



# BEA AquaLogic Interaction Process™

Implementation Guide  
for AquaLogic  
Interaction Process 1.5

Version 1.5  
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# Welcome to Plumtree Process

Welcome to Plumtree Process, a product which builds upon the Plumtree Portal to allow you to rapidly build and deploy applications which automate business processes within and across enterprises.

The purpose of this guide is to provide an overview of the major components of Plumtree Process, and to provide configuration and deployment details for creating business process applications delivered through the Plumtree Portal.

Plumtree Process is used to create and manage departmental, enterprise, and inter-enterprise business processes. Common examples of these processes include purchase order requisitions, performance reviews, travel authorizations, and work order requests. All businesses have tens or hundreds of processes that can potentially be automated with Plumtree Process. These processes generally involve human participants viewing and entering data through a Web browser and a flow of data through a dynamic sequence of steps encompassing both humans and systems.

This guide contains of the following chapters:

- [Chapter 2, “Overview”](#) – A description of the Process Designer and Process Execution Engine components, an architectural overview of the product, and a list of the available Process documentation and tips to help navigate it.
- [Chapter 3, “Development”](#) – A step by step description of application development with the Process Designer.
- [Chapter 4, “Configuration”](#) – How to configure your database and directory service for a process execution engine, deployed in the context of your Plumtree Portal deployment.
- [Chapter 5, “Deployment”](#) – A description of the deployment of a Process Designer application project.
- [Chapter 6, “Tips and Best Practices”](#) – Useful additional information about Process Execution Engine and Process Designer.

## Naming Conventions

BEA Systems closed its acquisition of Plumtree Software on October 20, 2005. As a result of the acquisition, the Plumtree product suite is now called BEA AquaLogic User Interaction. More specifically, the Plumtree Process (Server) product has been renamed AquaLogic Interaction Process. The 1.5 release of AquaLogic Interaction Process uses Plumtree-specific component names within the product’s user interface and documentation.

## Typographical Conventions

This book uses the following typographical conventions.

*Table 1-1: Typographical Conventions*

Convention	Typeface	Example
<ul style="list-style-type: none"> <li>• File names</li> <li>• Folder names</li> <li>• Screen elements</li> </ul>	<b>bold</b>	<ul style="list-style-type: none"> <li>• Upload <b>Procedures.doc</b> to the portal.</li> <li>• Open the <b>General</b> folder.</li> <li>• To save your changes, click <b>Apply Changes</b>.</li> </ul>
<ul style="list-style-type: none"> <li>• Text you enter</li> </ul>	computer	<ul style="list-style-type: none"> <li>• Type Marketing as the name of your community.</li> </ul>
<ul style="list-style-type: none"> <li>• Variables you enter</li> </ul>	<i>italic computer</i>	Enter the base URL for the Portlet Server. For example, <code>http://my_computer/</code> .
<ul style="list-style-type: none"> <li>• New terms</li> <li>• Emphasis</li> <li>• Plumtree object example names</li> </ul>	<i>italic</i>	<ul style="list-style-type: none"> <li>• <i>Portlets</i> are Web tools, embedded in your portal.</li> <li>• The URI <i>must</i> be a unique number.</li> <li>• The example Knowledge Directory displayed in Figure 5 shows the <i>Human Resources</i> folder.</li> </ul>

## Icons Used in This Book

This book uses the following icons:



**Note:** The Note icon is used to denote tips, best practices, or additional information related to the content in a paragraph.



**Security:** The Security icon is used to denote important information related to security for your Plumtree Portal.



**Important:** The Important icon is used to denote important information (including warnings) related to the content in a paragraph.

## Plumtree Documentation and Resources

This section describes the documentation and resources provided by Plumtree.

*Table 1-2: Plumtree Process Documentation and Resources (Sheet 1 of 2)*


Resource	Description
Administrator Guide	<p>This book is written for administrators. It is a comprehensive guide to the Process Administrator, which is used for deploying processes to the server, assigning roles to users, and configuring the runtime parameters of the server. This guide refers to a variety of deployment configurations. Portal administrators should use this guide as a reference after reading the “Configuration” section of the Implementation Guide.</p> <p>It is available in electronic form (PDF) in the release package and the Plumtree Product Center.</p>
Installation and Upgrade Guide	<p>This book contains installation and upgrade instructions for Process Execution Engine and Process Designer. Process developers and Portal administrators should read this guide before installing Process Execution Engine or Process Designer.</p> <p>It is available in electronic form (PDF) with the product installation package and in the Plumtree Product Center.</p>
Process Designer Tutorial Documentation	<p>This tutorial provides an introduction to the essential concepts of roles, processes, presentations, and components in Process Designer. Process developers should read this tutorial after installing Process Designer.</p> <p>The tutorial is installed with Process Designer.</p>
Additional Documentation	<p>This .zip file contains several guides that provide additional information on topics such as system administration, standalone engine tuning, engine failover, and Java component design. The additional documentation also includes developer guides and API documentation.</p> <p>The Additional Documentation .zip file is available in the Plumtree Product Center.</p>
Release Notes	<p>These files are written for Plumtree Process administrators. They include information about new features and known issues in the release.</p> <p>They are available in electronic form (HTML) in the Plumtree Product Center.</p>
Online Help	<p>The online help is written for all levels of Process users. It describes the user interface for the Process and gives detailed instructions for completing tasks using Process components and utilities.</p> <p>To access online help, click  <b>Help</b> in the upper-right corner of the Process application.</p>



Table 1-2: Plumtree Process Documentation and Resources (Sheet 2 of 2)

