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See Table of Contents for location of Third party acknowledgements within this documentation.
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Preface

For details, see the following topics:

• About this documentation
• User types
• Information on documentation
• Conventions used in this manual
• Product support contact information

About this documentation

This guide is part of the documentation set for Progress OpenEdge Business Process Server.

User types

Progress OpenEdge Business Process Server is a business process management system that can be used by the following types of users:
<table>
<thead>
<tr>
<th>User type</th>
<th>Responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manager</td>
<td>Responsible for automating business processes in a particular business domain. Business Process Portal’s Management module serves as the primary interface to Business Process Server for the Manager, enabling the manager to monitor, analyze, and control business processes. Also uses the Business Process Modeler for modeling and simulation.</td>
</tr>
<tr>
<td>Application Developer</td>
<td>Responsible for creating customized applications for implementing business processes and developing interfaces associated with tasks. Application developers may work closely with Managers to define the requirements of an application, and determine the business processes.</td>
</tr>
</tbody>
</table>

**Information on documentation**

This documentation includes information for the entire range of Progress OpenEdge Business Process Server users. In the following table, we recommend the guides that are most relevant to each type of user.

<table>
<thead>
<tr>
<th>If you are the …</th>
<th>Read the …</th>
</tr>
</thead>
</table>
|                             | *First Steps Guide*  
|                             | *Terminology Guide*                                                                 |
| Manager                     | *Business Process Portal Manager's Guide*  
|                             | *Business Process Portal User's Guide*  
|                             | *Terminology Guide*                                                                 |
If you are the … | Read the …
---|---
Application Developer | Application Developer’s Guide
| BP Server Developer’s Guide
| BPM Events User’s Guide
| Business Process Portal Manager’s Guide
| Business Process Portal User’s Guide
| OpenEdge Getting Started: Developing BPM Applications with Developer Studio
| Customization Guide
| Managed Adapters Guide
| First Steps Guide
| Terminology Guide
| Server Administrator’s Guide
| Web services Developer’s Guide

Business Process Server Administrator | BPM Events User’s Guide
| Business Process Portal Administrator’s Guide
| Business Process Portal Manager’s Guide
| Business Process Portal User’s Guide
| OpenEdge Getting Started: Installation and Configuration Guide
| Managed Adapters Guide
| Terminology Guide
| Server Administrator’s Guide
| Troubleshooting Guide for Administrators

For the latest Business Process Server documentation updates, see OpenEdge Product Documentation on PSDN (http://communities.progress.com/pcom/docs/DOC-16074).

**Conventions used in this manual**

This document uses the following conventions and terminology notations.

<table>
<thead>
<tr>
<th>Convention (styles and terms)</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>bold</strong></td>
<td>Indicates titles of command buttons, check boxes, options, lists, dialog boxes, and portal page names.</td>
</tr>
<tr>
<td><strong>file path</strong></td>
<td>Indicates folder paths and filenames.</td>
</tr>
<tr>
<td><em>italic</em></td>
<td>Indicates book titles.</td>
</tr>
<tr>
<td>Convention (styles and terms)</td>
<td>Purpose</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>monospace</td>
<td>Represents code segments or examples.</td>
</tr>
<tr>
<td>backward slash &quot;&quot;</td>
<td>Indicates the path in Windows environment. For UNIX environment, replace with forward slash &quot;/&quot;</td>
</tr>
<tr>
<td>OEBPS_HOME or %OEBPS_HOME%</td>
<td>Represents the installation folder of Business Process Server, C:\Progress\OpenEdge\oebpm\server.</td>
</tr>
<tr>
<td>STUDIO_HOME or %STUDIO_HOME%</td>
<td>Represents the installation folder of OpenEdge BPM components, C:\Progress\OpenEdge\oebpm\studio.</td>
</tr>
<tr>
<td>JBOSS_HOME or %JBOSS_HOME%</td>
<td>Represents the installation folder of JBOSS server, C:\Progress\OpenEdge\oebpm\jboss.</td>
</tr>
</tbody>
</table>

**Product support contact information**

If the product documentation does not provide a solution to your specific issue, or if you need clarification on the issue, then contact our Product Support team. You can contact the team through the Internet, telephone, or postal mail, as per the details provided in Table 1 on page 10.

**Table 1: Product Support Contact Information**

<table>
<thead>
<tr>
<th>To contact by</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web site</td>
<td><a href="http://progresslink.progress.com/supportlink">http://progresslink.progress.com/supportlink</a></td>
</tr>
<tr>
<td></td>
<td>If you are an existing customer, then you can log in to the above site for product support. If you are a first time user, then you need to create an account first.</td>
</tr>
<tr>
<td>Telephone¹</td>
<td>1-781-280-4999 for US, Latin America and Canada</td>
</tr>
<tr>
<td></td>
<td>1-781-280-4543 for the Product Support Fax Line</td>
</tr>
<tr>
<td>Postal Address¹</td>
<td>Progress Software Corporation</td>
</tr>
<tr>
<td></td>
<td>14 Oak Park Drive</td>
</tr>
<tr>
<td></td>
<td>Bedford, MA 01730, USA.</td>
</tr>
</tbody>
</table>

To enable us to quickly answer your questions, please provide the following information:

- Your name, installation site address and the license key for Business Process Server software.
- Your Business Process Server version and build number.
- Your operating system, application server and browser, with version and service pack details, if any.
- Your database management system and version, and information on JVM and JDBC used.

