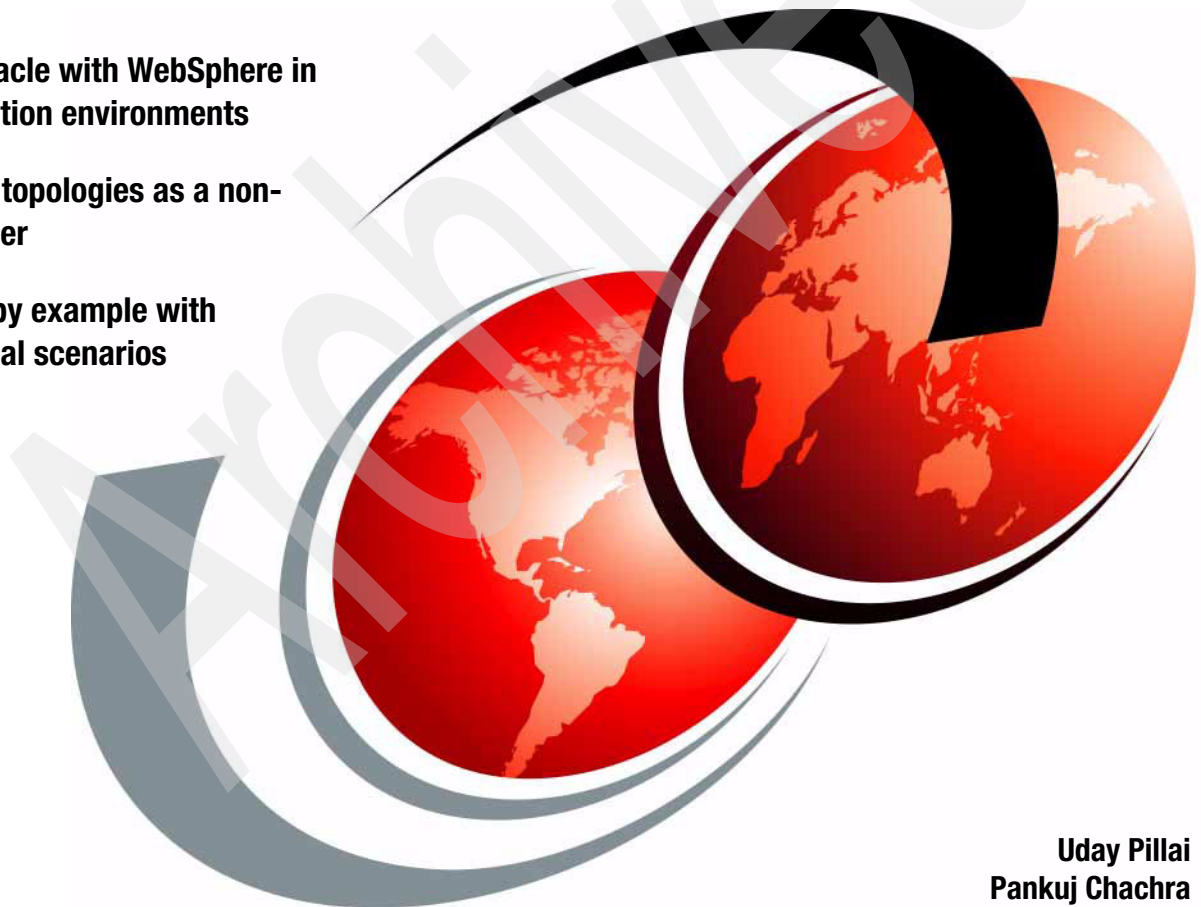


# Deploying WebSphere Business Process Management V7 in Secured Production Environments

Use Oracle with WebSphere in  
production environments

Create topologies as a non-  
root user

Learn by example with  
practical scenarios



Uday Pillai  
Pankuj Chachra





International Technical Support Organization

**Deploying WebSphere Business Process  
Management V7 in Secured Production  
Environments**

November 2010

Archived

**Note:** Before using this information and the product it supports, read the information in “Notices” on page vii.

### **First Edition (November 2010)**

This edition applies to IBM WebSphere Process Server V7.0.0.2, WebSphere Business Monitor V7.0.0.2, and WebSphere Business Services Fabric V7.0.0.2.

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# Preface

This IBM® Redbooks® publication describes how to build a production topology for business process management (BPM) solutions. The target audience is IT architects and IT specialists who want to implement a production topology in secured production environments and who have a high-level understanding of WebSphere® BPM products. This book focuses on the following subjects with regard to WebSphere BPM products:

- ▶ Installing and configuring a WebSphere topology as a non-root user
- ▶ Creating response files for silent installation
- ▶ Creating common response files that include base and fix pack installs
- ▶ Configuring profiles using response files
- ▶ Building and configuring a topology deployment environment using a command-line interface (CLI)
- ▶ Configuring an Oracle database for WebSphere production deployments

This book emphasizes the steps for a successful installation without root access and without a graphic user interface (GUI). Reasons for needing a non-root, non-GUI (or silent) install in a production environment are:

- ▶ As part of the corporate information security and auditing policies, customers prefer to install vendor software using non-root user IDs.
- ▶ Because the customer can have a multitude of vendor products on the same operating system (OS) or in the same environment that is managed by the system administrators with root privileges, customers like to separate the responsibilities of an OS/system administrator from those of a vendor software installation/administration person.
- ▶ Companies restrict the use of browsers in production environments and, therefore, a non-GUI (silent) install is necessary.

This book addresses the following products and provides instructions for creating a production-level Remote Messaging and Remote Support environment using a deployment environment pattern:

- ▶ WebSphere Process Server V7.0.0.2
- ▶ WebSphere Business Monitor V7.0.0.2
- ▶ WebSphere Business Services Fabric V7.0.0.2

## The team who wrote this book

This book was produced by a team of specialists working at IBM in Austin, Texas, U.S.A.

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Thanks to the following people for their contributions to this project:

- ▶ Martin Keen
- ▶ Ritesh Saxena
- ▶ Naveen Balani
- ▶ Srikanth Bhattiprolu
- ▶ Charles L. Matthews
- ▶ Jacek Laskowski
- ▶ Authors of the Redbooks publication *WebSphere Business Process Management V7 Production Topologies*, SG24-7854

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# IBM business process management products overview

This chapter provides a short introduction to the IBM business process management (BPM) product family, with emphasis on the related products discussed in this book. It includes the following sections:

- ▶ “Business process management products” on page 2
- ▶ “New features in IBM BPM V7.0.0.2” on page 4

The IBM BPM suite brings together IBM software and service offerings used for successful BPM projects. It includes two foundational offerings:

- ▶ The IBM WebSphere Dynamic Process Edition
- ▶ The IBM FileNet® Business Process Manager (IBM FileNet BPM)

These offerings optionally can be augmented by extended value offerings. The service offerings provided by IBM help organizations to realize BPM projects based on each client's individual business strategy.

**Note:** Learn more about the IBM BPM Suite at:

<http://www-01.ibm.com/software/info/bpm/offerings.html>

## 1.1 Business process management products

The IBM BPM products provide tools that monitor business activities and assist in decision-making and daily business functions.

### 1.1.1 WebSphere Business Monitor

WebSphere Business Monitor is a comprehensive business activity monitoring tool that provides a nearly real-time, end-to-end view of business process performance. It allows for business users to predict problems before they occur. Process events and data can be collected from a wide variety of sources, such as business applications running on the WebSphere Process Server runtime environment. This information is then presented in personalized dashboards to business users.

WebSphere Business Monitor V7 has added the ability to link strategic organizational goals to operational metrics, has capabilities to handle in-flight processes, and improves end-to-end process monitoring by capturing events from additional IBM middleware and applications. In addition, the installation is simplified due to the new wizard-driven topology configuration capabilities.

**Note:** Learn more about WebSphere Business Monitor at:

<http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.btools.help.monitor.intro.doc/intro/intro.html>

### 1.1.2 WebSphere Process Server

WebSphere Process Server is a standard-based business process integration server underpinned by the robust Java™ EE infrastructure of WebSphere Application Server, on which it is based. It allows deployment and execution of business processes that orchestrate services within a service-oriented architecture (SOA) environment. It also includes the complete functionality of WebSphere Enterprise Service Bus, enabling the implementation of SOA-based integration solutions.

WebSphere Process Server serves as the execution engine of business modules designed in WebSphere Business Modeler and WebSphere Integration Developer.

New features of WebSphere Process Server V7 include enhanced support for open standards such as Java EE 5 and EJB 3.0, simplified system installation, easier cluster configuration, richer capabilities for process administrators, and



single-step migration. WebSphere Process Server V7 now allows you to change process instances in-flight to react dynamically to changing business conditions.

**Note:** Learn more about WebSphere Process Server at:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.websphere.wps.doc/doc/covw\\_intro\\_server.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.websphere.wps.doc/doc/covw_intro_server.html)

### 1.1.3 WebSphere Business Services Fabric

WebSphere Business Services Fabric is an end-to-end platform that rapidly assembles, delivers, and governs industry-focused composite business services in a SOA. A business service represents a business function for which behavior can be adapted at run time based on the current business situation and policy. These business services are assembled into modules for which life cycles are separated from the core processes, making complex BPM projects more manageable.

WebSphere Business Services Fabric enables easy and fast governed change of business processes. It includes two software packages:

- ▶ IBM Business Services Foundation Pack
- ▶ IBM Business Services Tool Pack

The foundation pack contains a runtime business service policy enforcement and building engine that enables the dynamic assembly of intelligent business services. It is based on WebSphere Process Server.

The tool pack is integrated into WebSphere Integration Developer and includes a visual assembly environment for creating and managing intelligent business service models and policies. In the WebSphere Business Services Fabric V7 release, IBM Installation Manager now installs both the tool pack and the foundation pack.

**Note:** Learn more about WebSphere Business Services Fabric at:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.ws.fabric.intro.doc/intro/concept/c\\_product\\_overview.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.ws.fabric.intro.doc/intro/concept/c_product_overview.html)

## 1.2 New features in IBM BPM V7.0.0.2

This section describes the functional and installation changes in the IBM BPM products at V7.0.0.2.

### 1.2.1 Functional changes

This section describes the functional changes in V7.0.0.2 of the various IBM BPM products.

#### **New features in WebSphere Process Server V7.0.0.2**

New features and capabilities in this version of WebSphere Process Server include:

- ▶ Migration enhancements that improve the ease of migrating from WebSphere InterChange Server by enabling users to migrate a partial WebSphere InterChange Server repository and to complete a migration when content is missing.
- ▶ A migration enhancement that makes it possible for WebSphere Process Server environments running V6.0.2 to migrate to V7.0 in a single step.
- ▶ Optimizations to the Business Process Choreographer database (BPCDB) to improve the scalability and performance of long-running business processes. In addition, changes have been made to improve the performance of Business Process Choreographer Explorer by enabling the use of query tables.
- ▶ Consumability improvements, including the ability to specify cluster names and cluster member names during the creation of a deployment environment.
- ▶ Platform alignment and currency:
  - This fix pack is the minimum supported fix pack level for the product on the Microsoft® Windows® Server 2008 R2 and Windows 7 operating systems.
  - On the Windows XP and Windows Vista platforms, this product complies with the security settings as defined by the Federal Desktop Core Configuration (FDCC) for the United States federal government.
- ▶ Enhanced capabilities for working with and administering human workflows. This enables the business to react quickly to changing business requirements by allowing installation of new versions of a process and allowing the migration of running processes to a new version to use those changes immediately.
- ▶ Supports additional human workflow scenarios, including parallel approval with voting and result aggregation.

- ▶ Uses the versatility of the human task and workflow widgets in Business Space in additional scenarios such as human task, workflow, and escalation management. Uses innovative capabilities including on demand multi-column filtering and adaptive paging.
- ▶ Provides richer capabilities for process administrators to manage in-flight processes, including modifying ownership of a process instance, and enhanced activity repair capabilities such as resetting timers and repairing correlation sets.
- ▶ Enhancements that empower users and accelerate productivity across all process roles.
- ▶ Assistance in improving productivity with faster deployment of BPM solutions, from WebSphere Business Modeler and the command line, and faster iterative development with WebSphere Integration Developer.
- ▶ Improved user experience for Interactive Process Design scenarios with faster deployment.
- ▶ Enhances operational visibility with new and improved Business Space widgets for better service monitoring and health and problem determination.
- ▶ Improves problem determination with consistent fault handling across Service Component Architecture (SCA) bindings and cross-component trace enhancements.
- ▶ Enhances operational flexibility with new and improved Business Space widgets for better module administration.
- ▶ Improved time-to-value for implementing and deploying BPM solutions.
- ▶ Simplified system installation, including easier cluster configuration:
  - Provides consistent, flexible, and independent BPM topology and database configuration and management
  - Simplifies handling of runtime environment outages with support for unexpected service downtime with *store and forward* capability to queue events until service is restored
  - Eases the process of loading or unloading static relationship data with a data import and export capability
  - Uses web-based forms rendered from Lotus® Forms Server, in addition to the existing Lotus Forms Client rendering capabilities

- ▶ Enhancements designed to ease the effort of migrating from WebSphere Business Integration server solutions:
  - Enhances the maintainability of the generated Business Process Execution Language (BPEL) from migrated WebSphere InterChange Server repositories
  - Improves performance of WebSphere InterChange Server migration for improved user experience when migrating large repositories
- ▶ Enhanced support for open standards:
  - Java enhancements including Java EE 5 with EJB 3.0 and JPA, Java SDK 6 support, and enhanced Java integration
  - Web services enhancements including JAX-WS 2.0, WS-Addressing, Attachments, Kerberos token profile, and WS-Policy support
  - Interoperability with Open SCA, enhanced OSGi support, and enhanced XML fidelity
- ▶ Platform alignment and currency:
  - Uses and extends WebSphere Application Server V7.0, providing enhanced standard support, simplified system installation and administration, and enhanced WebSphere MQ V7 integration
  - Enables the use of Microsoft SQL Server 2008 as the underlying database for storing WebSphere Process Server program data (excluding Business Process Choreographer Explorer reporting capabilities)

### **New in WebSphere Business Monitor V7.0.0.2**

New capabilities enable tasks that achieve these benefits:

- ▶ Link the business strategy to operational metrics:
  - Identify business-interest metrics using BlueWorks and WebSphere Business Compass.
  - Capture real-time metrics to assess the impact of operational metrics on your business strategy.
- ▶ Achieve business flexibility: Attain real-time and consistent visibility into processes that changed or were migrated to new process versions.
- ▶ Accelerate the development of monitoring solutions:
  - Enjoy enhanced support for multi-user deployments for interactive process design.
  - Harness a quick-start monitoring solution to display potential metrics that can be monitored.

- ▶ Expand the reach of business activity monitoring:
  - Process events from additional IBM middleware, including Customer Information Control System (CICS®), Information Management System (IMS™), and WebSphere Sensor Events.
  - Rapidly develop monitoring solutions for WebSphere Message Broker customers.
  - Deliver XML events over Java Message Service (JMS) queues.
- ▶ Experience greater return on investment (ROI) by accelerating deployment and lowering total cost of ownership (TCO):
  - Enjoy streamlined installation configuration and accelerated deployments.
  - Configure security following a more streamlined path.
- ▶ Receive improved support for System z®:
  - Improve management and lower TCO because Linux® on System z or distributed WebSphere Business Monitor are now federated into a z/OS® cell.
  - Garner improved performance with the database on System z.