Resource	Description										
Plumtree Support Center	<p>The Plumtree Support Center is a comprehensive repository for technical information on Plumtree products. From the Support Center, you can access products and documentation, search knowledge base articles, read the latest news and information, participate in a support community, get training, and find tools to meet most of your Plumtree-related needs. The Support Center encompasses the following communities:</p> <p><b>Technical Support Center</b> Submit and track support incidents and feature requests, search the knowledge base, access documentation, and download service packs and hotfixes.</p> <p><b>Deployment Center</b> Find the tools you need to roll out, drive, and maintain a successful Plumtree Application Suite deployment. Collaborate with peers on strategic business and technical objectives, learn application best practices, download portal launch examples, and calculate your return on investment (ROI).</p> <p><b>Product Center</b> Download products, read Release Notes, access recent product documentation, and view interoperability information.</p> <p><b>Developer Center</b> Download developer tools and documentation, get help with your development project, and interact with other developers via discussion forums.</p> <p><b>Education Center</b> Find information about available training courses, purchase training credits, and register for upcoming classes.</p> <p>If you do not see the Support Center when you log in to <a href="http://portal.plumtree.com">http://portal.plumtree.com</a>, contact <a href="mailto:support@plumtree.com">support@plumtree.com</a> for the appropriate access privileges.</p>										
Technical Support	<p>If you cannot resolve an issue using the above resources, Plumtree Technical Support is happy to assist. Our staff is available 24 hours a day, 7 days a week to handle all your technical support needs.</p> <p>E-mail: <a href="mailto:support@plumtree.com">support@plumtree.com</a></p> <p>Phone Numbers:</p> <table> <tr> <td>U.S. and Canada</td><td>+1 415.263.1696 or +1 866.262.PLUM (7586)</td></tr> <tr> <td>Asia Pacific</td><td>+61 2.9931.7822</td></tr> <tr> <td>Europe and U.K.</td><td>+44 (0)1628 589124</td></tr> <tr> <td>France</td><td>+33 1.46.91.86.79</td></tr> <tr> <td>Singapore</td><td>+65 6832.7747</td></tr> </table>	U.S. and Canada	+1 415.263.1696 or +1 866.262.PLUM (7586)	Asia Pacific	+61 2.9931.7822	Europe and U.K.	+44 (0)1628 589124	France	+33 1.46.91.86.79	Singapore	+65 6832.7747
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## Product Component Mapping from Process Server 1.0 to Process 1.5

*Table 1-3: Mapping of Process Server 1.0 Component Names to Process 1.5 Component Names*

<b>Process Server 1.0 Component Name</b>	<b>Process 1.5 Component Name</b>
Process Designer	Process Designer
Process Server, Web Application Server	Host Process Execution Engine
WorkSpace	WorkSpace (in Process Designer)
WorkSpace	Worklist Portlets (in Process Execution Engine)
Web Console	Process Administrator
Log Viewer	Process Log Viewer
Studio Log Viewer	Process Designer Log Viewer
Web Console Log Viewer	Process Administrator Log Viewer
Standalone Log Viewer	Process Log Viewer
Admin Center Log Viewer (bottom panel includes WorkSpace log, Web Console log, Web Application Server log, and Console log)	Admin Center Logs (bottom panel includes Worklist Portlets log, Process Administrator log, Host Process Execution Engine log, and Embedded Servlet Engine log)
Archive Viewer	Process Archive Viewer
Admin Center	Admin Center
Admin Center Configuration Utility	Admin Center Configuration Utility

## Process Server 1.0 Features Not Supported in Process 1.5

- **Organizational Units (Process Designer/Logging Utilities)** – Plumtree supports the concept of organizational units via AD/LDAP Identity Services in the form of authentication sources. However, the concept of organizational units in process design is not supported.
- **Application Server Integration** – WebLogic and WebSphere integration is replaced by the embedded servlet engine.
- **Groups of Roles (Fuego Groups)** are not supported.

# 2 Overview

## Product Components

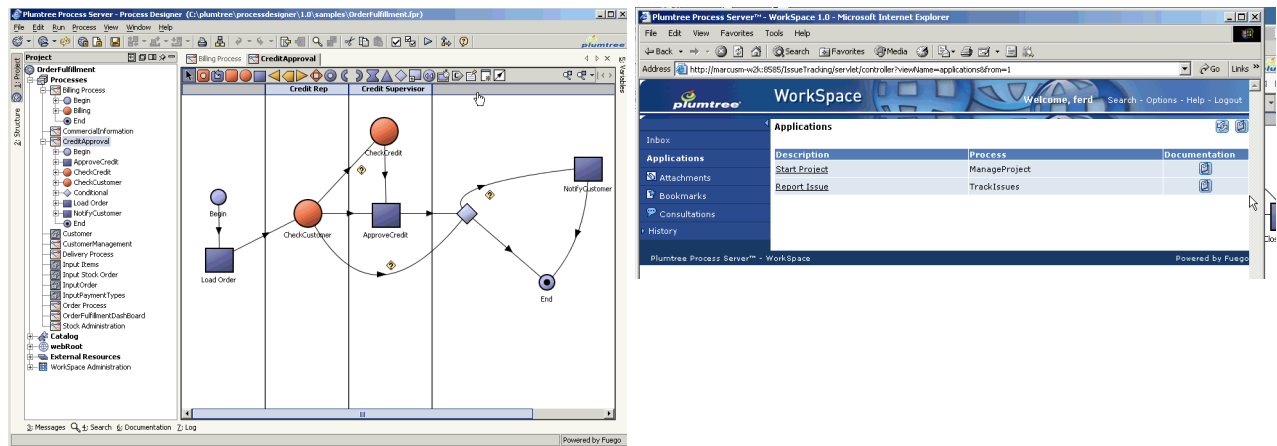
The Process product consists of two separately installable components: Process Designer and Process Execution Engine. Each component contains a combination of thick client, Web application, and server programs.

### Process Designer

The Process Designer contains a thick client graphical design tool for modeling, creating, and simulating processes, a Web application known as the WorkSpace for testing projects created with the design tool, and a lightweight process execution engine. The Process Designer component also includes an embedded servlet container and database suitable for local testing. This component is completely self-contained and is typically installed on a developer laptop or desktop.

The figure below shows a screen from the thick client graphical designer on the left and a screen from the browser-based WorkSpace on the right.