¹ For support telephone numbers and offices in your region, visit the support web site above. This contact information is for customer support only.
OpenEdge Business Process Server overview

Progress Software Corporation is a leading global provider of automated business process management solutions. The company’s product, Progress OpenEdge Business Process Server (henceforth referred to as Business Process Server or BP Server), is a comprehensive business process management platform, which enables companies to quickly transform their business processes into flexible and manageable Web applications, distributed over intranets, extranets, and the Internet.
Business Process Server addresses every stage in the business life cycle: define, integrate, publish, monitor, analyze, improve, and control. By adopting an end-to-end approach, Business Process Server incorporates all the key elements required to meet the ever-changing demands of e-business while ensuring e-business success. By providing integrated management tools, Business Process Server lets you monitor operations proactively, modifying automated processes dynamically based on changing external operations online. An overview of a typical automated business process management solutions is shown in Figure 1 on page 12.

**Figure 1: Business Process Server overview**
For details, see the following topics:

- Business Process Server components
- How Business Process Server works
- Business Process Server user types

**Business Process Server components**

Business Process Server is a suite of integrated components that enables you to easily build intranet, extranet, and Internet applications and manage your e-business. Business Process Server consists of the following components as in Figure 2 on page 13:

**Figure 2: Business Process Server components**
### Table 2: Business Process Server components

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Process Portal Home</td>
<td>The Home module of Business Process Portal is the primary interface for application users, enabling them to interact with Business Process Server applications. Users can complete entries to various tasks and applications, and link to the support infrastructure required to complete these tasks.</td>
</tr>
<tr>
<td>Business Process Portal Management</td>
<td>The Management module enables managers to query, report on, and control processes and resources, visible only to the managers.</td>
</tr>
<tr>
<td>Business Process Portal Administration</td>
<td>The Administration module enables Business Process Server Administrators to modify configuration parameters, manage user or group access control, and install or uninstall Business Process Server applications.</td>
</tr>
<tr>
<td>Web services</td>
<td>This component allows application developers to: publish their applications as Web services, and find and convert other available Web services on the Internet into Business Process Server applications.</td>
</tr>
<tr>
<td>BPM Workflow</td>
<td>This component provides a framework for developing and implementing Web-enabled workflow applications.</td>
</tr>
<tr>
<td>Progress Developer Studio for OpenEdge</td>
<td>This is the primary application development tool for Business Process Server, which provides an Eclipse-based integrated development environment in which users can create BPM projects, processes, Web applications, and rule files.</td>
</tr>
<tr>
<td>Business Process Modeler</td>
<td>This tool is used to design templates for basic business processes, and to run simulations of processes and individual worksteps.</td>
</tr>
<tr>
<td>BP Server</td>
<td>This is a flexible, lightweight, scalable workflow process engine for intranets, extranets, and the Internet.</td>
</tr>
<tr>
<td>BPM Events</td>
<td>This open, event-driven rule engine is used to formulate and enforce policies in business applications.</td>
</tr>
</tbody>
</table>
How Business Process Server works

Figure 3 on page 15 provides an overview of the interaction between Business Process Server components.

Figure 3: How Business Process Server works

The following explanations correspond to the labels shown in Figure 3 on page 15, and describe how the components operate.

1. Progress Developer Studio for OpenEdge and Business Process Modeler provide an integrated development environment (IDE) for Business Process Server, where you can design and publish business processes. The application developer designs a process template (with the *.spt or *.swt extension) in the IDE that reflects the business flow and other business process requirements. Business rules for the process template can be defined using the Rule Editor, a BPM Events component that is launched with Progress Developer Studio for OpenEdge.


3. Once the process template is defined, Business Process Server Administrators use the Administration module to install the business process on the BP Server. Administrators can also configure Business Process Server components, manage user or group access control,
and publish Business Process Server applications as Web services. Once installed, users access applications through servlets that pass the requests over an RMI/IIOP connection to the BP Server within an EJB Container.

4. The EJB Container provides a runtime environment that executes and manages Java-based program components that run on the server side of a client/server network. Within the EJB Container are the BP Server and BPM Events server.

5. The BP Server writes events to event tables in the database. Each Business Process uses JDBC to connect to database server as well as store events in the database. Within the BP Server, BPM Process Store uses JDBC to connect to the database server process and retrieve the events deposited by the BP Server process. BPM Process Store interprets the events and populates the process tables. These populated tables are used by Business Process Portal modules.

6. Once the process template is installed as a Business Process Server application, application users can use the Home module to do the following:
   - Access applications
   - Obtain information to perform their tasks
   - Launch the application to start process instances from the BP Server

7. Once the process template is installed as an Business Process Server application, managers can use the Management module (if they have access privileges) to monitor execution of process instances and create reports. Servlets receive requests from managers and pass them onto the BP Server over an RMI/IIOP connection. Managers use the Report Builder to define management reports that retrieve information through JDBC to the database server.

8. BPM Events is a rule-based event or message processing server that loads application rules and executes them against the BP Server and/or external events or messages. This server persists data in the database for recovery and with the help of JDBC connects to the database.

9. Managed Adapters exchange information between Business Process Server applications and external applications by converting Business Process Server-specific protocol to the protocol of an external system such as a database or ERP system. When users add a Managed Adapter to a workstep, they can define complex mapping between Business Process Server dataslots and adapter inputs or outputs of the external application. At runtime when the workstep is executed, the Managed Adapter sets the adapter inputs and configuration, and maps the outputs to the appropriate output dataslots.

10. BPM Workflow is a run-time component that executes the presentation flows. This component provides a Model, View, Controller (MVC) paradigm for developing presentation flow-based applications and executing them in a Web container.

