property values for Process Server and selected resources.

Note: Before running the utility, ensure that your server container is stopped.

Starting the Configuration Utility

Execute one of the following utilities based on your operating system:
Windows

```
{install_dir}/server/tomcat_config/bin/config_deploy.bat
```

Linux

```
{install_dir}/server/tomcat_config/bin/config_deploy.sh
```

If You Have Manually Installed or Updated the Database Schema

If you have manually installed or updated the database schema, when prompted, you must not select the "Install Database Schema" checkbox.

Running the Configuration Utility in Different Modes

The Configuration utility can be run with a graphical interface (default), in console mode or silently. When you run the utility your configuration options are automatically written to the `install.properties` file and they will be used as the defaults the next time the application is configured. One of the following parameters is accepted by the Configuration utility:
Help: `help`

> This option displays the usage for console and silent modes.

Console mode: `console`

> Runs the Configuration utility in text mode within a command window.

Silent mode: `silent`

> Silent mode: `silent`. Runs in the background requiring no user interaction. This option requires that you have already run the Configuration utility in default mode, which sets configuration options in the `install.properties` file.

An example of running the Configuration utility from the command line is `config_deploy help`

Configuration Help

The Configuration utility contains online help for each panel of the utility. Access Help by clicking the **Help** button in each panel. Additionally you can access the help from `{install_dir}/server/tomcat_config/doc/html/config`.

Installation Checklist

This section provides a list of most of the items that you should either have completed or information noted prior to attempting to install Process Server.

Hardware

- Server hardware must meet the requirements listed for each third-party application, including server container, database server and Java environment.

Software

- A user account with administrative rights to install or manage all required software including the application and database servers and the Process Server.

- A supported database server installed and accessible.

- The supported Server container installed on each machine intended to host Process Server.

- JVM Memory arguments have been added to your environment variable: `-Xms256m -Xmx1024m -XX:MaxPermSize=384m`. (See .)

- Process Server must be configured for WS-Security. (See Configuring Process Server for WS-Security.)

- In your Identity Service (JDBC, LDAP, or XML), add the `abTaskClient` role to each Process Central user. This security role, described in the `web.xml` file, is required for access to Process Central.

- On the URN Mappings page of the Process Console, update the host and port for Process Central to match your installation, if needed. The default address is `http://localhost:8080/activevos-central/avc`.

License Information

- Valid license keys for the total number of sockets intended to host Process Server.

Database Information

- Permissions must be set for Process Server to access your schema. For example, `GRANT SELECT`, `INSERT`, `UPDATE`, `DELETE`, `CREATE`, `DROP`, `REFERENCES`, `INDEX`, `ALTER`, `CREATE TEMPORARY TABLES`, `LOCK TABLES`, `EXECUTE`, `CREATE VIEW`, `SHOW VIEW`, `CREATE ROUTINE`, and `ALTER ROUTINE`.

- For WebLogic and WebSphere, configuration of a JNDI data source.

- The URL to use to connect to the Process Server database.

- The database user name and password to be used by Process Server to connect to the database.

- If you are using an Oracle database, the Process Server tablespace created.

- For RDBMS, if you are not using the database driver and information supplied with the Application Server you must also have the following two:

  - A JDBC database driver that provides the required functionality.

  - The class name of the JDBC database driver.

Server Container Information

- The installation location of your Server containers.

Glossary

API

Application Program Interface, a set of routines, protocols, and tools for building software applications.

Application Server

Also called an appserver. A program that handles all application operations between users and an organization's backend business applications or databases. Application servers are typically used for complex transaction-based applications. To support high-end needs, an application server has to have built-in redundancy, monitors for high-availability, high-performance distributed application services and support for complex database access.

DDL

Data Definition Language is used to specify a database scheme as a set of definitions expressed in a DDL script. The basic idea is to hide implementation details of the database schemes from the users.

EAR

J2EE modules that comprise an application are assembled into a single application Enterprise Archive (EAR) file.

J2EE

Java 2 Platform Enterprise Edition, a platform-independent, Java-centric environment from Sun for developing, building and deploying Web-based enterprise applications online.

Java

A high-level programming language developed by Sun Microsystems. Java is an object-oriented language similar to C++, but simplified to eliminate language features that cause common programming errors. Java source code files (files with a `.java` extension) are compiled into a format called bytecode (files with a `.class` extension), which can then be executed by a Java interpreter.

JAR

Java Archive, a file format used to bundle all components required by a Java applet. JAR files simplify the downloading of applets since all the components (`.class` files, images, sounds, and the like) can be packaged into a single file. In addition, JAR supports data compression, which further decreases download times.

JNDI

Java Naming and Directory Interface (JNDI). Allows Java-enabled applications to use a unified interface to multiple naming and directory services in the enterprise. Part of the Java Enterprise API set. JNDI works with other J2EE technologies to organize and locate components in a distributed computing environment.

JVM

Java Virtual Machine. An abstract computing machine, or virtual machine, JVM is a platform-independent programming language that converts Java bytecode into machine language and executes it.

URL

Uniform Resource Locator, the global address of documents and other resources on the World Wide Web.

WAR

Java modules that comprise an application are assembled into a single application Web Archive (WAR) file.

Web Server

A Web Server a computer that delivers (serves up) Web pages. Every Web server has an IP address and possibly a domain name. For example, if you enter the URL `http://www.pcwebopedia.com/index.html` in your browser, this sends a request to the server whose domain name is `pcwebopedia.com`. The server then fetches the page named `index.html` and sends it to your browser. That request can also cause complex logic to be executed and manage database access.

XML

Extensible Markup Language, a specification developed by the W3C. XML is a pared-down version of SGML, designed especially for Web documents. It allows designers to create their own customized tags, enabling the definition, transmission, validation, and interpretation of data between applications and between organizations.

Configuration

The topics in the section provide information on pages within the Configuration Wizard.

Configuration and Deployment

Please review the important information in *Prerequisites* and *Installation Checklist* before running ActiveVOS Server configuration.

For Tomcat, WebSphere, and JBoss: This panel allows you to select what operations you would like to perform. Subsequent panels show the details of each option. The selections and the results are described in the table below.

For WebLogic: The configuration wizard collects details for ActiveVOS Server to communicate with a selected database, a work manager, and ActiveVOS Central. It can deploy applications and install the database schema. Select the options you want to execute.

Note: Many of the options presented in the configuration wizard are only used within development servers. The availability of these options on production servers may be limited or unavailable due to security restrictions or other limitations imposed by the administrators of the target server, or by your particular configuration and situation.

Select the options you would like to perform and click **Next** to continue.

Selection	Description
Configure ActiveVOS Server	Allows the setting of the parameters required to start and run the ActiveVOS Server and set the security options for the application.
Configure ActiveVOS Central	When enabled, allows setting of configuration parameters for the ActiveVOS Central application.
For WebSphere: Configure Application Resources	Allows configuration of your work manager4, timer manager, JAAS logins, and database resource.
For Tomcat and JBoss: Configure Database	Configuration of an application server's native data source files or wizards.
For Tomcat, WebSphere, and JBoss: Deploy Applications and Resources	Deployment of ActiveVOS Server and datasource.
For WebLogic: Deploy Applications	Select deployment of ActiveVOS Server and ActiveVOS Central. It also allows you install the database schema. Note that you can run the `config-deploy` tool more than once on separate servers, to deploy ActiveVOS Central to different machines.

Engine Configuration

This panel provides information required for ActiveVOS Server to access your database server. Choices on this panel change the settings in the configuration of the `aeEngineConfig.xml` file, which is contained in the `activevos.war` file.

Field Name	Default Value	Descripton
Database	MySQL	This setting is used internally by ActiveVOS Server to handle communication for the supported database.

Select **Next** to save your value and continue.

JNDI Configuration

The Server JNDI Configuration panel allows configuration of the various files that contain JNDI references.

For Tomcat and JBoss: In general, if you have not preconfigured resources on your application server, it is not necessary to change the default values. If you have already configured resources you must match the field to your corresponding resource.

For WebLogic: You should configure JNDI resources before completing this configuration. Refer to Configuration for guidelines on configuring a JDBC Data Source and a Work Manager.

For Websphere: You should preconfigure a work manager and timer manager on your application server prior to completing this configuration. However, you can configure them later and rerun the configuration. If you have already configured resources, you must match the field to your corresponding resource.

Server	Field Name	Default Value	Description
All	Database JNDI	`jdbc/ActiveVOS`	The ActiveVOS Server Database resource must be assigned a JNDI name for location at run-time. Enter this JNDI name in the text box provided.
WebLogic	Work Manager JNDI	`wm/ActiveVOS` (suggested name)	Name that is used to connect to a WebLogic Work Manager that you have created in the WebLogic Application Server's Process Console. **Note**: If you do not configure a WebLogic Work Manager, ActiveVOS Server ignores this name and instead use its own internal Work Manager. Enter your WebLogic JNDI name if it differs from the suggested name.

Server	Field Name	Default Value	Description
WebSphere	Work Manager JNDI	`wm/ActiveVOS` (suggested name)	Name that is used to connect to a WebSphere Work Manager that you have created in the WebSphere Application Server using the Process Console. **Note**: If you do not specify a Work Manager JNDI name then ActiveVOS will ignore this name and instead use its own internal Work Manager. Enter your WebSphere JNDI name if it differs from the suggested name.
WebSphere	Timer Manager JNDI	`tm/ActiveVOS` (suggested name)	Name that is used to connect to a WebSphere Timer Manager that you have created in the WebSphere Application Server using the Administration Console. Note: If you do not specify a Timer Manager JNDI name then ActiveVOS will ignore this name and instead use its own internal Timer Manager. Enter this JNDI name if it differs from the suggested name.

Select **Next** to save your value and continue.

Security Configuration

ActiveVOS Server can be deployed in a secured manner. The Security Configuration panel allows you to configure the security parameters that will be applied to the ActiveVOS Server Console, and deployed BPEL process services. Select the security options you want to enable.

After completing configuration, you must assign security roles to users and groups. You can find details on configuring security in the *Process Server Guide*.

If you have a license for the multi-tenant feature, you must enable security.

After entering this information, click **Next** to save your values and to continue.

Administrative Functions

These functions add security parameters to the ActiveVOS Consoles and services by setting the following roles:

abAdmin

> Users associated with this role have full administrative rights to ActiveVOS Server.

abBusinessManager

> Users associated with this role have access to process instance details (but cannot operate on them). They can monitor active processes and tasks, and work queues. They have a read-only view of process instance details.

abDeployer

> Users associated with this role have rights restricted to deploying business process archive files to ActiveVOS Server.

abDeveloper

> Users associated with this role have rights restricted to service artifacts, endpoint information, and sample messages for the services they consume and expose (that is, processes) after they are deployed. Developers need the ability to deploy process deployment archives, initiate process execution and analyze them. Developers also need to configure global function contexts for custom functions, URN mappings, and the ability to schedule process execution. Specifically, this user has access to the Active Process list, the Process Instance View, the Active Task and Work Queues lists, the Server Log, the Dashboard and all reports, and the catalog's content.

abOperator

> Users associated with this role have rights restricted to operating the system. These include observing the functionality of processes, managing process instances using the process instance detail view, running reports, logging, viewing exceptions, acquiring information on service operations, adding and removing tenants, and managing the scheduled database delete schedule.

abTaskClient

> Required. You must configure permission to access ActiveVOS Central for all users. In addition, users who interact with the Human Task (WS-HT) API must have this role.

> ActiveVOS Central presents a login page to users.

Process Services

The process services adds security parameters to the Web Services handler for all deployed BPEL services with a role. The services listed at `http://[host]:[port]/active-bpel/services` are secured. The process services (roles) are:

abRestrictedServiceConsumer

> Users associated with this role cannot access a service unless it is deployed with allowed roles specified in the `pdd` and the user belongs to at least of these roles. If no roles are specified in the `pdd`, access to services with no roles specified in the `pdd` are also denied. Users in this role can view the `wsdl` files for other services like **abServiceConsumer**; however, they are blocked at runtime.

abServiceConsumer

> Users associated with this role have rights restricted to start process instances of deployed processes, including from ActiveVOS Central, the Eclipse Web Tools Project, or other client application,such as SOAPUI.

abTenantAdmin

> (For a Multi-Tenant licensed server only.) Users associated with this role have rights to deploy and manage contributions into a configured tenant on the server.

> Based on a Tenant Definition configured by the ActiveVOS Server administrator (with the abAdmin role), a tenant administrator user can log into the tenant context on the server. A service consumer user can create process instances for processes deployed to the tenant context.

Identity Service Consumer

The identity service consumer adds security parameters to the Web Services handler for Process Identity service used by the ActiveVOS Central application using the following roles:

abIdentityListConsumer

> Only users associated with this role or **abAdmin** have rights to submit Web Service requests to the identity service from Process Developer.

Clustering Configuration

ActiveVOS Server can be deployed to a cluster. The following information is required to ensure communication between all the clustered nodes.

Parameter	Default Value	Description
Enable Clustering	(not enabled) false	This option enables or disables cluster mode.
Cluster Multicast Address	228.1.221.1	The multicast address that the membership will broadcast its presence and listen for other heartbeats on. You must use an address within this range: 224.0.1.0 through 239.255.255.255.
Cluster Multicast Port	45566	The multicast port. The multicast port, in conjunction with the address, is what creates a cluster group.
Cluster Binding Address	(none)	(Optional). Use this attribute if you wish to bind your multicast traffic to a specific network interface. You can leave this address blank, and it will be filled in with the default network adapter's IP address at run time. **Note:** When you re-run this configuration utility for another node in the cluster, ensure that you modify this address for the new node.

Note: ActiveVOS Server creates default engine instance names based on the host name and main connector port. If desired, when you start Tomcat, you can specify your own logical name for each node. To specify your own names, set a `JAVA_OPTS` variable before running your `startup.bat` (or `startup.sh`) file.

The `JAVA_OPTS` setting should look like the following example:

In Windows:

```
SET JAVA_OPTS='-Dae.engine.name=engineOne'
```

In Linux:

```
export JAVA_OPTS='-Dae.engine.name=engineOne'
```

After entering the information described above, click **Next** to save your values and to continue.

ActiveVOS Central Configuration

The ActiveVOS Central Communications Configuration panel allows setting of the connection information to be used when ActiveVOS Central communicates with the ActiveVOS Server. This panel allows the configuration of the following parameters:

Parameter	Default Value	Description
Session Timeout	30 seconds	The session timeout sets the duration that an inactive session will remain connected to the ActiveVOS Central database.
ActiveVOS Central `AeTaskService` URL	`http://` *`[hostname.domainname]`*`:` *`[port]`*`/active-bpel/` `services/AeB4PTaskClient-` `taskOperations`	(Required) ActiveVOS Server can run on the same or a different server than the ActiveVOS Central. Modify this URL to specify the host and port where ActiveVOS Server runs. Modify the protocol, to add security, if needed. The URL displayed is the default URL of the Web service that ActiveVOS Central needs to call ActiveVOS Server.

After entering this information, click **Next** to save your values and to continue.

Database Configuration

Note: It is highly recommended that these panels only be used for development servers. Refer to your application server user guide and your database administrators guide for configuring data sources for production installations.

The panels that follow provide the ability to configure a data source file. The information that is entered here is only a subset of the options that can be configured for a data source. Ensure that you have completed the configuration of a JNDI data source prior to completing this step. For details, see *Configuration*.

Setting	Default Value	Description
Driver class	None	(Required.) The name of your JDBC driver's implementation of `java.sql.driver`. Some driver examples are shown here: - **MySQL**: `com.mysql.jdbc.Driver` - **MS SQL SERVER**: `com.microsoft.sqlserver.jdbc.SQLServerDriver` - **ORACLE**: `oracle.jdbc.OracleDriver` - **DB2**: `com.ibm.db2.jcc.DB2Driver`
Driver url	None	(Required.) Used to connect to your database. Typical URLS are shown here; however, refer to your database and JDBC driver documentation for further information. - **MySQL**: `jdbc:mysql://[host]:[port]/[database_name]?useUnicode=true&characterEncoding=UTF-8&characterSetResults=utf8` (Default port is 3306) UTF-8 encoding is required. - **MS SQL SERVER**: `jdbc:sqlserver://[host]:[port];databaseName=[database_name]` (Default port is 1433) UTF-8 encoding is highly recommended. - **Oracle**: `jdbc:oracle:thin:@//[host]:[port]/[database_name]` (Default port is 1521) UTF-8 encoding is highly recommended. - **DB2**: `jdbc:db2://[host]:[port]/[database_name]` DB2 = (Default port is 50000) UTF-8 encoding is highly recommended. **Example**: `jdbc:mysql://localhost:3306/ActiveVOS?useUnicode=true&characterEncoding=UTF-8&characterSetResults=utf8`
Database name	ActiveVOS	(Required.) The name of your database. It must match the `database_name` provided in the Driver URL.
Driver jar	None	Driver `.jar` file must be selected using the **Select File** button to the right of this field. Select your driver file so that is can be copied to the correct location. Some driver file examples are shown here, but we strongly recommend you check the Prerequisites details before making your selection. - **MySQL**: `mysql-connector-java-5.0.7-bin.jar` - **MS SQL SERVER**: `sqljdbc.jar` - **Oracle**: `ojdbc14.jar` - **DB2**: `db2jcc.jar` and `db2jcc_license_cu.jar`
Username	bpeluser	(Required by default.) The name associated with the privileges to access your database. Unless you modified this name, it is described in the DDL schema.
Password	bpel	(Required by default.) The password of the above user name. Unless you modified this name, it is described in the DDL schema.
For Tomcat and JBoss: Connection Timeout	1000	The maximum time to wait in milliseconds for a database connection to become available.
For Tomcat and JBoss: Minimum Connections	10	The maximum number of idle connections in the database pool.

Setting	Default Value	Description
For Tomcat and JBoss: Maximum Connections	100	The maximum number of connections in the database pool.
Validate Connection	Checked	Checking this entry will cause the configuration wizard to attempt to connect to your database with the supplied information.

Validate Connection. After you enter all required database connection information and click **Next**, the utility checks that your driver jar and URL are valid, and that the database name matches the name in the URL. The utility does not check the username and password of the database. If the server cannot make a connection because these are in error, you can re-run the configure-deploy utility and enter new names. All other values are preserved.

After entering this information, click **Next** to save your values and to continue.

Deployment Options

The Deployment Options panel allows the selection of deployment items. The check boxes on this panel are as follows:

Install database schema (New Installation Only)

This option controls whether or not the configuration wizard will install the Process database schema to your database.

Note: This option requires that the user information and database name entered in the *Database Configuration Panel* have already been created. Additionally, this option must not be selected by users wishing to update from a previous database version. For upgrade instructions, please see the *Configuration Wizard* document.

Install database schema

This option controls whether or not the configuration utility installs the ActiveVOS database schema to your database. Selecting this option will present a Database Configuration panel on the next wizard page.

Note: Do not select this option if you are updating from a previous database version. For upgrade instructions, please see the *Configuration* section of your documentation.

Install database descriptor (For Tomcat and JBoss Only)

Checking this option installs the application server specific database descriptor file to your application server. Selecting this option eliminates the need to create the descriptor file through application server management consoles.

Install Application Resources (For WebSphere Only)

Checking this option installs the ActiveVOS Server resources to your application server, including settings for work manager, timer manager, JAAS login, and database resource.

Deploy ActiveVOS

Checking this option installs the ActiveVOS Server to your application server.