### **New in WebSphere Business Services Fabric V7.0.0.2**

New features and capabilities in this version of WebSphere Business Services Fabric include:

- ▶ High-availability support.
- ▶ The IBM Installation Manager now installs both the tool pack and the foundation pack.
- ▶ Context extraction now has a user interface (UI) that makes mapping convenient and easy to perform.
- ▶ Dynamic Assembly events have been integrated with WebSphere Business Monitor.
- ▶ WebSphere Business Services Fabric now tolerates (with certain restrictions) modules with version information.
- ▶ System messages and error codes have been updated for more efficient problem determination.
- ▶ WebSphere Business Services Fabric has been branded in the WebSphere Process Server administrative console.
- ▶ The WebSphere Business Services Fabric administrative console can now be launched from the unit test environment (UTE) Server.
- ▶ The tooling experience has been improved.

- ▶ Performance has been improved.
- ▶ REST API performance has been improved.
- ▶ BPM runtime integration has been improved.
- ▶ Support for SLES 11 and the DB2 9.7 environment has been added.

## 1.2.2 Installation changes in IBM BPM V7

Table 1-1 outlines changes to the installation process.

*Table 1-1 Improvements in the installation process in V7*

<b>BPM V6.2 install</b>	<b>BPM V7 install</b>
Mixed set of technology used for install. Some ISMP based, some install anywhere (IA) based, some install manager (IM) based.	All BPM Server and Tooling installers are now using the same technology, IBM Installation Manager (IM).
Mixed ways of doing service. Certain products use WebSphere Update Installer (UPDI), and others use compressed files only. Some are full product replacements, whereas others are using IM.	With the move to IM all the server and tooling products are now using IM for maintenance. This includes live repositories for downloading and installing maintenance, even during installations.
Mixed set of launchpads. Individual (and different) launchpads for different BPM products. Inconsistent terminology used between different product launchpads. Different look and feel between products.	Consistent launchpads are used across the BPM stack. One launchpad is used for all server installs, and one for all tooling installs. There is a consistent terminology and look and feel across the stack.
No WebSphere Dynamic Process Edition Server install. WebSphere Dynamic Process Edition Client (now tool and testing) install is just an IA-based silent install with many restrictions.	IM-based WebSphere Dynamic Process Edition installers for both the server and tool and the testing pack.
Creating a WebSphere Dynamic Process Edition profile is a multi-step process. It involves creating a fabric or monitor profile, then augmenting it with the other.	WebSphere Dynamic Process Edition profile templates provided for creating WDPE profiles in a single step.
The front end of the Profile Management Tool (PMT) is confusing. It mixes WebSphere Application Server and Stack profile types that are not consistent.	Moved up to use WebSphere Application Server V7 based PMT that is much easier to use and much clearer up front.



# **Business process management production topologies**

This chapter provides an introduction to supported business process management (BPM) topology patterns. This chapter describes the suggested topology pattern and includes guidelines for selecting a production topology that best meets project requirements.

## 2.1 Introduction

A BPM topology is the physical layout of the deployment environment required to meet business needs for capacity, availability, and scalability. Key aspects of BPM topology design are:

- ▶ The number of physical machines (in distributed environments)
- ▶ The number of servers on the physical machines
- ▶ The number of clusters needed to provide the production environment with high availability, failover, and the required processing capabilities

In addition, a production deployment topology includes other supporting resources such as a user registry (for security), one or more HTTP servers (for web content or Internet Protocol (IP) spraying), necessary firewalls, load balancers, and so forth.

Carefully plan the production deployment topology, considering the following:

- ▶ Number of physical machines and hardware resources required
- ▶ Number of clusters and cluster members required
- ▶ Number of databases required
- ▶ Authentication roles and security considerations
- ▶ Method that will be used to implement the deployment environment
- ▶ The cost of software and hardware

To make the topology design and implementation process easier, the IBM BPM suite includes a set of deployment environment patterns that represent common production topologies.

The deployment patterns offer a repeatable method that can be automated for creating the deployment environment that lowers the barrier to introduce them for better compliance with customer requirements. The patterns also allow the capture of the configuration for later export for use on other systems. However, manual deployment (through the Administrative Console) or a scripted install is still possible with IBM BPM V7. Whether a manual configuration topology is performed or deployment topology patterns are used, there are a number of components to consider when creating the topology. The following topology patterns are supported through a BPM install and configuration process:

- ▶ Single cluster topology
- ▶ Remote Messaging topology
- ▶ Remote Messaging and Remote Support topology
- ▶ Double Remote Messaging and Remote Support topology
- ▶ Remote Messaging, Support, and Web topology
- ▶ Five-cluster topology



**Note:** You can learn more about BPM topology patterns in *WebSphere Business Process Management V7 Production Topologies*, SG24-7854, and at the following websites:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.websphere.wps.doc/doc/cp1n\\_top\\_setup.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.websphere.wps.doc/doc/cp1n_top_setup.html)

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.btools.help.monitor.inst.doc/plan/ha\\_intro.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.btools.help.monitor.inst.doc/plan/ha_intro.html)

## 2.2 Production topologies

This section suggests production topologies for multiple IBM BPM run times.

### 2.2.1 WebSphere Process Server: Remote Messaging and Remote Support topology

The topology known as Remote Messaging and Remote Support is one of the BPM topology patterns. In the Remote Messaging and Remote Support pattern, the deployment environment functions are split across three separate clusters.

With this three-cluster pattern, resources are allocated to the cluster that handles the highest load. This pattern is the most flexible, most versatile, and is preferred by most users (except for z/OS). The components are divided between the three clusters.

For the vast majority of customers, especially those with large computing infrastructures, the Remote Messaging and Remote Support topology is preferred. The hardware requirements for distributed platforms are more intensive, but having three (or more) clusters with multiple members performing specific functions allows for greater flexibility in adjusting and tuning memory usage for the Java Virtual Machines (JVMs).

Creating three clusters, each with its own functions and applications, creates an additional administrative burden. As clusters and cluster members are added, performance tuning and troubleshooting burdens can expand tremendously. Spreading messaging engines across the members of the messaging cluster also adds to the administrative burden associated with creating and maintaining high-availability policies.

From a scalability standpoint, the Remote Messaging and Remote Support topology provides the most flexibility. Because each of the distinct functions

within WebSphere Process Server is divided among the three clusters, performance bottlenecks can be identified and the cluster size adjusted fairly easily. If additional CEI processing is needed, add a node and cluster member to the support cluster. Similarly, if more processing capability is needed for business processes or human tasks, additional nodes and members can be added to the application target cluster. Because expanding the messaging infrastructure beyond three cluster members has no affect on processing capability, the scalability limitations of the remote messaging policy also apply to the Remote Messaging and Remote Support topology.

As with the Remote Messaging topology, the Remote Messaging and Remote Support topology provide an ideal environment for long-running business processes, state machines, human tasks, and asynchronous interactions (including JMS and MQ/JMS bindings). Because the application target cluster only runs the business integration applications, performance tuning and diagnostics are much simpler than in the previous topologies, for which the application target cluster ran additional applications. The Remote Messaging and Remote Support topology is also ideal for environments that make extensive use of Common Event Infrastructure (CEI) for monitoring and auditing (including environments with WebSphere Business Monitor). Separating the support infrastructure into its own cluster provides a dedicated set of cluster members for CEI and for supporting applications, such as BPC Explorer and Business Space. Each infrastructure cluster contains:

- ▶ Remote Messaging cluster
  - Service Component Architecture (SCA) application bus members
  - SCA system bus members
  - Business Process Choreographer (BPC) bus members
  - CEI bus members
- ▶ Remote Support infrastructure cluster
  - CEI server application
  - Business Rules manager
  - BPC components such as BPC Explorer and BPC Observer
- ▶ Application deployment cluster
  - Application deployment target
  - BPC container

## **2.2.2 WebSphere Business Monitor: Remote Messaging, Remote Support, and Web topology**

The suggested deployment topology for WebSphere Business Monitor is based on the Remote Messaging, Remote Support, and Web topology four-cluster pattern. WebSphere Process Server is deployed in a separate remote cell that hosts CEI.

The WebSphere Business Monitor four-cluster topology uses the Remote Messaging, Remote Support, and Web topology deployment environment pattern. This pattern groups the WebSphere Business Monitor applications into four logical clusters in a single cell:

- ▶ Messaging engine cluster
  - Messaging engine for the WebSphere Business Monitor bus
  - Messaging engine for the CEI bus
- ▶ Support cluster
  - Event service
  - Event emitter services
  - Action services
  - Monitor scheduled services
- ▶ Application cluster
  - Monitor model applications
- ▶ Web cluster
  - Business Space application
  - Business Space widgets
  - Representational State Transfer (REST) services application
  - Alphablox®

**Note:** For improved performance, place the event emitter services and CEI event service on the same cluster. Event emitter services include the REST event emitter and the Java Message Service (JMS) event emitter.

### **WebSphere Business Monitor: Cross-cell queue-bypass mode**

In this topology WebSphere Business Monitor is installed in its own WebSphere Application Server cell. common business events (CBEs) issued by a remote WebSphere Process Server instance using the CEI service are delivered to the monitor model application through the WebSphere Business Monitor database. This event delivery mode is called queue-bypass.

## Topology summary

Figure 2-1 depicts the suggested production topology and shows the distribution of the main BPM components described in this book.

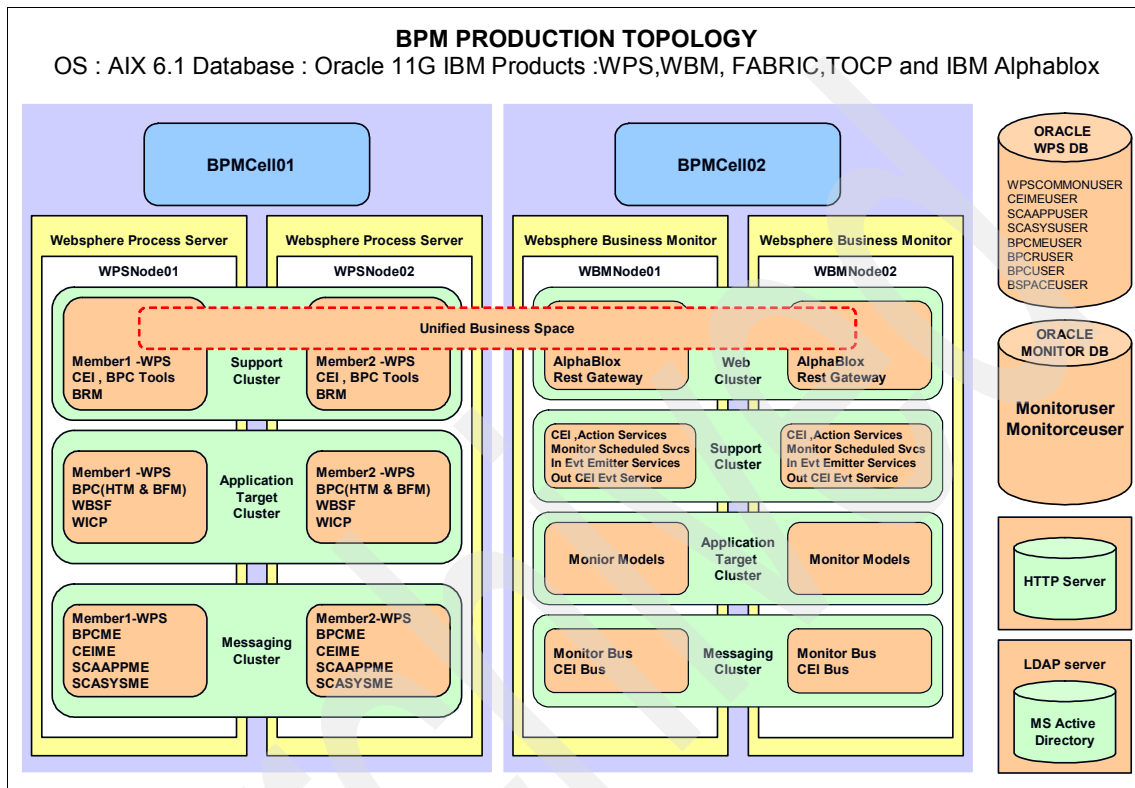


Figure 2-1 Recommended production topology

### 2.2.3 Guidelines on when to choose this topology

Choose this topology when the following are required:

- ▶ Process runtime and monitoring components on separate cells.
- ▶ Separate maintenance time for WebSphere Process Server and WebSphere Business Monitor installations.
- ▶ Different migration time frames for WebSphere Business Monitor and WebSphere Process Server.
- ▶ A reduction in production downtime by isolating deployment of both components in different cells.

- ▶ Greater flexibility in adjusting and tuning memory and CPU usage of the JVMs.
- ▶ Hardware requirements for distributed platforms are more intensive, but having separate clusters with multiple members performing specific functions provides this flexibility.
- ▶ Performance bottlenecks can be eliminated by adjusting the cluster size fairly easily. If additional CEI processing is needed, add a node and cluster member to the support cluster. Similarly, if more processing capability is needed for your business processes or human tasks, add additional nodes and members to the application target cluster.
- ▶ Performance tuning and diagnostics are much simpler, because all of the major components are deployed in individual clusters.

Archived

## Preparing the environment

This chapter describes how to prepare the environment with regard to:

- ▶ Detailed system requirements
- ▶ Software prerequisites for installation
- ▶ Software versions used in this IBM Redbooks publication
- ▶ Hardware versions used in this Redbooks publication
- ▶ Preparing the AIX® operating system for installation
- ▶ Preparing an Oracle database for WebSphere installation
  - Preparing an Oracle database for WebSphere Process Server installation
  - Preparing an Oracle database for WebSphere Business Monitor installation
- ▶ Creating a software repository

## 3.1 Detailed system requirements

Detailed system requirements for each product are separate and can be accessed on the web:

- ▶ WebSphere Process Server system requirements  
<http://www-01.ibm.com/support/docview.wss?uid=swg27016092>
- ▶ Prerequisites for installing WebSphere Process Server  
[http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.websphere.wps.doc/doc/cins\\_install\\_prereqs.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.websphere.wps.doc/doc/cins_install_prereqs.html)
- ▶ WebSphere Business Monitor system requirements  
<http://www-01.ibm.com/support/docview.wss?rs=802&uid=swg27016838>
- ▶ Prerequisites for installing WebSphere Business Monitor  
[http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.btools.help.monitor.inst.doc/inst/prep\\_inst.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.btools.help.monitor.inst.doc/inst/prep_inst.html)
- ▶ WebSphere Business Services Fabric system requirements  
<http://www-01.ibm.com/support/docview.wss?uid=swg27016905>

## 3.2 Software versions described in this book

Software packages referred to in this document are as follows:

- ▶ AIX operating system 6.1
- ▶ Oracle Enterprise Server 11g R1
- ▶ WebSphere Process Server V7.0.0.2, 64-bit
- ▶ WebSphere Business Monitor 7.0.0.2, 64-bit
- ▶ WebSphere Business Services Fabric 7.0.0.2, 64-bit

Prior to installing the product, the Oracle database server and LDAP need to be installed and configured. If they have not been, refer to the product documentation for installing that software. The Microsoft Active Directory, configured as the LDAP repository, is used for the purpose of this publication.



## 3.3 Hardware used in this book

For this publication, four AIX OS V6.1 machines are used, each with the following high-level configuration:

- ▶ 149 GB HDD
- ▶ 8 GB RAM

## 3.4 Preparing an AIX operating system

Preparing the operating system (OS) involves changes, such as allocating disk space and installing OS patches.

### 3.4.1 Preparing AIX system for installation of WebSphere products

IBM tests WebSphere Application Server products on each OS platform. Such tests verify whether an OS change is required for WebSphere Application Server products to run correctly. Without the required changes, WebSphere Application Server products do not run correctly.