11. Business Process Servers Web services component allows BP Server applications to be published as Web services.


Business Process Server user types

There are four user types within Business Process Server, Application users, Managers, Application developers, Business Process Server administrators.
User types

Each Business Process Server user type is defined below:

• **Application users** — Application Users use Business Process Server applications to coordinate specific business tasks with another department within their company, with another company within their organization, and/or with a business partner in another organization. The Home module in Business Process Portal serves as the primary interface in which Application Users run Business Process Server applications.

• **Managers** — Managers are typically experts in a particular business domain, such as quality assurance or human resources. They might need to work with managers from other groups in automating some of the business procedures that these groups share. The Management module in Business Process Portal serves as the primary Business Process Server interface for business managers to coordinate and integrate business processes, enabling them to exchange information with one another, and to share functionality over such standard communication channels as the Internet or e-mail.

• **Application developers** — Application developers are responsible for analyzing business processes and developing interfaces associated with creating tasks or processes. Application developers are often not domain experts themselves, but work closely with Managers to define business processes and determine the requirements of an application. Application developers use Progress Developer Studio for OpenEdge or Business Process Modeler to define the business process; the resulting process template file is tested, simulated, published, and run as a Business Process Server application.

• **Business Process Server administrators** — Business Process Server administrators are responsible for configuring Business Process Server components, managing user or group profiles and access control, and installing or uninstalling Business Process Server applications. The Administration module in Business Process Portal serves as the primary interface for Business Process Server Administrators to administer applications.

All Business Process Server user types can communicate by using one or more Business Process Server applications. They can also communicate with external applications.
Introducing Business Process Server Web Services

Web services is an Internet technology that enables businesses to provide their services, and to discover the services of other businesses. These services are self-contained, self-describing modular applications that businesses can publish, discover and invoke across the Web. This publish-discovery mechanism facilitates B2B communication by enabling business applications to directly connect to other business applications.

Web Services create Internet-based applications sharing common components for more efficient communication across the World Wide Web. The World Wide Web Consortium has defined a Web Service as:

Business Process Server Web Services obtain information about the Business Process Server applications and convert it to a Web Service. Its definition can be discovered by other software systems through service registries. These systems may then interact with the Web Service in a manner prescribed by its definition, using XML-base messages conveyed by Internet protocols.
For details, see the following topics:

- Web Services architecture
- Web Services standards
- Business Process Server Web Services
- Configuring Business Process Server Web Services properties

## Web Services architecture

Web Services architecture basically consists of Web services technologies that are capable of: exchanging messages, describing Web services, and publishing and discovering Web service descriptions. To accomplish these ends, interactions involving publish, find and bind operations must occur between the following three roles:

- The Service Provider typically hosts an implementation of a web service (a network-accessible software module) and provides a description of the web service. The service description includes data type and structure information, identifies message exchange patterns, and contains the address of the Service Provider. The Service Provider then publishes the service description to a Service Registry.

- The Service Registry is a searchable set of service descriptions where Service Providers publish their service descriptions. The Service Registry acts as a discovery agency that provides, as well as makes discoverable, service descriptions.

- The Service Requester interacts with the Service Registry to find required services. A service is invoked after the description is found, since the service description is required to establish a binding. Once found, the Service Requester interacts with the Service Provider, using the binding details in the service description to locate, contact, and invoke the service. This bind creates an association between them that ensures web service implementation.

In this architecture, a service is an implementation of a Web service; that is a software module deployed on network-accessible platform provided by the Service Provider. A service description contains details of the service, including data types, operations, binding information and its network location (as well as the metadata describing this service). The service description must include sufficient information for a service requester to access the service it describes. This architecture is shown in the following figure, and described in Table 3 on page 21.
Table 3: Fundamental roles in Web Services

<table>
<thead>
<tr>
<th>Service role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Provider</td>
<td>The Service Provider publishes a service description to a Service Registry. From a business perspective, the Service Provider is the owner of the service. From an architectural perspective, it is the platform that hosts access to the service.</td>
</tr>
<tr>
<td>Service Registry</td>
<td>The service registry provides a searchable set of services, enabling users to find businesses worldwide that offer the exact products and services that are required.</td>
</tr>
<tr>
<td>Service Requester</td>
<td>From a business perspective, a service requester is the consumer of a service. From an architectural perspective, it is an application that searches for a service description that matches its request via the Service Registry, and then invokes or initiates an interaction with the service. When the request and matching description bind, the application connects to a Web service at a particular Web location and starts interacting with it.</td>
</tr>
</tbody>
</table>

Figure 4: Web Services architecture

Web Services standards

Web Services are based on standard infrastructures, using XML to communicate across such standard protocols as HTTP, TCP/IP, SMTP or FTP. Because all communication is in XML, Web Services are not tied to any one operating system or programming language.
Web Services also use newer standards that include such terms as SOAP, WSDL, and UDDI. These Web Services-specific standards are described below:

- **WSDL.** The Web Services Description Language provides a standard XML-based language used to describe Web Services. You can use a WSDL document to capture service descriptions that determine the operations a Web service provides and to execute them. WSDL uses an XML format to describe network services as a set of endpoints operating on messages containing either document-oriented or procedure-oriented information. The operations and messages are described abstractly, and are then bound to a concrete network protocol and message format to define an endpoint.

- **SOAP.** Simple Object Access Protocol is a standard for an XML-based exchange of information between distributed applications, transferring data over such standard transport protocols as HTTP. SOAP is a lightweight, platform-independent protocol consisting of the following parts:
  - An envelope that defines a framework for describing what is in a message and how to process it.
  - A set of encoding rules for expressing instances of application-defined data types.
  - A convention for representing remote procedure calls and responses.
  - A binding convention for exchanging messages using an underlying protocol.