Note: If you plan to enable clustering, you must re-run this configuration utility and, on the last page, select a different directory for deployment.

Include Process Console

Selecting this option installs Process Console on your application server. Process Console is an optional component that you can choose to install.

Note: If you select the **Include Process Console** option, you must also select the **Deploy ActiveVOS** option.

Deploy ActiveVOS Central

Checking this option installs ActiveVOS Central to your application server.

If you want to install ActiveVOS Central to a different server, re-run the `config-deploy` utility on that server.

After entering this information, click **Next** to save your values and to continue.

Deployment Targets

For each node in a Tomcat cluster, provide a new directory.

After entering this information, click **Next** to save your values and to continue.

CHAPTER 2

WebLogic

This chapter includes the following topics:

General Information

The Process Server Setup Wizard lets you install a new server or update an existing one.

1. Download and obtain a license for Process Server.

2. Download and run the Process Server installation.

3. To configure and deploy a server, open `quickstart_server.html`, which directs you to the file you are reading now.

4. Review the Prerequisites and Release Notes for Process Server by selecting the links in the navigation bar on the right.

Note: If the Setup Wizard detects an existing installation, it lets you either update the existing installation or install the server in a different directory. When you update an existing installation, the Wizard replaces any file that a previous Wizard had installed. All other files in your server's install directory remain as they were.

Quick Start

Preconfiguration

1. Create a database (or *tablespace*) for Process Server. Select the **Configuration** link in the navigation bar for details.

2. Process Server needs to be granted the following permissions on your schema:
   `GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES, INDEX, ALTER, CREATE TEMPORARY TABLES, LOCK TABLES, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROUTINE, ALTER ROUTINE`

   If Process Server does not have the permissions it needs, you will see an error message that begins as follows: `Failed to get version info from the AeMetaInfo table`.

3. Collect the following information that you will be prompted for during configuration:

   - Host, port number, and database name where you are deploying Process Server

   - The full path to a supported JDBC database driver

- Driver implementation class name

- Database username and password
  Hints and examples of this information are provided in the appropriate page of the Configuration utility's online Help.

4. For an upgrade installation of Process Server, manually install the database schema. For a new installation, you can automatically install the database schema during configuration.

5. Ensure that the `JAVA_HOME` environment variable is set.
   Note for Tomcat and JBoss: To avoid issues with multiple JDKs, we recommend that you set `JAVA_HOME` in the application server startup file instead of in the system environment.

6. Ensure that your JVM memory settings in your application server match the recommendations described in .

7. **MultiSite Installations Only:** To configure MultiSite clustering, be sure to review the instructions in **Process Server MultiSite Configuration**. Access the instructions from the **Configuration** link in the navigation bar on the right.

8. **Unix Platform Only:** After installing any version of the Process Server on any UNIX OS, you may receive an error when starting the server such as `cannot write to temp location [/temp]`. This is due to an OS restriction on the number of files that can be created. To avoid this error, before installing the server edit your UNIX security configuration file directly to allow a larger number of files to be opened. In UNIX the parameter NOFILE sets the maximum number of files that can be opened by a single process. For example, in the file `/etc/security/limits.conf` you could add the line `- nofile 10240` to raise the limit from the default 1024 value. 10240 should be large enough. If you are unsure, setting "unlimited" can be considered.

Configuration and Deployment

1. In your `ActiveVOS` installation folder, locate the `[server]-config>bin` folder, and select the `config-deploy` utility.

2. Complete the configuration and deployment. Use the online Help as needed.

3. Use your server container's documentation for help in starting the Process Server.

Note: When you are deploying Process Server to a Tomcat server, `activebpel-cert.war` is not deployed. You must copy it from `{installation_directory}\server-enterprise\tomcat_config\webapps` to `{Tomcat_Home}\webapps` directory when deploying an SSO configuration

Add Your License

1. You will need access to your Process Server license.

2. Open the Process Console in a browser:
   `http://[host]:[port]/activevos`

3. Add your license on the License page. Select the Admin menu item of the Process Console and then select License. Select **Add** and copy and paste all of the Process Server license into the dialog. Then select the Server Status navigation menu item and select **Start Server** to start the Process Server.

Prerequisites

Process Server relies on a valid license and third party software components. Ensure that your application server environment meets the requirements before beginning the configuration procedure.

Process Server Licensing

A valid license is required to run Process Server. You enter the license information after you've configured Process Server. Do this as follows:

1. Start Process Console.

2. Select **Admin | License**. (**Admin** is in the toolbar; **License** is about a third of the way down on the left.)

3. Press the **Add License** button, copy and paste all of the Process Server license into the dialog, and then press the **Add License** button.

4. Select the Server Status link near the ver top of the left area press the **Start Server** button to start the Process Server

Obtaining a License Key

If you did not receive your license prior to receiving the software, contact the Informatica sales department.

Our sales support staff can assist you with licensing questions.

Hardware Requirements

Application Server Hardware

Process Server runs within different server containers, and the hardware requirements of the server are superseded by the requirements of the container.

Database Hardware

Process Server application supports multiple database servers and has no additional requirements besides those of your selected database server.

Note: For maximum performance, we recommend that you run Process Server and its database schema on separate servers.

JVM Memory Requirements

We strongly recommend that you run your application server with at least the following memory settings:

```
-Xms256m -Xmx1024m -XX:MaxPermSize=384m
```

where Xms is starting memory, Xmx is maximum memory, and $MaxPermSize$ is the amount of memory set aside for loading class files.

Disk Space Requirements

At least 1 GB of disk space is required to install the Process Server application.

Note: Considerably more disk space is required to run your applications. The amount is dependent on several factors including logging levels you select, number of processes you run, and size of processes.

Software Requirements

Specific versions of Eclipse, client and server operating systems, application and database servers are supported. Support means that Informatica will assist customers with the installation and operation of Business Process Manager products on these 3rd party product versions.

Also certified are specific combinations of 3rd party products. Use of Certified Systems described here will reduce the risk of problems as a result of extensive testing of Business Process Manager with these specific versions. Database connectivity is required for Process Server persistence and version control of deployed processes. It is recommended that the database resides on a dedicated server.

The following software is supported for use with Process Server:

Operating Systems

- Microsoft Windows 2003/2008 Server
- Linux operating system versions that support the JVM, application and selected database servers supported by Informatica for use by Process Server.
- Solaris 10 (x86/Sparc)
- HP-UX 11i v3 (on Itanium processor)
- AIX 5.3 and 6.1
- Mac OS 10.6 64-bit or higher

Web Browser

- Any browser. A browser is required to view the Release Notes and run the Process Server consoles. Review the `activevos.com` certified system support page for details.
- There are specific requirements for Screenflow execution in the Screenflow product.

Application Servers

- Apache Tomcat 7.x
- JBoss AS
- Oracle WebLogic 12.1.1
- IBM WebSphere Server 8.5

Note: Other releases of these servers should work. However, they have not been tested.

JAVA Environment

If you are running a Linux distribution and you are using the US ASCII codeset, you will need to add the following startup parameter to your JVM:

```
-Dfile.encoding=UTF-8 encoding
```

Application Server	JVM	Comment
Tomcat	Sun JDK	To avoid issues with multiple JDKs, we recommend that you set JAVA_HOME in the application server startup file instead of in the system environment.
JBoss	Sun JDK	To avoid issues with multiple JDKs, we recommend that you set JAVA_HOME in the application server startup file instead of in the system environment.
WebLogic	Sun JDK	
WebSphere	IBM J9 VM build 2.4, J2RE 1.6.0	

Setting JAVA_OPTS for DOM Processing

If you are using a Java server and the DOM being produced is incorrect, you should add the following definitions to the definition of JAVA_OPTS in your server startup script

```
set JAVA_OPTS=%JAVA_OPTS%
    -
Dorg.apache.xerces.xni.parser.XMLParserConfiguration=org.apache.xerces.parsers.XIncludePa
rserConfiguration
    -
Djavax.xml.transform.TransformerFactory=org.apache.xalan.processor.TransformerFactoryImpl
```

Note: If this is not set, the classloader must search through the classpath to locate the appropriate class. Depending on the size of the classpath, this operation can degrade performance.

Database Servers

Process Server uses standard database servers as the persistent storage mechanism. You must have access to one of the supported database servers with the proper privileges to create databases and tables as well as privileges to update, insert and delete into those tables.

Supported Databases

- MySQL 5.5
- MySQL 5.1.x (For more information, see the *MySQL Configuration Note* below.)
- Microsoft SQL Server 2005, 2008, 2008 R2, 2012
- Oracle Database 10g, 11g
- IBM DB2 9.7

Certified JDBC Database Drivers

A JDBC database driver is required. For certain configurations, you will be asked to provide the location of driver during configuration. For other configurations, you will be instructed to use your application server administration console to configure the database.

Note: For a clustered environment, you must install the driver to each node in the cluster.

Database Server	JDBC Driver
MySQL	`mysql-connector-java-5.1.6-bin.jar`
Microsoft SQL Server	`sqljdbc.jar (1.2)`, `sqljdbc4.jar`. JBoss 7.x requires sqljdbc4.jar
Oracle	`ojdbc6.jar`
DB2 9.7	`db2jcc_license_cu.jar`, `db2jcc.jar`.JBoss 7.x requires db2jcc4.jar

Process Server

Process Server supports 64-bit Java Virtual Machines (JVM) for the Windows and Linux systems listed above. When installing Process Server on a 64-bit server, the 64-bit JVM supported for a given application server is required.

Process Developer

Process Developer embeds Eclipse 3.7.2 and a 32-bit version of JRE 7 for Windows systems allowing it to run on both 32-bit and 64-bit Windows operating systems and hardware environments. The Linux distribution of Process Developer does not embed the required 32-bit version of JRE 7. Users must install JRE 7 separately. Users wishing to use a 64-bit version of Eclipse must download the 64-bit version of Eclipse for RCP and RAP Developers, and then use the Process Developer Plugin installation.

Before You Configure and Deploy Process Server

Third party software components are required to be installed prior to configuring and deploying Process Server.

Application Server must be Installed

An application server provides Process Server a framework within which to run. Install the appropriate supported server container according to software vendor's documentation on each machine intended to run Process Server.

Note: Set up clustering according to your software vendor's documentation. Once clustering is set up on the application server, follow our documentation for configuring clustering.

Database Server must be Installed

Process Server requires only one database server per any number of application servers running in a cluster.

All databases require a user with administrative rights to the computer in order to install them. Process Server also requires a connection to your database server. This user needs the proper privileges to connect to the Process Server database, update, insert and delete records within that database.

MySQL Configuration Note

A BPEL process can send and receive variables with attachments such as images or documents. Attachments may be large or numerous, causing database connection errors.

To avoid connection errors to MySQL Server, you may need to configure MySQL with more allocated memory than the default of 1MB.

To configure MySQL:

1. Open MySQL Administrator. (If unavailable, see the note below.)

2. Select Startup Variables.

3. Select Advanced Networking.

4. In the Data/Memory Size panel, enable Max Packet Size.

5. Set the packet size higher than the default of 1MB. The size depends on the attachment sizes you expect.

6. Apply changes.

Note: If MySQL Administrator is not available, refer to the MySQL documentation regarding how to set the `max_allowed_packet` setting for your environment.

About the Process Server Database Schema

Process Server provides database schema definition files for all supported databases. Before you start the configuration and deploy utility, refer to Configuration topic in this help for specific recommendations on how to install the schema for your database.

Installation Folders

Download and extract the installation folders as described in *Quick Start.* The following describes the contents of the Process Server installation:

`{install_dir}/server-enterprise`

> `quickstart_server.html`. Open this file for quick start and complete details for configuration and deployment.

`{install_dir}/server-enterprise/weblogic_config/bin`

> Configuration and deployment tool

`{install_dir}/server-enterprise/weblogic_config/ddls`

> Database schema to be installed automatically (recommended) or manually, as described in *Configuration*

`{install_dir}/server-enterprise/weblogic_config/deploy`

> Files to be installed automatically by the configuration and deploy utility

```
{install_dir}/server-enterprise/weblogic_config/doc/html/config
```

Copies of the Configuration utility's online help files. These files are accessible from the Help butotn within this utility

WebLogic Configuration

This section leads you through configuration of the resources required for Process Server. You must configure your database, Apache Tomcat Server and Process Server before deploying and running Process Server. The sections below provide information for completing the configuration.

Configuration Instructions

Before running the Configuration utility, perform the following pre-configuration steps:

- Create a database (or tablespace) where Process Server persistence information will be stored
- Create a default user with administrative rights to the computer and database for use by Process Server
- Create a JDBC Data source as described below.

Configuring a JDBC Data Source

You must configure a JDBC Data Source in WebLogic in order to provide details of database connectivity for the Process Server database. Use the WebLogic Server® Administration Console to select **Services > JDBC > Data Sources**, and provide the required details, including the following:

Property	Description
Data Source Name	The Data Source name ActiveVOS will use to connect to the database, such as ActiveVOS.
JNDI Name	The Data Source name ActiveVOS will use to connect to the database, such as ActiveVOS.
Database Type and Database Driver	You must select one of the supported types: - MySQL - MS SQL SERVER - ORACLE - DB2 Select a recommended database driver, as described in Prerequisites.
Connection Properties	- **Database Name** is ActiveVOS (default, as defined in the DDL script) - **Database User Name and Password**. The suggested credentials during configuration are `bpeluser/bpel`. - **URL**. The format of the URL varies by JDBC driver. **Note:** For mySQL you must configure character encoding in the URL as follows:`jdbc:mysql://localhost:3306/ActiveVOS?useUnicode=true&characterEncoding=UTF-8&characterSetResults=utf8`

Configuring a Work Manager

To ensure optimal server performance, we highly recommend that you configure a WebLogic Work Manager. A Work Manager is a mechanism that prioritizes work and allocates execution threads for work requests. As your test and production versions of Process Server get underway, a Work Manager helps you tune performance. WebLogic provides a comprehensive set of components to configure a Work Manager in the WebLogic Administration Console. Refer to an overview of *Oracle WebLogic 10.3 Work Manager* documentation. For configuration in the Oracle WegLogic 10.3 Administration Console, see *Create global Work Managers* and *Create application-scoped Work Managers*.

If there is no Work Manager configured when you execute the Config-Deploy utility, Process Server provides its own internal work manager. The internal work manager is configured with a basic set of minimum and maximum execution threads.

First Time or New Install

If you are performing a clean installation, that is, a first-time install or a new database, you can use the Configuration utility to automatically install the database schema.

Manual Install or Update of Database Schema

It is strongly recommended that you automatically install the database schema; however, you can manually install it. Customers migrating from an earlier version should follow the instructions below.

Migrating from an earlier release of ActiveVOS to Process Server

If you are migrating from ActiveVOS, perform the following steps:

- Manually update the Process Server database schema using the DDL patches provided in `{install_dir}/server/tomcat_config/ddls/updates`
- Run the Configuration utility
- Review the Release Notes for late breaking migration information
- Review the Process Developer help topic, Migrating from Earlier Versions

Process Server can be configured to use an RDBMS database.

Relational Database Schemas

These instructions are generalized to make sure they can be followed for each database. When creating the database schema for Process Server, you can either create a new database definition or upgrade an existing definition.

- Refer to the install a new database schema section for a new installation.
- Refer to upgrade a database schema when performing a version upgrade.

Install a new database schema

1. Identify your DDL. Use the information provided in the table below to locate the correct DDL file.

Database Server	DDL File Name and Location	Notes
MYSQL	`{install_dir}/server /weblogic_config/ddls/ActiveBPEL-Enterprise-MYSQL.SQL`	The default database name, ActiveVOS is defined within the DDL file. If you edit this name, ensure that you do not replace ActiveVOS Enterprise, a name that is inserted into the `AeMetaInfo` table.
MS SQL SERVER	`{install_dir}/server /weblogic_config/ddls/ActiveBPEL-Enterprise-SQLSERVER.SQL`	The default database name, ActiveVOS is defined within the DDL file. If you edit this name, ensure that you do not replace ActiveVOS Enterprise, a name that is inserted into the `AeMetaInfo` table.

Database Server	DDL File Name and Location	Notes
ORACLE	`{install_dir}/server/ weblogic_config/ddls/ ActiveBPEL-Enterprise- ORACLE.SQL`	Create a tablespace prior to running the DDL.
DB2	`{install_dir}/server/ weblogic_config/ddls/ ActiveBPEL-Enterprise- DB2.SQL`	

2. Copy the DDL file from above, and rename it.
    Note: The original files must remain unchanged for the Configuration utility to work properly

3. (Optional) Modify the database name. Be sure to see the notes above.

4. Execute the DDL script.

5. Permissions must be set for Process Server to access your schema. For example, `GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES, INDEX, ALTER, CREATE TEMPORARY TABLES, LOCK TABLES, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROUTINE, ALTER ROUTINE`
    If Process Server does not have the permissions it needs, you will see an error message that begins as follows: Failed to get version info from the AeMetaInfo table

Each database server provides its own mechanism or utility for executing a DDL script file. Execute the DDL script file using the appropriate utility. For example, if you are using Oracle, the utility to execute the DDL script file would be SQL Plus.

Upgrade an Existing Database Schema

To upgrade your Process Server database to be compatible with the new version of software, follow the instructions below:

1. Shutdown Process Server before executing a database upgrade.

2. Make a backup copy of your database.

3. Identify your current running version of Process Server. Database upgrades are provided to upgrade from one version back at a time. This means that more than one upgrade script may need to be applied to your database. For example, if you are running ActiveVOS version 8.0.x, you must go to the **updates** folder, and apply all patch scripts with higher numbers, starting with `[database name]-Patch-9.0.sql`. Be sure to run the patch scripts in *ascending* order. Do not run any upgrade script with a version number equal to or less than your current running version.

4. For each upgrade that needs to be applied perform the following:

   a. Identify your DDL. Use the information provided in the table below to locate the correct DDL file. Note: The updates must be applied in ascending order.
      MYSQL

      {install_dir}/server/weblogic_config/ddls/updates/enterprise/ActiveBPEL-Enterprise-MYSQL-PATCH-{patch number}.SQL

      MS SQL SERVER

      {install_dir}/server/weblogic_config/ddls/updates/enterprise/ActiveBPEL-Enterprise-SQLSERVER-PATCH-{patch number}.SQL

      ORACLE

      {install_dir}/server/weblogic_config/ddls/updates/enterprise/ActiveBPEL-Enterprise-ORACLE-PATCH-{patch number}.SQL

      DB2

      {install_dir}/server/weblogic_config/ddls/updates/enterprise/ActiveBPEL-Enterprise-DB2-PATCH-{patch number}.SQL

   b. Execute the DDL script.
      Each database server provides its own mechanism or utility for executing a DDL script file. Execute the DDL upgrade script file using the appropriate utility. For example, if you are using Oracle, the utility to execute the DDL script file would be SQL Plus.

Versions of WebLogic Prior to 12.2 Have File Upload Issues

Versions of WebLogic prior to 12.2 have file upload issues and you may see one or more of the following:

- Cannot deploy bpr.
- Cannot import the identity configuration settings: after you import the configuration file, the data does not get filled.
- Cannot add an attachment using a **Task Screenflow > Add attachment** automated action where the screen allows you to browse a file. The guide hangs in this step. You get the message "the Guide session is not available and cannot be used"

This is a known issue with weblogic 12.1.1. You either need to install a later versio or obtain the patch 13657792 and install it. If you wish to install the patch, enter this value in the Patch Number Search field on the Patches > Updates tab of My Oracle Support.