To prepare an AIX system for installation:

1. Log in to the OS as a non-root user.
2. Set the `umask` value to 022 using the `umask 022` command.
3. The application server product contains IBM Software Development Kit (SDK) Version 6. Review the following SDK V6 requirements:
  - For SDK 6 to operate properly, run AIX v5.3 Maintenance Package AIX 5300-07 or later, or AIX v6.1.
  - To test whether this Java SDK is supported on a specific System p® system, at a system prompt, enter `lscfg -p | fgrep Architecture` and receive the reply `Model Architecture: chrp`.  
Only Common Hardware Reference Platform (CHRP) systems are supported.

The environment variable `LDR_CNTRL=MAXDATA` is not supported for 64-bit processes. Use `LDR_CNTRL=MAXDATA` on 32-bit processes only. To display the value of this variable, enter the `echo $LDR_CNTRL` command.

4. Use the System Management Interface Tool (SMIT) to display a list of installed packages to determine whether updates are needed. If so, update the packages as follows:
  - a. Download the most current version of the INFOZIP product to avoid problems with compressed files. Although compressed files are primarily used in the service stream, prepare the AIX operating system by downloading a current version of the INFOZIP package from:  
<http://www.info-zip.org>
  - b. Provide adequate disk space. The amount of disk space required varies with the number of features and products installed. If the installation wizard is being used for this installation, the installation summary panel indicates the approximate amount of disk space required based on the features and products selected. Installing all features and products, including the centralized installation manager (CIM), requires approximately 15 GB of disk space. This estimate includes the following products:
    - Centralized Installation Manager
    - WebSphere Application Server product installation
    - IBM HTTP Server
    - WebSphere Process Server
    - WebSphere Business Monitor
    - WebSphere Business Services Fabric

With the Journaled File System (JFS) on AIX, allocate expansion space for directories. If the installation wizard does not have enough space, ISMP issues a system call for more space that increases the space allocation dynamically. The message when this occurs for the /usr directory is similar to:

The /usr file systems will be expanded during the installation

5. Unmount file systems with broken links to avoid `java.lang.NullPointerException` errors. Installation can fail with the error shown in Figure 3-1 when there are broken links to the file systems.

*Example 3-1 Installation failure error because of broken links to file systems*

---

An error occurred during wizard bean change notification:

```
java.lang.NullPointerException
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getFileSystemData(AixFileUtils.java:388)
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getPartitionDataWithExecs(AixFileUtils.java:172)
  at com.ibm.wizard.platform.aix.AixFileUtils.
    getPartitionData(AixFileUtils.java:104)
```

```
at com.ibm.wizard.platform.aix.AixFileServiceImpl.  
getPartitionNames(AixFileServiceImpl.java:397)
```

---

6. Use the **df -k** command to check for broken links to file systems. Look for file systems that list blank values in the 1024-blocks size column. Columns with a value of a dash (-) are not a problem. Use the **umount** command to resolve such problems. Start the installation again. If the problem continues, unmount any file systems that have blank values. If this does not solve the problem, reboot the machine and restart the installation.
7. Verify that prerequisites and corequisites are at the required release levels. Although the installation wizard checks for prerequisite OS patches with the `prereqChecker` application, review the prerequisites on the supported hardware and software website not already reviewed.
8. Verify that the Java SDK on the installation image disk is functioning correctly if you had created the disk. For example, the installation might have been downloaded from Passport Advantage®, or it might have been copied from the installation image onto a backup disk. In either case, perform the following steps to verify that the disk contains a valid Java SDK:
  - a. Change directories to the `JRE_HOME` directory on the product disk. For example:

```
cd /JDK/jre.pak/repository/package.java.jre/java/jre/bin
```
  - b. Verify the Java version. Type the following command:

```
./java -version
```

The command completes successfully with no errors when the SDK is intact.
9. Optional: Install the Mozilla Firefox browser. The Mozilla Firefox browser supports the launchpad console. Follow these instructions for installing Firefox Version 1.7 or later on AIX:
  - a. Download the latest supported version of Mozilla Firefox (1.7 or later) for AIX.
  - b. Download the install image and install it from the SMIT.
  - c. Optional: Export the location of the supported browser using a command that identifies the actual location of the browser. If the Mozilla Firefox package is in the `bin/firefox` directory, for example, use the following command to export it:

```
export BROWSER=/usr/bin/firefox
```
10. For silent installations only: Make an allowance for a known ISMP problem that causes a call to the X Windows service during a silent installation.

The DISPLAY environment variable on the AIX machine might point to an X server that is not logged in.

To show the value of this variable, use the **echo \$DISPLAY** command.

Two common scenarios can cause this to occur:

- Your AIX machine has an X server running, but the X server is stuck at the graphical login screen because you have not yet logged in.
- Your AIX machine is configured to display X Windows applications on a remote X server that is not logged in.

A silent installation can hang in either case, as ISMP calls X windows services. There are two solutions for this:

- Log in to the local X server using the GUI before beginning the silent installation.
- Export the DISPLAY environment variable to point to a null or blank. To export, run the **export DISPLAY=null** command.

### 3.4.2 Preparing AIX system for WebSphere Business Monitor installation

Use the information in this section to prepare the AIX operating system for a WebSphere Business Monitor installation.

#### Before you begin

Because WebSphere Application Server is a prerequisite of WebSphere Business Monitor, you must complete the required preparation steps outlined in 3.5.1, “Preparing the database for WebSphere Process Server” on page 24, prior to carrying out the steps in 3.5.2, “Preparing the database for WebSphere Business Monitor” on page 31.

#### About this task

Certain steps are specific to an OS version, so all steps might not apply to an environment. If no qualifier is provided for a given step, complete the step on all versions of the OS. Complete the following steps on your AIX system before installing WebSphere Business Monitor:

1. If portlet-based dashboards will be installed, set the maximum number of open files using the **ulimit -n 20000** command before installing WebSphere Portal or portlet-based dashboards.

Alternatively, use the following steps to edit the resource limits file:

- a. Open `/etc/security/limits`.
- b. Edit or add the default section and enter `nofiles = 20000`.

- c. Save and close the file.
- d. Log off from the OS and log in again.
2. Set the umask value to 022 using the **umask 022** command.
3. For installation purposes, ensure that the Mozilla browser, V1.7.13.1 or later, is installed.

## 3.5 Preparing the Oracle database for a WebSphere installation

Before starting this task:

1. Download the Oracle JDBC drivers from the Oracle website:  
[http://www.oracle.com/technology/software/tech/java/sqlj\\_jdbc/index.html](http://www.oracle.com/technology/software/tech/java/sqlj_jdbc/index.html)
2. Keep these files in a temporary location and copy them later to the WebSphere Process Server system into the following directories:
  - For UNIX® operating system: /opt/ProcServer1/OracleDrivers
  - For Windows operating system: wps\_install\_root/OracleDrivers

### Configuring the Oracle database to enable Oracle JVM

The Oracle database must be configured to enable Oracle JVM. The user of this procedure is required to have SYS privileges.

To enable the Oracle JVM, perform the following steps:

1. As the SYS user, determine whether the Oracle JVM component is already installed by invoking the query from SQL\*Plus (Example 3-2).

*Example 3-2 Determine whether JVM is installed*

---

```
select comp_name, version, status from dba_registry;
```

You see the following messages:

```
COMP_NAME VERSION STATUS
Oracle Database Catalog Views 11.7.0.1.0 VALID
Oracle Database Packages and Types 11.7.0.1.0 VALID
Oracle Workspace Manager 11.7.0.1.0 VALID
JServer JAVA Virtual Machine 11.7.0.1.0 VALID
Oracle XDK 11.7.0.1.0 VALID
Oracle Database Java Packages 11.7.0.1.0 VALID
```

---

- To enable Oracle JVM, use the Oracle Database Configuration Assistant or specific SQL scripts. For details, see the Oracle documentation available at: <http://www.oracle.com/technology/documentation/index.html>

### Configuring Oracle Database for XA

The Oracle database must be configured to enable XA. Perform the following steps as a database user with SYS access:

- Configure the database for XA by running the following script on the common database:

```
oracle_root/javavm/install/initxa.sql script
```

- Run the queries shown in Example 3-3.

*Example 3-3 Configuring the database for XA*

---

```
grant select on pending_trans$ to public;
grant select on dba_2pc_pending to public;
grant select on dba_pending_transactions to public;
```

---

The above steps ensure that the Oracle database has been modified to enable Oracle JVM and to allow XA transactions.

## 3.5.1 Preparing the database for WebSphere Process Server

This publication is based on a production topology with the database being on a separate (remote) system, that is:

- ▶ WebSphere products are installed on a separate system.
- ▶ Oracle is installed on its own system.

### Preparing the environment

Plan for the minimum space required by Oracle tablespaces used by WebSphere Process Server components (Table 3-1).

*Table 3-1 WebSphere Process Server database space requirements*

Component	Minimum space needed
Common database	200 MB
Common event infrastructure (CEI)	400 MB
Business Process Choreographer (BPC) container	1.3 GB
BPC reporting	600 MB

Component	Minimum space needed
Messaging engines	425 MB
Business Space	200 MB

More information about database configuration for WebSphere Process Server components like CEI, BPC, enterprise service bus logger mediation, messaging engine, selector, Business Space, and business rules group is outlined at:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.websphere.wps.doc/doc/cins\\_db\\_specs.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.websphere.wps.doc/doc/cins_db_specs.html)

### Database privileges

Database privileges need to be set up to determine the access required to create or access your data store tables for each supported database management system.

### Minimum privileges required to use data store tables

The user ID requires SESSION privileges to connect to the database. If the same user ID owns both the data store schema and the component that is connecting to the database, the user ID has sufficient privilege to manipulate the tables. Otherwise, the user ID requires SELECT, INSERT, UPDATE, and DELETE object privileges on the tables that make up the data store, and DROP ANY TABLE system privilege to enable use of the TRUNCATE TABLE statement.

The Oracle database must be created using a UTF-8 character set that supports the other customer character sets supported by the WebSphere Process Server.

### Additional privileges required to create the data store tables

The user ID requires sufficient privileges to create relational tables and indexes in the data store schema. The database also requires a space quota in the default tablespace of the owner of that schema. Table 3-2 outlines configuration and runtime privileges for Oracle components.

Table 3-2 Additional Oracle database privileges

Component	Configuration privileges	Runtime privileges
Common DB	CREATE TABLE, CREATE INDEXTYPE, ALTER TABLE, INSERT, CREATE SEQUENCE, CREATE USER, ALTER USER, CREATE TABLESPACE	SELECT, UPDATE, DELETE, INSERT, CREATE VIEW, CREATE PROCEDURE

Component	Configuration privileges	Runtime privileges
BPC	CREATE TABLE, ALTER TABLE, CREATE VIEW, CREATE TABLESPACE, CREATE USER, CREATE PROCEDURE	SELECT, UPDATE, DELETE, INSERT
CEI	CREATE TABLE, CREATE INDEXTYPE, ALTER TABLE, CREATE VIEW, ALTER SESSION, SELECT, UPDATE, DELETE, INSERT, CREATE TABLESPACE, CREATE PROFILE, CREATE ROLE, CREATE PROCEDURE, CREATE TEMPORARY TABLESPACE	SELECT, UPDATE, DELETE, INSERT, CREATE PROCEDURE
Messaging Engines	CREATE TABLE, CREATE INDEXTYPE	SELECT, UPDATE, DELETE, INSERT, DROP ANY TABLE

### Creating tablespaces for WebSphere Process Server components

Table 3-3 lists the scripts that are available for a WebSphere Process Server installation.

*Table 3-3 Scripts available for WebSphere Process Server installation*

Tablespace name	WPS component	Location/script name
AUDITLOG	BPC	WPS_HOME/profiles/<DMGR_profile>/dbscripts/ProcessChoreographer/<oracle_sid>/<BPC User>/createSchema.sql
INSTANCE	BPC	WPS_HOME/profiles/<DMGR_profile>/dbscripts/ProcessChoreographer/<oracle_sid>/<BPC User>/createSchema.sql
STAFFQRY	BPC	WPS_HOME/profiles/<DMGR_profile>/dbscripts/ProcessChoreographer/<oracle_sid>/<BPC User>/createSchema.sql



Tablespace name	WPS component	Location/script name
TEMPLATE	BPC	WPS_HOME/profiles/<DMGR_profile>/dbscripts/ProcessChoreographer/<oracle_sid>/<BPC User>/createSchema.sql
WORKITEM	BPC	WPS_HOME/profiles/<DMGR_profile>/dbscripts/ProcessChoreographer/<oracle_sid>/<BPC User>/createSchema.sql
LOBTS	BPC	WPS_HOME/profiles/<DMGR_profile>/dbscripts/ProcessChoreographer/<oracle_sid>/<BPC User>/createSchema.sql
INDEXTS	BPC	WPS_HOME/profiles/<DMGR_profile>/dbscripts/ProcessChoreographer/<oracle_sid>/<BPC User>/createSchema.sql
SCHEDTS	BPC	WPS_HOME/profiles/<DMGR_profile>/dbscripts/ProcessChoreographer/<oracle_sid>/<BPC User>/createSchema.sql
OBSVRTS	BPC Reporting Function	WPS_HOME/profiles/<DMGR_profile>/dbscripts/ProcessChoreographer/<oracle_sid>/<BPC User>/createSchema_Observer.sql
OBSVRLOB	BPC Reporting Function	WPS_HOME/profiles/<DMGR_profile>/dbscripts/ProcessChoreographer/<oracle_sid>/<BPC User>/createSchema_Observer.sql
OBSVRIDX	BPC Reporting Function	WPS_HOME/profiles/<DMGR_profile>/dbscripts/ProcessChoreographer/<oracle_sid>/<BPC User>/createSchema_Observer.sql
BSPBSPACE	Business Space	WPS_HOME/profiles/<DMGR_profile>/dbscripts/BusinessSpace/<Support Cluster>/Oracle/<oracle_sid>/createTables_BusinessSpace.sql
BSPREGTABSPACE	Business Space Mashup	WPS_HOME/profiles/<DMGR_profile>/dbscripts/BusinessSpace/<Support Cluster>/Oracle/<oracle_sid>/CreateTablespace.sql
{CEIUSER}_cei_ts_extended	CEI	WPS_HOME/profiles/<DMGR_profile>/databases/event/<SupportCluster>/dbscripts/oracle/cr_ts.ora

Tablespace name	WPS component	Location/script name
{CEIUSER}_c ei_ts_base	CEI	WPS_HOME/profiles/<DMGR_profile>/databases/event/<SupportCluster>/dbscripts/oracle/cr_ts.ora
{CEIUSER}_c ei_ts_temp	CEI	WPS_HOME/profiles/<DMGR_profile>/databases/event/<SupportCluster>/dbscripts/oracle/cr_ts.ora
{CEIUSER}_c ei_ts_catalog	CEI	WPS_HOME/profiles/<DMGR_profile>/databases/event/<SupportCluster>/dbscripts/oracle/cr_ts.ora

### Tablespaces for CommonDB and messaging

The tablespaces named in Table 3-4 are required for the WebSphere Process Server database. By default, these scripts are not provided in the WebSphere Process Server install and, therefore, need to be created by a database administrator. Custom database scripts are provided with this book. These can be used for production deployments.

**Notes:** The tablespace names are suggestions. Changing the tablespace name can be done in the `01createWPS0raTablespaces.sql` script. If the tablespace names are being changed in this script, they need to be changed in the script `02CreateWPS0raUsers.sql`.

Ensure that 3.5 GB of storage space is available on the file system before you execute the create tablespace script for the WebSphere Process Server.