- **UDDI.** Universal Description, Discovery and Integration registry is a searchable directory of Web services that Service Requesters can use to search for Web Services and access WSDL documents. UDDI provides a distributed registry of businesses and their service descriptions implemented in a common XML format, and acts as a “Yellow Pages” service that defines a way to publish and discover information about Web Services.

In summary, UDDI enables users to publish and/or find specified web services; WSDL enables users to describe web services in a standard, accessible format; and SOAP enables users to bind and use the Web Services from an application. These Web Services-specific standards provide the infrastructure to publish (using WSDL and UDDI), find (using WSDL and UDDI) and bind (using WSDL and SOAP) Web Services in an interoperable manner.

### Business Process Server Web Services

Business Process Server Web Services automate the development of Web services. This component provides, in combination with Progress Developer Studio for OpenEdge and Business Process Portal, a way to simplify development of Web services and facilitates accessibility between your business applications and other applications, both inside and outside a business enterprise. Business Process Server Web Services simplify Web services development by automating the following steps:

- Service code generation.
- Service code compilation.
- Deployment descriptor generation.
- Web Services Description Language (WSDL) generation.
- Service deployment.
- Service registration to the Universal Description, Discovery and Integration (UDDI) Registry.
Business Process Server provides the following services:

- Publishing BP Server and Web Applications as Web services. For more information, refer to Business Process Portal Administrator's Guide.

- Custom utility services for improving Business Process Server application design and development, including users, groups, application, adapter, and Web application discovery services.

- Support for Web services worksteps within BP Server and Web processes. For more information, refer to OpenEdge Getting Started: Developing BPM Applications with Developer Studio.

Business Process Server Web Services obtain information is about an Business Process Server application and converts it to a Web Service. The Web Service can then be published to a registry or deployed on the SOAP server.
Business Process Server Web Services relationships

Business Process Server Web Services enable you to be a service provider by converting and publishing Business Process Server applications as Web Services. Business Process Server Web Services also publish Business Process Server applications as Web services through a SOAP server, and this Business Process Server-based Web service binds with a matching request from the Requester to enable the Requester to use the Business Process Server-based Web service. Figure 5 on page 24 shows the relationship between the three service roles, where the:

- Service Provider consists of Business Process Server applications, the Business Process Server Web Services mechanism and the SOAP server.
- Service Registry is the UDDI Operator Site.
- Service Requester is the Requester.

**Figure 5: Business Process Server Web Services relationships**

Service generation mechanism

Business Process Server Web Services perform the following steps to create Web services:

1. Generates service code.
2. Compiles service code into class file.

a. In the Administration component, you can automatically process these four steps by entering information in the user interfaces seen under the Applications menu. For more information, see the section entitled *Publishing BP Server applications as Business Process Server Web Services* on page 29.

## Configuring Business Process Server Web Services properties

Business Process Server Web Services configuration properties are defined in `OEBPS_HOME\conf\webservice.conf`. The default properties are automatically set by the Business Process Server installer. The following table describes the configuration properties of Business Process Server Web Services.

### Table 4: Business Process Server Web Services configuration properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>uddi.0.name</td>
<td>The display name the user sees in the Publish page.</td>
</tr>
<tr>
<td>uddi.0.businessKey</td>
<td>The businessKey associated with your business name.</td>
</tr>
<tr>
<td>uddi.0.userid</td>
<td>The user ID at the UDDI operator site.</td>
</tr>
<tr>
<td>uddi.0.password</td>
<td>The password associated with your user ID at the UDDI operator site.</td>
</tr>
<tr>
<td>uddi.0.inquiryURL</td>
<td>The URL where the UDDI provides inquiry (service lookup) service.</td>
</tr>
<tr>
<td>uddi.0.publishURL</td>
<td>The URL where the UDDI provides publish (service registration/update) service.</td>
</tr>
</tbody>
</table>

## Understanding the Business Process Server Web Services directory structure

Business Process Server Web Services maintain the following directory structure:

`<WEBAPP_DIR>/wsdl/`

### Table 5: Business Process Server Web Services directory structure

<table>
<thead>
<tr>
<th>Directory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;WEBAPP_DIR&gt;</code></td>
<td>The context root of the Business Process Server on the application server. The configuration parameter, <code>param name=&quot;OEBPS.WebAppDir&quot;</code>, is located in the <code>oebps.conf</code> file at <code>OEBPS_HOME/conf</code> folder. The configuration parameter provides the location of the <code>&lt;WEBAPP_DIR&gt;</code>. For example, for Business Process Server on a embedded JBoss application server, the path is: <code>&lt;WEBAPP_DIR&gt;/wsdl</code>.</td>
</tr>
<tr>
<td><code>wsdl</code></td>
<td>The directory where all WSDL files generated for the services are placed. All WSDL files in this directory are accessible via the Internet.</td>
</tr>
</tbody>
</table>
Error/Log files

The open structure of Web Services means that all the services are accessible to the public. Therefore, you may trace who uses the services by logging access to Web Services.

Error messages and log files can be found in the `webservice.log` file in `OEBPS_HOME\logs`. The Log category information is hardcoded in `com.savvion.util.Nlog.java`. All log4j calls from classes not defined in `com.savvion.util.Nlog` —including messages from Axis’s log4j—are redirected to the `oebps.log` file in `OEBPS_HOME\logs`. 
Installing Business Process Server applications as Web Services

Business Process Server Web Services automate the process of converting Business Process Server applications to Web services. This chapter describes how to start Business Process Server Web Services, explore the interface, and install/uninstall BP Server and Web applications as Web Services for Business Process Server.