A second Weblogic problem is that that Servlet 3.0 file upload is enabled by default and cannot be disabled using a flag in the WebLogic Server. This causes problems when using other file upload frameworks.

Multisite Configuration

For details, see *Process Server MultiSite Configuration*.

Security Configuration

You can find details on configuring Process Server security roles in Process Developer Help or in the Infocenter.

Configuration for Headless Mode

Process Server relies on GUI components from the Java's SWT package, such as Fonts. If you are running on a headless server (i.e., the server does not have a graphic subsystem), you may see one of the following errors in the stack trace:

- java.lang.NoClassDefFoundError: sun/awt/X11GraphicsEnvironment

- Can't connect to X11 window server using ':0.0' as the value of the DISPLAY variable
- org.eclipse.birt.report.service.api.ReportServiceException

Use one of the following techniques to correct errors:

- Configure the JVM system property `java.awt.headless=true` and at the command line, start the JVM with the argument: `-Djava.awt.headless=true`
- Run a X-windows virtual frame buffer (Xvfb)

Using the Configuration Utility

The Configuration utility walks through the steps required to provide the property values for Process Server and selected resources.

Note: Before running the utility, ensure that your server container is stopped.

Starting the Configuration Utility

Execute one of the following utilities based on your operating system:
Windows

```
{install_dir}/server/weblogic_config/bin/config_deploy.bat
```

Linux

```
{install_dir}/server/weblogic_config/bin/config_deploy.sh
```

If You Have Manually Installed or Updated the Database Schema

If you have manually installed or updated the database schema, when prompted, you must not select the "Install Database Schema" checkbox.

Running the Configuration Utility in Different Modes

The Configuration utility can be run with a graphical interface (default), in console mode or silently. When you run the utility your configuration options are automatically written to the install.properties file and they will be used as the defaults the next time the application is configured. One of the following parameters is accepted by the Configuration utility:

- Help: `help`. This option displays the usage for console and silent modes.
- Console mode: `console`. Runs the Configuration utility in text mode within a command window.
- Silent mode: `silent`. Runs in the background requiring no user interaction. This option requires that you have already run the Configuration utility in default mode, which sets configuration options in the install.properties file.

An example of running the Configuration utility from the command line is: `config_deploy help`

Configuration Help

The Configuration utility contains online help for each panel of the utility. Access Help by clicking the Help button on each panel. Additionally you can access the help from `{install_dir}/server/weblogic_config/doc/html/config`.

Multisite Configuration

The prerequisites for using Multisite Clustering include the following:

- This feature requires a Multisite license. Be sure to obtain a license to enable this feature in Process Server. The server configuration instructions describe how to enter your license. Enter the license into one server in your Multisite environment.

- You must use either an Oracle or MySQL database. Currently Multisite supports Oracle Database 11g and MySql.
- Use of Multisite requires that the Process Server Eventing Service is disabled. Eventing is disabled in a Multisite license.
- Follow all instructions below to ensure successful Multisite configuration.

What is Multisite?

Process Server supports a site configuration, which allows a cluster of process servers to replicate its database to other databases serving other sites. Each site has a cluster of Process Servers (one or more servers) with a single persistent database, and the site operates independently of other sites. All process instances are available for execution at each site. In the event of a server failure, a process can start execution on one site and complete on a different site. In addition, most Process Server configuration properties are replicated from site to site. This means you can configure server properties in one site, and they are automatically copied to another site's administration console.

The following illustration shows a sample Multisite environment. The database setup is a master-master replication, as shown below. This technique allows you to replicate data in tables across separate databases.
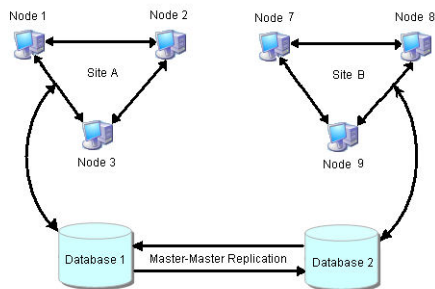
Oracle and MySQL

The procedures you follow when you are using Oracle differ from those you use when using MySQL. Use the following links to jump to the description for your database.

- Oracle
- MySQL

Following these descriptions is a section describing "Pausing Replication When Performing Database Updates. This section applies to Oracle and MySQL.

Oracle Multisite Setup

On each site, complete all Process Server prerequisites as well as the following:

- **Step One**: Configure WS-Security
- **Step Two**: Enable Archivelog Mode in Oracle
- **Step Three**: Install the Process Server database schema for Oracle database
- **Step Four**: Perform Oracle Streams set up using Process Server-provided scripts
- **Step Five**: Test Oracle Streams set up using Process Server-provided scripts
- **Step Six**: Configure and deploy Process Server
- **Step Seven**: Add the MultiSite license
- **Step Eight**: Configure and enable MultiSite properties

Step One. Configure WS-Security

Configure WS-Security in each server node in each site, if desired, to enable the MultiSite WS-Security property for site communication. For details, refer to *Configuring Process Server for WS-Security* elsewhere in this help. Alternately, go to `activevos.com` to link to the product documentation.

Step Two: Enable Archivelog Mode in Oracle

The Oracle Streams capture process reads information from the redo log files of the database. This requires that the database is run in ARCHIVELOG mode. In this mode, Oracle archives the filled online redo log files before reusing them in the cycle. A Recovery Manager (RMAN) utility can be setup to periodically clear or backup these files before they fill up the allocation.

Step Three. Install the Process Server Database Schema

Install the Process Server database schema for Oracle database. The database DDL files are located in your installation folder. For instructions, see **Process Server and Resource Configuration**.

Step Four: Set up Oracle Streams

Process Server provides an automated setup environment for Oracle Streams. The setup files are in the Process Server installation folder in the following location:

    <applicationserver>_config/bin/multisite_setup

Note: The automated setup configures two databases at a time. If your environment requires multiple databases, you can reconfigure setup.

The setup files include the following:

File	Description
`streams_readme.txt`	Contains instructions for configuring MultiSite
`database.properties`	Contains your values for user/password of the Oracle user with administrative (DBA) rights
`multisite.properties`	Contains your values for setup of two MultiSite databases to replicate
`setup.cmd`	Command line script to perform Oracle Streams setup with your values
`teardown.cmd`	Command line script to remove Oracle Streams setup
`multisite.xml`	Ant file used in setup and teardown commands

Complete Streams setup as follows:

1. Read all instructions in the `streams_readme.txt` file.
2. As described in `streams_readme.txt`, edit `database.properties` and add your values.
3. As described in `streams_readme.txt`, edit `multisite.properties` and add your values. See the example below.
4. Execute `setup.cmd` now or just create the completed setup file to run later. By default, when you execute the setup file, Streams is configured. However, you can set a *multisite.execute.scripts* flag to *false* in the `multisite.xml` Ant script to create an executable script that you can run later.
5. Execute the setup script.
6. Test database replication, as described below in Step Five.

As the `streams_readme.txt` file describes, you must provide values for Streams parameters in the `multisite.properties` file. The following example shows a completed file:

```
multisite.src.tablespace.dir= C:\\ORACLE\\ORADATA\\MY_DB1
multisite.src.strmadmin=STRMADMIN
multisite.src.strmadmin.pwd=BPEL
multisite.src.schema=ABPELRN
multisite.src.db.link=MY_DB1
multisite.src.host.name=PLUTO
multisite.src.port=1521
multisite.src.sid=MY_DB1

multisite.tgt.tablespace.dir= C:\\ORACLE\\ORADATA\\MY_DB2
multisite.tgt.strmadmin=STRMADMIN
multisite.tgt.strmadmin.pwd=BPEL
multisite.tgt.schema=ABPELRN
multisite.tgt.db.link=MY_DB2
multisite.tgt.host.name=NEPTUNE
multisite.tgt.port=1521
multisite.tgt.sid=MY_DB2

multisite.execute.scripts=true
multisite.oracle.sqlplus.path=\\\\neptune\\oracle\\product\\11.1.0\\db_1
multisite.queue.suffix=_RN
multisite.sga.size=50
```

Step Five: Test Database Replication

After completing database replication for all databases in your sites, you can test the replication process to determine if your configuration is successful.

Note: Multisite setup is based on the default configuration of privileges granted to users in Oracle. If you have revoked privileges from users, such as from the PUBLIC user, you may experience replication problems.

Process Server MultiSite Test Utility
Process Server provides a utility that verifies database replication. Essentially, the utility performs inserts and deletes within each site's database tables and verifies synchronization of the data. To use this utility, you must modify a configuration file to provide parameters describing your environment. Then run the utility with the provided batch file. For details on using this utility, see the **readme.txt** file. The test files are located in:

```
weblogic_config\bin\multisite_test
```

Note: Be sure that no Process Servers are running when you are testing.

Step Six. Configure and Deploy Process Server

Configure and deploy Process Server by following the instructions in **Process Server and Resource Configuration**.

Step Seven. Add the MultiSite License

Launch the Process Console and add the MultiSite license, as described in server and resource configuration. You only need to add the license to one server. The license is replicated to other sites.

Step Eight. Configure/Enable MultiSite Properties

Configure/enable MultiSite properties in Process Console on the **Admin > MultiSite > Site Properties** page. Some properties are site independent and others will be replicated as detailed in the Process Console Help.

MySQL Multisite Setup

On each site, complete all Process Server prerequisites as well as the following:

- **Step One**: Configure WS-Security.
- **Step Two**: Set Up the MySQL Server.

- **Step Three**: Install the Process Server database schema for the MySQL database

- **Step Four**: Test MySQL set up using Process Server-provided scripts.

- **Step Five**: Configure and deploy Process Server.

- **Step Six**: Add the MultiSite license.

- **Step Seven**: Configure and enable MultiSite properties.

Step One: Configure WS-Security (Optional)

If desired, configure WS-Security in each server node in each site to enable the MultiSite WS-Security property for site communication. For details, refer to *Configuring Process Server for WS-Security* elsewhere in this help. Alternately, go to `activevos.com` to link to the product documentation.

Step Two: Set Up the MySQL Server

You will need to perform the actions described in the following list on each target server. Note that the minimum MySQL version is 5.5.

1. Create a MySQL config file for each server based on the following file:

    ```
    my-innodb-heavy-4G.ini
    ```

    Copy this information to your `activevos.ini` files.

2. Start the server and log in as root.

3. Create a user who will have permissions to perform replication. For example:
   User: `replication` Password: `activevos`

4. Assign the following rights to the `replication` user:

   - RELOAD

   - REPLICATION CLIENT

   - REPLICATION SLAVE

   - SUPER

Step Three: Install the Process Server Database Schema for the MySQL Database

1. Login in using your administrator password.

2. Create `activevos` schema and install Process Server tables and views.

3. Stop the MySQL server.

4. Edit the `activevos.ini` file on each server as follows:
   On Server A:

    ```
    server-id = 1
    replicate-same-server-id = 0
    auto-increment-increment = 2
    auto-increment-offset = 1
    master-connect-retry = 60

    sync_binlog=1
    log-bin = C:\mysql\log\log-bin.log # change this to a path/name appropriate to your
    system
    relay-log=MySQLStreamA-relay-bin
    # replicate all changes to activevos database, but ignore specific tables
    replicate-ignore-table=activevos.AeCounter
    replicate-ignore-table=activevos.AeMetaInfo
    replicate-ignore-table=activevos.AeLock
    replicate-ignore-table=activevos.AeURNValues
    ```

On Server B:

```
server-id = 2
replicate-same-server-id = 0
auto-increment-increment = 2
auto-increment-offset = 2
master-connect-retry = 60
sync_binlog=1
log-bin = C:\mysql\log\log-bin.log # change this to a path/name appropriate to your
system
relay-log=MySQLStreamB-relay-bin
# replicate all changes to activevos database, but ignore specific tables
replicate-ignore-table=activevos.AeCounter
replicate-ignore-table=activevos.AeMetaInfo
replicate-ignore-table=activevos.AeLock
replicate-ignore-table=activevos.AeURNValues
```

5. Perform the following query on each database:

```
CHANGE MASTER TO MASTER_HOST='[ip address or hostname of master]',
    MASTER_USER='replication', MASTER_PASSWORD='activevos'
```

6. On each database, start replication using the following statement:
```
START SLAVE
```

Step Four: Test MySQL Set Up Using Process Server-provided Scripts

After completing database replication for all databases in your sites, you can test the replication process to determine if your configuration is successful.

Note: Multisite setup is based on the default configuration of privileges granted to users in MySQL. If you have revoked privileges from users, such as from the PUBLIC user, you may experience replication problems.

Process Server MultiSite Test Utility

Process Server has a utility that verifies database replication. Essentially, the utility performs inserts and deletes within each site's database tables and verifies synchronization of the data. To use this utility, you must modify a configuration file to provide parameters describing your environment. Then run the utility with the provided batch file. For details on using this utility, see the **readme.txt** file. The test files are located in:

`mysql_config\bin\multisite_test`

Note: Be sure that no Process Servers are running when you are testing.

Step Five: Configure and Deploy Process Server

Configure and deploy Process Server by following the instructions in **Process Server and Resource Configuration**.

Step Six: Add the MultiSite license

Launch the Process Console and add the MultiSite license, as described in server and resource configuration. You only need to add the license to one server. The license is replicated to other sites.

Step Seven: Configure and Enable MultiSite Properties

Configure and enable MultiSite properties in Process Console on the **Admin > MultiSite > Site Properties** page. Some properties are site independent and others are replicated. For information, see the Process Console Help.

Pausing Replication When Performing Database Updates

When you upgrade the database schema for a new version of Process Server, be sure to follow the instructions below and then to perform the upgrade as described in Process Server and Resource Configuration.

Do the following:

- You must temporarily stop database replication.
  In Oracle Streams, follow the instructions to *stop the Capture and Apply processes* for each database in replication. These tasks are located on the Oracle Enterprise Manager's **Streams > Manage > Capture** and Oracle Enterprise Manager's **Streams > Manage > Apply** pages.
- You must ensure that all servers are stopped before upgrading. the schema. Upgrade each site database before starting any server.
- When all databases have been upgraded, you can start up the Streams Capture and Apply processes and the Process Server servers.

Installation Checklist

This section provides a list of most of the items that you should either have completed or information noted prior to attempting to install Process Server.

Hardware

- Server hardware must meet the requirements listed for each third-party application, including server container, database server and Java environment.

Software

- A user account with administrative rights to install or manage all required software including the application and database servers and the Process Server.
- A supported database server installed and accessible.
- The supported Server container installed on each machine intended to host Process Server.
- JVM Memory arguments have been added to your environment variable: `-Xms256m -Xmx1024m -XX:MaxPermSize=384m`. (See "Prerequisites" on page 8.)
- Process Server must be configured for WS-Security. (See Configuring Process Server for WS-Security.)
- In your Identity Service (JDBC, LDAP, or XML), add the `abTaskClient` role to each Process Central user. This security role, described in the `web.xml` file, is required for access to Process Central.
- On the URN Mappings page of the Process Console, update the host and port for Process Central to match your installation, if needed. The default address is `http://localhost:8080/activevos-central/avc`.

License Information

- Valid license keys for the total number of sockets intended to host Process Server.

Database Information

- Permissions must be set for Process Server to access your schema. For example, `GRANT SELECT`, `INSERT`, `UPDATE`, `DELETE`, `CREATE`, `DROP`, `REFERENCES`, `INDEX`, `ALTER`, `CREATE TEMPORARY TABLES`, `LOCK TABLES`, `EXECUTE`, `CREATE VIEW`, `SHOW VIEW`, `CREATE ROUTINE`, and `ALTER ROUTINE`.
- For WebLogic and WebSphere, configuration of a JNDI data source.
- The URL to use to connect to the Process Server database.
- The database user name and password to be used by Process Server to connect to the database.
- If you are using an Oracle database, the Process Server tablespace created.
- For RDBMS, if you are not using the database driver and information supplied with the Application Server you must also have the following two:
  - A JDBC database driver that provides the required functionality.

- The class name of the JDBC database driver.

Server Container Information

• The installation location of your Server containers.

Glossary

API

Application Program Interface, a set of routines, protocols, and tools for building software applications.

Application Server

Also called an appserver. A program that handles all application operations between users and an organization's backend business applications or databases. Application servers are typically used for complex transaction-based applications. To support high-end needs, an application server has to have built-in redundancy, monitors for high-availability, high-performance distributed application services and support for complex database access.

DDL

Data Definition Language is used to specify a database scheme as a set of definitions expressed in a DDL script. The basic idea is to hide implementation details of the database schemes from the users.

EAR

J2EE modules that comprise an application are assembled into a single application Enterprise Archive (EAR) file.

J2EE

Java 2 Platform Enterprise Edition, a platform-independent, Java-centric environment from Sun for developing, building and deploying Web-based enterprise applications online.

Java

A high-level programming language developed by Sun Microsystems. Java is an object-oriented language similar to C++, but simplified to eliminate language features that cause common programming errors. Java source code files (files with a `.java` extension) are compiled into a format called bytecode (files with a `.class` extension), which can then be executed by a Java interpreter.

JAR

Java Archive, a file format used to bundle all components required by a Java applet. JAR files simplify the downloading of applets since all the components (`.class` files, images, sounds, and the like) can be packaged into a single file. In addition, JAR supports data compression, which further decreases download times.

JNDI

Java Naming and Directory Interface (JNDI). Allows Java-enabled applications to use a unified interface to multiple naming and directory services in the enterprise. Part of the Java Enterprise API set. JNDI works with other J2EE technologies to organize and locate components in a distributed computing environment.

JVM

Java Virtual Machine. An abstract computing machine, or virtual machine, JVM is a platform-independent programming language that converts Java bytecode into machine language and executes it.

URL

Uniform Resource Locator, the global address of documents and other resources on the World Wide Web.

WAR

>Java modules that comprise an application are assembled into a single application Web Archive (WAR) file.

Web Server

>A Web Server a computer that delivers (serves up) Web pages. Every Web server has an IP address and possibly a domain name. For example, if you enter the URL `http://www.pcwebopedia.com/index.html` in your browser, this sends a request to the server whose domain name is `pcwebopedia.com`. The server then fetches the page named `index.html` and sends it to your browser. That request can also cause complex logic to be executed and manage database access.

XML

>Extensible Markup Language, a specification developed by the W3C. XML is a pared-down version of SGML, designed especially for Web documents. It allows designers to create their own customized tags, enabling the definition, transmission, validation, and interpretation of data between applications and between organizations.

Configuration

The topics in the section provide information on pages within the Configuration Wizard.

Configuration and Deployment

Please review the important information in *Prerequisites* and *Installation Checklist* before running ActiveVOS Server configuration.

For Tomcat, WebSphere, and JBoss: This panel allows you to select what operations you would like to perform. Subsequent panels show the details of each option. The selections and the results are described in the table below.

For WebLogic: The configuration wizard collects details for ActiveVOS Server to communicate with a selected database, a work manager, and ActiveVOS Central. It can deploy applications and install the database schema. Select the options you want to execute.

Note: Many of the options presented in the configuration wizard are only used within development servers. The availability of these options on production servers may be limited or unavailable due to security restrictions or other limitations imposed by the administrators of the target server, or by your particular configuration and situation.

Select the options you would like to perform and click **Next** to continue.