Table 3-4 Custom database scripts suitable for production deployments

Tablespace name	Description	Location
WPS_COMMON_TBS	Tablespace for common database	Custom script provided
WPS_MEAPP_TBS	Tablespace for SCA application messaging engine	Custom script provided
WPS_MESYS_TBS	Tablespace for SCA system messaging engine	Custom script provided
WPS_MECEI_TBS	Tablespace for CEI messaging engine datastore	Custom script provided
WPS_MEBPC_TBS	Tablespace for BPC messaging engine datastore	Custom script provided

Tablespace name	Description	Location
WPS_TEMP_TBS	Temporary tablespace for all WebSphere Process Server components	Custom script provided

We combined all of the scripts from the locations listed in Table 3-4 on page 28 into a single script for creating tablespaces for WebSphere Process Server components. Database administrators can customize the attached script and use it to create tablespaces for WebSphere Process Server environments.

## Running the script

To run the script:

1. Edit the script to change the following values:
  - Define datafile paths as needed.
  - Prefix {CEI USER name} with CEI event tablespace names.
2. Execute the `@1createWPS0raTablespaces.sql` script by entering the following command as user Oracle:

```
sqlplus sys/<yourPassword>@<db_name> AS SYSDBA
@01createWPS0raTablespaces
```

3. Create Oracle users for WebSphere Process Server components.

A set of users needs to be created by the database administrator.

**Note:** The user names created in step 3 are suggestions and can be changed in the `@1createWPS0raUsers.sql` script.

Table 3-5 lists the required users and user names.

*Table 3-5 Required Oracle users for WebSphere Process Server*

DB user	Tablespace access	Privileges	Description
WPS_CDB USER	WPS_COMMON_T BS	CONNECT,RESOU RCE,UNLIMITED TABLESPACE	Common DB user
WPS_BPC USER	AUDTLOG,INSTAN CE,STAFFQRY,TE MPLATE,WORKITE M,LOBTS,INDEXTS ,SCHEDTS	CONNECT,RESOU RCE,UNLIMITED TABLESPACE	BPC DB User

DB user	Tablespace access	Privileges	Description
WPS_OBS USER	OBSVRTS,OBSVR LOB,OBSVRIDX	CONNECT,RESOU RCE,UNLIMITED TABLESPACE	Observer DB user
WPS_CEI USER	W_CEIUSER_cei_t s_extended,W_CEI USER_cei_ts_base, W_CEIUSER_cei_t s_temp,W_CEIUSE R_cei_ts_catalog,W _CEIUSER_cei_ts_ catalog	CONNECT,RESOU RCE,UNLIMITED TABLESPACE	CEI DB user
WPS_BSP USER	BSPREGTABSPAC E,BSPBSPACE	CONNECT,RESOU RCE,UNLIMITED TABLESPACE	Business Space DB user
WPS_APP MSGUSER	WPS_MEAPP_TBS	CONNECT,RESOU RCE	SCA application messaging datastore DB user
WPS_SYS MSGUSER	WPS_MESYS_TBS	CONNECT,RESOU RCE	SCA system messaging datastore DB user
WPS_CEI MSGUSER	WPS_MECEI_TBS	CONNECT,RESOU RCE	CEI messaging datastore DB user
WPS_BPC MSGUSER	WPS_MEBPC_TBS	CONNECT,RESOU RCE	BPC messaging datastore DB user

## Running the script

To run the script:

1. Optional: Edit the script to change the user names to those created in Table 3-5 on page 29.
2. Execute the 02createWPS0raUsers.sql script by entering the following command as user Oracle on the database system:

```
sqlplus sys/<yourPassword>@bpm7ora AS SYSDBA
@02createWPS0raUsers.sql
```

## Creating database objects for common database

After the tablespaces and users have been created, the next step is to create the database objects for the common database. This can only be done after the WebSphere Process Server profile has been created, as the profile creation

code also generates the database object creation scripts and copies them to a specified location. Certain scripts generated by the process server profile creation also create the database tablespace along with database objects.

Included with this book are custom scripts for creating the required database objects that can be used for production deployments.

**Note:** If you have used the scripts provided with this book for creating a tablespace and users, use these same scripts for creating WebSphere Process Server database objects.

### 3.5.2 Preparing the database for WebSphere Business Monitor

This section describes the database storage requirements, database privileges, and creation of Oracle users and tablespaces for the WebSphere Business Monitor database.

A minimum of 1.5 GB storage space is required for following WebSphere Business Monitor database components (Table 3-6).

*Table 3-6 Tablespace requirements for the WebSphere Business Monitor database*

Component	Minimum space needed
Monitor and Alphablox	1.1 GB
Monitor messaging engine data store	100 MB

## Creating Tablespaces for the WebSphere Business Monitor

The scripts listed in Table 3-7 are available for installation of the tablespaces for the WebSphere Business Monitor.

**Note:** These tablespace names are suggestions and can be changed in the 01createWBM0raTablespaces.sql script. If the tablespace names are being changed in this script, they also must be changed in the 02CreateWBM0raUsers.sql script.

Ensure that 1.3 GB storage space is available on the file system before you execute the create tablespace script for WBM.

Table 3-7 Tablespace names for WebSphere Business Monitor

Tablespace name	Description	Script location/file name
MONDSTS	Monitor DataServices and Alphablox Tables	WBM_HOME/profiles/<DMGR_profile>/dbscripts/Monitor/Oracle/createDatabase.sql
MONDMSTS	Monitor data movement service	WBM_HOME/profiles/<DMGR_profile>/dbscripts/Monitor/Oracle/createDatabase.sql
MONIDXTS	Monitor index	WBM_HOME/profiles/<DMGR_profile>/dbscripts/Monitor/Oracle/createDatabase.sql
MONLOBTS	Monitor large objects	WBM_HOME/profiles/<DMGR_profile>/dbscripts/Monitor/Oracle/createDatabase.sql
MON_ME_TBS	Monitor messaging engine	Not available as part of the product installation. Available as part of the custom tablespace script provided with this publication.

**Note:** The tablespace names are suggestions and can be changed in the 01createWBM0raTablespaces.sql script. If the tablespace names are being changed in the above script, you also must change the names in the 02CreateWBM0raUsers.sql script.

Ensure that 1.3 GB storage space is available on the file system before you execute the create tablespace script for WBM.

## Running the script

To run the script:

1. Edit the script to change the datafile paths as needed.
2. Execute the 01createWBM0raTablespaces.sql script by entering the following command when logged in as user Oracle on the database system (Example 3-4):

```
./sqlplus sys/<yourPassword>@<db_name> AS SYSDBA  
@01createWBM0raTablespaces
```

*Example 3-4 Run the script to create Oracle tablespace names*

---

```
$ ./sqlplus sys/Bpm7admin@bpm7ora AS SYSDBA  
@01createWBM0raTablespaces
```

---

## Creating users for WebSphere Business Monitor

The users listed in Table 3-8 need to be created by the database administrator.

Table 3-8 WebSphere Business Monitor database users

Database user	Tablespace access	Privileges	Description
WBM_MONUSER	MONDSTS,MONDMSTS	CONNECT,RESOURCE,UNLIMITEDTABLESPACE	Monitor and Alphablox user
WBM_MSGUSER	WBM_ME_TBS	CONNECT,RESOURCE	Monitor messaging datastore user
WBM_CEIMSGUSER	WBM_CEI_TBS	CONNECT,RESOURCE	Monitor CEI messaging user

**Note:** The user names are only suggestions. Changing the user name can be done in the 01createWBM0raUsers.sql script.

### Run the script

To run the script:

1. Optional: Edit the script to change the user names
2. Execute 02createWBM0raUsers.sql by entering the following command as user Oracle on the database system (Example 3-5):

```
sqlplus sys/<yourPassword>@bpm7ora AS SYSDBA  
@02createWBM0raUsers.sql
```

*Example 3-5 Run the script to create users in the WebSphere Business Monitor*

---

```
./sqlplus sys/Bpm7admin@bpm7ora AS SYSDBA @02createWBM0raUsers.sql
```

---



## 3.6 Creating a software repository

A repository is a folder that contains the installation software and fix packs. In the lab environment for this product, we used a 64-bit OS and installed the 64-bit version of the products. However, either the 64-bit or 32-bit product can be installed. Table 3-9 lists the software repository that pertains to this Redbooks publication.

Table 3-9 Inventory of software repository used in this publication

Product/fix pack	Source file part number (file name)	Details
WebSphere Process Server	CZ7GTM(L(WPS_v7_AIX64_Insta11.tar.gz)	Can be downloaded from the passport site
WebSphere Business Monitor	CZ8WOM(L(Monitor_V7.0_AIX_64.tar.gz)	Can be downloaded from the passport site
WebSphere Business Services Fabric	CZAQ9M(L(CZAQ9M.tar.gz)	Can be downloaded from the passport site
IBM WebSphere HTTP Server v7.0 (IBM WebSphere Application Server Network Deployment V7.0 Supplements )	C1G2RM(L(C1G2RM.tar.gz)	Can be downloaded from the passport site
WebSphere Process Server fix pack 2	wps.7002.repository.zip	Can be downloaded from the passport site
WebSphere Application Server XML fix pack	xml.1.0.0.5.fp.zip	<a href="http://public.dhe.ibm.com/software/websphere/downloads/xml/service/1.0/fixpacks">http://public.dhe.ibm.com/software/websphere/downloads/xml/service/1.0/fixpacks</a>
SCA fix pack	sca.1.0.1.3.fp.zip	<a href="http://public.dhe.ibm.com/software/websphere/downloads/sca/service/1.0/fixpacks/">http://public.dhe.ibm.com/software/websphere/downloads/sca/service/1.0/fixpacks/</a>
WebSphere Business Monitor fix pack 2	7.0.0-WS-WBM-FP0000002.zip	<a href="http://www-01.ibm.com/support/docview.wss?rs=802&amp;uid=swg24026057">http://www-01.ibm.com/support/docview.wss?rs=802&amp;uid=swg24026057</a>
WebSphere Business Services Fabric fix pack 2	WBSF7.0.0.2-foundation-pack-cd-image-multiplatform.zip	<a href="http://www-01.ibm.com/support/docview.wss?uid=swg24026479">http://www-01.ibm.com/support/docview.wss?uid=swg24026479</a>

Product/fix pack	Source file part number (file name)	Details
WBSF7.0.0.2-foundation-pack-cd-image-multiplatform.zip	WICP7.0.0.2-banking-cd-image.zip	<a href="http://www-01.ibm.com/support/docview.wss?uid=swg24026640">http://www-01.ibm.com/support/docview.wss?uid=swg24026640</a>

To unpack the product images and prepare the response files:

1. Download the product image for your OS.
2. Copy the product image (WPS\_v7\_AIX64\_Install.tar.gz) downloaded in to the software repository <base\_dir> and extract it (Example 3-6).

*Example 3-6 Command to uncompress the image files*

---

```
gunzip -c WPS_v7_AIX64_Install.tar.gz | tar xvf -
```

---

3. Download the fix pack images for your OS, uncompress them (Example 3-6), and extract them into <fixpack\_dir> from fixpack central. “Creating a software repository” on page 35 contains detailed information about the fix pack.

**Note:** Learn more about WebSphere Process Server latest fix packs at:  
<http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg27006649>

# WebSphere Process Server: Remote Messaging and Remote Support topology

This chapter provides instructions for installing WebSphere Process Server binaries as a non-root user in silent mode, using response files and creating an Remote Messaging and Remote Support topology deployment environment pattern for WebSphere Process Server V7.0.

This chapter emphasizes the need for an installation to work without root access and without a GUI. Reasons for a non-root, non-GUI (silent) installation, important in a production environment, are:

- ▶ As part of their corporate information security and auditing policies, customers prefer to install vendor software using non-root user IDs.
- ▶ Because the customer can have a multitude of vendor products on the same operating system (OS)/environment that is managed by the system administrators with root privileges, customers like to separate out the responsibilities of an OS/system administrator from that of a vendor software installation/administration person.
- ▶ Companies restrict the use of browsers on production environments and therefore need a non-GUI (silent) installation.

## 4.1 Topology summary

In this environment, the Remote Messaging and Remote Support topology is deployed on two nodes. This deployment environment pattern of an Remote Messaging and Remote Support topology consists of three clusters. The clusters and components of each are:

- ▶ Remote Messaging cluster
  - Service Component Architecture (SCA) application bus members
  - SCA system bus members
  - Business Process Choreographer (BPC) bus members
  - Common event infrastructure (CEI) bus members
- ▶ Remote Support cluster
  - CEI server application
  - Business rules manager
  - BPC components
  - Business Space components
- ▶ Application deployment cluster
  - Application deployment target
  - BPC container

## 4.2 Installing WebSphere Process Server binaries

The WebSphere Process Server binaries are installed in silent installation mode and as a non-root user. Using silent mode, the UI is not available. Instead, a response file is used that includes the required commands for installation. The procedure that follows presumes that, prior to this installation, the existing system does *not* have any installations of the prerequisite base products necessary for WebSphere Process Server installation. Prerequisite products include Installation Manager, WebSphere Application Server Network Deployment, WebSphere Application Server Feature Pack for XML, and WebSphere Application Server Feature Pack for SCA with the service data objects (SDO) feature.

Before product installation is started, prepare the OS and ensure that the software repository is available, as described in Chapter 3, “Preparing the environment” on page 17.

## 4.2.1 Preparing response files to install WebSphere Process Server as a non-root user

The following steps prepare the response files located in the software repository downloaded in 3.6, “Creating a software repository” on page 35:

1. The response file and script for installing the WebSphere Process Server are located in the following `<base_dir>/responsefiles/WBI` directory. The files are:
  - Script file: `run_templates`
  - Response file: `template_response.xml`
2. Back up the original `run_templates` script and `template_response.xml` response file (Example 4-1).

*Example 4-1 Backup commands*

---

```
$ mv run_templates wps_binary_install
$ mv template_response.xml wps_binary_install_template.xml
```

---

3. Edit the `wps_binary_install` script in accord with Example 4-2. All changes that are required are highlighted in **bold**.

*Example 4-2 Edit the install script*

---

```
#!/bin/sh
#####
# sample_run_templates
#
# Note: Before you run this script, make sure that you modify the
# parameters that follow this comment. Also make sure that you
# have modified all of the options in the response file template.
# If required also comment out steps that
# you do not need to perform (for example, comment out WAS install
# if the product is already installed on your system).
#
# All templates are run relative to the directory in which this
# script runs.
#
#####
#
# Set the directory name where this file is located.
curdir="`pwd`"
PROGDIR="`dirname "$0`"
cd "${PROGDIR?}"
PROGDIR="`pwd`"
```

```
cd "${curdir?}"
TEMPDIR=/tmp/wbpm/install
```

```
##### PARAMETERS #####
WAS_IMAGE="${PROGDIR}"/../WAS
# AIX default WAS_LOCATION=/usr/IBM/WebSphere/ProcServer
# HP-UX default WAS_LOCATION=/opt/IBM/WebSphere/ProcServer
# SunOS default WAS_LOCATION=/opt/IBM/WebSphere/ProcServer
# Linux default WAS_LOCATION=/opt/ibm/WebSphere/ProcServer
# WAS_LOCATION = the path to the directory where WebSphere
Application Server Network Deployment will be installed to
WAS_LOCATION=/opt/IBM/WebSphere/ProcServer
IM_IMAGE="${PROGDIR}"/../IM
KEYRING=
#####
# Install WebSphere Application Server Network Deployment silently
as a non-root user.
#
# Note: Comment out this section if WebSphere Application Server
Network Deployment is already installed
#####
"${WAS_IMAGE}"/install -silent -OPT
silentInstallLicenseAcceptance=true -OPT
allowNonRootSilentInstall=true -OPT disableOSPrereqChecking=true
-OPT disableNonBlockingPrereqChecking=true -OPT
installType=installNew -OPT profileType=none -OPT
feature=samplesSelected -OPT feature=languagepack.console.all -OPT
feature=languagepack.server.all -OPT
installLocation="${WAS_LOCATION}"

echo WAS rc: $?

#####
# Install WebSphere Process Server and prerequisite products.
#
# The example template runs the following procedures:
# 1. Install or update to IM v1.3.2
# 2. Synchronize the WebSphere Application Server Network
Deployment installation with IM
# 3. Install the WebSphere Application Server Feature Pack for XML
# 4. Install the WebSphere Application Server Feature Pack for SCA
# 5. Install WebSphere Process Server using IM
#
# To modify install options modify the template_response.xml file
```

```
#####
# Installs WebSphere Process Server silently as non-root user

echo "${IM_IMAGE}"/userinst --launcher.ini
"${IM_IMAGE}"/user-silent-install.ini -input
"${PROGDIR}"/wps_binary_install.xml -log
"${WAS_LOCATION}"/wps/silent_install.log

"${IM_IMAGE}"/userinst --launcher.ini
"${IM_IMAGE}"/user-silent-install.ini -input
"${PROGDIR}"/wps_binary_install.xml -log
"${WAS_LOCATION}"/wps/silent_install.log

exit $?