Figure 2-1: Process Designer Images

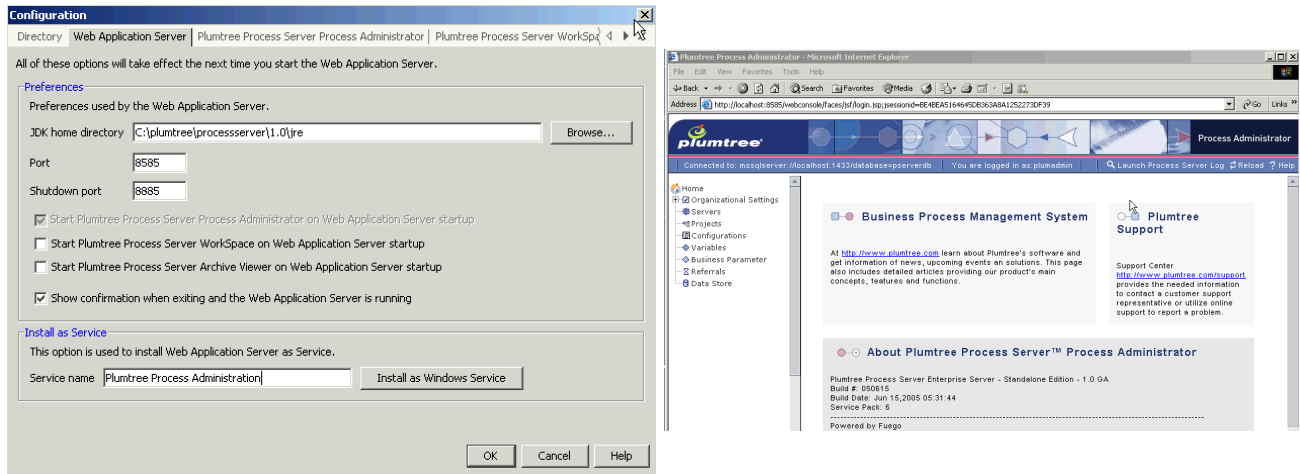


### Process Execution Engine

The Process Execution Engine component contains an enterprise-grade version of the process execution engine, a thick client configuration utility for setting database and directory service connections, an administrative Web application known as the Process Administrator for deploying and configuring processes created with the designer, and a Worklist Portlets Web application for end users to manage their activities. The Process Execution Engine installation is not self-contained; it combines with a Plumtree Portal deployment in a comparable manner to remote portlet servers such as Collaboration Server. It requires a relational database (Oracle or Microsoft SQL Server) and an installation of the Plumtree Corporate Portal. This component is typically installed on server-class hardware in development and production environments.

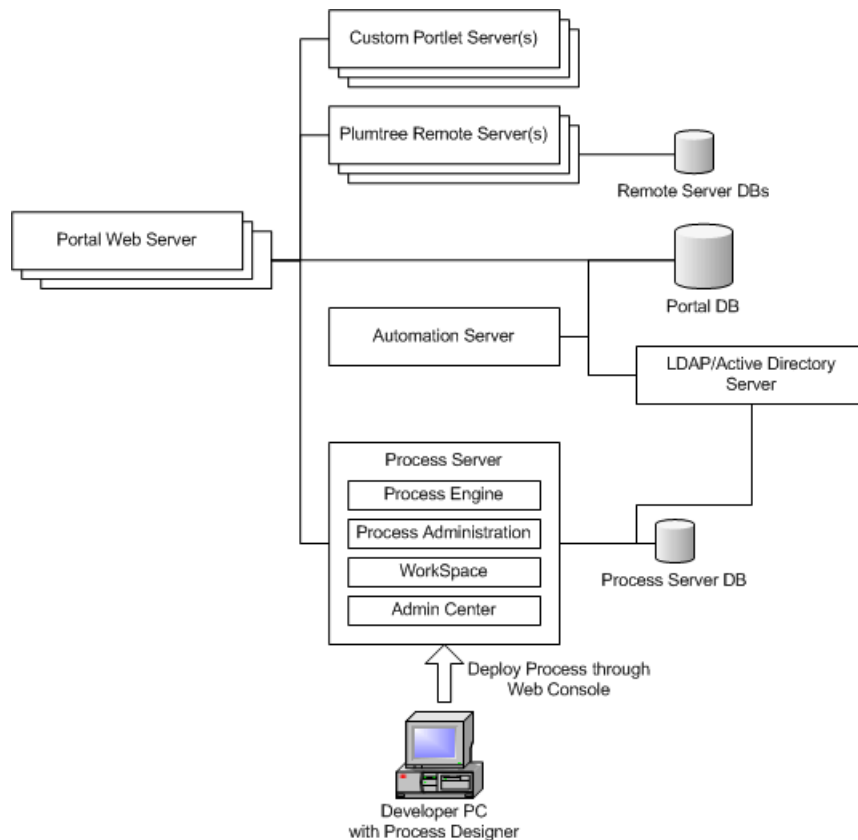
The figure below shows a screen from the Process Execution Engine thick client configuration utility on the left and a screen from the browser-based Process Administrator on the right.

Figure 2-2: Process Images



The figure below shows the product components in the context of a Plumtree Portal deployment:

*Figure 2-3: Process Components in a Plumtree Portal Deployment*



## Product Users

There are three main types of users that interact with the Process components: process developers/system analysts, portal administrators, and participants.

### Process Developers/System Analysts

Process developers and system analysts are IT professionals who design, develop, and maintain business process applications. This type of user is comfortable using high-level languages such as Visual Basic, C#, and Java. Process Developers will use the Process Designer to create and modify projects; a project is a bundle of files that comprise a business process application, including XML process definitions, imported

WSDL and jar files for connecting to services, and presentation files defining the user interface. Process Developers will also use Integrated Development Environments such as Eclipse or Visual Studio.NET to create back-end services and integration components to be used by their process definitions. Finally, they will work with portal administrators to deploy completed projects to the Portal.

## Portal Administrators

Portal administrators are IT professionals who install, upgrade, and maintain Plumtree Portal and Portlet Server deployments. This type of user is comfortable with enterprise software, database, and directory service configuration. Portal administrators will interact primarily with parts of the Process Execution Engine component: They will use the Admin Center configuration tool to set up database and directory service connections and the Process Administrator to deploy projects created by process developers.

## Participants

Participants are end users who use the business process applications created by developers. This type of user is comfortable using the Plumtree Portal, Portlets, My Pages, and Communities. Process participants will mainly interact with the Worklist Portlets section of the Process Execution Engine component in order to initiate new processes, fill out forms to complete interactive activities, and manage assigned tasks.

## Platform Support

- **Operating Systems:**
  - Process Execution Engine and Admin Center (Utility): Windows 2003 SP1, Linux Red Hat 3 Update 4 ES & AS (on x86), SUSE Enterprise Linux 9 (on x86)
  - Process Designer: Windows 2003 Standard Edition SP2, Windows XP, Linux Red Hat 3 Update 4 ES & AS (on x86), SUSE Enterprise Linux 9 (on x86)
- **Database Servers:** QL Server 2000 SP3a through the use of the SQL Server Data Direct Plumtree JDBC Drivers, Oracle 9i (9.2.0.4 and 9.2.0.6) and 10g (10.1.0.3) in default configuration or in Oracle RAC configuration through the use of Oracle Data Direct Plumtree JDBC Drivers
- **Browsers:** IE 6.0 (administrative use), Netscape 7.2, Firefox 1.0, Safari 1.3
- **Java Virtual Machines:** Plumtree Process ships with JRE 1.4.2 for Windows and Linux versions. Installers for other operating systems require a 1.4.2 JVM (JRE + tools.jar or JDK) with the latest patches applied.
- **Application Servers:** N/A.