Selection	Description
Configure ActiveVOS Server	Allows the setting of the parameters required to start and run the ActiveVOS Server and set the security options for the application.
Configure ActiveVOS Central	When enabled, allows setting of configuration parameters for the ActiveVOS Central application.
For WebSphere: Configure Application Resources	Allows configuration of your work manager4, timer manager, JAAS logins, and database resource.

Selection	Description
For Tomcat and JBoss: Configure Database	Configuration of an application server's native data source files or wizards.
For Tomcat, WebSphere, and JBoss: Deploy Applications and Resources	Deployment of ActiveVOS Server and datasource.
For WebLogic: Deploy Applications	Select deployment of ActiveVOS Server and ActiveVOS Central. It also allows you install the database schema. Note that you can run the `config-deploy` tool more than once on separate servers, to deploy ActiveVOS Central to different machines.

Engine Configuration

This panel provides information required for ActiveVOS Server to access your database server. Choices on this panel change the settings in the configuration of the `aeEngineConfig.xml` file, which is contained in the `activevos.war` file.

Field Name	Default Value	Descripton
Database	MySQL	This setting is used internally by ActiveVOS Server to handle communication for the supported database.

Select **Next** to save your value and continue.

JNDI Configuration

The Server JNDI Configuration panel allows configuration of the various files that contain JNDI references.

For Tomcat and JBoss: In general, if you have not preconfigured resources on your application server, it is not necessary to change the default values. If you have already configured resources you must match the field to your corresponding resource.

For WebLogic: You should configure JNDI resources before completing this configuration. Refer to Configuration for guidelines on configuring a JDBC Data Source and a Work Manager.

For Websphere: You should preconfigure a work manager and timer manager on your application server prior to completing this configuration. However, you can configure them later and rerun the configuration. If you have already configured resources, you must match the field to your corresponding resource.

Server	Field Name	Default Value	Description
All	Database JNDI	`jdbc/ActiveVOS`	The ActiveVOS Server Database resource must be assigned a JNDI name for location at run-time. Enter this JNDI name in the text box provided.
WebLogic	Work Manager JNDI	`wm/ActiveVOS` (suggested name)	Name that is used to connect to a WebLogic Work Manager that you have created in the WebLogic Application Server's Process Console. **Note**: If you do not configure a WebLogic Work Manager, ActiveVOS Server ignores this name and instead use its own internal Work Manager. Enter your WebLogic JNDI name if it differs from the suggested name.

Server	Field Name	Default Value	Description
WebSphere	Work Manager JNDI	`wm/ActiveVOS` (suggested name)	Name that is used to connect to a WebSphere Work Manager that you have created in the WebSphere Application Server using the Process Console. **Note**: If you do not specify a Work Manager JNDI name then ActiveVOS will ignore this name and instead use its own internal Work Manager. Enter your WebSphere JNDI name if it differs from the suggested name.
WebSphere	Timer Manager JNDI	`tm/ActiveVOS` (suggested name)	Name that is used to connect to a WebSphere Timer Manager that you have created in the WebSphere Application Server using the Administration Console. Note: If you do not specify a Timer Manager JNDI name then ActiveVOS will ignore this name and instead use its own internal Timer Manager. Enter this JNDI name if it differs from the suggested name.

Select **Next** to save your value and continue.

Internal Work Manager Configuration

The execution thread values displayed are used for the internal ActiveVOS Server work manager. We highly recommend that you configure a WebLogic Work Manager. You can accept these initial values for the internal work manager. In the ActiveVOS Console, you can modify these values, as desired.

Value	Description
Minimum Threads	(Optional). The minimum number of threads that are available for performing process work. The default is 10.
Maximum Threads	(Optional). The maximum number of threads that are available for performing process work. The default is 50.

If the number of threads being run is equal to this value, processes can fault as no threads are available when a node needs to broadcast information to other nodes. To be safe, you should create a secondary pool to be used by ActiveVOS Server. (This is done in the app server's console. ActiveVOS Server will only use threads in the pool when critical system work must be performed.

After entering this information, click **Next** to save your values and to continue.

Security Configuration

ActiveVOS Server can be deployed in a secured manner. The Security Configuration panel allows you to configure the security parameters that will be applied to the ActiveVOS Server Console, and deployed BPEL process services. Select the security options you want to enable.

After completing configuration, you must assign security roles to users and groups. You can find details on configuring security in the *Process Server Guide*.

If you have a license for the multi-tenant feature, you must enable security.

After entering this information, click **Next** to save your values and to continue.

Administrative Functions

These functions add security parameters to the ActiveVOS Consoles and services by setting the following roles:

abAdmin

Users associated with this role have full administrative rights to ActiveVOS Server.

abBusinessManager

Users associated with this role have access to process instance details (but cannot operate on them). They can monitor active processes and tasks, and work queues. They have a read-only view of process instance details.

abDeployer

Users associated with this role have rights restricted to deploying business process archive files to ActiveVOS Server.

abDeveloper

Users associated with this role have rights restricted to service artifacts, endpoint information, and sample messages for the services they consume and expose (that is, processes) after they are deployed. Developers need the ability to deploy process deployment archives, initiate process execution and analyze them. Developers also need to configure global function contexts for custom functions, URN

mappings, and the ability to schedule process execution. Specifically, this user has access to the Active Process list, the Process Instance View, the Active Task and Work Queues lists, the Server Log, the Dashboard and all reports, and the catalog's content.

abOperator

Users associated with this role have rights restricted to operating the system. These include observing the functionality of processes, managing process instances using the process instance detail view, running reports, logging, viewing exceptions, acquiring information on service operations, adding and removing tenants, and managing the scheduled database delete schedule.

abTaskClient

Required. You must configure permission to access ActiveVOS Central for all users. In addition, users who interact with the Human Task (WS-HT) API must have this role.

ActiveVOS Central presents a login page to users.

Process Services

The process services adds security parameters to the Web Services handler for all deployed BPEL services with a role. The services listed at `http://[host]:[port]/active-bpel/services` are secured. The process services (roles) are:

abRestrictedServiceConsumer

Users associated with this role cannot access a service unless it is deployed with allowed roles specified in the `pdd` and the user belongs to at least of these roles. If no roles are specified in the `pdd`, access to services with no roles specified in the `pdd` are also denied. Users in this role can view the `wsdl` files for other services like **abServiceConsumer**; however, they are blocked at runtime.

abServiceConsumer

Users associated with this role have rights restricted to start process instances of deployed processes, including from ActiveVOS Central, the Eclipse Web Tools Project, or other client application,such as SOAPUI.

abTenantAdmin

(For a Multi-Tenant licensed server only.) Users associated with this role have rights to deploy and manage contributions into a configured tenant on the server.

Based on a Tenant Definition configured by the ActiveVOS Server administrator (with the abAdmin role), a tenant administrator user can log into the tenant context on the server. A service consumer user can create process instances for processes deployed to the tenant context.

Identity Service Consumer

The identity service consumer adds security parameters to the Web Services handler for Process Identity service used by the ActiveVOS Central application using the following roles:

abIdentityListConsumer

Only users associated with this role or **abAdmin** have rights to submit Web Service requests to the identity service from Process Developer.

ActiveVOS Central Configuration

The ActiveVOS Central Communications Configuration panel allows setting of the connection information to be used when ActiveVOS Central communicates with the ActiveVOS Server. This panel allows the configuration of the following parameters:

Parameter	Default Value	Description
Session Timeout	30 seconds	The session timeout sets the duration that an inactive session will remain connected to the ActiveVOS Central database.
ActiveVOS Central `AeTaskService` URL	`http://` `[hostname.domainname]:` `[port]/active-bpel/` `services/AeB4PTaskClient-` `taskOperations`	(Required) ActiveVOS Server can run on the same or a different server than the ActiveVOS Central. Modify this URL to specify the host and port where ActiveVOS Server runs. Modify the protocol, to add security, if needed. The URL displayed is the default URL of the Web service that ActiveVOS Central needs to call ActiveVOS Server.

After entering this information, click **Next** to save your values and to continue.

Deployment Options

The Deployment Options panel allows the selection of deployment items. The check boxes on this panel are as follows:

Install database schema (New Installation Only)

This option controls whether or not the configuration wizard will install the Process database schema to your database.

Note: This option requires that the user information and database name entered in the ***Database Configuration Panel*** have already been created. Additionally, this option must not be selected by users wishing to update from a previous database version. For upgrade instructions, please see the ***Configuration Wizard*** document.

Install database schema

This option controls whether or not the configuration utility installs the ActiveVOS database schema to your database. Selecting this option will present a Database Configuration panel on the next wizard page.

Note: Do not select this option if you are updating from a previous database version. For upgrade instructions, please see the *Configuration* section of your documentation.

Install database descriptor (For Tomcat and JBoss Only)

Checking this option installs the application server specific database descriptor file to your application server. Selecting this option eliminates the need to create the descriptor file through application server management consoles.

Install Application Resources (For WebSphere Only)

Checking this option installs the ActiveVOS Server resources to your application server, including settings for work manager, timer manager, JAAS login, and database resource.

Deploy ActiveVOS

Checking this option installs the ActiveVOS Server to your application server.

Note: If you plan to enable clustering, you must re-run this configuration utility and, on the last page, select a different directory for deployment.

Include Process Console

Selecting this option installs Process Console on your application server. Process Console is an optional component that you can choose to install.

Note: If you select the **Include Process Console** option, you must also select the **Deploy ActiveVOS** option.

Deploy ActiveVOS Central

Checking this option installs ActiveVOS Central to your application server.

If you want to install ActiveVOS Central to a different server, re-run the `config-deploy` utility on that server.

After entering this information, click **Next** to save your values and to continue.

Database Configuration

Note: It is highly recommended that these panels only be used for development servers. Refer to your application server user guide and your database administrators guide for configuring data sources for production installations.

The panels that follow provide the ability to configure a data source file. The information that is entered here is only a subset of the options that can be configured for a data source. Ensure that you have completed the configuration of a JNDI data source prior to completing this step. For details, see *Configuration*.

Setting	Default Value	Description
Driver class	None	(Required.) The name of your JDBC driver's implementation of `java.sql.driver`. Some driver examples are shown here: - **MySQL**: `com.mysql.jdbc.Driver` - **MS SQL SERVER**: `com.microsoft.sqlserver.jdbc.SQLServerDriver` - **ORACLE**: `oracle.jdbc.OracleDriver` - **DB2**: `com.ibm.db2.jcc.DB2Driver`
Driver url	None	(Required.) Used to connect to your database. Typical URLS are shown here; however, refer to your database and JDBC driver documentation for further information. - **MySQL**: `jdbc:mysql://[host]:[port]/[database_name]?useUnicode=true&characterEncoding=UTF-8&characterSetResults=utf8` (Default port is 3306) UTF-8 encoding is required. - **MS SQL SERVER**: `jdbc:sqlserver://[host]:[port];databaseName=[database_name]` (Default port is 1433) UTF-8 encoding is highly recommended. - **Oracle**: `jdbc:oracle:thin:@//[host]:[port]/[database_name]` (Default port is 1521) UTF-8 encoding is highly recommended. - **DB2**: `jdbc:db2://[host]:[port]/[database_name]` DB2 = (Default port is 50000) UTF-8 encoding is highly recommended. **Example**: `jdbc:mysql://localhost:3306/ActiveVOS?useUnicode=true&characterEncoding=UTF-8&characterSetResults=utf8`
Database name	ActiveVOS	(Required.) The name of your database. It must match the `database_name` provided in the Driver URL.

Setting	Default Value	Description
Driver jar	None	Driver `.jar` file must be selected using the **Select File** button to the right of this field. Select your driver file so that is can be copied to the correct location. Some driver file examples are shown here, but we strongly recommend you check the Prerequisites details before making your selection. - **MySQL**: `mysql-connector-java-5.0.7-bin.jar` - **MS SQL SERVER**: `sqljdbc.jar` - **Oracle**: `ojdbc14.jar` - **DB2**: `db2jcc.jar` and `db2jcc_license_cu.jar`
Username	bpeluser	(Required by default.) The name associated with the privileges to access your database. Unless you modified this name, it is described in the DDL schema.
Password	bpel	(Required by default.) The password of the above user name. Unless you modified this name, it is described in the DDL schema.
For Tomcat and JBoss: Connection Timeout	1000	The maximum time to wait in milliseconds for a database connection to become available.
For Tomcat and JBoss: Minimum Connections	10	The maximum number of idle connections in the database pool.
For Tomcat and JBoss: Maximum Connections	100	The maximum number of connections in the database pool.
Validate Connection	Checked	Checking this entry will cause the configuration wizard to attempt to connect to your database with the supplied information.

Validate Connection. After you enter all required database connection information and click **Next**, the utility checks that your driver jar and URL are valid, and that the database name matches the name in the URL. The utility does not check the username and password of the database. If the server cannot make a connection because these are in error, you can re-run the configure-deploy utility and enter new names. All other values are preserved.

After entering this information, click **Next** to save your values and to continue.

Deployment Targets

Provide communication and other details for the deployment targets.

Target Information	Description
WebLogic Home	Select the root folder of your application server. For example `C:\bea\wlserver_10.3`.
WebLogic URL	URL of the WebLogic Administration Server.

Target Information	Description
User Name	A username that has administrative rights to your application server.
Password	Password for the user name.
WebLogic Domain	The name of your WebLogic domain. A *domain* is the basic administration unit for WebLogic Server instances. A domain consists of one or more WebLogic Server instances (and their associated resources) that you manage with a single Administration Server.
Deployment Target Type	A deployment target is the server, virtual host, or cluster to which you deploy an application. Identify the type of your deployment target. According to the WebLogic documentation, in most production environments, you typically deploy applications to one or more Managed Servers configured in a Weblogic Server domain. In some cases, the servers may be included as part of a WebLogic Server cluster, or a virtual host may be used for directing Web application requests.
Deployment Target	A deployment target is the server, cluster, or virtual host to which you deploy an application. Identify the name of your deployment target. Consult your application server Administration Console to identify the name you want to use.

After entering this information, click **Next** to save your values and to continue.

CHAPTER 3

IBM Websphere

This chapter includes the following topics:

General Information

The Process Server Setup Wizard lets you install a new server or update an existing one.

1. Download and obtain a license for Process Server.

2. Download and run the Process Server installation.

3. To configure and deploy a server, open `quickstart_server.html`, which directs you to the file you are reading now.

4. Review the Prerequisites and Release Notes for Process Server by selecting the links in the navigation bar on the right.

Note: If the Setup Wizard detects an existing installation, it lets you either update the existing installation or install the server in a different directory. When you update an existing installation, the Wizard replaces any file that a previous Wizard had installed. All other files in your server's install directory remain as they were.

Quick Start

Preconfiguration

1. Create a database (or *tablespace*) for Process Server. Select the **Configuration** link in the navigation bar for details.

2. Process Server needs to be granted the following permissions on your schema:
   `GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES, INDEX, ALTER, CREATE TEMPORARY TABLES, LOCK TABLES, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROUTINE, ALTER ROUTINE`

   If Process Server does not have the permissions it needs, you will see an error message that begins as follows: `Failed to get version info from the AeMetaInfo table`.

3. Collect the following information that you will be prompted for during configuration:

   - Host, port number, and database name where you are deploying Process Server

   - The full path to a supported JDBC database driver

- Driver implementation class name
- Database username and password
  Hints and examples of this information are provided in the appropriate page of the Configuration utility's online Help.

4. For an upgrade installation of Process Server, manually install the database schema. For a new installation, you can automatically install the database schema during configuration.

5. Ensure that the `JAVA_HOME` environment variable is set.
   Note for Tomcat and JBoss: To avoid issues with multiple JDKs, we recommend that you set `JAVA_HOME` in the application server startup file instead of in the system environment.

6. Ensure that your JVM memory settings in your application server match the recommendations described in ["Prerequisites" on page 8](#).

7. **MultiSite Installations Only:** To configure MultiSite clustering, be sure to review the instructions in **Process Server MultiSite Configuration**. Access the instructions from the **Configuration** link in the navigation bar on the right.

8. **Unix Platform Only:** After installing any version of the Process Server on any UNIX OS, you may receive an error when starting the server such as `cannot write to temp location [/temp]`. This is due to an OS restriction on the number of files that can be created. To avoid this error, before installing the server edit your UNIX security configuration file directly to allow a larger number of files to be opened. In UNIX the parameter NOFILE sets the maximum number of files that can be opened by a single process. For example, in the file `/etc/security/limits.conf` you could add the line `- nofile 10240` to raise the limit from the default 1024 value. 10240 should be large enough. If you are unsure, setting "unlimited" can be considered.

Configuration and Deployment

1. In your `ActiveVOS` installation folder, locate the `[server]-config>bin` folder, and select the `config-deploy` utility.

2. Complete the configuration and deployment. Use the online Help as needed.

3. Use your server container's documentation for help in starting the Process Server.

Note: When you are deploying Process Server to a Tomcat server, `activebpel-cert.war` is not deployed. You must copy it from `{installation_directory}\server-enterprise\tomcat_config\webapps` to `{Tomcat_Home}\webapps` directory when deploying an SSO configuration

Add Your License

1. You will need access to your Process Server license.

2. Open the Process Console in a browser:
   `http://[host]:[port]/activevos`

3. Add your license on the License page. Select the Admin menu item of the Process Console and then select License. Select **Add** and copy and paste all of the Process Server license into the dialog. Then select the Server Status navigation menu item and select **Start Server** to start the Process Server.

Prerequisites

Process Server relies on a valid license and third party software components. Ensure that your application server environment meets the requirements before beginning the configuration procedure.

Process Server Licensing

A valid license is required to run Process Server. You enter the license information after you've configured Process Server. Do this as follows:

1. Start Process Console.

2. Select **Admin | License**. (**Admin** is in the toolbar; **License** is about a third of the way down on the left.)

3. Press the **Add License** button, copy and paste all of the Process Server license into the dialog, and then press the **Add License** button.

4. Select the Server Status link near the ver top of the left area press the **Start Server** button to start the Process Server

Obtaining a License Key

If you did not receive your license prior to receiving the software, contact the Informatica sales department.

Our sales support staff can assist you with licensing questions.

Hardware Requirements

Application Server Hardware

Process Server runs within different server containers, and the hardware requirements of the server are superseded by the requirements of the container.

Database Hardware

Process Server application supports multiple database servers and has no additional requirements besides those of your selected database server.

Note: For maximum performance, we recommend that you run Process Server and its database schema on separate servers.

JVM Memory Requirements

We strongly recommend that you run your application server with at least the following memory settings:

```
-Xms256m -Xmx1024m -XX:MaxPermSize=384m
```

where Xms is starting memory, Xmx is maximum memory, and $MaxPermSize$ is the amount of memory set aside for loading class files.

Disk Space Requirements

At least 1 GB of disk space is required to install the Process Server application.

Note: Considerably more disk space is required to run your applications. The amount is dependent on several factors including logging levels you select, number of processes you run, and size of processes.

Software Requirements

Specific versions of Eclipse, client and server operating systems, application and database servers are supported. Support means that Informatica will assist customers with the installation and operation of Business Process Manager products on these 3rd party product versions.

Also certified are specific combinations of 3rd party products. Use of Certified Systems described here will reduce the risk of problems as a result of extensive testing of Business Process Manager with these specific versions. Database connectivity is required for Process Server persistence and version control of deployed processes. It is recommended that the database resides on a dedicated server.