```

---

4. Edit the `wps_binary_install_template.xml` file as shown in Example 4-3. All changes that are required are highlighted in **bold**.
  - a. Edit the repository section to add fix pack repositories. Add the location of local repositories that have been downloaded and extracted in the repository section.

*Example 4-3 Edit `wps_binary_install_template.xml` file*

---

```
<server>
  <!-- ##### IM Repository Location
  #####-->
  <repository location='../IM/' temporary='true' />
  <!-- ##### WebSphere Application Server Import Repository
  Location #####-->
  <repository location="../WAS_SYNC/" />
  <!-- ##### WebSphere Application Server Feature Pack for
  XML Repository Location #####-->
  <repository location="../repository/" />
  <!-- ##### WebSphere Application Server Feature Pack
  for SCA Repository Location #####-->
  <repository location="../repository/" />
  <!-- ##### WebSphere Process Server and WebSphere
  Enterprise Service Bus Repository Location #####-->
  <repository location="../repository/" />
  <repository location="/opt/srceimg/fixpacks/SCA/sca.1.0.1.3.fp/" />
  <repository
  location="/opt/srceimg/fixpacks/XML/xml.1.0.0.5.fp/" />
  <repository
  location="/opt/srceimg/fixpacks/WPS/wbis.7002.repository/" />
  <!-- ##### WebSphere Application Server Live Update
  Repository #####-->

```

```

<!--<repository
location="http://public.dhe.ibm.com/software/websphere/repositories/"
/>-->
</server>

```

---

- b. Edit the location of the Installation Manager (Example 4-4).

**Note:** For this publication, the response file has been modified to specify that the Installation Manager be installed in /opt/IBM/IM/eclipse and the cache installed in /opt/IBM/IM/eclipseCache.

*Example 4-4 Edit the Installation Manager location*

---

```

<!--
#####
#####
This profile node defines where IBM Installation Manager (IM)
is/or will be installed.
If you want to modify where IM is installed modify both the
installLocation and eclipseLocation values to specify the correct
directory
#####
#####-->
<profile kind='self' installLocation='/opt/IBM/IM/eclipse'
id='IBM Installation Manager'>
  <data key='eclipseLocation' value='/opt/IBM/IM/eclipse' />
</profile>

```

---

- c. Edit the profile install location. References to the Installation Manager profile refer to the binary installation location, *not* the WebSphere Application Server profiles (Example 4-5).

*Example 4-5 Edit profile install location*

---

```

If you would like to create the default profile uncomment and
provide valid values for the ID and password properties below
#####
#####
# AIX default
installLocation/eclipseLocation='/usr/IBM/WebSphere/ProcServer'
# HP-UX default
installLocation/eclipseLocation='/opt/IBM/WebSphere/ProcServer'
# SunOS default
installLocation/eclipseLocation='/opt/IBM/WebSphere/ProcServer'

```



```

# Linux default
installLocation/eclipseLocation='/opt/ibm/WebSphere/ProcServer'
-->
<profile installLocation='/opt/IBM/WebSphere/ProcServer' id='IBM
WebSphere Application Server - ND'>
  <data key='eclipseLocation'
value='/opt/IBM/WebSphere/ProcServer' />
  <data key="cic.selector.nl" value="en" />
  <data key="user.cic.imported,com.ibm.websphere.ND.70"
value="WAS" />
  <!-- #####
  <data key='user.bpm.admin.username' value='admin' />
  <data key='user.bpm.admin.password' value='admin' />
  #####-->
</profile>

```

---

- d. Edit the command to import WebSphere Application Server Network Deployment to IM (Example 4-6).

If you changed the profile ID in Example 4-5 on page 42, you must also change the profile ID here.

*Example 4-6 Add WAS imports*

---

```

<!--
#####
####
This command directs IM to import WebSphere Application Server
Network Deployment, whose location is specified in the previous
section, into IM.
If you changed the profile ID above, you must also change the
profile ID here.
#####
#####-->
<import profile="IBM WebSphere Application Server - ND"
type="WAS" /

```

---

- e. Specify that you want to install the required prerequisites along with WebSphere Process Server.

- f. If the profile ID in Example 4-5 on page 42 has been changed, then the profile ID must be changed here as well. Recall that the term *profile* in Installation Manager refers to the binary installation location (Example 4-7).

*Example 4-7 Add prerequisite install*

---

```
<install>
  <offering profile="IBM WebSphere Application Server - ND"
id="com.ibm.websphere.XML.v10" />
  <offering profile="IBM WebSphere Application Server - ND"
id="com.ibm.websphere.SCA.v10" />
  <offering profile="IBM WebSphere Application Server - ND"
id="com.ibm.ws.WPS" />
</install>
```

---

- g. Because we are installing fix pack updates from local artifacts along with the base install, the values in Example 4-8 need to be changed in the response file.

*Example 4-8 Add fix packs*

---

```
<!--
#####
#####
Modifying the properties in this section depends upon your type
of install and might be required if you are installing updates
along with the base install .
#####
#####-->
<preference value="true"
name="offering.service.repositories.areUsed" />
<preference value="false"
name="com.ibm.cic.common.core.preferences.searchForUpdates" />
```

---

## 4.2.2 Executing the script to install the WebSphere Process Server

Begin the installation by running the `wps_binary_install` script that was edited in Example 4-2. This script must be run on *all* the systems that need to be configured for the cluster (DMGR and node machines).

The script performs the following tasks:

- ▶ Installs WebSphere Application Server Network Deployment
- ▶ Installs IBM Installation Manager if it is not already installed or updates it to the appropriate level if it is installed
- ▶ Imports WebSphere Application Server Network Deployment into the Installation Manager
- ▶ Installs the required base products and WebSphere Process Server using the response file
- ▶ Installs the required fix packs (up to V7.0.0.2) for WebSphere Process Server, SCA, and XML
- ▶ Automatically configures the installation with the location of the repository that contains the product packages

### Executing the script

To execute the script:

1. Log in to the AIX system as a non-root user.

**Note:** Note the following information:

- ▶ All installation source directories including the fix pack repositories should be owned by the non-root user.
- ▶ All installation source directories should have write permissions for the non-root user.
- ▶ All installation destination directories should have write permissions for the non-root user.

2. To run the script, enter `./wps_binary_install` in the AIX terminal and press Enter. This launches the script to install the WebSphere Process Server binaries and complete the installation.

## Verifying the binary installation

Verification steps are:

1. Verify that the INSTCONFSUCCESS message displays in the WAS\_LOCATION/logs/install/log.txt file to indicate that the WebSphere Application Server was installed.
2. Check the WAS\_LOCATION/logs/wps/silent\_install.log to verify that the WebSphere Process Server was installed. A message similar to that in Figure 4-1 displays if the installation was successful. You will also see the same message in the shell that was used to run the run\_templates script.

```
$ ./wps_binary_install
WAS rc: 0
/opt/srceimg/wps/responsefiles/WBI/../../IM/userinst --launcher.ini /opt/srceimg
/wps/responsefiles/WBI/../../IM/user-silent-install.ini -input /opt/srceimg/wps/
responsefiles/WBI/wps_binary_install_template.xml -log /opt/IBM/WebSphere/ProcSe
rver/wps/silent_install.log

The next step is to use the manageProfiles command or the Profile Management Too
l to augment existing profiles or create a new profile to enable the functionali
ty provided by the feature pack. See the Information Center articles on creating
, deleting, and augmenting profiles. Additionally, Network Deployment customers
should read the profile rules and limitations topic.
The next step is to use the manageProfiles command or the Profile Management Too
l to augment existing profiles or create a new profile to enable the functionali
ty provided by the feature pack. See the Information Center articles on creating
, deleting, and augmenting profiles. Additionally, Network Deployment customers
should read the profile rules and limitations topic.
$ $
```

Figure 4-1 Successful install message

3. If IBM Installation Manager was installed as a non-root user, the `~/var/ibm/InstallationManager` folder is created in the user's home directory, `/home/user/var/ibm/InstallationManager`. If IBM Installation Manager was installed as a root user, this folder is created directly in `~/var/ibm/InstallationManager`. This is the agent data location that contains information about the Installation Manager and the packages that it handles.

**Note:** It is a requirement to install the binaries on all systems that need to be configured for the cluster (the DMGR and node machines). Run the script on all such systems.

## 4.3 Configuring WebSphere Process Server profiles

A profile defines a unique runtime environment, with separate command, configuration, and log files. Profiles define three types of environments on WebSphere Process Server systems:

- ▶ A stand-alone server
- ▶ A deployment manager (Dmgr)
- ▶ A managed node

Using profiles, more than one runtime environment can reside on a system, without having to install multiple copies of the WebSphere Process Server binary files.

Use the Profile Management Tool or the **manageprofiles** command-line utility to create profiles.

For this publication, we create a profile using **manageprofile** commands and response files.

### 4.3.1 Creating the deployment manager profile

In this section, we create a WebSphere Process Server deployment manager profile using **manageprofiles** commands inside a response file.

The following steps describe the procedure to create a WebSphere Process Server deployment manager profile using the **manageprofiles** command:

1. Log in to the AIX system as a non-root user.
2. Create the `dmgr.resp` response file in the `<base_dir>` directory with content similar to that in Figure 4-9 on page 56, changing the values to suit your product installation (sample response files are in Appendix A, “Additional material” on page 135).

*Example 4-9 DMGR response file*

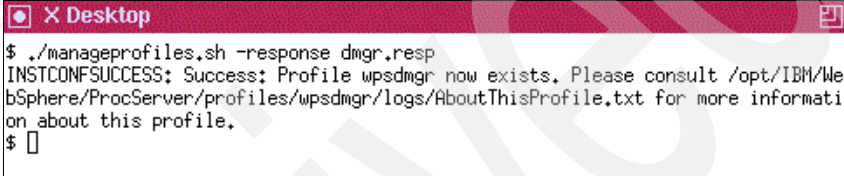
---

```
create
templatePath=/opt/IBM/WebSphere/ProcServer/profileTemplates/dmgr.wbiserver
profilePath=/opt/IBM/WebSphere/ProcServer/profiles/wpsdmgr
profileName=wpsdmgr
cellName=wpscell
nodeName=wpsdmgrnode
enableAdminSecurity=true
adminUserName=wpsadmin
adminPassword=bpmadmin
dbType=ORACLE
```

```
dbDelayConfig=true
dbSchemaName=WPS_CDBUSER
dbName=bpm7ora
dbUserId=WPS_CDBUSER
dbPassword=WPS_CDBUSER
dbJDBCClasspath=/opt/oracle11g/jdbc
dbHostName=webifyaix4.austin.ibm.com
dbServerPort=1521
dbDriverType=4
```

---

3. Run the **manageprofiles** command from your product install location:  
`<install_dir>/bin/manageprofiles.sh -response <base_dir>/dmgr.resp`  
After the installation, the message in Figure 4-2 displays.



```
X Desktop
$ ./manageprofiles.sh -response dmgr.resp
INSTCONFSUCCESS: Success: Profile wpsdmgr now exists. Please consult /opt/IBM/WebSphere/ProcServer/profiles/wpsdmgr/logs/AboutThisProfile.txt for more information about this profile.
$
```

Figure 4-2 DMGR profile create success message

### 4.3.2 Creating and configuring the WebSphere Process Server common database objects

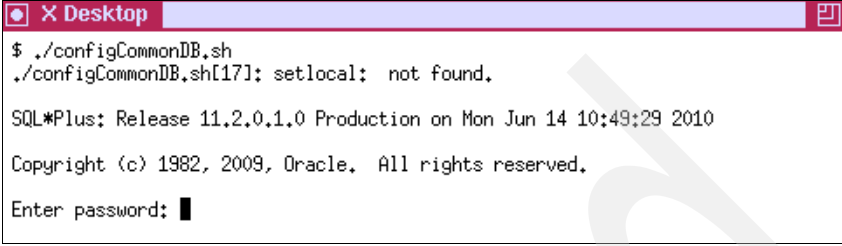
Before we start the DMGR profile and verify the installation, the common database objects that are used by the DMGR profile on startup need to be created and configured.

Data Definition Language (DDL) files are generated as part of the deployment manager profile creation process and are located in the `<WPS_HOME>/profiles/<Dmgr_profile>/dbscripts/CommonDB/Oracle/<ORACLE_SID>/` directory on the Deployment manager system.

To create and configure the WebSphere Process Server Common Database objects:

1. Log on to the database server as an Oracle user and create a file system on the database server for dbscripts.
2. Copy all the database scripts from the deployment manager system to the location in the previous step on the database server.
3. Ensure that the scripts have execute permissions.

4. Set the ORACLE\_HOME and ORACLE\_SID variables. Start the CommonDB script from the created directory on the Oracle host by executing the command shown in Figure 4-3 as **user:oracle**.



```

X Desktop
$ ./configCommonDB.sh
./configCommonDB.sh[17]: setlocal: not found.

SQL*Plus: Release 11.2.0.1.0 Production on Mon Jun 14 10:49:29 2010
Copyright (c) 1982, 2009, Oracle. All rights reserved.

Enter password: █

```

Figure 4-3 Execute commonDB script

5. Enter the password for the common db user, and the script runs and creates the database objects.
6. Verify that the database objects were created properly, by querying the database as follows:
  - a. Start sqlplus with the following command:  
`./sqlplus W_CDBUSER/<password>@<db_name>`
  - b. Run the following command at the sqlplus prompt:  
`select * from tab;`
  - c. The results display a list of 44 tables, or '44 rows selected.'

### 4.3.3 Starting and verifying the deployment manager

To do this:

1. Start the deployment manager from `<WPS_HOME>/bin` by running the following command:  
`./startManager.sh`
2. Verify the logs in `<WPS_HOME>/profiles/<Dmgr profile>/logs/dmgr/` and ensure that there are no errors on startup.
3. Open the WebSphere Process Server Integrated Solutions console and verify the installed version:
  - a. Open a browser and go to `http://<hostname/ip>:<port>/admin`, usually `http://localhost:9060/admin`.
  - b. Log in with the administrative user name and password (for example, `wpsadmin/bpmadmin`).

The welcome screen displays the installed versions (Figure 4-4).