For details, see the following topics:

• Logging into the Administration Module
• Publishing BP Server applications as Business Process Server Web Services

Logging into the Administration Module


To install Business Process Server applications as Web services, you must be granted permission to access the Administration Module and install applications. For more information, refer to Business Process Portal Administrator’s Guide.

Assuming you have the proper permissions, open the Administration module in the Business Process Portal. The Business Process Portal is a cross-over and component mapping feature that allows you to access all components and features of Business Process Server to which you are granted authorization. With Business Process Portal, you do not have to log in to each of the modules separately.
To navigate to the Administration component, perform the following:

1. After starting the servers, do any one of the following:
   
   - For Windows platform, from the Start menu choose **All Programs > Progress > OpenEdge > BP Server > Admin Consoles > Portal Console** if you are using the installation machine.
   
   - Otherwise enter `http://machine_name.domain.com:port_number/sbm/bpmportal/login.jsp` in your browser if you are accessing the Administration component from a client.
   
   - For Unix platform, enter `http://machine_name.domain.com:port_number/sbm/bpmportal/login.jsp` into your browser.

   **Note:** Be sure to set the UNIX environment variables required by Business Process Server before starting any Business Process Server component. For more information refer to the *OpenEdge Getting Started: Installation and Configuration Guide*.

2. The **Login** page appears, as shown in the figure below.

   **Figure 6: The Business Process Portal login page**

   ![Login page](image)

3. Enter your user name and password, and click the **Login** button.

   You must have Administrator permissions to install Business Process Server applications as Web Services.

   Business Process Server authenticates the user name and password and opens the Business Process Portal.

4. To access the Administration component, click **Administration** in the Navigation bar and open the **Applications** menu. Perform any one of the following:

   - Select the BP Server submenu item if you want to publish a BP Server application as a Web service
   - Select BPM Workflow to publish a Web application as a Web service.

   Business Process Server automatically authenticates your user name and password and displays the **BP Server Applications** page or the BPM Workflow Applications page, depending on the selection you made in the previous step.

   **Note:** With the addition of the Access Control Management feature, an error message appears if you are not granted permission to use this or any other resource.
Publishing BP Server applications as Business Process Server Web Services

If you have installed Business Process Server on JBoss, you must perform the following additional steps before you publish a BP Server application as a Web service.

For JBoss Community Edition 5.1: Copy `jboss-javaee.jar` file from `OEBPS_HOME\jboss\common\lib` folder to `OEBPS_HOME\webapps\deploy\sbm.war\WEB-INF\lib` folder.

For JBoss Enterprise Application Platform 5.1.1: Copy `jboss-javaee.jar` file from `JBOSS_SERVER_HOME\lib` folder to `OEBPS_HOME\webapps\deploy\sbm.war\WEB-INF\lib` folder.

Restart Business Process Servers.

To publish a BP Server application as a Web service:

1. In the Administration module, go to **Applications > BP Server**.

   Business Process Server displays the **BP Server Applications** page listing all current BP Server applications as shown in the following figure.

   Figure 7: Installing a BP Server Application as a Web Service

2. Use the Filtering functions to select an option from the **Application Status** drop-down list.

3. Click **Go** to display only those applications in which you are interested.

   The BP Server Applications page contains information on:

   - **Status**, indicating the current status of the application. Options include All, Installed, Uninstalled, Suspended, Resumed, Published, Unpublished or Deprecated.

   - **Process Template Name**, or the name assigned by the developer when defining the process template in Progress Developer Studio for OpenEdge.

   - **Label**, or the name users see in Business Process Portal. The developer defines this name as the Label when designing the process template in Progress Developer Studio for OpenEdge.
• **Rule**, indicating whether the application contains rules (Yes) or has none (No). If BPM Events is not running, then Business Process Server allows you to install or uninstall applications without rules, but BPM Events must be running if you want to install/uninstall applications that contain rules.

• **Application Name**, the name of the application. Business Process Server supports versioning for applications, where a new version can be installed on an existing application. In case of a versioned application, this displays the name of the application of which the current process template is a version.

• **Description**, providing a brief description of the application. If required, you can define the description as a text link to a lengthier, more detailed description.

• **Migrate ACL**, select this check box, if the permissions created for other versions of this application need to be migrated to the current version of the application.

4. You can publish an application (or BPM Workflow workstep) whose status is Installed. Select the check box associated with a BP Server application you wish to publish as a Web service, and click **Publish**.

   **Note**: If permission is not granted to you or your group for publishing applications, then an error message displays when you click the Publish button.

   The Publish Applications page is displayed.

5. Select **Methods** to be published, and **where to Publish**.

6. Optionally, enter Service description.

7. Click **Publish**.

   You may also publish and unpublish applications in Progress Developer Studio for OpenEdge. Select **Project > Publish** from the Progress Developer Studio for OpenEdge menu bar and provide the user name and password. For more information, see the *OpenEdge Getting Started: Developing BPM Applications with Developer Studio*.

   **Note**: When you publish an application as a Web services, its available tasks cannot be completed using a Web Services call.

Business Process Server publishes the selected BP Server application as Web services.

### Unpublishing BP Server application Web Services

To unpublish a BP Server application that has been published as a Web Service:


2. Select the check box associated with any published BP Server application you wish to unpublish, and click **Unpublish**.