The following software is supported for use with Process Server:

Operating Systems

- Microsoft Windows 2003/2008 Server
- Linux operating system versions that support the JVM, application and selected database servers supported by Informatica for use by Process Server.
- Solaris 10 (x86/Sparc)
- HP-UX 11i v3 (on Itanium processor)
- AIX 5.3 and 6.1
- Mac OS 10.6 64-bit or higher

Web Browser

- Any browser. A browser is required to view the Release Notes and run the Process Server consoles. Review the `activevos.com` certified system support page for details.
- There are specific requirements for Screenflow execution in the Screenflow product.

Application Servers

- Apache Tomcat 7.x
- JBoss AS
- Oracle WebLogic 12.1.1
- IBM WebSphere Server 8.5

Note: Other releases of these servers should work. However, they have not been tested.

JAVA Environment

If you are running a Linux distribution and you are using the US ASCII codeset, you will need to add the following startup parameter to your JVM:

```
-Dfile.encoding=UTF-8 encoding
```

Application Server	JVM	Comment
Tomcat	Sun JDK	To avoid issues with multiple JDKs, we recommend that you set JAVA_HOME in the application server startup file instead of in the system environment.
JBoss	Sun JDK	To avoid issues with multiple JDKs, we recommend that you set JAVA_HOME in the application server startup file instead of in the system environment.
WebLogic	Sun JDK	
WebSphere	IBM J9 VM build 2.4, J2RE 1.6.0	

Setting JAVA_OPTS for DOM Processing

If you are using a Java server and the DOM being produced is incorrect, you should add the following definitions to the definition of JAVA_OPTS in your server startup script

```
set JAVA_OPTS=%JAVA_OPTS%
    -
Dorg.apache.xerces.xni.parser.XMLParserConfiguration=org.apache.xerces.parsers.XIncludePa
rserConfiguration
    -
Djavax.xml.transform.TransformerFactory=org.apache.xalan.processor.TransformerFactoryImpl
```

Note: If this is not set, the classloader must search through the classpath to locate the appropriate class. Depending on the size of the classpath, this operation can degrade performance.

Database Servers

Process Server uses standard database servers as the persistent storage mechanism. You must have access to one of the supported database servers with the proper privileges to create databases and tables as well as privileges to update, insert and delete into those tables.

Supported Databases

- MySQL 5.5
- MySQL 5.1.x (For more information, see the *MySQL Configuration Note* below.)
- Microsoft SQL Server 2005, 2008, 2008 R2, 2012
- Oracle Database 10g, 11g
- IBM DB2 9.7

Certified JDBC Database Drivers

A JDBC database driver is required. For certain configurations, you will be asked to provide the location of driver during configuration. For other configurations, you will be instructed to use your application server administration console to configure the database.

Note: For a clustered environment, you must install the driver to each node in the cluster.

Database Server	JDBC Driver
MySQL	`mysql-connector-java-5.1.6-bin.jar`
Microsoft SQL Server	`sqljdbc.jar (1.2)`, `sqljdbc4.jar`. JBoss 7.x requires sqljdbc4.jar
Oracle	`ojdbc6.jar`
DB2 9.7	`db2jcc_license_cu.jar`, `db2jcc.jar`.JBoss 7.x requires db2jcc4.jar

Process Server

Process Server supports 64-bit Java Virtual Machines (JVM) for the Windows and Linux systems listed above. When installing Process Server on a 64-bit server, the 64-bit JVM supported for a given application server is required.

Process Developer

Process Developer embeds Eclipse 3.7.2 and a 32-bit version of JRE 7 for Windows systems allowing it to run on both 32-bit and 64-bit Windows operating systems and hardware environments. The Linux distribution of Process Developer does not embed the required 32-bit version of JRE 7. Users must install JRE 7 separately. Users wishing to use a 64-bit version of Eclipse must download the 64-bit version of Eclipse for RCP and RAP Developers, and then use the Process Developer Plugin installation.

Before You Configure and Deploy Process Server

Third party software components are required to be installed prior to configuring and deploying Process Server.

Application Server must be Installed

An application server provides Process Server a framework within which to run. Install the appropriate supported server container according to software vendor's documentation on each machine intended to run Process Server.

Note: Set up clustering according to your software vendor's documentation. Once clustering is set up on the application server, follow our documentation for configuring clustering.

Database Server must be Installed

Process Server requires only one database server per any number of application servers running in a cluster.

All databases require a user with administrative rights to the computer in order to install them. Process Server also requires a connection to your database server. This user needs the proper privileges to connect to the Process Server database, update, insert and delete records within that database.

MySQL Configuration Note

A BPEL process can send and receive variables with attachments such as images or documents. Attachments may be large or numerous, causing database connection errors.

To avoid connection errors to MySQL Server, you may need to configure MySQL with more allocated memory than the default of 1MB.

To configure MySQL:

1. Open MySQL Administrator. (If unavailable, see the note below.)

2. Select Startup Variables.

3. Select Advanced Networking.

4. In the Data/Memory Size panel, enable Max Packet Size.

5. Set the packet size higher than the default of 1MB. The size depends on the attachment sizes you expect.

6. Apply changes.

Note: If MySQL Administrator is not available, refer to the MySQL documentation regarding how to set the `max_allowed_packet` setting for your environment.

About the Process Server Database Schema

Process Server provides database schema definition files for all supported databases. Before you start the configuration and deploy utility, refer to Configuration topic in this help for specific recommendations on how to install the schema for your database.

Installation Folders

Download and extract the installation folders as described in *Quick Start.* The following describes the contents of the Process Server installation:

`{install_dir}/server-enterprise`

> quickstart_server.html. Open this file for quick start and complete details for configuration and deployment.

`{install_dir}/server-enterprise/websphere_config/bin`

> Configuration and deployment tool

`{install_dir}/server-enterprise/websphere_config/ddls`

> Database schema to be installed automatically (recommended) or manually, as described in *Configuration*

`{install_dir}/server-enterprise/websphere_config/deploy`

> Files to be installed automatically by the configuration and deploy utility.

```
{install_dir}/server-enterprise/websphere_config/doc/html/config
```

Copies of the Configuration utility's online help files. These files are accessible from the Help button within the utility.

Configuration

This section leads you through configuration of the resources required for Process Server. You must configure your database, Apache Tomcat Server and Process Server before deploying and running Process Server. The sections below provide information for completing the configuration.

Configuring a JDBC Data Source

To configure a JDBC Datasource within WebSphere, perform the following steps

1. Navigate to JDBC Providers under Resources.

2. Select Create a New Database Provider.

3. Select either a known database provider type (e.g., DB2 Universal JDBC Driver Provider) or create a new user defined provider (i.e., User-defined JDBC Provider). The table below provides information on the parameters that must be filled in.

Parameter	Description
Name	User defined or the value from the drop-down list
Description	User defined.
Classpath	The classpath for the jar(s) that contain the JDBC Driver, for example: - ${DB2_JDBC_DRIVER_PATH}/db2jcc.jar - ${DB2_JDBC_DRIVER_PATH}/db2jcc_license_cu.jar
Implementation Classname	The implementation name for the data source; for example: - DB2= com.ibm.db2.jcc.DB2ConnectionPoolDataSource - mySQL = com.mysql.jdbc.jdbc2.optional.MysqlConnectionPoolDataSource

4. Apply changes.

5. Select the Data Sources link under Additional Properties.

6. Create a new data source. The table below describes the properties and associated values:

Propety	Description
Name	Process Server data source
JNDI Name	jdbc/ActiveVOS
Data storage helper classname (for DB2 only)	com.ibm.websphere.rsadapter.GenericDataStoreHelperClasspath

7. Apply changes

8. Select Additional Properties then Connection Pool.

9. Set the Min Connections and the Max Connections. The suggested values are min = 10 and max = 50.

10. Select the link J2EE Connector Architecture (J2C) authentication data entries from the DataSource definition page.

11. Create a database authorization alias to be used during EAR deployment. You should use ActiveVOSDBAlias as the name of the alias.

12. Provide the user name and password to access the database.

13. Press OK to return to the Data Source configuration page.

14. Select Additional Properties then Connection Pool.

15. Select Custom Properties and add/modify the property values as required. The table below provides examples of the properties and associated values for DB2 and MySQL:

Property	DB2 Value	MySQL Value
databaseName	ABPEL	ActiveVOS
serverName	host name where DB2 installed	host name where MySQL installed
portNumber	50000	3306
user	db user name	db user name
password	db password	db password
useUnicode	N/A	true
characterEncoding	N/A	UTF-8
characterSetResults	N/A	utf8

16. Save the changes.

17. Test the newly created connection.

18. Provide the user name and password to access the database.

Configuration Instructions

Before running the Configuration utility, perform the following pre-configuration steps:

- Create a database (or tablespace) where Process Server persistence information will be stored

- Create a default user with administrative rights to the computer and database for use by Process Server

- Configure a JDBC Data source as described above.

First Time or New Install

If you are performing a clean installation, that is, a first-time install or a new database, you can use the Configuration utility to automatically install the database schema.

Manual Install or Update of Database Schema

It is strongly recommended that you automatically install the database schema; however, you can manually install it. Customers migrating from an earlier version should follow the instructions below.

Migrating from ActiveVOS to Process Server

If you are migrating from an earlier release of ActiveVOS, perform the following steps:

- Manually update the Process Server database schema using the DDL patches provided in `{install_dir}/server/tomcat_config/ddls/updates`

- Run the Configuration utility

- Review the Release Notes for late breaking migration information
- Review the Process Developer help topic, Migrating from Earlier Versions

Process Server can be configured to use an RDBMS database.

Relational Database Schemas

These instructions are generalized to make sure they can be followed for each database. When creating the database schema for Process Server, you can either create a new database definition or upgrade an existing definition.

- Refer to the install a new database schema section for a new installation.
- Refer to upgrade a database schema when performing a version upgrade.

Install a new database schema

1. Identify your DDL. Use the information provided in the table below to locate the correct DDL file.

Database Server	DDL File Name and Location	Notes
MYSQL	`{install_dir}/server/ websphere_config/ddls/ ActiveBPEL_Enterprise-MYSQL.SQL`	The default database name, ActiveVOS is defined within the DDL file. If you edit this name, ensure that you do not replace ActiveVOS Enterprise, a name that is inserted into the `AeMetaInfo` table.
MS SQL SERVER	`{install_dir}/server / websphere_config/ddls/ ActiveBPEL_Enterprise-MYSQL.SQL`	The default database name, ActiveVOS is defined within the DDL file. If you edit this name, ensure that you do not replace ActiveVOS Enterprise, a name that is inserted into the `AeMetaInfo` table.
ORACLE	`{install_dir}/server/ websphere_config/ddls/ ActiveBPEL_Enterprise- ORACLE.SQL`	Create a tablespace prior to running the DDL.
DB2	`{install_dir}/server/ websphere_config/ddls/ ActiveBPEL_Enterprise- DB2.SQL`	

2. Copy the DDL file from above, and rename it.
   Note: The original files must remain unchanged for the Configuration utility to work properly

3. (Optional) Modify the database name. Be sure to see the notes above.

4. Execute the DDL script.

5. Permissions must be set for Process Server to access your schema. For example, `GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES, INDEX, ALTER, CREATE TEMPORARY TABLES, LOCK TABLES, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROUTINE, ALTER ROUTINE`
   If Process Server does not have the permissions it needs, you will see an error message that begins as follows: Failed to get version info from the AeMetaInfo table.

Each database server provides its own mechanism or utility for executing a DDL script file. Execute the DDL script file using the appropriate utility. For example, if you are using Oracle, the utility to execute the DDL script file would be SQL Plus.

Upgrade an Existing Database Schema

To upgrade your existing Process Server database to be compatible with the new version of software, follow the instructions below:

1. Shutdown Process Server before executing a database upgrade.

2. Make a backup copy of your database.

3. Identify your current running version of Process Server. Database upgrades are provided to upgrade from one version back at a time. This means that more than one upgrade script may need to be applied to your database. For example, if you are running ActiveVOS version 8.0.x, you must go to the **updates** folder, and apply all patch scripts with higher numbers, starting with `[database name]-Patch-9.0.sql`. Be sure to run the patch scripts in *ascending* order. Do not run any upgrade script with a version number equal to or less than your current running version.

4. For each upgrade that needs to be applied perform the following:

   a. Identify your DDL. Use the information provided in the table below to locate the correct DDL file. Note: The updates must be applied in ascending order.

      MYSQL

      {install_dir}/server/websphere_config/ddls/updates/enterprise/ActiveBPEL_Enterprise-MYSQL-PATCH-{patch number}.SQL

      MS SQL SERVER

      {install_dir}/server/wwebsphere_config/ddls/updates/enterprise/ActiveBPEL-Enterprise-SQLSERVER-PATCH-{patch number}.SQL

      ORACLE

      {install_dir}/server/websphere_config/ddls/updates/enterprise/ActiveBPEL-Enterprise-ORACLE-PATCH-{patch number}.SQL

      DB2

      {install_dir}/server/websphere_config/ddls/updates/enterprise/ActiveBPEL-Enterprise-DB2-PATCH-{patch number}.SQL

   b. Execute the DDL script.
      Each database server provides its own mechanism or utility for executing a DDL script file. Execute the DDL upgrade script file using the appropriate utility. For example, if you are using Oracle, the utility to execute the DDL script file would be SQL Plus.

Multisite Configuration

For details, see ***Process Server MultiSite Configuration***.

Security Configuration

You can find details on configuring Process Server security roles in Process Developer Help or in the Infocenter.

Configuration for Headless Mode

Process Server relies on GUI components from the Java's SWT package, such as Fonts. If you are running on a headless server (i.e., the server does not have a graphic subsystem), you may see one of the following errors in the stack trace:

- java.lang.NoClassDefFoundError: sun/awt/X11GraphicsEnvironment

- Can't connect to X11 window server using ':0.0' as the value of the DISPLAY variable

- org.eclipse.birt.report.service.api.ReportServiceException

Use one of the following techniques to correct errors:

- Configure the JVM system property `java.awt.headless=true` and at the command line, start the JVM with the argument: `-Djava.awt.headless=true`
- Run a X-windows virtual frame buffer (Xvfb)

Configuration for Process Central when Using MultiTenant Feature

There an issue with WebSphere that prevents Process Central from working properly in a multi-tenant environment. There is a simple fix, however. In order to get Websphere 6.1 and 7.0 to handle servlet filters properly, you need to set the following web container property:

```
com.ibm.ws.webcontainer.invokefilterscompatibility = true
```

See http://www-01.ibm.com/support/docview.wss?uid=swg24014758 for a description of the defect

See http://www-01.ibm.com/support/docview.wss?rss=180&uid=swg21284395 for general instructions on how to set web container properties

Using the Configuration Utility

The Configuration utility walks through the steps required to provide the property values for Process Server and selected resources.

Note: Before running the utility, ensure that your server container is stopped.

Starting the Configuration Utility

Execute one of the following utilities based on your operating system:
Windows

```
{install_dir}/server/websphere_config/bin/config_deploy.bat
```

Linux

```
{install_dir}/server/websphere_config/bin/config_deploy.sh
```

If You Have Manually Installed or Updated the Database Schema

If you have manually installed or updated the database schema, when prompted, you must not select the "Install Database Schema" checkbox.

Running the Configuration Utility in Different Modes

The Configuration utility can be run with a graphical interface (default), in console mode or silently. When you run the utility your configuration options are automatically written to the install.properties file and they will be used as the defaults the next time the application is configured. One of the following parameters is accepted by the Configuration utility:

- Help: `help`. This option displays the usage for console and silent modes.
- Console mode: `console`. Runs the Configuration utility in text mode within a command window.
- Silent mode: `silent`. Runs in the background requiring no user interaction. This option requires that you have already run the Configuration utility in default mode, which sets configuration options in the install.properties file.

An example of running the Configuration utility from the command line is: `config_deploy help`

Configuration Help

The Configuration utility contains online help for each panel of the utility. Access Help by clicking the Help button on each panel. Additionally you can access the help from `{install_dir}/server/tomcat_config/doc/html/config`.

Configuring a JMS Messaging Service

You can configure a JMS Messaging Service in ActiveVOS in order to communicate with external clients and services over JMS. To set up a listener on a JMS queue or topic, you must deploy a message-driven bean

For details, refer to the JMS Messaging Service help topic from the Help link in the Process Console

Installation Checklist

This section provides a list of most of the items that you should either have completed or information noted prior to attempting to install Process Server.

Hardware

- Server hardware must meet the requirements listed for each third-party application, including server container, database server and Java environment.

Software

- A user account with administrative rights to install or manage all required software including the application and database servers and the Process Server.

- A supported database server installed and accessible.

- The supported Server container installed on each machine intended to host Process Server.

- JVM Memory arguments have been added to your environment variable: `-Xms256m -Xmx1024m -XX:MaxPermSize=384m`. (See "Prerequisites" on page 8.)

- Process Server must be configured for WS-Security. (See Configuring Process Server for WS-Security.)

- In your Identity Service (JDBC, LDAP, or XML), add the `abTaskClient` role to each Process Central user. This security role, described in the `web.xml` file, is required for access to Process Central.

- On the URN Mappings page of the Process Console, update the host and port for Process Central to match your installation, if needed. The default address is `http://localhost:8080/activevos-central/avc`.

License Information

- Valid license keys for the total number of sockets intended to host Process Server.

Database Information

- Permissions must be set for Process Server to access your schema. For example, `GRANT SELECT`, `INSERT`, `UPDATE`, `DELETE`, `CREATE`, `DROP`, `REFERENCES`, `INDEX`, `ALTER`, `CREATE TEMPORARY TABLES`, `LOCK TABLES`, `EXECUTE`, `CREATE VIEW`, `SHOW VIEW`, `CREATE ROUTINE`, and `ALTER ROUTINE`.

- For WebLogic and WebSphere, configuration of a JNDI data source.

- The URL to use to connect to the Process Server database.

- The database user name and password to be used by Process Server to connect to the database.

- If you are using an Oracle database, the Process Server tablespace created.

- For RDBMS, if you are not using the database driver and information supplied with the Application Server you must also have the following two:

   - A JDBC database driver that provides the required functionality.

   - The class name of the JDBC database driver.

Server Container Information

- The installation location of your Server containers.

Glossary

API

Application Program Interface, a set of routines, protocols, and tools for building software applications.

Application Server

Also called an appserver. A program that handles all application operations between users and an organization's backend business applications or databases. Application servers are typically used for complex transaction-based applications. To support high-end needs, an application server has to have built-in redundancy, monitors for high-availability, high-performance distributed application services and support for complex database access.

DDL

Data Definition Language is used to specify a database scheme as a set of definitions expressed in a DDL script. The basic idea is to hide implementation details of the database schemes from the users.

EAR

J2EE modules that comprise an application are assembled into a single application Enterprise Archive (EAR) file.

J2EE

Java 2 Platform Enterprise Edition, a platform-independent, Java-centric environment from Sun for developing, building and deploying Web-based enterprise applications online.

Java

A high-level programming language developed by Sun Microsystems. Java is an object-oriented language similar to C++, but simplified to eliminate language features that cause common programming errors. Java source code files (files with a `.java` extension) are compiled into a format called bytecode (files with a `.class` extension), which can then be executed by a Java interpreter.