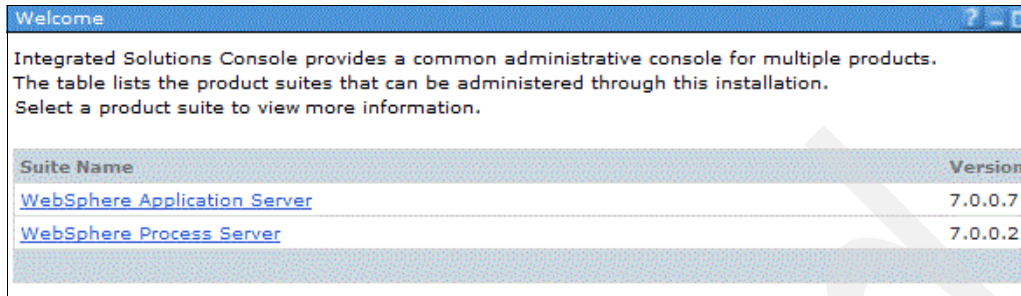


Figure 4-4 installed versions

#### 4.3.4 Configuring Microsoft Active Directory as user account registry

The steps in this section describe the procedure to configure Microsoft Active Directory as the user registry. The steps are:

1. Start the deployment manager:  
`<WPS_HOME>/bin/startManager.sh`
2. Log in to the Integrated Solutions Console.
3. Navigate to **Security** → **Global security**.
4. Make sure that **Enable administrative security** is selected.
5. Confirm that the User account repository panel, from the Available realm definitions list, has a default realm, Federated repositories.
6. Click **Configure**.
7. From the Federated repositories window, under Related Items, click **Manage Repositories** (Figure 4-5).



Figure 4-5 Manage Repositories

8. On the Manager repositories panel, click **Add**.



9. On the New Repository panel (Figure 4-6), set the following attributes:
  - a. Set the repository identifier to a suitable name for the active directory server (for example, BPMAD).
  - b. For the directory type, select **Microsoft Windows Active Directory**.
  - c. Set the primary host name to the host name of the active directory server (for example, adtest.austin.ibm.com).
  - d. Ensure that the port is set to 389.
  - e. Set the bind distinguished name to `cn=wpsadmin,ou=IBM,o=BPMAD`.
  - f. Set the bind password as per the active directory wpsadmin user.
  - g. Set the login properties to `uid;cn`.
  - h. Click **Apply** and then **Save**.

Figure 4-6 displays the results.

Global security > Federated repositories > Manage repositories > New

Specifies the configuration for secure access to a Lightweight Directory Access Protocol (LDAP) repository with optional failover servers.

**General Properties**

\* Repository identifier  
BPM AD

**LDAP server**

\* Directory type  
Microsoft Windows Active Directory

\* Primary host name  
adtest.austin.ibm.com

Port  
389

Failover server used when primary is not available:

Select	Failover Host Name	Port
None		

Add

Support referrals to other LDAP servers  
ignore

**Security**

Bind distinguished name  
cn=wpsadmin,ou=IBM,o=BPMAD

Bind password  
\*\*\*\*\*

Login properties  
uid

LDAP attribute for Kerberos principal name

Certificate mapping  
EXACT\_DN

Certificate filter

Require SSL communications

Centrally managed  
 Manage endpoint security configurations

Use specific SSL alias  
 CellDefaultSSLSettings  SSL configurations

The additional properties will not be available until the general properties for this item are applied or saved.

Figure 4-6 Results of creating a new repository

10. After the repository is created, confirm that there are two repositories in the list:
  - a. Click the **Federated Repositories** link at the top of the page.
  - b. From the Federated Repositories panel, in the Repositories in the realm section, click **Add Base Entry to Realm**.
  - c. On the Repository Reference panel, enter the following attributes:
    - i. For the “Distinguished name of a base entry that uniquely identifies this set of entries in the realm” field, enter `ou=IBM,o=BPMAD`.
    - ii. For the “Distinguished name of a base entry in this repository” field, enter `ou=IBM,o=BPMAD`.
    - iii. Click **OK** → **Save**.
11. The Federated Repositories panel displays two repositories.
  - a. From the Federated Repositories panel, in the Repositories in the realm, remove the InternalFileRepository repository as follows:
    - i. Select the **InternalFileRepository** check box.
    - ii. Click **Remove**.
    - iii. Click **Save**.
  - b. From the Federated Repositories panel, enter the following attributes:
    - i. Set the realm name to `BPMAD`.
    - ii. Set the primary administrative user name to **wpsadmin** (this user must exist in the user repository).
    - iii. Click the server identity that is stored in the repository.
    - iv. Set Server User ID or administrative user to `cn=wpsadmin,ou=IBM,o=BPMAD`
    - v. Set the password to `Bpmadmin01`. (This is the password as set in the user repository.)
    - vi. Click **OK**, → **Save**.
  - c. Log out of the Integrated Solutions Console.
  - d. Restart the deployment manager.
  - e. Log in with the user ID and password that was used for the primary administrative user (`wpsadmin/Bpmadmin01`).

### 4.3.5 Creating and configuring custom profiles

In this section we create and federate a custom profile into the deployment manager cell, using the `manageprofiles` command with a response file.

The following steps describe the procedure to create a WebSphere Process Server custom profile using the `manageprofiles` command.

1. Log in to the AIX system as a non-root user.
2. Create a `node.resp` response file in the `<base_dir>` directory with content similar to that shown in Example 4-11.
  - a. Change the values to the product being installed (sample response files are provided in Appendix A, “Additional material” on page 135).
  - b. Ensure that the user password is the one being used in the user repository. Because the Microsoft Active Directory was configured as the repository, use the password for that in the response file shown in Example 4-10.

*Example 4-10 node.resp*

---

```
create
templatePath=/opt/IBM/WebSphere/ProcServer/profileTemplates/managed.
wbiserver
profileName=wpsnode2
nodeName=wpsnode2
profilePath =/opt/IBM/WebSphere/ProcServer/profiles/wpsnode2
dmgrHost= webifyaix4.austin.ibm.com
dmgrPort=8879
dmgrAdminUserName=wpsadmin
dmgrAdminPassword=Bpadmin01
dbType=ORACLE
dbJDBCClasspath =/opt/oracle11g/jdbc
```

---

- c. The `dbJDBCClasspath` in Example 4-10 is the location of the oracle JDBC driver.
- d. Run the `manageprofiles` command from your product install location:  
`<install_dir>/bin/manageprofiles.sh -response  
<base_dir>/node.resp`

When the installation is complete, the INSTCONFSUCCESS message displays (Figure 4-7).



```
Jun 16, 2010 4:39:59 PM null null
INFO: ssl.disable.url.hostname.verification,CWPKI0027I
Jun 16, 2010 4:40:00 PM null null
AUDIT: Self Signed Certificate: notBefore time: Tue Jun 15 16:40:00 CDT 2010 not
After time: Wed Jun 11 16:40:00 CDT 2025
Jun 16, 2010 4:40:01 PM com.ibm.ffdc.osgi.ProviderTracker AddingService
INFO: FFDC1007I: FFDC Provider Installed: com.ibm.ffdc.EmptyProvider(silent)
Jun 16, 2010 4:40:02 PM null null
WARNING: ADMCO046W
Jun 16, 2010 4:40:02 PM null null
INFO: Client code attempting to load security configuration
Jun 16, 2010 4:40:04 PM null null
INFO: Client code attempting to load security configuration
Jun 16, 2010 4:40:19 PM null null
AUDIT: Self Signed Certificate: notBefore time: Tue Jun 15 16:40:18 CDT 2010 not
After time: Wed Jun 11 16:40:18 CDT 2025
Jun 16, 2010 4:40:19 PM null null
WARNING: ADMCO046W
Jun 16, 2010 4:40:33 PM null null
WARNING: ADMCO046W
INSTCONFSUCCESS: Success: Profile wpsnode2 now exists. Please consult /opt/IBM/W
ebSphere/ProcServer/profiles/wpsnode2/logs/AboutThisProfile.txt for more informa
tion about this profile.
$ □
```

Figure 4-7 Custom profile create success message

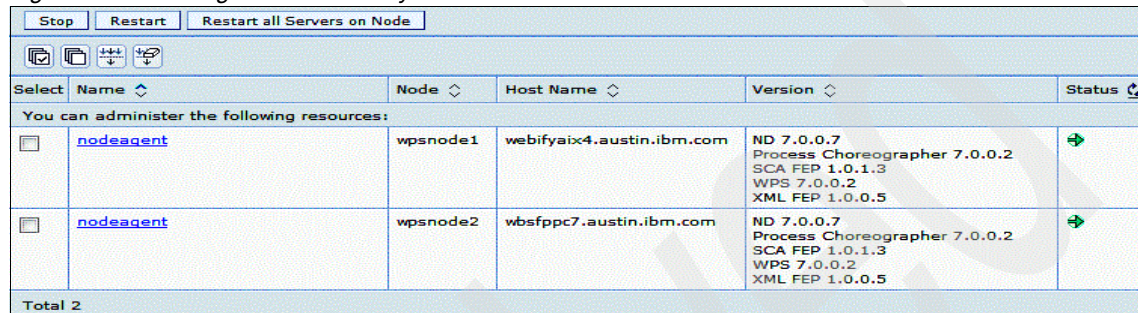
**Note:** Repeat this process for all the nodes in the WebSphere Process Server Cell. Change the parameters in the script (profileName, nodeName, profilePath) for each node.

## Verifying successful installation and federation

Ensure that the custom profiles were successfully created and federated into the Deployment Manager. To do so:

1. Start the Integration Solutions Console and go to **System Administration** → **Node Agents**.
2. Confirm that the node agents display has started (Figure 4-8).

Figure 4-8 Node agents successfully started



The screenshot shows a web interface for managing node agents. At the top, there are buttons for 'Stop', 'Restart', and 'Restart all Servers on Node'. Below these are icons for refresh, save, zoom in, and zoom out. The main area is a table with columns: 'Select', 'Name', 'Node', 'Host Name', 'Version', and 'Status'. The table contains two rows, both with a green arrow icon in the 'Status' column, indicating they are running. The first row is for 'nodeagent' on 'wpsnode1' at 'webifyaix4.austin.ibm.com'. The second row is for 'nodeagent' on 'wpsnode2' at 'wbsfppc7.austin.ibm.com'. Both agents are running version 'ND 7.0.0.7' with sub-profiles 'Process Choreographer 7.0.0.2', 'SCA FEP 1.0.1.3', 'WPS 7.0.0.2', and 'XML FEP 1.0.0.5'. A 'Total 2' label is at the bottom left of the table.

Select	Name	Node	Host Name	Version	Status
<input type="checkbox"/>	nodeagent	wpsnode1	webifyaix4.austin.ibm.com	ND 7.0.0.7 Process Choreographer 7.0.0.2 SCA FEP 1.0.1.3 WPS 7.0.0.2 XML FEP 1.0.0.5	➔
<input type="checkbox"/>	nodeagent	wpsnode2	wbsfppc7.austin.ibm.com	ND 7.0.0.7 Process Choreographer 7.0.0.2 SCA FEP 1.0.1.3 WPS 7.0.0.2 XML FEP 1.0.0.5	➔

Total 2

### 4.3.6 Creating and generating the WebSphere Process Server deployment environment

This section describes the creation and generation of a Remote Messaging and Remote Support deployment environment by using **wsadmin** commands.

#### Creating a new deployment environment

From the deployment manager, create a new deployment environment using the **createDeploymentEnvDef wsadmin** command. Alternatively, add the nodes to the deployment environment using the **addNodeToDeploymentEnvDef wsadmin** command.

We use a python script (`createEnvironment.py`) to run both the commands. This creates a deployment environment definition, adds the nodes to it, and saves it. It does not generate the deployment environment. That needs to be done separately by running another python script (`generateEnvironment.py`).

In addition, you must have the database design file that was generated by the Database Design Tool (DDT) loaded by the **createDeploymentEnvDef** command. We included a sample design file (`wps.nd.topology.dbDesign`) that can be used in production environments. You must edit the file using the DDT before you can use it.

## ***Editing the database design file using the database design tool***

This section describes the database configuration for WebSphere Process Server using the new Database Design Tool. The DDT can generate most of the WebSphere Process Server component-specific database scripts, except for the CEI database. The output of this tool is a collection of SQL and other scripts to create the databases, schemas, and so on (if required), and a configuration file. This configuration file can be used to:

- ▶ Provide database information during profile creation.
- ▶ Specify database configuration properties during deployment environment configuration.

We use the design file only for specifying database configuration properties during deployment environment configuration.

**Note:** More information about the DDT is available at:

[http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.websphere.wesb.doc/doc/tcfg\\_ddl\\_generator.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/index.jsp?topic=/com.ibm.websphere.wesb.doc/doc/tcfg_ddl_generator.html)

1. Edit an existing design file:
  - a. Log in as a non-root user.
  - b. In a terminal window, run the `<WPS_HOME>/util/dbUtils/DbDesignGenerator.sh` command to launch the DDT (Figure 4-9).

```
$ pwd
/opt/IBM/WebSphere/ProcServer/util/dbUtils
$ ./DbDesignGenerator.sh

[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu; '?' for
help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment Environment
(2)Create a database design for a single component (e.g. BPC, CEI etc)
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]

Please enter the number for the design option :3
```

*Figure 4-9 Database design generator tool*

2. Choose option 3 to edit the existing database design file provided with this publication.
3. Enter the location of the design file (Figure 4-10).

```
$ pwd
/opt/IBM/WebSphere/ProcServer/util/dbUtils
$ ./DbDesignGenerator.sh

[info] running DbDesignGenerator in interactive mode...

[info] Enter 'q' to quit without saving; '-' for back to previous menu; '?' for
help at any time.
[info] To accept the given default values, simply press the 'Enter' key.

[info] Please pick one of the following [design option(s)] :

(1)Create a database design for Standalone profile or Deployment Environment
(2)Create a database design for a single component (e.g. BPC, CEI etc)
(3)Edit an existing database design
(4)Generate database scripts from a database design
(5)exit [q]

Please enter the number for the design option :3

Please enter the database design file :/srceimg/wps.nd.topology.dbDesign█
```

Figure 4-10 Database design generator tool

This analyzes the design file and displays a number of database components as options to pick from. These are the various databases for each component of the WebSphere Process Server (Table 4-1).

```
[info] analyzing the database design ...

[status] wps.nd.topology is complete with 0 remaining item(s):

-----
-----

[info] Please edit any database component with status of 'not complete' for required properties.
[info] Completed database components can be edited to change existing or default ed property values.
[info] Design the 'master' component first, and then any parent components, since other components may inherit values from them.

[info] Please pick one of the following [database component(s)] :

(1)[CommonDB]   WBI_CommonDB : [master] [status = complete]
(2)[BPCReporting] WBI_BPCEventCollector : [status = complete]
(3)[BPC]        WBI_BPC : [status = complete]
(4)[BSPACE]     WBI_BSPACE : [status = complete]
(5)[CEI]        WBI_CEI_EVENT : [status = complete]
(6)[SibME]     WBI_SCA_SYS_ME : [status = complete]
(7)[SibME]     WBI_BPC_ME : [parent = WBI_SCA_SYS_ME] [status = complete]
(8)[SibME]     WBI_CEI_ME : [parent = WBI_SCA_SYS_ME] [status = complete]
(9)[SibME]     WBI_SCA_APP_ME : [parent = WBI_SCA_SYS_ME] [status = complete]
(10)[save and exit]

Please enter the number for the database component : █
```

*Table 4-1 List of database components*

4. Select each database individually and make the necessary changes starting with database type. The other changes are database name, schema names, and so on. If you are using the names and paths from this publication, you only need to change the database host name and port number, if necessary. Go through each prompt for each component to make sure that the entries match the environment and, if they do not, change them.
5. After the components are set up properly, the user is prompted to save the file. Do so by overwriting the existing file or saving it with a new name.