Business Process Server unpublishes the selected published Web service.
After publishing Business Process Server Web Services

After publishing your service to public UDDI registries, you may add detailed information about your service at the UDDI portal site of your choice. The information you provide must include the service description and service locators (taxonomies). The key taxonomies are explained below:

- **Name.** The name of the service you registered. This entry is automatically added by Business Process Server Web Services.
- **Description.** Zero or more language-qualified text descriptions of the service you registered. Multi-byte languages, like Chinese and Japanese, may not be supported by your UDDI site operator.
- **Taxonomies (business/service classifications).** A list of name-value pairs used to tag your service with specific taxonomy information.

**Caution:** Be careful when you add technical information due to the limit of tModels you can register. If you maximize the number of tModels, then you cannot add any more as, according to the specification, a registered tModel cannot be unregistered. Once you reach the maximum number, you must either reuse registered tModels by updating them or contact the UDDI site operator.

**Note:** There is no need to register at multiple UDDI operator sites. Your business and service information is automatically replicated between the certified UDDI site operators.
You can deploy the Progress® Apama® widgets using Business Process Portal's web service. Business Process Portal exposes the widget deployment API as a web service that registers dashboard widgets.

Business Process Portal's web service takes a complex type of object containing the following information as an input parameter.

**Table 6: Information contained in a complex type of object of a Web Service**

<table>
<thead>
<tr>
<th>Parameter name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WidgetName</td>
<td>This is the name of the widget that appear in the Add Widget dialog box.</td>
</tr>
<tr>
<td>WidgetType</td>
<td>This represents the type of widget. Widget type &quot;compositeui&quot; supports Apama widgets.</td>
</tr>
<tr>
<td>WidgetAppName</td>
<td>This is the name of an application from which the widget is deployed. In case of ‘Common Resource Project’, the widgets are listed below ‘ALL’ application.</td>
</tr>
<tr>
<td>Category</td>
<td>You can specify a category for a widget. For Apama widgets, the category must be ‘Apama’. This is a mandatory attribute.</td>
</tr>
<tr>
<td>Description</td>
<td>This is the description of a widget.</td>
</tr>
<tr>
<td>Title</td>
<td>This is the title for a widget. This appears in the header of the widget.</td>
</tr>
<tr>
<td>Height</td>
<td>This is the height of the graph. For iframe based widgets, the height is set to iframe.</td>
</tr>
<tr>
<td>Width</td>
<td>For graphical widgets, this is the width of a graph.</td>
</tr>
<tr>
<td>Parameter name</td>
<td>Description</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Renderer</td>
<td>This can be set to NULL. To use this parameter, you need to add the renderer jsp and make the URL available. Typically, this is used for customization. If you set this to NULL, then the default renderer for Apama is used.</td>
</tr>
<tr>
<td>TargetUrl</td>
<td>This is the URL for Apama widgets. You can specify this URL in one of the following ways: Absolute URL using server alias</td>
</tr>
<tr>
<td>UrlParam</td>
<td>These are the parameters (name-value) pairs for the target URL.</td>
</tr>
</tbody>
</table>

You need to write the widget rendering JSP in the `WEBAPP_DIR/bpmportal/widget/ext` folder, where `WEBAPP_DIR` is the folder where your application server is installed. The configuration parameter, `param name=“OEBPS.WebAppDir”`, is located in the `oebps.conf` file at `OEBPS_HOME/conf` folder. The configuration parameter provides the location of the `WEBAPP_DIR`.

Business Process Portal generates a name for this JSP based on the category you specify. For example, if you set ‘Apama’ as the widget category, then Business Process Portal generates an `ApamaWidget.jsp` file for displaying the Apama widget. The implementation of this JSP is to call the Apama widget URL (Target URL). The registered widgets are added in the list of components in the Business Process Portal that users can add in their dashboards.
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This package contains C software to implement JPEG image compression and decompression.
JPEG (pronounced "jay-peg") is a standardized compression method for full-color and gray-scale
images. JPEG is intended for compressing "real-world" scenes; line drawings, cartoons and other
non-realistic images are not its strong suit. JPEG is lossy, meaning that the output image is not
exactly identical to the input image. Hence you must not use JPEG if you have to have identical
output bits. However, on typical photographic images, very good compression levels can be obtained
with no visible change, and remarkably high compression levels are possible if you can tolerate a
low-quality image. For more details, see the references, or just experiment with various compression
settings. This software implements JPEG baseline, extended-sequential, and progressive
compression processes. Provision is made for supporting all variants of these processes, although
some uncommon parameter settings aren't implemented yet.

For legal reasons, we are not distributing code for the arithmetic-coding variants of JPEG; see
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defined in the standard. We provide a set of library routines for reading and writing JPEG image
files, plus two sample applications "cjpeg" and "djjpeg", which use the library to perform conversion
between JPEG and some other popular image file formats. The library is intended to be reused in
other applications.
In order to support file conversion and viewing software, we have included considerable functionality beyond the bare JPEG coding/decoding capability; for example, the color quantization modules are not strictly part of JPEG decoding, but they are essential for output to colormapped file formats or colormapped displays. These extra functions can be compiled out of the library if not required for a particular application. We have also included "jpegtran", a utility for lossless transcoding between different JPEG processes, and "rdjpgcom" and "wrjpgcom", two simple applications for inserting and extracting textual comments in JFIF files.

The emphasis in designing this software has been on achieving portability and flexibility, while also making it fast enough to be useful. In particular, the software is not intended to be read as a tutorial on JPEG. (See the REFERENCES section for introductory material.) Rather, it is intended to be reliable, portable, industrial-strength code. We do not claim to have achieved that goal in every aspect of the software, but we strive for it.