# 3

## Development

The easiest way to understand how the Process Designer, the developer WorkSpace, Process Administrator, and Plumtree Corporate Portal fit together is to walk through the steps for developing and deploying a business process application. These steps are:

1. Set up the development environment.
2. Define the process and create roles for the application.
3. Define business objects, services, and components for the application.
4. Create input and display views for interactive activities.
5. Test and refine the application in a developer WorkSpace.
6. Deploy the application through the Process Administrator and Plumtree Portal.



**Note:** Steps 1-5 require only the Process Designer components, while the final step requires Process Execution Engine components. [“Configuration” on page 4-15](#) describes the (one-time) setup of the Process Execution Engine components and [“Deployment” on page 5-25](#) provides detailed instructions for Step 6.

The remainder of this chapter describes Steps 1-5 (development and testing) in more detail.

### Step 1: Set Up the Development Environment

The key element of the Process development environment is the self-contained Process Designer module. Install it on a development-class desktop or laptop PC by following the instructions in the Installation and Upgrade Guide for Process.

Once installed, the Process Designer can be started as follows:

1. Select **Start | Programs | Plumtree | Process Designer** to launch the designer
2. When you start the designer for the first time, you'll be prompted to create a new **project**. Enter a unique name for the project (e.g. MyFirstProject) but leave all other settings at their default values.
3. A variety of sample projects can be found in **C:\Program Files\plumtree\ptprocessdesigner\1.5\samples**. You can load a sample project into the Designer by selecting **File | Open | Project**, navigating to the samples directory, and choosing one of the available projects.

The Process Designer Tutorial Documentation provides an easy-to-follow introduction to using the Designer with the HelloWorld sample project. The Process Designer Tutorial Documentation also includes samples that describe how to use the Plumtree EDK. The Plumtree EDK samples demonstrate how to design processes that interact with Plumtree Collaboration and Plumtree Publisher.

### Step 2: Define the Process and Participant Roles

The initial stages of creating a process application are fundamentally the same as other kinds of application development – it is important to gather requirements, understand the use cases behind the application, and

the technical constraints for development and deployment. The Process Designer helps break down design and development into distinct parts, two of which are:

- **Roles** – Who needs to participate in the application? For example, a simple application to automate job offer requisitions might involve a Hiring Manager who submits an offer proposal for approval, a Department Manager who approves or modifies all job offers for a part of the company, and an HR Administrator who ensures that all offers conform to company standards and policies. A more complex application might add roles for a CFO who must examine and approve all offers above a certain compensation level, a Finance Accountant who tracks pending offers to incorporate them into up-to-the-minute spending models, or a Candidate who will actually receive the offer and any associated materials.
- **Process Definition** – What are the types of interactive activities that people in different roles must perform? What are the types of automatic activities that must be performed by back-end systems involved in the process? For example, the job offer requisition process involves interactive activities such as Offer Submission, Offer Approval, Compensation Negotiation, Offer Acceptance, etc. Such a process could also involve automatic activities such as Generate Offer Letter, Update HR Database, Lookup Department Manager, etc. These activities are linked together through transitions that indicate the flow from one activity to another.

After gathering initial requirements for the application, business analysts and application developers can use the Process Designer to define the abstract Roles that are required and to create a Process Definition consisting of interactive and automatic activities and transitions between them.

The Process Designer Guide and the Process Designer Online Help are the best resources for the details of creating roles, activities, and transitions.

## Step 3: Define Business Objects and Components

The next step in application development involves implementing the details of any automatic activities and integrating the process with external services and systems.

There are two important concepts for integration:

- **Business Objects** – Also referred to as Fuego Objects, these encapsulate a set of data and/or operations for a business function. Business Objects act as a “translation layer” between the complexities of back-end services and the Process Definitions which depend on those services. For example, a JobOffer business object would act as a container for information about an applicant, the proposed salary, the job description, etc. It could contain operations (also known as methods) for actions like storing the object to a database, or updating the contents of the object from a lookup service. Other common examples of business objects are PurchaseOrder, TravelRequest, or EmployeeRecord.
- **Components** – Components are the reusable elements that make up business objects, and they represent explicit connection points to different technologies in a service-oriented architecture. Components are best illustrated by example: suppose you have an enterprise application (e.g. a CRM program) that exposes a Java Application Programming Interface. The jar files comprising the API can be “introspected” by the Process Designer and the public methods and classes made available for reuse. The resulting collection of methods is referred to as a Java Component, and the methods can be invoked from activities in a process definition. Other types of API technology can be introspected to create components – Web Services defined by WSDL, .NET assemblies, COM libraries, XML schemas, SQL database tables, and Enterprise Java Beans.



After creating roles and sketching out the process definition for an application, developers can use the Process Designer to create Components to connect to external resources and services, and Business Objects to encapsulate data and methods using the components.

The Process Designer Guide and the Process Designer Online Help are the best resources for the details of creating Business Objects and Components. The Java Components Guide in the Additional Documentation file provides further details about components created from Java APIs.

## Step 4: Create Input and Display Views

Interactive activities require user interface views for the display and entry of information relevant to the process. For example, a Job Offer process application requires views for submitting an offer, revising an existing offer, attaching an offer letter, adding comments about a rejected applicant, etc.

There are three ways to create input and display views with Process, offering different levels of flexibility and control:

- **Creating Presentations in the Process Designer** – Presentations are HTML elements that can be used to display or request information about business objects in a process. Presentations are essentially tables with rows, cells, and graphical components such as checkboxes, text fields, and combo boxes. They are created within the Designer and described in detail starting on page 790 of the Process Designer Guide. Creating presentations with the Designer is useful for rapid application development, and the presentations can be highly customized with the use of cascading style sheets.
- **Creating JSP pages and importing them into the Process Designer** – JSP pages created in tools like Dreamweaver or Eclipse can be used as presentations as well. Dedicated tools allow the creation of more sophisticated pages and give the developer fine-grained, HTML-level control. JSP pages can be substituted for built-in presentations by importing them into the Process Designer. Using JSP pages is described in detail starting on page 917 of the Process Designer Guide.
- **Creating a Web-based UI that interacts with the Process through Web Services** – The Process embedded servlet engine exposes a Web Services interface through the Web application hosting the Process Administrator and WorkSpace. This Web Services interface can be used to initiate and transition processes. For example, display and input forms written in a .NET language can be used to instantiate a process in the engine.