### **Modifying the createEnvironment.py file**

When the database design file is ready for use, refer to it in the createEnvironment.py script, and change other parameters in this script as follows:

1. Open the createEnvironment.py file in a text editor.
2. Edit the lines as shown in Example 4-11 to match the name of the topology to select and the location of the design file.

#### *Example 4-11 createEnvironment.py*

---

```
topologyName='BPMRemote Messaging and Remote Support'  
dbDesignFile='/opt/IBM/WebSphere/ProcServer/util/dbUtils/wps.nd.topology.dbDesign'
```

---

3. Save the file.

### **Creating and generating the deployment environment**

**Note:** The generation of a deployment environment might take a long time. To prevent incomplete configuration due to time out, set the value of com.ibm.SOAP.requestTimeout to at least 1800 in WPS\_HOME/profiles/<dmgr\_profile>/properties/soap.client.props.

These steps are to create a deployment environment, add the nodes to it, and validate and save the changes. To do so:

1. Run the createEnvironment.py script.

- a. Log in as non-root user.
- b. In a terminal window run the **wsadmin** command:

```
wps_home/bin/./wsadmin.sh -lang jython -f createEnvironment.py  
-connType SOAP -host localhost -port 8879 -user wpsadmin  
-password Bpmadmin01
```

Note that no activity displays in the terminal for the time that it takes to perform these actions.

2. Generate the deployment environment using the `generateEnvironment.py` file.
  - a. Open the `generateEnvironment.py` file in a text editor.
  - b. Edit the file as shown in Example 4-12 to match the name of the topology that was created in Example 4-11 on page 59.

*Example 4-12 Change the topology of the deployment environment*

---

```
topologyName='BPMRemote Messaging and Remote Support'
```

---

- c. Save the file.
- d. Log in as a non-root user.
- e. In a terminal window run the **wsadmin** command:

```
wps_home/bin/./wsadmin.sh -lang jython -f generateEnvironment.py  
-connType SOAP -host localhost -port 8879 -user wpsadmin  
-password Bpmadmin01
```

The script generates the deployment environment, synchronizes the nodes, and saves the environment to the master repository.

## Verifying the deployment environment generation

On each node, check the `SystemOut.log` file of each node agent for success messages (Example 4-13).

*Example 4-13 Systemout log output*

---

```
ADMA7021I: Distribution of application  
HTM_PredefinedTaskMsg_V700_BPMRemote Messaging and Remote Support  
.AppTarget completed successfully.  
ADMS0003I: The configuration synchronization completed successfully.  
ADMA7021I: Distribution of application  
BPMAAdministrationWidgets_BPMRemote Messaging and Remote Support  
.Support completed successfully.  
ADMA7021I: Distribution of application sca.sib.mediation completed  
successfully.  
ADMA7021I: Distribution of application EventService completed  
successfully.  
ADMA7021I: Distribution of application BusinessRules_BPMRemote  
Messaging and Remote Support .Support completed successfully.  
ADMA7021I: Distribution of application wesbWidget_BPMRemote Messaging  
and Remote Support .Support completed successfully.
```

ADMA7021I: Distribution of application  
HumanTaskManagementWidgets\_BPMRemote Messaging and Remote Support  
.Support completed successfully.  
ADMS0003I: The configuration synchronization completed successfully.

---

### 4.3.7 Post deployment environment database configuration

This section describes the database configuration required after a successful deployment environment creation and generation. In this section, we create and run scripts for the other WebSphere Process Server database components that were not generated during deployment environment generation. These components are:

- ▶ BPC
- ▶ BPC event collector
- ▶ Business Space
- ▶ CEI
- ▶ Messaging engines

In this section, we also verify and correct the authentication aliases for BPC messaging, CEI messaging, and SCA app messaging. This is a required step because the DDT configures the user name for the above components as the user name of the default system bus. It is important that we change the user name to match the user name/schemas created in Chapter 2, “Business process management production topologies” on page 9.

#### ***Business Process Choreographer (BPC)***

The database scripts generated during deployment environment creation are copied to following directory:

```
/WPS_HOME/profiles/<DMGR  
profile>/dbscripts/ProcessChoreographer/Oracle/<ORACLE_SID>/<BPC  
Schema>
```

Figure 4-11 shows the BPC database scripts on the deployment manager system.

```
/opt/IBM/WebSphere/ProcServer/profiles/wpsdmgr/dbscripts/ProcessChoreographer/Oracle/bpm7ora/W
PS_BPCUSER
$ ls -la
total 408
drwxr-xr-x  2 bpmosadm bpmadm    256 Jun 17 17:36 .
drwxr-xr-x  4 bpmosadm bpmadm    256 Jun 17 17:36 ..
-rw-r--r--  1 bpmosadm bpmadm   1863 Jun 17 17:36 createSchema.properties
-rw-r--r--  1 bpmosadm bpmadm  200910 Jun 17 17:36 createSchema.sql
$ █
```

Figure 4-11 Location of BPC database scripts on deployment manager system

Perform the following steps to run the database scripts:

1. Log in to the database server with an Oracle user ID and create a file system on the database server for BPC dbscripts.
2. Copy all of the database scripts from the deployment manager system to the database server directory created in the previous step.
3. Ensure that the scripts have execute permissions.
4. If tablespaces for BPC tables were created according to the instructions in Chapter 3, “Preparing the environment” on page 17, comment out the create tablespace section in the createSchema.sql file.
5. Log in to sqlplus as sys or system user to run the scripts. To capture the output from the scripts, toggle the spool on by using the **spool on;** command and specify a spool file as shown in Figure 4-12.

```
$ ./sqlp.sh

SQL*Plus: Release 11.2.0.1.0 Production on Sat Jun 19 14:58:52 2010

Copyright (c) 1982, 2009, Oracle. All rights reserved.

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL> spool /opt/app/oracle/dbscripts/ProcessChoreographer/Oracle/bpm7ora/WPS_BPCUSER/bpc.txt

SQL> @/opt/app/oracle/dbscripts/ProcessChoreographer/Oracle/bpm7ora/WPS_BPCUSER/createSchema
```

Figure 4-12 Output to the spool file

6. Verify the spool log for any errors before proceeding with the next component.

## **BPC Event Collector**

The database scripts generated during deployment environment creation are copied to the following location:

```
/WPS_HOME/profiles/<DMGR  
profile>/dbscripts/ProcessChoreographer/Oracle/<ORACLE_SID>/<BPC Event  
collector Schema>
```

Proceed with BPC Event Collector:

1. Copy the scripts to the database server scripts directory.
2. If tablespaces were created according to the instructions in Chapter 3, “Preparing the environment” on page 17, comment out the create tablespace section in createSchemaObserver.sql.
3. Ensure that the scripts have execute permissions.
4. Log in to sqlplus as sys or system user to run the scripts. To capture the output from the scripts, toggle the spool on by using the **spool on;** command and specify a spool file. Figure 4-13 provides a sample.

```
pwd  
/opt/app/oracle  
./sqlp.sh  
  
SQL*Plus: Release 11.2.0.1.0 Production on Sat Jun 19 12:45:29 2010  
Copyright (c) 1982, 2009, Oracle. All rights reserved.  
  
Connected to:  
Oracle Database 11g Enterprise Edition Release 11.2.0.1.0 - 64bit Production  
With the Partitioning, OLAP, Data Mining and Real Application Testing options  
  
SQL> spool /opt/app/oracle/dbscripts/ProcessChoreographer/Oracle/bpm7ora/WPS_OBSUSER/obs.txt  
SQL> @/opt/app/oracle/dbscripts/ProcessChoreographer/Oracle/bpm7ora/WPS_OBSUSER/createSchema_Observer.
```

Figure 4-13 BPC Observer tables

5. Verify the spool log for any errors before proceeding with the next component. Note that the sqlp.sh script that you see is just a user-written script to connect to the database.

## **Business Space**

The database scripts generated during deployment environment creation are copied to the following location:

```
/WPS_HOME/profiles/<DMGR  
profile>/dbscripts/ProcessChoreographer/Oracle/<ORACLE_SID>/<Business  
Space Schema>
```

Proceed with the Business Space:

1. Copy the scripts from the above location to the database server scripts directory.
2. If tablespaces were created according to the instructions in Chapter 3, “Preparing the environment” on page 17, comment out the CREATE TABLESPACE and CREATE USER statements in the following scripts:
  - createSchema.sql
  - createTablespace.sql
  - createTablesBusinessSpace.sql
3. Run the configBusinessSpaceDB.sh file as an Oracle user, ensuring that the Oracle user has execute permissions for all files:
  - a. Log in as the Oracle user.
  - b. Ensure that the \$ORACLE\_HOME variable has been set so that the ORACLE\_HOME/bin directory is in the user’s path.
  - c. Navigate to the database scripts location and run the configBusinessSpaceDB.sh file (Figure 4-14).

```
$ pwd  
/opt/app/oracle/dbscripts/BusinessSpace/BPMRMS.Support/Oracle/bpm7ora  
$ ls  
configBusinessSpaceDB.bat      createTable.sql          files.sql  
configBusinessSpaceDB.sh      createTables_BusinessSpace.sql  migrateSchema.bat  
createGrant.sql                createTablespace.sql     migrateSchema.sh  
createSchema.sql               dropTable.sql  
$ ./configBusinessSpaceDB.sh  
  
Enter Oracle system administrator user name:  
sys@bpm7ora as sysdba
```

Figure 4-14 Business Space database script

- d. Enter the database administrator user name and password.
- e. After the script has run, scroll back to ensure that there are no errors.

## **Common event infrastructure (CEI)**

The database scripts generated during deployment environment creation are copied to the following location:

```
/WPS_HOME/profiles/<DMGR  
profile>/databases/event/<topologyName>.Support/dbscripts/oracle
```

Proceed with the CEI:

1. Copy the scripts from the above location to the database server scripts directory.
2. Log in as an the Oracle user.
3. Ensure that the \$ORACLE\_HOME variable has been set and that the ORACLE\_HOME/bin directory is in the user path.
4. Go to the database scripts location.
5. If you have already created tablespaces and users according to Chapter 3, “Preparing the environment” on page 17, run the following scripts:

```
– @cr_security.ora  
– @cr_tbl.ora  
– @ins_metadata.ora  
– @cr_tbl_catalog.ora  
– @catalogSeed.ora  
– @cr_stored_procedure.ora
```

6. These scripts can be run from the command line using the syntax shown in Example 4-14:

```
sqlplus <SYS_UserID>/password@dbname as SYSDBA @file_name
```

### *Example 4-14 Run script commands*

---

```
export ORACLE_HOME=/opt/app/oracle/orabase/product/11.2.0/dbhome_1  
export PATH=$ORACLE_HOME/bin:$PATH  
sqlplus SYS/Bpm7admin@bpm7ora as SYSDBA @cr_security.ora  
sqlplus SYS/Bpm7admin@bpm7ora as SYSDBA @cr_tbl.ora  
sqlplus SYS/Bpm7admin@bpm7ora as SYSDBA @ins_metadata.ora  
sqlplus SYS/Bpm7admin@bpm7ora as SYSDBA @cr_tbl_catalog.ora  
sqlplus SYS/Bpm7admin@bpm7ora as SYSDBA @catalogSeed.ora  
sqlplus SYS/Bpm7admin@bpm7ora as SYSDBA @cr_stored_procedure.ora
```

---

7. To capture the output from the scripts, toggle the spool on by using the **spool on;** command and specify a spool file as shown in Figure 5 on page 63.
8. Review the spool log for any errors.

## ***Messaging engines***

The messaging engine scripts are not generated during deployment environment creation. These are generated separately by running the `sibDDLGenerator.sh` script for all the messaging engine users.

To generate the scripts and run them on the database:

1. Create a folder called ME in `<WPS_HOME>/dbscripts`.
2. Run the **`sibDDLGenerator.sh`** command for all the four messaging engine users (Example 4-15).

### *Example 4-15 Messaging engine database scripts*

---

```
./sibDDLGenerator.sh -system oracle -version 11g -platform unix
-schema WPS_SYMSGUSER -statementend \; -user WPS_SYMSGUSER >
/<WPS_HOME>/dbscripts/ME/WPS_SYMSGUSER.sql
./sibDDLGenerator.sh -system oracle -version 11g -platform unix
-schema WPS_APPMSGUSER -statementend \; -user WPS_APPMSGUSER >
/<WPS_HOME>/dbscripts/ME/WPS_APPMSGUSER.sql
./sibDDLGenerator.sh -system oracle -version 11g -platform unix
-schema WPS_CEIMSGUSER -statementend \; -user WPS_CEIMSGUSER >
/<WPS_HOME>/dbscripts/ME/WPS_CEIMSGUSER.sql
./sibDDLGenerator.sh -system oracle -version 11g -platform unix
-schema WPS_BPCMSGUSER -statementend \; -user WPS_BPCMSGUSER >
/<WPS_HOME>/dbscripts/ME/WPS_BPCMSGUSER.sql
```

---

3. Copy the scripts to the database server location, `/Oracle_home/dbscripts/ME`.
4. If all of the users were created according to the steps in Chapter 3, “Preparing the environment” on page 17, then comment out the CREATE USER statements in all of the scripts:

```
--CREATE USER WPS_xxxMSGUSER IDENTIFIED EXTERNALLY DEFAULT
TABLESPACE USERS QUOTA UNLIMITED ON USERS ACCOUNT LOCK;
```

5. Run the scripts using `sqlplus` (Example 4-16).

### *Example 4-16 sqlplus script*

---

```
export ORACLE_HOME=/opt/app/oracle/orabase/product/11.2.0/dbhome_1
export PATH=$ORACLE_HOME/bin:$PATH
sqlplus SYS/Bpm7admin@bpm7ora as SYSDBA
@WPS_SYMSGUSER.sql
@WPS_APPMSGUSER.sql
@WPS_CEIMSGUSER.sql
@WPS_BPCMSGUSER.sql
```

---



6. Ensure that there are no errors in the output.

### ***Verifying messaging engine authentication aliases***

To do this:

1. Log in to the Integrated Solutions Console.
2. Navigate to **Security** → **Global Security** → **Java Authentication and Authorization Service** → **J2C authentication data**.
3. Change the user names and passwords for the three components in Table 4-2 to match the user names in Table 4-2 and as detailed in Table 3-5 on page 29.

*Table 4-2 Messaging engine user names*

<b>Component name</b>	<b>User name</b>
BPC Messaging Engine (BPC ME)	WPS_BPCMSGUSER
CEI Messaging Engine (CEI ME)	WPS_CEIMSGUSER
SCA APP Messaging Engine (SCA APP ME)	WPS_APPMSGUSER

## **4.3.8 Starting and verifying the deployment environment**

In this section, we carry out the following tasks:

- ▶ Start the deployment environment.
- ▶ Verify that there are no errors in the server logs.
- ▶ Test the data sources.
- ▶ Verify virtual host settings and host aliases.
- ▶ Verify login credentials for the various WebSphere Process Server components.