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zlib 1.1.3 is a general purpose data compression library. All the code is thread safe. The data format used by the zlib library is described by RFCs (Request for Comments) 1950 to 1952 in the files ftp://ds.internic.net/rfc/rfc1950.txt (zlib format), rfc1951.txt (deflate format) and rfc1952.txt (gzip format). These documents are also available in other formats from ftp://ftp.uu.net/graphics/png/documents/zlib/zlibzdoc-index.html

All functions of the compression library are documented in the file zlib.h (volunteer to write man pages welcome, contact jloup@gzip.org). A usage example of the library is given in the file example.c which also tests that the library is working correctly. Another example is given in the file minigzip.c. The compression library itself is composed of all source files except example.c and minigzip.c.

To compile all files and run the test program, follow the instructions given at the top of Makefile. In short "make test; make install" should work for most machines. For Unix: "configure; make test; make install"

For MSDOS, use one of the special makefiles such as Makefile.msc.

For VMS, use Make_vms.com or descrip.mms.

Questions about zlib should be sent to <zlib@quest.jpl.nasa.gov>, or to Gilles Vollant <info@winimage.com> for the Windows DLL version.

The zlib home page is http://www.cdrom.com/pub/infozip/zlib/

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Before reporting a problem, please check those sites to verify that you have the latest version of zlib; otherwise get the latest version and check whether the problem still exists or not.

Mark Nelson <markn@tiny.com> wrote an article about zlib for the Jan. 1997 issue of Dr. Dobb’s Journal; a copy of the article is available in http://web2.airmail.net/markn/articles/zlibtool/zlibtool.htm

The changes made in version 1.1.3 are documented in the file ChangeLog.

The main changes since 1.1.2 are:

- fix "an inflate input buffer bug that shows up on rare but persistent occasions" (Mark)
- fix gzread and gztell for concatenated .gz files (Didier Le Botlan)
- fix gzseek(..., SEEK_SET) in write mode
- fix crc check after a gseek (Frank Faubert)
- fix miniunzip when the last entry in a zip file is itself a zip file

(J Lilge)
- add contrib/asm586 and contrib/asm686 (Brian Raiter)

See http://www.muppetlabs.com/~breadbox/software/assembly.html
- add support for Delphi 3 in contrib/delphi (Bob Dellaca)
- add support for C++Builder 3 and Delphi 3 in contrib/delphi2 (Davide Moretti)
- do not exit prematurely in untgz if 0 at start of block (Magnus Holmberg)
- use macro EXTERN instead of extern to support DLL for BeOS (Sander Stoks)
- added a FAQ file

plus many changes for portability.

Unsupported third party contributions are provided in directory "contrib". A Java implementation of zlib is available in the Java Development Kit 1.1
http://www.javasoft.com/products/JDK/1.1/docs/api/Package-java.util.zip.html
See the zlib home page http://www.cdrom.com/pub/infozip/zlib/ for details.

A Perl interface to zlib written by Paul Marquess <pmarquess@bfsec.bt.co.uk> is in the CPAN
(Comprehensive Perl Archive Network) sites, such as:

A Python interface to zlib written by A.M. Kuchling <amk@magnet.com> is available in Python 1.5
and later versions, see http://www.python.org/doc/lib/module-zlib.html

A zlib binding for TCL written by Andreas Kupries >a.kupries@westend.com> is available at

An experimental package to read and write files in .zip format, written on top of zlib by Gilles Vollant
>info@winimage.com>, is available at http://www.winimage.com/zLibDll/unzip.html and also in the
contrib/minizip directory of zlib.

Notes for some targets:

- To build a Windows DLL version, include in a DLL project zlib.def, zlib.rc and all .c files except
example.c and minigzip.c; compile with -DZLIB_DLL

The zlib DLL support was initially done by Alessandro Iacopetti and is now maintained by Gilles
Vollant <info@winimage.com>. Check the zlib DLL home page at
http://www.winimage.com/zLibDll

From Visual Basic, you can call the DLL functions which do not take a structure as argument:
compress, uncompress and all gz* functions.

See contrib/visual-basic.txt for more information, or get
http://www.tcfb.com/dowseware/cmp-z-it.zip

- For 64-bit Irix, deflate.c must be compiled without any optimization. With -O, one libpng test
fails. The test works in 32 bit mode (with the -n32 compiler flag). The compiler bug has been
reported to SGI.

- zlib doesn't work with gcc 2.6.3 on a DEC 3000/300LX under OSF/1 2.1 it works when compiled
with cc.

- on Digital Unix 4.0D (formely OSF/1) on AlphaServer, the cc option -std1 is necessary to get
gzprintf working correctly. This is done by configure.
- zlib doesn't work on HP-UX 9.05 with some versions of /bin/cc. It works with other compilers. Use "make test" to check your compiler.

- gzdopen is not supported on RISCOS, BEOS and by some Mac compilers.

- For Turbo C the small model is supported only with reduced performance to avoid any far allocation; it was tested with -DMAX_WBITS=11 -DMAX_MEM_LEVEL=3

- For PalmOs, see http://www.cs.uit.no/~perm/PASTA/pilot/software.html Per Harald Myrvang
  <perm@stud.cs.uit.no> Acknowledgments:

The deflate format used by zlib was defined by Phil Katz. The deflate and zlib specifications were written by L. Peter Deutsch. Thanks to all the people who reported problems and suggested various improvements in zlib; they are too numerous to cite here.

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This is a listing of common Business Process Server terminology. For a full version of terms used in Business Process Server documentation, refer to the *OpenEdge Business Process Server: Terminology Guide*.