For those comfortable with Java and Java Server Pages, the second method (creating and importing JSP pages) offers the best trade-off between simplicity and control for creating production-quality process applications.

The Process Designer Administrator Guide and the Process Designer Online Help are the best resources for the details of creating input and display views, either with built-in presentations (Topic: Business Objects Presentation) or with JSP pages (Topic: Using JSP and Fuego Objects).

## Step 5: Test and Refine the Application in the WorkSpace

The Process Server WorkSpace Guide is the best resource for the details of testing process applications.

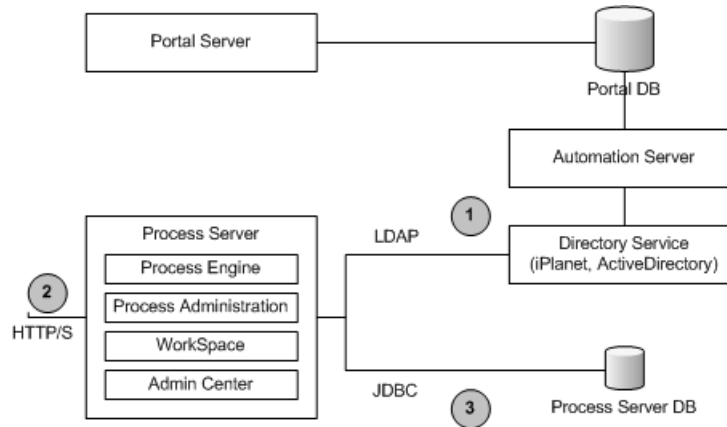


# 4

## Configuration

After installing the Process Execution Engine product module on a server-class machine, the Admin Center utility and Process Administrator must be used to configure port numbers, database connections, and directory service connections. These represent the three most important integration points that a Portal administrator must understand, illustrated in the following diagram and described below:

Figure 4-1: Configuration Integration Points



1. **Directory Service** – Participants in process applications are also Plumtree Portal users. In order to access information about Portal users, the host process execution engine must be connected to a directory service, and this must be a directory service used by the Plumtree Portal as an authentication source. In the figure above, note that the connection between the host process execution engine and the directory service uses the LDAP protocol. The Plumtree Automation Server connects through an Authentication Web Service to synchronize the users and groups with the Portal database.



**Note:** In addition to accessing information about users and groups, the process execution engine must store information about deployed process definitions in the directory service.

2. **Port Numbers** – The process execution engine uses HTTP/HTTPS for the Web applications such as the Process Administrator and the Worklist Portlets, and to support a SOAP-based Web Services API. As a result, the process execution engine requires free port numbers on the host machine. The host process execution engine requires a port for the Process Administration and the Worklist Portlets (default 8585) and individual ports for process engines. The host process execution engine also requires a port for the Plumtree Identity Service (default 11980).
3. **Database** – The process execution engine uses a relational database (Oracle or MS SQL Server) to store information about executing process instances, in much the same way that other Plumtree remote servers, such as Collaboration Server, require a database to store data. Like all other Plumtree remote servers, the connection between the process execution engine and its database uses JDBC. Note that in Oracle the process execution engine database need only be a logically separate table space – depending on an organization's IT requirements and conventions, it may reside in the same physical database used for the Portal and other remote servers.

## Configuration Overview

### Assumptions

These configuration instructions are based on the following assumptions:

- Process Execution Engine has been installed on a server-class machine.
- The host machine runs Windows 2003 Server SP1, Solaris 8 and 9, RedHat Linux 3 Update 4, or SuSE SLES 9 as the operating system.
- The installation is in the default location C:\Program Files\plumtree\ptprocess\1.5.
- The relational database is Microsoft SQL Server 2000.

### Configuration Steps

The steps to configure the Process Execution Engine are:

1. Launch the Admin Center utility.
2. Configure a directory service.
3. Configure the Process Execution Engine Web applications.
4. Start the host process execution engine.
5. Create an engine and script the database.
6. Start the engine.

The remainder of this chapter describes these steps in more detail.

## Step 1: Launch the Admin Center Utility

The Admin Center utility runs from the desktop of the host machine where the host process execution engine is installed:

1. To launch the utility, select **Start | Programs | Plumtree | Process | Process Execution Engine | Admin Center**.
2. The main window of the Admin Center is divided into two regions – an upper region to launch and configure the host process execution engine, and a lower region that displays startup and log information. Click **Configuration** in the upper region.

A configuration screen opens with tabs for Directory, Embedded Servlet Engine, Process Administrator, Worklist Portlets, and Service Pack Updates. The steps below describe these tabs in more detail.

## Step 2: Configure a Directory Service

Configure the host process execution engine to connect to the directory service used as an authentication source for Plumtree Portal users and groups. The directory service must be installed prior to configuration. The following steps describe how to configure the connection settings:

1. On the Directory tab of the configuration utility, click **Add**.
2. On the Add dialog box, choose **Create New Directory**.
3. On the Create a New Directory dialog box, enter a name to use as the **Directory ID** for the configuration.
4. Choose a database provider: **Plumtree (Oracle)** or **Plumtree (SQLServer)**.
5. Enter the properties for the selected database:

The SQL Server (Plumtree) directory service database properties are:

- a. **Plumtree Directory Service Host** - The name of the host computer or server on which the directory service will be created.
- b. **Plumtree Directory Service Port** - The directory service will use this port on the host.
- c. **Show SQL Statements** - Do not use this option.
- d. **Database Host** - The name of the host computer or server on which Microsoft SQL resides.
- e. **Database Port** - The database will use this port on the host.
- f. **Directory Service Name** - A name that is created to identify the directory service if it needs to communicate with other host process execution engines using external processes configured in Process Administrator. In most cases, there is no need to change the provided default directory service name.
- g. **Administrator User** - The name of a user with administrative write privileges for the host database.
- h. **Administrator Password** - The password for the administrator user.
- i. **Database** - The name of the directory service database that will be created.
- j. **Login Name** - A user name for the directory service database that will be created when the database is created.



**Note:** Once this login name has been defined in the directory service configuration, the name cannot be changed. If a new login name is necessary, create a new directory service configuration that uses the new login name.