JAR

Java Archive, a file format used to bundle all components required by a Java applet. JAR files simplify the downloading of applets since all the components (`.class` files, images, sounds, and the like) can be packaged into a single file. In addition, JAR supports data compression, which further decreases download times.

JNDI

Java Naming and Directory Interface (JNDI). Allows Java-enabled applications to use a unified interface to multiple naming and directory services in the enterprise. Part of the Java Enterprise API set. JNDI works with other J2EE technologies to organize and locate components in a distributed computing environment.

JVM

Java Virtual Machine. An abstract computing machine, or virtual machine, JVM is a platform-independent programming language that converts Java bytecode into machine language and executes it.

URL

Uniform Resource Locator, the global address of documents and other resources on the World Wide Web.

WAR

Java modules that comprise an application are assembled into a single application Web Archive (WAR) file.

Web Server

A Web Server a computer that delivers (serves up) Web pages. Every Web server has an IP address and possibly a domain name. For example, if you enter the URL `http://www.pcwebopedia.com/index.html` in your browser, this sends a request to the server whose domain name is `pcwebopedia.com`. The server then fetches the page named `index.html` and sends it to your browser. That request can also cause complex logic to be executed and manage database access.

XML

Extensible Markup Language, a specification developed by the W3C. XML is a pared-down version of SGML, designed especially for Web documents. It allows designers to create their own customized tags, enabling the definition, transmission, validation, and interpretation of data between applications and between organizations.

Configuration

The topics in the section provide information on pages within the Configuration Wizard.

Configuration and Deployment

Please review the important information in *Prerequisites* and *Installation Checklist* before running ActiveVOS Server configuration.

For Tomcat, WebSphere, and JBoss: This panel allows you to select what operations you would like to perform. Subsequent panels show the details of each option. The selections and the results are described in the table below.

For WebLogic: The configuration wizard collects details for ActiveVOS Server to communicate with a selected database, a work manager, and ActiveVOS Central. It can deploy applications and install the database schema. Select the options you want to execute.

Note: Many of the options presented in the configuration wizard are only used within development servers. The availability of these options on production servers may be limited or unavailable due to security restrictions or other limitations imposed by the administrators of the target server, or by your particular configuration and situation.

Select the options you would like to perform and click **Next** to continue.

Selection	Description
Configure ActiveVOS Server	Allows the setting of the parameters required to start and run the ActiveVOS Server and set the security options for the application.
Configure ActiveVOS Central	When enabled, allows setting of configuration parameters for the ActiveVOS Central application.
For WebSphere: Configure Application Resources	Allows configuration of your work manager4, timer manager, JAAS logins, and database resource.
For Tomcat and JBoss: Configure Database	Configuration of an application server's native data source files or wizards.

Selection	Description
For Tomcat, WebSphere, and JBoss: Deploy Applications and Resources	Deployment of ActiveVOS Server and datasource.
For WebLogic: Deploy Applications	Select deployment of ActiveVOS Server and ActiveVOS Central. It also allows you install the database schema. Note that you can run the `config-deploy` tool more than once on separate servers, to deploy ActiveVOS Central to different machines.

Engine Configuration

This panel provides information required for ActiveVOS Server to access your database server. Choices on this panel change the settings in the configuration of the `aeEngineConfig.xml` file, which is contained in the `activevos.war` file.

Field Name	Default Value	Descripton
Database	MySQL	This setting is used internally by ActiveVOS Server to handle communication for the supported database.

Select **Next** to save your value and continue.

JNDI Configuration

The Server JNDI Configuration panel allows configuration of the various files that contain JNDI references.

For Tomcat and JBoss: In general, if you have not preconfigured resources on your application server, it is not necessary to change the default values. If you have already configured resources you must match the field to your corresponding resource.

For WebLogic: You should configure JNDI resources before completing this configuration. Refer to Configuration for guidelines on configuring a JDBC Data Source and a Work Manager.

For Websphere: You should preconfigure a work manager and timer manager on your application server prior to completing this configuration. However, you can configure them later and rerun the configuration. If you have already configured resources, you must match the field to your corresponding resource.

Server	Field Name	Default Value	Description
All	Database JNDI	`jdbc/ActiveVOS`	The ActiveVOS Server Database resource must be assigned a JNDI name for location at run-time. Enter this JNDI name in the text box provided.
WebLogic	Work Manager JNDI	`wm/ActiveVOS` (suggested name)	Name that is used to connect to a WebLogic Work Manager that you have created in the WebLogic Application Server's Process Console. **Note**: If you do not configure a WebLogic Work Manager, ActiveVOS Server ignores this name and instead use its own internal Work Manager. Enter your WebLogic JNDI name if it differs from the suggested name.

Server	Field Name	Default Value	Description
WebSphere	Work Manager JNDI	`wm/ActiveVOS` (suggested name)	Name that is used to connect to a WebSphere Work Manager that you have created in the WebSphere Application Server using the Process Console. **Note**: If you do not specify a Work Manager JNDI name then ActiveVOS will ignore this name and instead use its own internal Work Manager. Enter your WebSphere JNDI name if it differs from the suggested name.
WebSphere	Timer Manager JNDI	`tm/ActiveVOS` (suggested name)	Name that is used to connect to a WebSphere Timer Manager that you have created in the WebSphere Application Server using the Administration Console. Note: If you do not specify a Timer Manager JNDI name then ActiveVOS will ignore this name and instead use its own internal Timer Manager. Enter this JNDI name if it differs from the suggested name.

Select **Next** to save your value and continue.

Global Security Configuration

The Global Security Configuration panel allows you to specify the JAAS Login that you want to use for cluster communications. Complete the following options:

Cluster communications use JAAS Login

Select this check box to enable the remaining options.

Security JAAS Login Name

- **ActiveVOSProvidedUser**. This name is passed through to the WebSphere Application Server through the login credentials of the ActiveVOS Console. On the next page of this wizard, you can create the login and provide the credentials.

- **ActiveVOSIdentityAssertion**. This name is defined on the WebSphere Application Server and uses the WebSphere identity assertion authentication method. On the next page of this wizard, you can create the login.

- **Custom**

Custom Name

Enter the login name that you wish to use. You must create this login in the WebSphere Application Server Administration Console.

After entering the above information, click **Next** to save your values and to continue.

JAAS Login Configuration

ThiThe JAAS Login Configuration panel allows you create JAAS application logins for cluster communication in a secured environment. You can create a login for both the ActiveVOSIdentityAssertion and the ActiveVOS Provided User. If you select to create ActiveVOS Provided User, you must enter a user name and password. Please note that ActiveVOS Server with MultiSite capabilities requires the ActiveVOS Provided User selection. Complete the following options:

If you do not complete this panel, you must provide the information in the WebSphere Application Server Administration Console.

ActiveVOSIdentityAssertion

(Optional). Name that is displayed in the WebSphere Administration Console for this JAAS user. Uses the WebSphere identity assertion authentication method.

ActiveVOS Provided User

(Optional). Name that is displayed in the WebSphere Administration Console as described by the user name and password below.

Provided Username (for ActiveVOS Provided User)

The actual user name associated with this JAAS user. This must be a valid user defined to the WebSphere application server and the user must have Monitor rights.

Provided Password

The password associated with the user.

After entering the above information, click **Next** to save your values and to continue.

Security Configuration

ActiveVOS Server can be deployed in a secured manner. The Security Configuration panel allows you to configure the security parameters that will be applied to the ActiveVOS Server Console, and deployed BPEL process services. Select the security options you want to enable.

After completing configuration, you must assign security roles to users and groups. You can find details on configuring security in the *Process Server Guide*.

If you have a license for the multi-tenant feature, you must enable security.

After entering this information, click **Next** to save your values and to continue.

Administrative Functions

These functions add security parameters to the ActiveVOS Consoles and services by setting the following roles:

abAdmin

Users associated with this role have full administrative rights to ActiveVOS Server.

abBusinessManager

Users associated with this role have access to process instance details (but cannot operate on them). They can monitor active processes and tasks, and work queues. They have a read-only view of process instance details.

abDeployer

Users associated with this role have rights restricted to deploying business process archive files to ActiveVOS Server.

abDeveloper

Users associated with this role have rights restricted to service artifacts, endpoint information, and sample messages for the services they consume and expose (that is, processes) after they are deployed. Developers need the ability to deploy process deployment archives, initiate process execution and analyze them. Developers also need to configure global function contexts for custom functions, URN mappings, and the ability to schedule process execution. Specifically, this user has access to the Active Process list, the Process Instance View, the Active Task and Work Queues lists, the Server Log, the Dashboard and all reports, and the catalog's content.

abOperator

Users associated with this role have rights restricted to operating the system. These include observing the functionality of processes, managing process instances using the process instance detail view, running reports, logging, viewing exceptions, acquiring information on service operations, adding and removing tenants, and managing the scheduled database delete schedule.

abTaskClient

Required. You must configure permission to access ActiveVOS Central for all users. In addition, users who interact with the Human Task (WS-HT) API must have this role.

ActiveVOS Central presents a login page to users.

Process Services

The process services adds security parameters to the Web Services handler for all deployed BPEL services with a role. The services listed at `http://[host]:[port]/active-bpel/services` are secured. The process services (roles) are:

abRestrictedServiceConsumer

Users associated with this role cannot access a service unless it is deployed with allowed roles specified in the `pdd` and the user belongs to at least of these roles. If no roles are specified in the `pdd`, access to services with no roles specified in the `pdd` are also denied. Users in this role can view the `wsdl` files for other services like **abServiceConsumer**; however, they are blocked at runtime.

abServiceConsumer

Users associated with this role have rights restricted to start process instances of deployed processes, including from ActiveVOS Central, the Eclipse Web Tools Project, or other client application,such as SOAPUI.

abTenantAdmin

(For a Multi-Tenant licensed server only.) Users associated with this role have rights to deploy and manage contributions into a configured tenant on the server.

Based on a Tenant Definition configured by the ActiveVOS Server administrator (with the abAdmin role), a tenant administrator user can log into the tenant context on the server. A service consumer user can create process instances for processes deployed to the tenant context.

Identity Service Consumer

The identity service consumer adds security parameters to the Web Services handler for Process Identity service used by the ActiveVOS Central application using the following roles:

abIdentityListConsumer

Only users associated with this role or **abAdmin** have rights to submit Web Service requests to the identity service from Process Developer.

Work Manager Configuration

Configure your application server work manager by completing the following options:

Number of Alarm Threads

(Optional). The maximum number of threads to use for processing alarms. A single thread is used to monitor pending alarms and dispatch them. An additional pool of threads is used for dispatching the threads. The default is 10.

Thread Priority

(Optional). The order of the priority for threads available in the thread pool. The default is 10.

Minimum Threads

(Optional). The minimum number of threads that are available for performing process work. The default is 25.

Maximum Threads

(Optional). The maximum number of threads that are available for performing process work. The default is 150. The maximum number of threads can be exceeded temporarily if the **Growable** option is true. These additional threads are discarded when the work on the thread completes.

Growable

(Optional). Indicates whether or not the number of threads available should be allowed to increase temporarily.

Note: If the number of threads being run is equal to this value, processes can fault as no threads are available when a node needs to broadcast information to other nodes. To be safe, you must create a secondary pool to be used by ActiveVOS Server. (This is done in the app server's console. ActiveVOS Server will only use threads in the pool when critical system work must be performed.

After entering this information, click **Next** to save your values and to continue.

Timer Manager Configuration

A timer manager allows ActiveVOS Server to schedule future timer notifications and receive timer notifications. Specify the minimum threads for the pool.

Minimum Threads

(Required). The minimum number of threads to use for timers. The default is 50.

After entering the above information, click **Next** to save your values and to continue.

ActiveVOS Central Configuration

The ActiveVOS Central Communications Configuration panel allows setting of the connection information to be used when ActiveVOS Central communicates with the ActiveVOS Server. This panel allows the configuration of the following parameters:

Parameter	Default Value	Description
Session Timeout	30 seconds	The session timeout sets the duration that an inactive session will remain connected to the ActiveVOS Central database.
ActiveVOS Central `AeTaskService` URL	`http:// [hostname.domainname]: [port]/active-bpel/ services/AeB4PTaskClient- taskOperations`	(Required) ActiveVOS Server can run on the same or a different server than the ActiveVOS Central. Modify this URL to specify the host and port where ActiveVOS Server runs. Modify the protocol, to add security, if needed. The URL displayed is the default URL of the Web service that ActiveVOS Central needs to call ActiveVOS Server.

After entering this information, click **Next** to save your values and to continue.

Deployment Options

The Deployment Options panel allows the selection of deployment items. The check boxes on this panel are as follows:

Install database schema (New Installation Only)

This option controls whether or not the configuration wizard will install the Process database schema to your database.

Note: This option requires that the user information and database name entered in the *Database Configuration Panel* have already been created. Additionally, this option must not be selected by users wishing to update from a previous database version. For upgrade instructions, please see the *Configuration Wizard* document.

Install database schema

This option controls whether or not the configuration utility installs the ActiveVOS database schema to your database. Selecting this option will present a Database Configuration panel on the next wizard page.

Note: Do not select this option if you are updating from a previous database version. For upgrade instructions, please see the *Configuration* section of your documentation.

Install database descriptor (For Tomcat and JBoss Only)

Checking this option installs the application server specific database descriptor file to your application server. Selecting this option eliminates the need to create the descriptor file through application server management consoles.

Install Application Resources (For WebSphere Only)

Checking this option installs the ActiveVOS Server resources to your application server, including settings for work manager, timer manager, JAAS login, and database resource.

Deploy ActiveVOS

Checking this option installs the ActiveVOS Server to your application server.

Note: If you plan to enable clustering, you must re-run this configuration utility and, on the last page, select a different directory for deployment.

Include Process Console

Selecting this option installs Process Console on your application server. Process Console is an optional component that you can choose to install.

Note: If you select the **Include Process Console** option, you must also select the **Deploy ActiveVOS** option.

Deploy ActiveVOS Central

Checking this option installs ActiveVOS Central to your application server.

If you want to install ActiveVOS Central to a different server, re-run the `config-deploy` utility on that server.

After entering this information, click **Next** to save your values and to continue.

Database Configuration

Note: It is highly recommended that these panels only be used for development servers. Refer to your application server user guide and your database administrators guide for configuring data sources for production installations.

The panels that follow provide the ability to configure a data source file. The information that is entered here is only a subset of the options that can be configured for a data source. Ensure that you have completed the configuration of a JNDI data source prior to completing this step. For details, see *Configuration*.

Setting	Default Value	Description
Driver class	None	(Required.) The name of your JDBC driver's implementation of `java.sql.driver`. Some driver examples are shown here: - **MySQL**: `com.mysql.jdbc.Driver` - **MS SQL SERVER**: `com.microsoft.sqlserver.jdbc.SQLServerDriver` - **ORACLE**: `oracle.jdbc.OracleDriver` - **DB2**: `com.ibm.db2.jcc.DB2Driver`
Driver url	None	(Required.) Used to connect to your database. Typical URLS are shown here; however, refer to your database and JDBC driver documentation for further information. - **MySQL**: `jdbc:mysql://[host]:[port]/[database_name]?useUnicode=true&characterEncoding=UTF-8&characterSetResults=utf8` (Default port is 3306) UTF-8 encoding is required. - **MS SQL SERVER**: `jdbc:sqlserver://[host]:[port];databaseName=[database_name]` (Default port is 1433) UTF-8 encoding is highly recommended. - **Oracle**: `jdbc:oracle:thin:@//[host]:[port]/[database_name]` (Default port is 1521) UTF-8 encoding is highly recommended. - **DB2**: `jdbc:db2://[host]:[port]/[database_name]` DB2 = (Default port is 50000) UTF-8 encoding is highly recommended. **Example**: `jdbc:mysql://localhost:3306/ActiveVOS?useUnicode=true&characterEncoding=UTF-8&characterSetResults=utf8`

Setting	Default Value	Description
Database name	ActiveVOS	(Required.) The name of your database. It must match the `database_name` provided in the Driver URL.
Driver jar	None	Driver `.jar` file must be selected using the **Select File** button to the right of this field. Select your driver file so that is can be copied to the correct location. Some driver file examples are shown here, but we strongly recommend you check the Prerequisites details before making your selection. - **MySQL**: `mysql-connector-java-5.0.7-bin.jar` - **MS SQL SERVER**: `sqljdbc.jar` - **Oracle**: `ojdbc14.jar` - **DB2**: `db2jcc.jar` and `db2jcc_license_cu.jar`
Username	bpeluser	(Required by default.) The name associated with the privileges to access your database. Unless you modified this name, it is described in the DDL schema.
Password	bpel	(Required by default.) The password of the above user name. Unless you modified this name, it is described in the DDL schema.
For Tomcat and JBoss: Connection Timeout	1000	The maximum time to wait in milliseconds for a database connection to become available.
For Tomcat and JBoss: Minimum Connections	10	The maximum number of idle connections in the database pool.
For Tomcat and JBoss: Maximum Connections	100	The maximum number of connections in the database pool.
Validate Connection	Checked	Checking this entry will cause the configuration wizard to attempt to connect to your database with the supplied information.

Validate Connection. After you enter all required database connection information and click **Next**, the utility checks that your driver jar and URL are valid, and that the database name matches the name in the URL. The utility does not check the username and password of the database. If the server cannot make a connection because these are in error, you can re-run the configure-deploy utility and enter new names. All other values are preserved.

After entering this information, click **Next** to save your values and to continue.

Deployment Targets

Provide communication and other details for the deployment targets.

Target Information	Description
Application Server Home	Select the root folder of your application server. For example `C:\Program Files\IBM\WebSphere\AppServe`.
WebSphere Host	Name of the server where WebSphere is installed. The default is localhost.
WebSphere Port	Port number used by WebSphere to perform administrative tasks. The default is 8879.
Username	A user name that has administrative rights to your application server.
Password	Password for the user name.
Deployment Target Type	A deployment target is the server (single application server) or cluster (cluster of application servers) to which you deploy ActiveVOS Server. Identify the type of your deployment target. Select the default WebSphere server or ensure that another server or cluster is already configured.
Deployment Targets	A deployment target is the server or cluster to which you deploy ActiveVOS. Identify the name of your server or cluster. To do so, on the WebSphere Administrative Console, review your deployment targets on **Servers > Server Types > WebSphere application servers** or **Servers > Clusters > WebSphere application server clusters**.

After entering this information, click **Next** to save your values and to continue.

CHAPTER 4

JBoss

This chapter includes the following topics:

General Information

The Process Server Setup Wizard lets you install a new server or update an existing one.

1. Download and obtain a license for Process Server.

2. Download and run the Process Server installation.

3. To configure and deploy a server, open `quickstart_server.html`, which directs you to the file you are reading now.

4. Review the Prerequisites and Release Notes for Process Server by selecting the links in the navigation bar on the right.

Note: If the Setup Wizard detects an existing installation, it lets you either update the existing installation or install the server in a different directory. When you update an existing installation, the Wizard replaces any file that a previous Wizard had installed. All other files in your server's install directory remain as they were.

Quick Start

Preconfiguration

1. Create a database (or *tablespace*) for Process Server. Select the **Configuration** link in the navigation bar for details.

2. Process Server needs to be granted the following permissions on your schema:
   `GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES, INDEX, ALTER, CREATE TEMPORARY TABLES, LOCK TABLES, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROUTINE, ALTER ROUTINE`

   If Process Server does not have the permissions it needs, you will see an error message that begins as follows: `Failed to get version info from the AeMetaInfo table`.