**ACL manager**
In Business Process Server, Access Control List Manager provides a finer, more precise control over user access rights for resources and actions.

**Activity workstep**
In Business Process, the basic unit of work; must be performed by one or more human performers (valid individual user, multiple users or user group).

**Adapter**
A Java class that integrates remote, third party classes and actions with Business Process. An adapter can automate certain functions and tasks performed by a remote server or other external systems.

**Administration**
A module in Business Process Portal enabling the administrator to perform tasks such as installing/uninstalling applications, modifying configuration parameters controlling Business Process operations, and manage users, groups and access control. The Administration module is visible only to application users who have permissions to access it.

**Application**
In Business Process, an application is an installed, executable business process that automates a business flow.

**Balanced scorecard**
A management application in the Management module that measures performance by analyzing how an organization’s business activities help it achieve its strategic goals. The Balanced Scorecard provides an analysis from a range of perspectives.

**BAM**
Business Activity Management combines Business process management with strategic and analytical information on specific business performance indicators, providing real-time status information and identifying critical events to assist senior management in making informed business decisions.

**BP Server**
A Business Process Server component that provides a flexible, lightweight, scalable workflow process engine for intranets, extranets, and the Internet.

**BPM Events**
A Business Process Server component that provides an open event-driven rule engine to formulate and enforce policies in business applications.
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**Business rule**
A combination of elements, including validation edits, logon verifications, database lookups, policies and transformations, that represent an enterprise's way of doing business.

**Control flow**
The sequences of worksteps and workstep conditions, as defined in a process template in Progress Developer Studio for OpenEdge or Business Process Modeler.

**Dashboard**
A Business Process Server feature that provides a graphic overview of the status of several business processes on a single Web page, enabling users to monitor the progress of each process. Users can view business processes across all applications or for a selected application.

**Dataslot**
A data placeholder that persists through the entire process and defines the information flow of the business process. Dataslots are associated with processes, where they can add information into (Input type) or out of (Output type) worksteps, and appear as editable or read-only fields on a user's interface.

**Expression editor**
A Business Process Server tool that enables users to define complex conditional expressions within a Decision gateway to support their business requirements.

**Group**
In Business Process Server, an entity that has as members valid users or other groups who perform related work and have authorized access to specific components.

**Heatmap**
A Business Process Server feature that provides a convenient, graphical tool for managers to visually locate the bottlenecks in the process execution. It helps managers to get an overview of the status of the currently active instances, identify suspended instances, and analyze the history of the completed instances.

**Home**
A module in Business Process Portal through which users interact with Business Process Server. Using the Home module, users complete entries to various tasks and applications, update profile, set preferences, and link to the support infrastructure required to achieve these tasks. The Home module is the primary interface for application users.

**Infopad**
In Business Process Server, a data structure used to capture business metrics, typically displayed as a table with one or two dimensions.

**Instance**
An individual object within a specific class. In Business Process Server, a self-contained unit that is created each time you use a process template to run a Business Process Server application.

**KPI**
Key Performance Indicator, used in the Balanced Scorecard system, that provides the data translating enterprise goals into a set of measurable objectives.

**Management**
A module in Business Process Portal enabling the managers to query, report, and control processes and resources for application users. The Management module is visible only to application users who have permissions to access it.

**Managed adapter**
In Business Process Server, a Managed Adapter is an implementation of an adapter interface that facilitates data exchange between Business Process Server processes and external applications.

**Migration**
The process of moving from the use of one operating environment to another operating environment that is typically seen as improvement. Migration can involve moving to new hardware, new software, or both. It may involve a
new application, another type of database, or a redesigned network. Migration is also used to refer simply to the process of moving data from one storage device to another. Business Process Server supports data migration as well as application migration.

**Performer**
An entity that executes a workstep. Depending on the workstep type, the performer can be a human user, a group of users, an adapter or other external performer, or a script.

**Presentation flow**
The flow of information and user input from one interface to the next. Typically related to a single Activity workstep in the process and generated in a BPM Workflow environment.

**Process engine**
Orchestrates the execution of business processes and also coordinates conversations among process engines based on public processes, which forms the backbone of global business collaboration.

**Business Process Modeler**
A stand-alone component that enables users to design templates for basic business processes.

**Process refresh**
A Business Process Server feature for replacing the installed process without versioning, facilitating the running process instances to refresh and seamlessly adapt to the new workflow.

**Process template**
In Business Process Server, a model of business flow that includes worksteps, connectors and dataslots. After users publish and install it as an application in Business Process Server folder structure, they can use the application to create process instances.

**Rollback**
In Business Process Server, a feature that restarts the workflow from a workstep previously selected as the rollback point in the process, performed automatically in the event of a failure.

**Role**
The actions and activities assigned to a valid application user who is a member of a group. In Business Process Server, only members of a group can be assigned a role. A role indicates the relationships of the user in a group context.

**Rule wizard**
An interactive utility that enables application users to quickly develop rules that can be applied to a business process.

**Swim lanes**
Used in workflow diagrams to organize complex processes across functional boundaries. For example, seen as horizontal lines on a process map, swim lanes can be used to place individual task steps into different categories that depend on task ownership.

**Task**
In Business Process Server, a performer is assigned one or more work items that the performer sees as tasks. There are two types of tasks: Assigned, which are assigned specifically to you; and Available, which are available to be performed by you or other members of your user group.

**User**
In Business Process Server, a valid human performer with authorized access to specific modules.

**Workflow**
The logical sequence of activities performed by human performers. Workflow includes the tasks, procedural steps, organizations or people involved, required input and output information, and tools needed for each activity in a business process.