- k. **Login Password** - A password that will be created for the user when the database is created.
- l. **Confirm Password** - A confirmation of the login password.

The Oracle (Plumtree) directory service database properties are:

- a. **Plumtree Directory Service Host** - The name of the host computer or server on which the directory service will be created.
- b. **Plumtree Directory Service Port** - The directory service will use this port on the host.
- c. **Show SQL Statements** - Do not use this option.
- d. **Database Host** - The name of the host computer or server on which Oracle resides.
- e. **Database Port** - The database will use this port on the host.
- f. **Directory Service Name** - A name that is created to identify the directory service if it needs to communicate with other host process execution engines using external processes configured in Process Administrator. In most cases, there is no need to change the provided default directory service name.

- g. **Administrator User** - The name of a user with administrative write privileges for the host database.
- h. **Administrator Password** - The password for the administrator user.
- i. **Schema Name** - A schema name that will be created when the database is created.



**Note:** Once this schema name has been defined in the directory service configuration, the name cannot be changed. If a new schema name is necessary, create a new directory service configuration that uses the new schema name.

- j. **Schema Password** - A password that will be created for the schema when the database is created.
- k. **Confirm Password** - A confirmation of the schema password.
- l. **SID** - System identification for the database; also used to connect to the database. Sometimes called Oracle ID.
- m. **Specify JDBC URL** - If this option is selected, the database connection information can be entered in the form of a URL. Complete the host, port, SID, schema, and user fields. Then select the database string checkbox. In the database string field, enter the URL in the format jdbc:datadirect://host name:port number;SID.

The Oracle (Plumtree) engine Advanced properties are optional:

- a. **Tablespace** - Some database administrators divide databases into tablespaces to control and maintain table sizes. Enter the appropriate tablespace name here. Leave the field blank if there are no tablespaces and a default tablespace will be created. When the schema name is created, the schema creation statement references the tablespace.
  - b. **Temporary Tablespace** - The name of the temporary tablespace used by the process execution engine's database to perform temporary indexing for some access: TEMP of type TEMPORARY.
  - c. **Profile** - A profile is a set of limits on database resources. If you assign the profile to the user being created, that user cannot exceed the established limits in the profile. This allows the administrator to limit the actions of a particular Oracle user. The Oracle administrator may have different profiles set for different groups of users so that there is control over what each group is authorized to use and over which resources from the database a particular group will have.
6. Click **Start**. The Create a New Directory dialog box will display the following message:
- "The Directory Service has been successfully created."



**Note:** The Plumtree Identity Service must be running when you click Start in order to create a new directory service.

7. Click **Close**.



**Note:** It is possible to create more than one Directory ID. For example, you may want to create separate Directory IDs for development and production systems. As another example, you may have

separate populations of users residing in different directory services, so you could create separate Directory IDs for each user population.

## Step 3: Configure the Host Process Execution Engine

Next you will need to configure port numbers and logging levels for the host process execution engine.

1. In the Configuration Utility, select the **Embedded Servlet Engine** tab.
2. Configure any of the optional **Preferences**:
  - a. **JDK Home Directory** - The default setting is for the JDK directory created during installation. The host process execution engine can be directed to use a different JDK directory, but this is not recommended.
  - b. **Port** - The port that the host process execution engine will use to launch the Web application components such as Process Administrator and the Archive Viewer.
  - c. **Shutdown Port** - The port used by the host process execution engine to shutdown.
  - d. **Show confirmation on exit when the host process execution engine is running** - If this option is selected, a dialog box will remind the user that the host process execution engine is running before closing the Admin Center and shutting down the host process execution engine.
  - e. **Install as Service** - To install the host process execution engine as a service in the operating system, click Install as Service. If the host process execution engine is installed as a service, the host process execution engine can be started from the Services utility instead of being manually started in the Admin Center. To uninstall the host process execution engine as a service, click Uninstall as Service. To create a custom name for the service, enter a new Service Name.
3. To save the changes and close the Configuration Utility, click **OK**.
4. Start the host process execution engine. You can start the host process execution engine from the Admin Center by clicking the Start Host Process Execution Engine link in the Admin Center or, if you have installed the host process execution engine as a service on Windows, from the Services utility.



**Note:** Saved changes will not take effect until the host process execution engine is re-started.

Now that the basic configuration information has been provided, you can start the Process Administrator.

## Step 4: Start the Process Administrator

To start the Process Administrator:

1. Log in to Plumtree Portal as an administrative user.
2. Click **Administration**.
3. Under Admin Objects Directory, in the Select Utility drop-down list, choose **Process Administrator**.



**Note:** The Process Administrator utility will not be available in the Select Utility drop-down list until the PTE file has been imported. Refer to the Installation and Upgrade Guide for Plumtree Process for more information. Furthermore, the Process Administrator utility will be visible to all administrative users but accessible only to administrative users who are also members of the Process Administrators group.

The Process Administrator will appear in your browser, displaying left-hand navigational links as follows:

- About Plumtree Process
- Participants
- Roles
- Groups
- Holiday Rules
- Calendar Rules
- Engines
- Projects
- Business End Points
- Variables
- Business Parameters
- External Processes
- Process Data Mart
- Attachments

The most important links in the left-hand navigational area are Participants, Roles, Engines, and Projects.

## Step 5: Create a Process Execution Engine and Configure the Database

To add a process execution engine to the host engine:

1. In the left pane of the Process Administrator, select **Engines**.
2. On the Engines page, click **Add**.
3. On the Engines | Choose Engine Type page, enter the **Engine Name** and **Engine Database Type**. Ignore the Engine Type option - it cannot be configured.
4. Click **Next**.
5. On the Engines | Choose Engine Type | Edit Business End Point Engine 'engine name' Database Configuration page, enter the **Properties** for the process execution engine database.

The SQL Server (Plumtree) engine database properties are:

- a. **Host** - The name of the host computer or server on which Microsoft SQL resides and on which the database will be created.
- b. **Port** - The database will use this port on the host.
- c. **Database** - The name of the engine database that will be created.



- d. **User** - A user name that will be created when the database is created.



**Note:** Once this user name has been defined in the Process Administrator, the name cannot be changed. If a new administrative user name is necessary, create a new process execution engine that uses the new user name.

- e. **Password** - A password that will be created for the user when the database is created.