3. Collect the following information that you will be prompted for during configuration:

   - Host, port number, and database name where you are deploying Process Server

   - The full path to a supported JDBC database driver

- Driver implementation class name

- Database username and password
  Hints and examples of this information are provided in the appropriate page of the Configuration utility's online Help.

4. For an upgrade installation of Process Server, manually install the database schema. For a new installation, you can automatically install the database schema during configuration.

5. Ensure that the `JAVA_HOME` environment variable is set.
   Note for Tomcat and JBoss: To avoid issues with multiple JDKs, we recommend that you set `JAVA_HOME` in the application server startup file instead of in the system environment.

6. Ensure that your JVM memory settings in your application server match the recommendations described in .

7. **MultiSite Installations Only:** To configure MultiSite clustering, be sure to review the instructions in **Process Server MultiSite Configuration**. Access the instructions from the **Configuration** link in the navigation bar on the right.

8. **Unix Platform Only:** After installing any version of the Process Server on any UNIX OS, you may receive an error when starting the server such as `cannot write to temp location [/temp]`. This is due to an OS restriction on the number of files that can be created. To avoid this error, before installing the server edit your UNIX security configuration file directly to allow a larger number of files to be opened. In UNIX the parameter NOFILE sets the maximum number of files that can be opened by a single process. For example, in the file `/etc/security/limits.conf` you could add the line `- nofile 10240` to raise the limit from the default 1024 value. 10240 should be large enough. If you are unsure, setting "unlimited" can be considered.

Configuration and Deployment

1. In your `ActiveVOS` installation folder, locate the `[server]-config>bin` folder, and select the `config-deploy` utility.

2. Complete the configuration and deployment. Use the online Help as needed.

3. Use your server container's documentation for help in starting the Process Server.

Note: When you are deploying Process Server to a Tomcat server, `activebpel-cert.war` is not deployed. You must copy it from `{installation_directory}\server-enterprise\tomcat_config\webapps` to `{Tomcat_Home}\webapps` directory when deploying an SSO configuration

Add Your License

1. You will need access to your Process Server license.

2. Open the Process Console in a browser:
   `http://[host]:[port]/activevos`

3. Add your license on the License page. Select the Admin menu item of the Process Console and then select License. Select **Add** and copy and paste all of the Process Server license into the dialog. Then select the Server Status navigation menu item and select **Start Server** to start the Process Server.

Prerequisites

Process Server relies on a valid license and third party software components. Ensure that your application server environment meets the requirements before beginning the configuration procedure.

Process Server Licensing

A valid license is required to run Process Server. You enter the license information after you've configured Process Server. Do this as follows:

1. Start Process Console.

2. Select **Admin | License**. (**Admin** is in the toolbar; **License** is about a third of the way down on the left.)

3. Press the **Add License** button, copy and paste all of the Process Server license into the dialog, and then press the **Add License** button.

4. Select the Server Status link near the ver top of the left area press the **Start Server** button to start the Process Server

Obtaining a License Key

If you did not receive your license prior to receiving the software, contact the Informatica sales department.

Our sales support staff can assist you with licensing questions.

Hardware Requirements

Application Server Hardware

Process Server runs within different server containers, and the hardware requirements of the server are superseded by the requirements of the container.

Database Hardware

Process Server application supports multiple database servers and has no additional requirements besides those of your selected database server.

Note: For maximum performance, we recommend that you run Process Server and its database schema on separate servers.

JVM Memory Requirements

We strongly recommend that you run your application server with at least the following memory settings:

```
-Xms256m -Xmx1024m -XX:MaxPermSize=384m
```

where Xms is starting memory, Xmx is maximum memory, and $MaxPermSize$ is the amount of memory set aside for loading class files.

Disk Space Requirements

At least 1 GB of disk space is required to install the Process Server application.

Note: Considerably more disk space is required to run your applications. The amount is dependent on several factors including logging levels you select, number of processes you run, and size of processes.

Software Requirements

Specific versions of Eclipse, client and server operating systems, application and database servers are supported. Support means that Informatica will assist customers with the installation and operation of Business Process Manager products on these 3rd party product versions.

Also certified are specific combinations of 3rd party products. Use of Certified Systems described here will reduce the risk of problems as a result of extensive testing of Business Process Manager with these specific versions. Database connectivity is required for Process Server persistence and version control of deployed processes. It is recommended that the database resides on a dedicated server.

The following software is supported for use with Process Server:

Operating Systems

- Microsoft Windows 2003/2008 Server
- Linux operating system versions that support the JVM, application and selected database servers supported by Informatica for use by Process Server.
- Solaris 10 (x86/Sparc)
- HP-UX 11i v3 (on Itanium processor)
- AIX 5.3 and 6.1
- Mac OS 10.6 64-bit or higher

Web Browser

- Any browser. A browser is required to view the Release Notes and run the Process Server consoles. Review the `activevos.com` certified system support page for details.
- There are specific requirements for Screenflow execution in the Screenflow product.

Application Servers

- Apache Tomcat 7.x
- JBoss AS
- Oracle WebLogic 12.1.1
- IBM WebSphere Server 8.5

Note: Other releases of these servers should work. However, they have not been tested.

JAVA Environment

If you are running a Linux distribution and you are using the US ASCII codeset, you will need to add the following startup parameter to your JVM:

```
-Dfile.encoding=UTF-8 encoding
```

Application Server	JVM	Comment
Tomcat	Sun JDK	To avoid issues with multiple JDKs, we recommend that you set JAVA_HOME in the application server startup file instead of in the system environment.
JBoss	Sun JDK	To avoid issues with multiple JDKs, we recommend that you set JAVA_HOME in the application server startup file instead of in the system environment.
WebLogic	Sun JDK	
WebSphere	IBM J9 VM build 2.4, J2RE 1.6.0	

Setting JAVA_OPTS for DOM Processing

If you are using a Java server and the DOM being produced is incorrect, you should add the following definitions to the definition of JAVA_OPTS in your server startup script

```
set JAVA_OPTS=%JAVA_OPTS%
    -
Dorg.apache.xerces.xni.parser.XMLParserConfiguration=org.apache.xerces.parsers.XIncludePa
rserConfiguration
    -
Djavax.xml.transform.TransformerFactory=org.apache.xalan.processor.TransformerFactoryImpl
```

Note: If this is not set, the classloader must search through the classpath to locate the appropriate class. Depending on the size of the classpath, this operation can degrade performance.

Database Servers

Process Server uses standard database servers as the persistent storage mechanism. You must have access to one of the supported database servers with the proper privileges to create databases and tables as well as privileges to update, insert and delete into those tables.

Supported Databases

- MySQL 5.5
- MySQL 5.1.x (For more information, see the *MySQL Configuration Note* below.)
- Microsoft SQL Server 2005, 2008, 2008 R2, 2012
- Oracle Database 10g, 11g
- IBM DB2 9.7

Certified JDBC Database Drivers

A JDBC database driver is required. For certain configurations, you will be asked to provide the location of driver during configuration. For other configurations, you will be instructed to use your application server administration console to configure the database.

Note: For a clustered environment, you must install the driver to each node in the cluster.

Database Server	JDBC Driver
MySQL	`mysql-connector-java-5.1.6-bin.jar`
Microsoft SQL Server	`sqljdbc.jar (1.2)`, `sqljdbc4.jar`. JBoss 7.x requires sqljdbc4.jar
Oracle	`ojdbc6.jar`
DB2 9.7	`db2jcc_license_cu.jar`, `db2jcc.jar`.JBoss 7.x requires db2jcc4.jar

Process Server

Process Server supports 64-bit Java Virtual Machines (JVM) for the Windows and Linux systems listed above. When installing Process Server on a 64-bit server, the 64-bit JVM supported for a given application server is required.

Process Developer

Process Developer embeds Eclipse 3.7.2 and a 32-bit version of JRE 7 for Windows systems allowing it to run on both 32-bit and 64-bit Windows operating systems and hardware environments. The Linux distribution of Process Developer does not embed the required 32-bit version of JRE 7. Users must install JRE 7 separately. Users wishing to use a 64-bit version of Eclipse must download the 64-bit version of Eclipse for RCP and RAP Developers, and then use the Process Developer Plugin installation.

Before You Configure and Deploy Process Server

Third party software components are required to be installed prior to configuring and deploying Process Server.

Application Server must be Installed

An application server provides Process Server a framework within which to run. Install the appropriate supported server container according to software vendor's documentation on each machine intended to run Process Server.

Note: Set up clustering according to your software vendor's documentation. Once clustering is set up on the application server, follow our documentation for configuring clustering.

Database Server must be Installed

Process Server requires only one database server per any number of application servers running in a cluster.

All databases require a user with administrative rights to the computer in order to install them. Process Server also requires a connection to your database server. This user needs the proper privileges to connect to the Process Server database, update, insert and delete records within that database.

MySQL Configuration Note

A BPEL process can send and receive variables with attachments such as images or documents. Attachments may be large or numerous, causing database connection errors.

To avoid connection errors to MySQL Server, you may need to configure MySQL with more allocated memory than the default of 1MB.

To configure MySQL:

1. Open MySQL Administrator. (If unavailable, see the note below.)

2. Select Startup Variables.

3. Select Advanced Networking.

4. In the Data/Memory Size panel, enable Max Packet Size.

5. Set the packet size higher than the default of 1MB. The size depends on the attachment sizes you expect.

6. Apply changes.

Note: If MySQL Administrator is not available, refer to the MySQL documentation regarding how to set the `max_allowed_packet` setting for your environment.

About the Process Server Database Schema

Process Server provides database schema definition files for all supported databases. Before you start the configuration and deploy utility, refer to Configuration topic in this help for specific recommendations on how to install the schema for your database.

Installation Folders

Download and extract the installation folders as described in <u>"Quick Start" on page 7</u>. The following describes the contents of the Process Server installation:

`{install_dir}/server-enterprise`

> `quickstart_server.html`. Open this file for quick start and complete details for configuration and deployment.

`{install_dir}/server-enterprise/jboss_config/bin`

> Configuration and deployment tool

`{install_dir}/server-enterprise/jboss_config/ddls`

> Database schema to be installed automatically (recommended) or manually, as described in
> ***Configuration***

`{install_dir}/server-enterprise/jboss_config/deploy`

> Files to be installed automatically by the configuration and deploy utility.

```
{install_dir}/server-enterprise/jboss_config/doc/html/config
```

Copies of the Configuration utility's online help files. These files are accessible from the Help button within the utility.

Process Server and Resource Configuration

This topic leads you through configuration of the resources required for Process Server. You must configure your database, JBoss Server and Process Server before deploying and running Process Server. The sections below provide information for completing the configuration.

Configuration Instructions

Note: You will need to manually alter the `install.properties` file in you are using JBoss AS 7 (EAP 6) and up. for information, see #unique_9/
unique_9_Connect_42_SECTION_A964A43C83E543B8B266BBBF4065D9C0.

Before running the Configuration utility, perform the following pre-configuration steps:

- Create a database (or tablespace) where Process Server persistence information will be stored
- Create a default user with administrative rights to the computer and database for use by Process Server
- Note both the database name and port number, which you will be asked for during configuration.
- Process Server requires a JDBC driver to connect to your database. During configuration, you will be prompted for:

    - The full path to a supported JDBC database driver

    - The driver implementation class name

    Note that the Microsoft SQL Server 2005 JDBC Driver 1.2 driver, or the JDTS-1.2.jar drivers are supported. Version 1.1 of the Microsoft SQL Server will not function as it does not include all required functionality. JBoss 7.x requires sqljdbc4.jar. For DB2, JBoss 7.x requires db2jcc4.jar.

First Time or New Install

If you are performing a clean installation, that is, a first-time install or a new database, you can use the Configuration utility to automatically install the database schema.

Manual Install or Update of Database Schema

It is strongly recommended that you automatically install the database schema; however, you can manually install it. Customers migrating from an earlier version should follow the instructions below.

Migrating from ActiveVOS to Process Developer

If you are migrating from ActiveVOS, perform the following steps:

- Manually update the Process Server database schema using the DDL patches provided in `{install_dir}/
server/tomcat_config/ddls/updates`
- Run the *Configuration utility*
- Review the Release Notes for late breaking migration information
- Review the Process Developer help topic, Migrating from Earlier Versions

Process Server can be configured to use an RDBMS database.

Relational Database Schemas

These instructions are generalized to make sure they can be followed for each database. When creating the database schema for Process Server, you can either create a new database definition or upgrade an existing definition.

- Refer to the install a new database schema section for a new installation.
- Refer to upgrade a database schema when performing a version upgrade.

Install a new database schema

1. Identify your DDL. Use the information provided in the table below to locate the correct DDL file.

Database Server	DDL File Name and Location	Notes
MYSQL	`{install_dir}/server/ tomcat_config/ddls/ ActiveBPEL_Enterprise-MYSQL.SQL`	The default database name, ActiveVOS is defined within the DDL file. If you edit this name, ensure that you do not replace ActiveVOS Enterprise, a name that is inserted into the `AeMetaInfo` table.
MS SQL SERVER	`{install_dir}/server / tomcat_config/ddls/ ActiveBPEL_Enterprise-MYSQL.SQL`	The default database name, ActiveVOS is defined within the DDL file. If you edit this name, ensure that you do not replace ActiveVOS Enterprise, a name that is inserted into the `AeMetaInfo` table.
ORACLE	`{install_dir}/server/ tomcat_config/ddls/ ActiveBPEL_Enterprise- ORACLE.SQL`	Create a tablespace prior to running the DDL.
DB2	`{install_dir}/server/ tomcat_config/ddls/ ActiveBPEL_Enterprise- DB2.SQL`	

2. Copy the DDL file from above, and rename it.
   Note: The original files must remain unchanged for the Configuration utility to work properly

3. (Optional) Modify the database name. Be sure to see the notes above.

4. Execute the DDL script.

5. Permissions must be set for Process Server to access your schema. For example, `GRANT SELECT, INSERT, UPDATE, DELETE, CREATE, DROP, REFERENCES, INDEX, ALTER, CREATE TEMPORARY TABLES, LOCK TABLES, EXECUTE, CREATE VIEW, SHOW VIEW, CREATE ROUTINE, ALTER ROUTINE`
   If Process Server does not have the permissions it needs, you will see an error message that begins as follows: `Failed to get version info from the AeMetaInfo table.`

Each database server provides its own mechanism or utility for executing a DDL script file. Execute the DDL script file using the appropriate utility. For example, if you are using Oracle, the utility to execute the DDL script file would be SQL Plus.

Upgrade an existing database schema

To upgrade your existing Process Server database to be compatible with the new version of software, follow the instructions below:

1. Shutdown Process Server before executing a database upgrade.

2. Make a backup copy of your database.

3. Identify your current running version of Process Server. Database upgrades are provided to upgrade from one version back at a time. This means that more than one upgrade script may need to be applied to

your database. For example, if you are running ActiveVOS version 8.0.x, you must go to the **updates** folder, and apply all patch scripts with higher numbers, starting with `[database name]-Patch-9.0.sql`. Be sure to run the patch scripts in *ascending* order. Do not run any upgrade script with a version number equal to or less than your current running version.

4. For each upgrade that needs to be applied perform the following:

   a. Identify your DDL. Use the information provided in the table below to locate the correct DDL file. Note: The updates must be applied in ascending order.
   MYSQL

   JBoss: {install_dir}/server/jboss_config/ddls/updates/enterprise/ActiveBPEL_Enterprise-MYSQL-PATCH-{patch number}.SQL

   MS SQL SERVER

   JBoss: {install_dir}/server/jboss_config/ddls/updates/enterprise/ActiveBPEL_Enterprise-SQLSERVER-PATCH-{patch number}.SQL

   ORACLE

   JBoss: {install_dir}/server/jboss_config/ddls/updates/enterprise/ActiveBPEL_Enterprise-ORACLE-PATCH-{patch number}.SQL

   DB2

   JBoss: {install_dir}/server/jboss_config/ddls/updates/enterprise/ActiveBPEL_Enterprise-DB2-PATCH-{patch number}.SQL

   b. Execute the DDL script.
   Each database server provides its own mechanism or utility for executing a DDL script file. Execute the DDL upgrade script file using the appropriate utility. For example, if you are using Oracle, the utility to execute the DDL script file would be SQL Plus.

Deploying Process Server to a JBoss Domain Using the jboss-cli Utility

You can now deploy Process Server using the JBoss domain deployment features if you are using JBoss AS 7 (EAP 6) and up. Using this features requires that you manually edit the `install.properties` file, which is located within the `jboss_config` subdirectory of your Process Server installation.

- **domain.deploymen**t: Set to `true` to use domain deployment.

- **domain.username**: The username needed to connect to the JBoss instance.

- **domain.password**: The password associated with `domain.username`.

- **domain.host**: The JBoss host to which you are deploying Process server when you are deploying to a remote JBoss instance.

- **domain.server.groups**: Either a comma-separated list of server groups to which you are deploying or a single server group.

- **domain.profile**: (Optional) Add this setting if using the `config_deploy` utility to setup a datasource and driver. If you are manually setting up your system, you do not need this setting.

When you are deploying to a domain, the `config_deploy` utility calls `jboss-cli`, which will:

- Add the driver and data source, first undeploying any existing instances. The utility uses custom names `com.activevos` for the driver and `ActiveVOS_Pool` for the driver and datasource so no other datasources are altered.

- Undeploy `ave_jboss.ear` if it exists on the system, and then deploy it to the specified server groups.

- Undeploy `activevos-central.war` if it exists, and then deploy it to the specified server groups.

The scripts used with `jboss-cli` are saved in the `config_deploy` deploy directory so that, if necessary, you can reuse them.

When running Process Server unsecured on JBoss 7/EAP6, a security domain is still required and one is set up for you. However, this domain is not automatically created when you are deploying JBoss as described in this section and you will have to create it. While what you create will be unique to your environment, it will take the following form:

```
<security-domain name="ActiveVOS">
   <authentication>
      <login-module code="org.jboss.security.auth.spi.IdentityLoginModule"
flag="required">
         <module-option name="principal" value="aeadmin"/>
         <module-option name="roles" value="abAdmin,abTaskClient"/>
      </login-module>
   </authentication>
</security-domain>
```

Multisite Configuration

For details, see **Process Server MultiSite Configuration**.

JBoss Application Server Requirements and Considerations

Installation of the JDBC Driver

Process Server requires that you provide a JDBC driver to connect to your database. You must install the database driver into each server in the cluster, if you are making server clustering available. Refer to your application server's user guide for information on installing the appropriate JDBC driver

Note: The Microsoft SQL Server 2005 JDBC Driver 1.2 driver, or the `JDTS-1.2.jar` drivers are supported. Version 1.1 of the Microsoft SQL Server will not function as it does not include all required functionality. For DB2, JBoss 7.x requires `db2jcc4.jar`.

High Availability and Clustering

The *default* JBoss server configuration is not configured for high availability or clustering. The standalone server that is provided with JBoss has `standalone-ha.xml` and `standalone-full-ha.xml` configuration files that enables these features.

Configuring Security

You can find details on configuring security roles in Process Develoepr Help or in the Infocenter

Configuration for Headless Mode

Process Server relies on GUI components from the Java's SWT package, such as Fonts. If you are running on a headless server (that is, the server does not have a graphic subsystem), you may see one of the following errors in the stack trace:

- java.lang.NoClassDefFoundError: sun/awt/X11GraphicsEnvironment
- Can't connect to X11 window server using ':0.0' as the value of the DISPLAY variable
- org.eclipse.birt.report.service.api.ReportServiceException

Use one of the following techniques to correct errors:

- Configure the JVM system property `java.awt.headless=true` and at the command line, start the JVM with the argument: `-Djava.awt.headless=true`
- Run a X-windows virtual frame buffer (Xvfb)

Using the Configuration Utility

The Configuration utility walks through the steps required to provide the property values for Process Server and selected resources.

Note: Before running the utility, ensure that your server container is stopped.

Starting the Configuration Utility

Execute one of the following utilities based on your operating system:
Windows

    {install_dir}/server/tomcat_config/bin/config_deploy.bat

Linux

    {install_dir}/server/tomcat_config/bin/config_deploy.sh

If You Have Manually Installed or Updated the Database Schema

If you have manually installed or updated the database schema, when prompted, you must not select the "Install Database Schema" checkbox.

Running the Configuration Utility in Different Modes

The Configuration utility can be run with a graphical interface (default), in console mode or silently. When you run the utility your configuration options are automatically written to the `install.properties` file and they will be used as the defaults the next time the application is configured. One of the following parameters is accepted by the Configuration utility:

Help: `help`

> This option displays the usage for console and silent modes.

Console mode: `console`

> Runs the Configuration utility in text mode within a command window.

Silent mode: `silent`

> Silent mode: `silent`. Runs in the background requiring no user interaction. This option requires that you have already run the Configuration utility in default mode, which sets configuration options in the `install.properties` file.

An example of running the Configuration utility from the command line is `config_deploy help`

Configuration Help

The Configuration utility contains online help for each panel of the utility. Access Help by clicking the **Help** button in each panel. Additionally you can access the help from `{install_dir}/server/ tomcat_config/doc/html/config`.

Installation Checklist

This section provides a list of most of the items that you should either have completed or information noted prior to attempting to install Process Server.

Hardware

- Server hardware must meet the requirements listed for each third-party application, including server container, database server and Java environment.

Software

- A user account with administrative rights to install or manage all required software including the application and database servers and the Process Server.

- A supported database server installed and accessible.

- The supported Server container installed on each machine intended to host Process Server.

- JVM Memory arguments have been added to your environment variable: `-Xms256m -Xmx1024m -XX:MaxPermSize=384m`. (See .)

- Process Server must be configured for WS-Security. (See Configuring Process Server for WS-Security.)

- In your Identity Service (JDBC, LDAP, or XML), add the `abTaskClient` role to each Process Central user. This security role, described in the `web.xml` file, is required for access to Process Central.
- On the URN Mappings page of the Process Console, update the host and port for Process Central to match your installation, if needed. The default address is `http://localhost:8080/activevos-central/avc`.

License Information

- Valid license keys for the total number of sockets intended to host Process Server.

Database Information

- Permissions must be set for Process Server to access your schema. For example, `GRANT SELECT`, `INSERT`, `UPDATE`, `DELETE`, `CREATE`, `DROP`, `REFERENCES`, `INDEX`, `ALTER`, `CREATE TEMPORARY TABLES`, `LOCK TABLES`, `EXECUTE`, `CREATE VIEW`, `SHOW VIEW`, `CREATE ROUTINE`, and `ALTER ROUTINE`.
- For WebLogic and WebSphere, configuration of a JNDI data source.
- The URL to use to connect to the Process Server database.
- The database user name and password to be used by Process Server to connect to the database.
- If you are using an Oracle database, the Process Server tablespace created.
- For RDBMS, if you are not using the database driver and information supplied with the Application Server you must also have the following two:
  - A JDBC database driver that provides the required functionality.
  - The class name of the JDBC database driver.

Server Container Information

- The installation location of your Server containers.

Glossary

API

Application Program Interface, a set of routines, protocols, and tools for building software applications.

Application Server

Also called an appserver. A program that handles all application operations between users and an organization's backend business applications or databases. Application servers are typically used for complex transaction-based applications. To support high-end needs, an application server has to have built-in redundancy, monitors for high-availability, high-performance distributed application services and support for complex database access.

DDL

Data Definition Language is used to specify a database scheme as a set of definitions expressed in a DDL script. The basic idea is to hide implementation details of the database schemes from the users.

EAR

J2EE modules that comprise an application are assembled into a single application Enterprise Archive (EAR) file.

J2EE

Java 2 Platform Enterprise Edition, a platform-independent, Java-centric environment from Sun for developing, building and deploying Web-based enterprise applications online.

Java

A high-level programming language developed by Sun Microsystems. Java is an object-oriented language similar to C++, but simplified to eliminate language features that cause common programming errors. Java source code files (files with a `.java` extension) are compiled into a format called bytecode (files with a `.class` extension), which can then be executed by a Java interpreter.

JAR

Java Archive, a file format used to bundle all components required by a Java applet. JAR files simplify the downloading of applets since all the components (`.class` files, images, sounds, and the like) can be packaged into a single file. In addition, JAR supports data compression, which further decreases download times.

JNDI

Java Naming and Directory Interface (JNDI). Allows Java-enabled applications to use a unified interface to multiple naming and directory services in the enterprise. Part of the Java Enterprise API set. JNDI works with other J2EE technologies to organize and locate components in a distributed computing environment.

JVM

Java Virtual Machine. An abstract computing machine, or virtual machine, JVM is a platform-independent programming language that converts Java bytecode into machine language and executes it.

URL

Uniform Resource Locator, the global address of documents and other resources on the World Wide Web.

WAR

Java modules that comprise an application are assembled into a single application Web Archive (WAR) file.

Web Server

A Web Server a computer that delivers (serves up) Web pages. Every Web server has an IP address and possibly a domain name. For example, if you enter the URL `http://www.pcwebopedia.com/index.html` in your browser, this sends a request to the server whose domain name is `pcwebopedia.com`. The server then fetches the page named `index.html` and sends it to your browser. That request can also cause complex logic to be executed and manage database access.

XML

Extensible Markup Language, a specification developed by the W3C. XML is a pared-down version of SGML, designed especially for Web documents. It allows designers to create their own customized tags, enabling the definition, transmission, validation, and interpretation of data between applications and between organizations.

Configuration

The topics in the section provide information on pages within the Configuration Wizard.

Configuration and Deployment

Please review the important information in *Prerequisites* and *Installation Checklist* before running ActiveVOS Server configuration.

For Tomcat, WebSphere, and JBoss: This panel allows you to select what operations you would like to perform. Subsequent panels show the details of each option. The selections and the results are described in the table below.

For WebLogic: The configuration wizard collects details for ActiveVOS Server to communicate with a selected database, a work manager, and ActiveVOS Central. It can deploy applications and install the database schema. Select the options you want to execute.

Note: Many of the options presented in the configuration wizard are only used within development servers. The availability of these options on production servers may be limited or unavailable due to security restrictions or other limitations imposed by the administrators of the target server, or by your particular configuration and situation.

Select the options you would like to perform and click **Next** to continue.

Selection	Description
Configure ActiveVOS Server	Allows the setting of the parameters required to start and run the ActiveVOS Server and set the security options for the application.
Configure ActiveVOS Central	When enabled, allows setting of configuration parameters for the ActiveVOS Central application.
For WebSphere: Configure Application Resources	Allows configuration of your work manager4, timer manager, JAAS logins, and database resource.
For Tomcat and JBoss: Configure Database	Configuration of an application server's native data source files or wizards.
For Tomcat, WebSphere, and JBoss: Deploy Applications and Resources	Deployment of ActiveVOS Server and datasource.
For WebLogic: Deploy Applications	Select deployment of ActiveVOS Server and ActiveVOS Central. It also allows you install the database schema. Note that you can run the `config-deploy` tool more than once on separate servers, to deploy ActiveVOS Central to different machines.

Engine Configuration

This panel provides information required for ActiveVOS Server to access your database server. Choices on this panel change the settings in the configuration of the `aeEngineConfig.xml` file, which is contained in the `activevos.war` file.

Field Name	Default Value	Descripton
Database	MySQL	This setting is used internally by ActiveVOS Server to handle communication for the supported database.

Select **Next** to save your value and continue.

JNDI Configuration

The Server JNDI Configuration panel allows configuration of the various files that contain JNDI references.

For Tomcat and JBoss: In general, if you have not preconfigured resources on your application server, it is not necessary to change the default values. If you have already configured resources you must match the field to your corresponding resource.

For WebLogic: You should configure JNDI resources before completing this configuration. Refer to Configuration for guidelines on configuring a JDBC Data Source and a Work Manager.

For Websphere: You should preconfigure a work manager and timer manager on your application server prior to completing this configuration. However, you can configure them later and rerun the configuration. If you have already configured resources, you must match the field to your corresponding resource.

Server	Field Name	Default Value	Description
All	Database JNDI	`jdbc/ActiveVOS`	The ActiveVOS Server Database resource must be assigned a JNDI name for location at run-time. Enter this JNDI name in the text box provided.
WebLogic	Work Manager JNDI	`wm/ActiveVOS` (suggested name)	Name that is used to connect to a WebLogic Work Manager that you have created in the WebLogic Application Server's Process Console. **Note**: If you do not configure a WebLogic Work Manager, ActiveVOS Server ignores this name and instead use its own internal Work Manager. Enter your WebLogic JNDI name if it differs from the suggested name.

Server	Field Name	Default Value	Description
WebSphere	Work Manager JNDI	`wm/ActiveVOS` (suggested name)	Name that is used to connect to a WebSphere Work Manager that you have created in the WebSphere Application Server using the Process Console. **Note**: If you do not specify a Work Manager JNDI name then ActiveVOS will ignore this name and instead use its own internal Work Manager. Enter your WebSphere JNDI name if it differs from the suggested name.
WebSphere	Timer Manager JNDI	`tm/ActiveVOS` (suggested name)	Name that is used to connect to a WebSphere Timer Manager that you have created in the WebSphere Application Server using the Administration Console. Note: If you do not specify a Timer Manager JNDI name then ActiveVOS will ignore this name and instead use its own internal Timer Manager. Enter this JNDI name if it differs from the suggested name.

Select **Next** to save your value and continue.

Security Configuraton

ActiveVOS Server can be deployed in a secured manner. The Security Configuration panel allows you to configure the security parameters that will be applied to the ActiveVOS Server Console, and deployed BPEL process services. Select the security options you want to enable.

After completing configuration, you must assign security roles to users and groups. You can find details on configuring security in the *Process Server Guide*.

If you have a license for the multi-tenant feature, you must enable security.

After entering this information, click **Next** to save your values and to continue.

Administrative Functions

These functions add security parameters to the ActiveVOS Consoles and services by setting the following roles:

abAdmin

Users associated with this role have full administrative rights to ActiveVOS Server.

abBusinessManager

Users associated with this role have access to process instance details (but cannot operate on them). They can monitor active processes and tasks, and work queues. They have a read-only view of process instance details.

abDeployer

Users associated with this role have rights restricted to deploying business process archive files to ActiveVOS Server.

abDeveloper

Users associated with this role have rights restricted to service artifacts, endpoint information, and sample messages for the services they consume and expose (that is, processes) after they are deployed. Developers need the ability to deploy process deployment archives, initiate process execution and analyze them. Developers also need to configure global function contexts for custom functions, URN mappings, and the ability to schedule process execution. Specifically, this user has access to the Active Process list, the Process Instance View, the Active Task and Work Queues lists, the Server Log, the Dashboard and all reports, and the catalog's content.

abOperator

Users associated with this role have rights restricted to operating the system. These include observing the functionality of processes, managing process instances using the process instance detail view, running reports, logging, viewing exceptions, acquiring information on service operations, adding and removing tenants, and managing the scheduled database delete schedule.

abTaskClient

Required. You must configure permission to access ActiveVOS Central for all users. In addition, users who interact with the Human Task (WS-HT) API must have this role.

ActiveVOS Central presents a login page to users.

Process Services

The process services adds security parameters to the Web Services handler for all deployed BPEL services with a role. The services listed at `http://[host]:[port]/active-bpel/services` are secured. The process services (roles) are:

abRestrictedServiceConsumer

Users associated with this role cannot access a service unless it is deployed with allowed roles specified in the `pdd` and the user belongs to at least of these roles. If no roles are specified in the `pdd`, access to services with no roles specified in the `pdd` are also denied. Users in this role can view the `wsdl` files for other services like **abServiceConsumer**; however, they are blocked at runtime.

abServiceConsumer

Users associated with this role have rights restricted to start process instances of deployed processes, including from ActiveVOS Central, the Eclipse Web Tools Project, or other client application,such as SOAPUI.

abTenantAdmin

(For a Multi-Tenant licensed server only.) Users associated with this role have rights to deploy and manage contributions into a configured tenant on the server.

Based on a Tenant Definition configured by the ActiveVOS Server administrator (with the abAdmin role), a tenant administrator user can log into the tenant context on the server. A service consumer user can create process instances for processes deployed to the tenant context.

Identity Service Consumer

The identity service consumer adds security parameters to the Web Services handler for Process Identity service used by the ActiveVOS Central application using the following roles:

abIdentityListConsumer

Only users associated with this role or **abAdmin** have rights to submit Web Service requests to the identity service from Process Developer.

Security Domain

JBoss authentication is controlled by the security domain that ActiveVOS is linked to. You can use the suggested JNDI name for the security domain (ActiveVOS) or enter another name. You must remember this name to configure the corresponding application policy in the `conf/login-config.xml` file.

ActiveVOS Central Configuration

The ActiveVOS Central Communications Configuration panel allows setting of the connection information to be used when ActiveVOS Central communicates with the ActiveVOS Server. This panel allows the configuration of the following parameters:

Parameter	Default Value	Description
Session Timeout	30 seconds	The session timeout sets the duration that an inactive session will remain connected to the ActiveVOS Central database.
ActiveVOS Central `AeTaskService` URL	`http:// [hostname.domainname]: [port]/active-bpel/ services/AeB4PTaskClient- taskOperations`	(Required) ActiveVOS Server can run on the same or a different server than the ActiveVOS Central. Modify this URL to specify the host and port where ActiveVOS Server runs. Modify the protocol, to add security, if needed. The URL displayed is the default URL of the Web service that ActiveVOS Central needs to call ActiveVOS Server.

After entering this information, click **Next** to save your values and to continue.

Database Configuration

Note: It is highly recommended that these panels only be used for development servers. Refer to your application server user guide and your database administrators guide for configuring data sources for production installations.

The panels that follow provide the ability to configure a data source file. The information that is entered here is only a subset of the options that can be configured for a data source. Ensure that you have completed the configuration of a JNDI data source prior to completing this step. For details, see *Configuration*.

Setting	Default Value	Description
Driver class	None	(Required.) The name of your JDBC driver's implementation of `java.sql.driver`. Some driver examples are shown here: - **MySQL**: `com.mysql.jdbc.Driver` - **MS SQL SERVER**: `com.microsoft.sqlserver.jdbc.SQLServerDriver` - **ORACLE**: `oracle.jdbc.OracleDriver` - **DB2**: `com.ibm.db2.jcc.DB2Driver`
Driver url	None	(Required.) Used to connect to your database. Typical URLS are shown here; however, refer to your database and JDBC driver documentation for further information. - **MySQL**: `jdbc:mysql://[host]:[port]/[database_name]?useUnicode=true&characterEncoding=UTF-8&characterSetResults=utf8` (Default port is 3306) UTF-8 encoding is required. - **MS SQL SERVER**: `jdbc:sqlserver://[host]:[port];databaseName=[database_name]` (Default port is 1433) UTF-8 encoding is highly recommended. - **Oracle**: `jdbc:oracle:thin:@//[host]:[port]/[database_name]` (Default port is 1521) UTF-8 encoding is highly recommended. - **DB2**: `jdbc:db2://[host]:[port]/[database_name]` DB2 = (Default port is 50000) UTF-8 encoding is highly recommended. **Example**: `jdbc:mysql://localhost:3306/ActiveVOS?useUnicode=true&characterEncoding=UTF-8&characterSetResults=utf8`
Database name	ActiveVOS	(Required.) The name of your database. It must match the `database_name` provided in the Driver URL.
Driver jar	None	Driver `.jar` file must be selected using the **Select File** button to the right of this field. Select your driver file so that is can be copied to the correct location. Some driver file examples are shown here, but we strongly recommend you check the Prerequisites details before making your selection. - **MySQL**: `mysql-connector-java-5.0.7-bin.jar` - **MS SQL SERVER**: `sqljdbc.jar` - **Oracle**: `ojdbc14.jar` - **DB2**: `db2jcc.jar` and `db2jcc_license_cu.jar`
Username	bpeluser	(Required by default.) The name associated with the privileges to access your database. Unless you modified this name, it is described in the DDL schema.
Password	bpel	(Required by default.) The password of the above user name. Unless you modified this name, it is described in the DDL schema.
For Tomcat and JBoss: Connection Timeout	1000	The maximum time to wait in milliseconds for a database connection to become available.
For Tomcat and JBoss: Minimum Connections	10	The maximum number of idle connections in the database pool.

Setting	Default Value	Description
For Tomcat and JBoss: Maximum Connections	100	The maximum number of connections in the database pool.
Validate Connection	Checked	Checking this entry will cause the configuration wizard to attempt to connect to your database with the supplied information.

Validate Connection. After you enter all required database connection information and click **Next**, the utility checks that your driver jar and URL are valid, and that the database name matches the name in the URL. The utility does not check the username and password of the database. If the server cannot make a connection because these are in error, you can re-run the configure-deploy utility and enter new names. All other values are preserved.

After entering this information, click **Next** to save your values and to continue.

Deployment Options

The Deployment Options panel allows the selection of deployment items. The check boxes on this panel are as follows:

Install database schema (New Installation Only)

This option controls whether or not the configuration wizard will install the Process database schema to your database.

Note: This option requires that the user information and database name entered in the *Database Configuration Panel* have already been created. Additionally, this option must not be selected by users wishing to update from a previous database version. For upgrade instructions, please see the *Configuration Wizard* document.

Install database schema

This option controls whether or not the configuration utility installs the ActiveVOS database schema to your database. Selecting this option will present a Database Configuration panel on the next wizard page.

Note: Do not select this option if you are updating from a previous database version. For upgrade instructions, please see the *Configuration* section of your documentation.

Install database descriptor (For Tomcat and JBoss Only)

Checking this option installs the application server specific database descriptor file to your application server. Selecting this option eliminates the need to create the descriptor file through application server management consoles.

Install Application Resources (For WebSphere Only)

Checking this option installs the ActiveVOS Server resources to your application server, including settings for work manager, timer manager, JAAS login, and database resource.

Deploy ActiveVOS

Checking this option installs the ActiveVOS Server to your application server.

Note: If you plan to enable clustering, you must re-run this configuration utility and, on the last page, select a different directory for deployment.

Include Process Console

Selecting this option installs Process Console on your application server. Process Console is an optional component that you can choose to install.

Note: If you select the **Include Process Console** option, you must also select the **Deploy ActiveVOS** option.

Deploy ActiveVOS Central

Checking this option installs ActiveVOS Central to your application server.

If you want to install ActiveVOS Central to a different server, re-run the `config-deploy` utility on that server.

After entering this information, click **Next** to save your values and to continue.

Application Server Path

For each node in a cluster, provide a new Directory for deployment; for example, `jboss\`*`[your server]`*
`\deployments`.

After entering this information, click **Next** to save your values and to continue.