The Oracle (Plumtree) engine database properties are:

- a. **Host** - The name of the host computer or server on which Oracle SQL resides and on which the database will be created.
- b. **Port** - The database will use this port on the host.
- c. **SID** - System identification for the database; also used to connect to the database. Sometimes called Oracle ID.
- d. **User** - A user name that will be created when the database is created.



**Note:** Once this user name has been defined in the Process Administrator, the name cannot be changed. If a new administrative user name is necessary, create a new process execution engine that uses the new user name.

- e. **Password** - A password that will be created for the user when the database is created.
- f. **Schema** - This is an optional property. If the name of a schema is entered, the configuration and introspection will only work on tables of that schema. If a schema name is not entered, the schema could be changed at runtime. For example, if a table named devel.invoice is referenced in a development environment and in production a different schema name is used, production references to devel.invoice would work only if the schema name was not entered in this field.
- g. **Database String** - If this option is selected, the database connection information can be entered in the form of a URL. Complete the host, port, SID, user, and schema (schema is optional) fields. Then select the database string checkbox. In the database string field, enter the URL in the format jdbc:datadirect://host name:port number;SID. Enter and confirm a password for the user that will be created when the database is created.

The Oracle (Plumtree) engine **Advanced** properties are optional:

- a. **Tablespace** - Some database administrators divide databases into tablespaces to control and maintain table sizes. Enter the appropriate tablespace name here. Leave the field blank if there are no tablespaces and a default tablespace will be created. When the user name is created, the user creation statement references the tablespace.
- b. **Temporary Tablespace** - The name of the temporary tablespace used by the process executionengine's database to perform temporary indexing for some access: TEMP of type TEMPORARY.
- c. **Profile** - A profile is a set of limits on database resources. If you assign the profile to the user being created, that user cannot exceed the established limits in the profile. This allows the administrator to limit the actions of a particular Oracle user. The Oracle administrator may have different profiles set for different groups of users so that there is control over what each

group is authorized to use and over which resources from the database a particular group will have.

6. On the Engines | Choose Engine Type | Edit Business End Point Engine 'engine name' Database Configuration page, configure the following Runtime options for the process execution engine or accept the defaults:
  - a. **Maximum Pool Size** - Enter the maximum number of connections that the pool can allocate. The pool will never create more connections than this limit imposes. The default is 10.
  - b. **Connection Idle Time (Mins)** - Enter the amount of time the database connection can remain idle before the connection will be dropped. The default is 5 minutes.
  - c. **Maximum Opened Cursors** - Enter the maximum number of opened cursors allowed on the database. The default is 50. This value is related to the maximum pool size. The number of cursors is divided in between the number of maximum pool size and each connection will manage that number of cursors. For example, if you have 500 maximum opened cursors and the maximum pool size is 50, each connection can have a maximum of 10 opened cursors.
7. Click **Next**.
8. On the Engines | Choose Engine Type | Edit Business End Point Engine 'engine name' Database Configuration | Add Engine page, on the **Basic Configuration** tab:
  - a. Verify the **Name** of the process execution engine.
  - b. Ignore the **Type** - it cannot be configured.
  - c. Verify the **Host** location for the process execution engine.
  - d. Enter the **Home Directory** location or accept the default.
  - e. Enter the **Log Directory** location or accept the default.
9. Click **Save**.
10. In the left pane of Process Administrator, select **Engines**.
11. On the Engines page, **Stop** the process execution engine so that the process execution engine database can be created.
12. Click the engine **Name**.
13. On the Engines | Edit Engine enginename page, on the Basic Configuration tab, click **Manage Database**.
14. On the Engines | Edit Engine enginename | Manage Database page, under Database Creation, select **Create Database** and **Create Data Structure**.
15. Enter a **User Name** and **User Password** with administrative write privileges for the host engine.
16. Click **OK**.

At the top of the Engines | Edit Engine enginename page, the Message(s) section should contain the following confirmation messages:

- The database has been created.
- The data structure has been created.

17. To verify the creation of the database and data structure, check the host engine to see if the new database is there.



**Note:** Before starting the process execution engine, make sure the location port number is unique. Two process execution engines on the same host process execution engine cannot be running on the

same port. To view and change the location port, on the Engines | Edit Engine enginename page, on the Basic Configuration tab, click **Locations**.

Once the engine's database has been created, the engine can be started and used.

## Step 6: Start the Process Execution Engine

To start the process execution engine:

1. In the left pane of the Process Administrator, select **Engines**.
2. On the Engines page, click the **Start** button associated with the engine.
3. At the top of the Engines page, the Message(s) section should contain the following confirmation message:
  - The engine has been started.

After starting the process execution engine, the engine Status should display as Ready. The status change may take a few seconds. If the change is still not visible after a few seconds and the Message(s) section does not contain error messages, use the Refresh Status option at the top of the page until the engine status displays as Ready.

The next chapter describes how to publish and deploy projects to a running process execution engine using the Process Administrator.



# 5

## Deployment

Once an application has been developed and tested with the Process Designer and the Process Execution Engine has been installed and configured, continue with deployment.

1. Export the project from the Process Designer.
2. Create concrete Roles in the Process Administrator.
3. Publish and Deploy the project through the Process Administrator.

The remainder of this chapter describes these steps in more detail.

### Step 1: Export the Project from the Designer

Once you have developed and tested a process application in the Process Designer, you can export the project, creating a Zip format file that can be loaded into the Process Administrator. To export the project:

1. Select **File | Export Project**. An Export dialog will appear.
2. Choose the **Include Versionable libraries only** option.



**Note:** Versionable libraries are those that may change when processes are modified by analysts and developers. As a result each version of a process must be tied to a specific version of a library. The Plumtree EDK is an example of a Versionable library. In contrast, non-versionable libraries are intended to not change over time and to affect all processes deployed on the server. JDBC drivers are examples of non-versionable libraries. Non-versionable libraries, if they are used at all, must be manually placed in specific directories in the Process Execution Engine installation.

3. Enter a target filename and directory location for the exported project. The default filename is the name of the project.
4. Click **Finish** to complete the export. A file named `ProjectName.fpr.exp` is created in the target directory.

The exported file is now ready to be deployed.

### Step 2: Create Concrete Roles in the Process Administrator

The next step assumes that the Process Administrator utility is running. The project created in the Process Designer will contain a number of abstract Roles, e.g. `HiringManager` or `HRAdministrator`. In order to make the application available to real Portal users, the abstract Roles created in the Process Designer will need to be mapped to concrete Roles created in the Process Administrator. In turn, the concrete Roles created in the Process Administrator can be associated with specific users and groups in the Portal. So this step consists of creating concrete Roles in the Process Administrator. Note that roles do not need to be created manually if the Smart Publish option is used to publish the project.

Similar to Roles, there are a number of other project concepts that may be created in the Designer and need to be mapped to concrete counterparts in the Process Execution Engine. Business End Points capture

information about external components such as SQL databases and Web Services. A test Web Service used during development must be replaced with a real Web Service for production deployment. Additional examples of concepts requiring mapping through the Process Administrator are Variables and Business Parameters.

Here are the steps for creating Roles in the Process Administrator:

5. In the left pane of the Process Administrator, click **Roles**.
6. Click **Add**. A new pane with Role properties appears.
7. Enter the name and description for one of the Roles required by the process application you want to deploy. Leave the **Is Parametric** checkbox unchecked. Click **Save**.
8. Repeat the previous step for each Role required by the process application.
9. Click the **Participants** link in the left-hand navigation area of the Process Administrator. A paginated list of all participants appears.
10. Page or search to find a particular participant in order to assign a Role.



**Note:** The Filter box on the participant panel performs a regular-expression-based, database-backed search for participants. It does not use the Plumtree Search Server, so the filter syntax is different. Filters here are specified by regular expressions. The most commonly useful filter syntax uses the wildcard character \*. For example, applying a filter *jim\**, would return all users with user IDs beginning with *jim*.

11. Click on the id of a particular user, and select **Assigned Roles** in the **Advanced Properties** section. A table appears showing any existing assigned Roles for the user.
12. Click **Add**. A Role Assignment panel appears. Select the desired Role for this user from the Role ID drop-down, and click **Save**.
13. Repeat for other Participants who should be assigned to various Roles.

## Step 3: Publish and Deploy through the Process Administrator

The next step assumes that the Process Administrator utility is running.

1. Log in to the Process Administrator.
2. Select **Projects** in the left-hand navigation area. A list of all published projects appears on the right.
3. Select the **Publish** button. The Publish panel appears.
4. Select **Exported Project**, click **Browse**, and navigate to the exported project file (<Project-Name>.fpr.exp).
5. Select the **Smart Publish** and **Deploy Processes after publishing them** checkboxes. Smart Publish will create the roles for you if they do not already exist.



**Note:** A new panel appears listing the processes that are part of the project, and displaying sections for mapping **Roles**. If the process uses externally defined **Variables**, **Business End Points**, or **Business Parameters**, then sections will appear for mapping these items as well.

6. Perform the required mappings as necessary – between abstract **Roles** created at design time in the Process Designer and Roles created in the Process Administrator, **Variables** defined as external in the project and variables defined from the Process Administrator, **Business End Points** defined as external resources to the project and configurations created in the Process Administrator, **Business Parameters** defined at design time in the project and business parameters created in the Process Administrator.



**Note:** The Process Administrator will attempt to assign mappings by default based on the correspondence of names between (for example) Roles defined in the Designer and those defined in the Process Administrator.

7. Ensure that there are no red flags next to the Role, Variable, and Configuration mappings (signifying missing correspondences), and click **Publish**.
8. Once publication is completed, if the **Deploy processes after having published them** checkbox was checked, a Deploy panel appears. Click OK.
9. The Published Projects table should now show the newly deployed process along with a version number and a status of Completely Deployed.





# 6

## Tips and Best Practices

### Process Designer Tips

- The Process Designer creates some default folders in the home directory of the user who starts the program:
  - **.fuego/** - contains preferences, properties, and cache files. Nothing in this folder should be manually edited by the user.
  - **plumtreeProjects/** - default location for Project data. A Project consists of all the process definitions, catalogued components, configuration parameters, and Web resources that comprise a process application. The project is a directory named *Project.fpr* where *Project* is the name of the project created in the Process Designer. Nothing inside a project folder should be manually edited by the user. However, the location where project data is stored can be set to any location – *fuego-Projects/* is just the default. Also, projects can be “exported” to create a single file named *Project.fpr.exp*, which is a Zip archive of the *.fpr* directory structure.
- Participants created in the Process Designer are test users only. They can be assigned to Roles in a process and used to test process applications through the Workspace that is installed with the Process Designer. They are not real Portal users and they do not exist in either the Portal database or the directory service that is connected to the Portal and Process Execution Engine.
- Example projects can be found in *C:\Program Files\plumtree\ptprocessdesigner\1.5\samples\*. These samples illustrate many different aspects of process design. The most important samples are:
  - **HelloWorld** – Simple process described in detail in the Tutorial Documentation for Process Designer.
  - **Expenses** – A more complex process for expense reporting, also described briefly in the Tutorial Documentation.
  - **ScreenflowCase01** – A process that uses screenflows based on built-in Presentations created using the designer.
  - **FoodDelivery** – A process that uses screenflows based on imported JSP-based presentations.
  - **PublisherSample** – This sample project demonstrates how to use Publisher with Plumtree Process 1.5. It prompts the user for two fields to use in a content item, creates and publishes the content item, and then displays a link where the user can view the new content item. By way of creating the content item, this project also shows how to use screenflows, Fuego Objects, the EDK, the Publisher API, and how to use the Portal with JSP pages in screenflows.
  - **CollabSample** – This sample shows how to access the Collaboration Discussion API with Process User. First, it prompts a Discussion Manager for a Project ID, name, and description to create a discussion. Next, it prompts an employee to create a message in this newly created discussion. Finally, it displays the messages in this discussion to the Discussion Manager. In creating the discussion and discussion message, this project also shows how to use screenflows, Fuego Objects, the EDK, the Collaboration API, and how to use the Portal with JSP pages in screenflows.
- The Process Designer contains a lightweight version of the process execution engine, an embedded servlet engine. When you “Publish and Deploy” a project through the Process Designer, you are deploying only to the self-contained version of the server, for development and testing purposes.

## Process Execution Engine Tips

- Pay attention to the port number configuration for the Process Administrator and Worklist Portlets. If you install and run the Process Execution Engine on a machine that also has a Process Designer, you may inadvertently cause port conflicts. Use the Configuration utility in the Admin Center to choose free port numbers for the process execution engine.
- When you use the Admin Center to install the Host Process Execution Engine as a Windows Service, it uses the JRE included with the Process Execution Engine. If for any reason this \jre directory is deleted or inaccessible, the service will attempt to use a JRE determined from the value of the JAVA\_HOME environment variable.