### **Starting the deployment environment and verifying logs**

Start the deployment environment only after all of the database configuration steps have been completed. With those steps completed:

1. Log in to the Integrated Solutions Console.
2. Navigate to **Servers** → **Deployment Environments**.

3. Select the deployment environment and click **Start** (Figure 4-15).

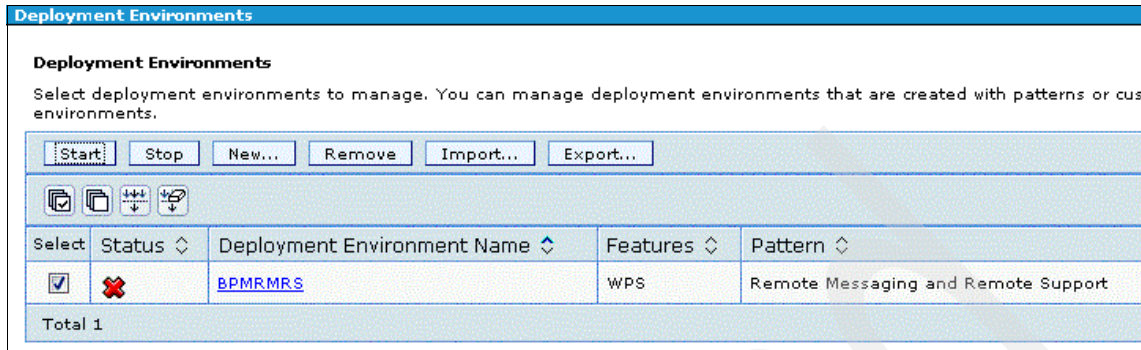


Figure 4-15 Deployment environment startup

The startup takes time. After it is running, verify logs to ensure that there are no errors in them. These logs are located at:

- <WPS\_HOME>/profiles/<node\_profile/logs/<topology\_name>.AppTarget<profile\_name>1.0
- <WPS\_HOME>/profiles/<node\_profile/logs/<topology\_name>.Messaging<profile\_name>1.0
- <WPS\_HOME>/profiles/<node\_profile/logs/<topology\_name>.Support<profile\_name>1.0

4. After the logs have been verified for errors, go back to **Servers** → **Deployment Environment**. You will see a started status for the deployment environment (Figure 4-16).

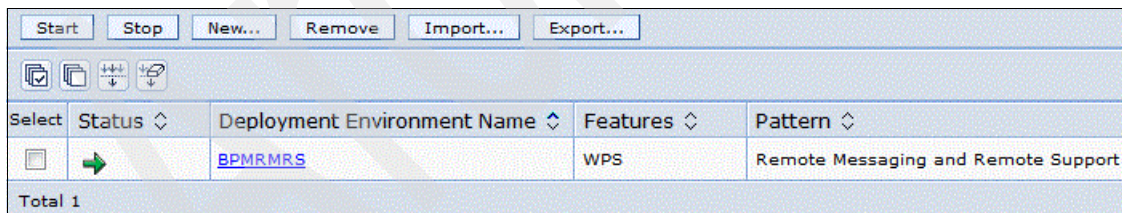


Figure 4-16 Deployment environment successful

## Testing the data sources

Test the data source connection:

1. Log in to the Integrated Solutions Console.
2. Navigate to **Resources** → **Datasources**.
3. Ensure that the scope drop-down menu includes the selection All scopes.

4. Select the **Select All** check box and click **Test Connection**.
5. The test takes time and should return successful messages for all data sources (Figure 4-17).

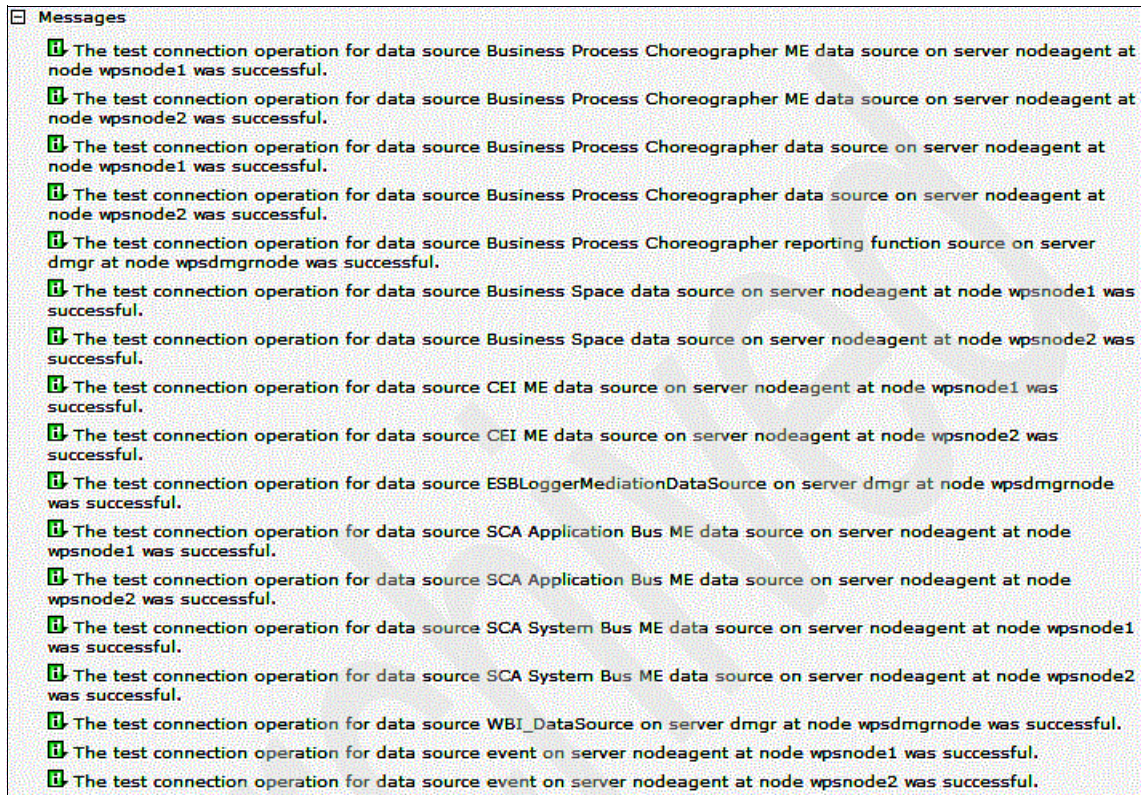


Figure 4-17 Data source test connection success

## Ensuring that the messaging engines are available

To verify the availability of the messaging engines:

1. Log in to the Integrated Solutions Console.
2. Navigate to **Service Integration** → **Buses**.
3. Click a bus name, and click **Local Topology**.

4. Drill down and check the status of all four messaging engines (Figure 4-18).

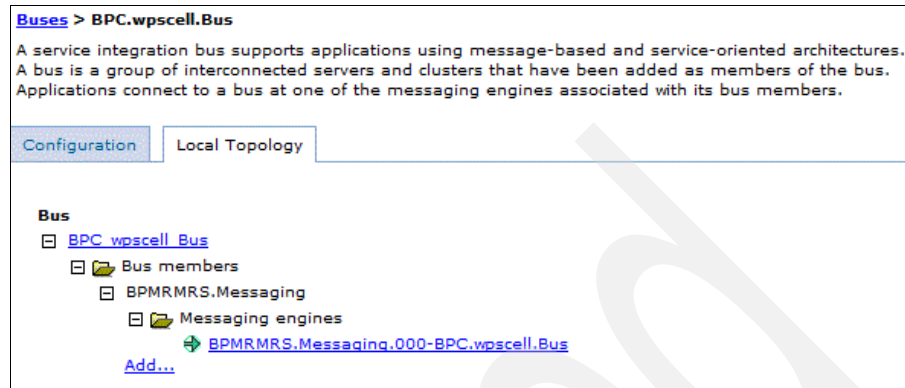


Figure 4-18 BPC messaging engine

**Note:** After the topology has been configured and the clusters are running, run the BPC installation verification application to verify the installation. This task is described in Chapter 8, “Verifying installations using sample applications” on page 125. This application can be run now as well as after all other components have been configured.

This concludes the WebSphere Process Server Remote Messaging and Remote Support topology installation and configuration.



# WebSphere Business Monitor: Cross-cell configuration

This chapter describes how to set up a WebSphere Business Monitor topology, based on the Remote Messaging, Support, and Web topology pattern. The WebSphere Process Server is deployed in a separate remote cell hosting the common event infrastructure (CEI) service.

## 5.1 Topology summary

This section outlines the steps to install WebSphere Business Monitor using a Remote Messaging, Support, and Web topology pattern. The installation steps were performed on three AIX 6.1 64-bit servers.

Figure 5-1 depicts the topology and shows the distribution of the main WebSphere Business Monitor components.

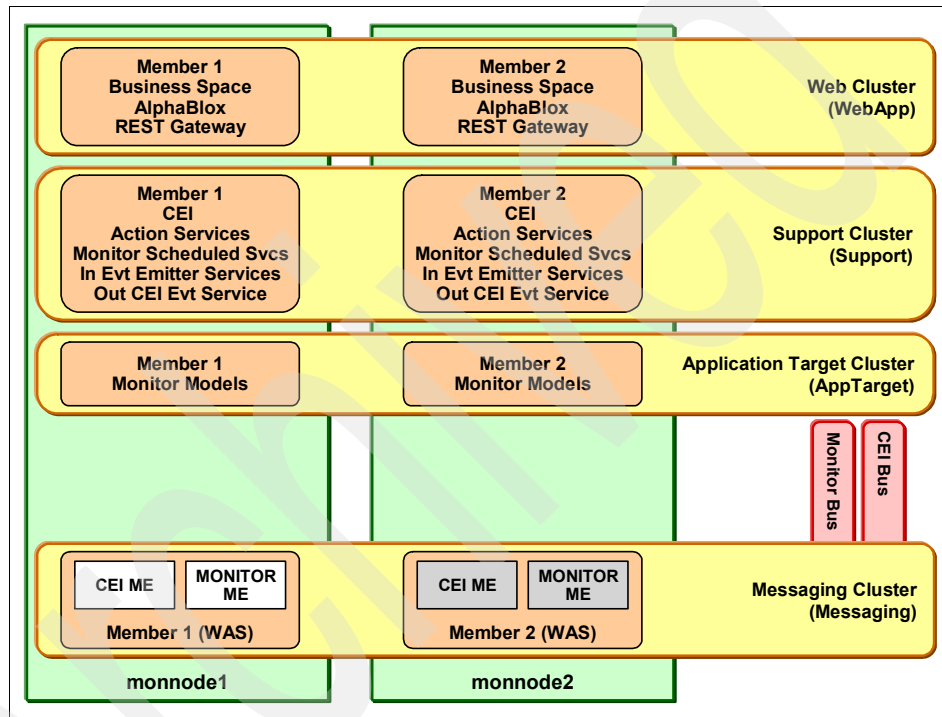


Figure 5-1 Remote Messaging, Support, and Web topology



In this topology, WebSphere Business Monitor is installed in its own WebSphere Application Server cell. Common business events (CBEs) issued by a remote WebSphere Process Server instance using the CEI service are delivered to the monitor model application by the WebSphere Business Monitor database. This event delivery mode is called *queue-bypass* (Figure 5-2).

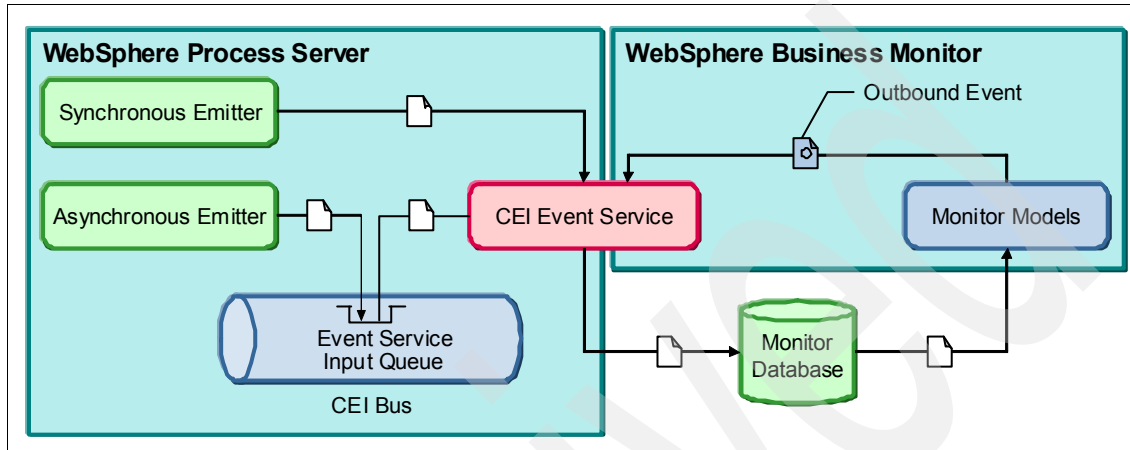


Figure 5-2 Queue-bypass event delivery

## 5.2 Prerequisites and summary

Before creating this topology, ensure that the prerequisite steps have been completed. See 3.2, "Software versions described in this book" on page 18.

## 5.2.1 Business SpacePreparing the operating system

It is crucial to verify that the hardware and operating system (OS) conform to system requirements. Prepare the OS in accord with the following standards:

- ▶ Detailed instructions are located in the Information Center at:  
<http://publib.boulder.ibm.com/infocenter>
- ▶ Hardware and software requirements specific to the AIX environment are located in the Information Center at:  
[http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.btools.help.monitor.inst.doc/plan/prep\\_os\\_aix.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.btools.help.monitor.inst.doc/plan/prep_os_aix.html)
- ▶ Information about your OS-specific instructions is located in the Information Center at:  
[http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.btools.help.monitor.inst.doc/plan/prep\\_os.html](http://publib.boulder.ibm.com/infocenter/dmndhelp/v7r0mx/topic/com.ibm.btools.help.monitor.inst.doc/plan/prep_os.html)

The WebSphere Business Monitor installation described in this chapter uses fully qualified host names. The host names, including the WebSphere Process Server and HTTP server host names, must be defined on all servers that are part of this topology. For this publication, host names have been added to the `/etc/hosts` file on each server.

## 5.2.2 Installing LDAP server

Microsoft Active Directory is used as a Lightweight Directory Access Protocol (LDAP) server.

## 5.2.3 Installing WebSphere business monitor

We followed the silent installation method using IBM Installation Manager response files for installing the WebSphere Business Monitor binaries.

## 5.2.4 Creating databases

WebSphere Business Monitor requires four schemas:

- ▶ WebSphere Business Monitor tables
- ▶ Business Space tables
- ▶ CEI messaging engine tables
- ▶ WebSphere Business Monitor messaging engine tables



## 5.2.5 Creating and configuring the deployment manager

To do this:

1. Create a deployment manager profile.
2. Set up the user registry integration.
3. Add IBM HTTP Server to the cell.
4. Modify configuration settings as described in 5.4.1, “Creating the deployment manager profile” on page 85.

## 5.2.6 Creating and federating custom nodes

Create and federate two custom nodes (monnode1 and monnode2), as per 5.4.5, “Creating and configuring custom profiles” on page 88.

## 5.2.7 Installing IBM HTTP Server

In this topology, an IBM HTTP server is used for load balancing and failover of the WebSphere Business Monitor WebApp cluster.

## 5.3 Installing WebSphere Business Monitor binaries

The WebSphere Process Server binaries are installed in *silent installation* mode with *non-root user* access. When the installation takes place in silent mode, a user interface is not available, so a response file is used to input the commands required to install the product.

These steps presume that the prerequisite products, those necessary for WebSphere Business Monitor installation, are not yet installed. The prerequisite products are the installation manager, WebSphere Application Server Network Deployment, and WebSphere Application Server feature pack for XML.

Before the installation is started, prepare the OS as described in 3.4, “Preparing an AIX operating system” on page 19. Also, ensure that the software repository is available as noted in 3.6, “Creating a software repository” on page 35.

### 5.3.1 Preparing response files to install WebSphere business monitor as non-root user

Follow this procedure to unpack the product images and prepare the response files:

1. Use the product image (Monitor\_V7.0\_AIX\_64.tar.gz) downloaded to the software repository `<base_dir>` and extract the file as shown in Example 5-1.

*Example 5-1 Uncompress command*

---

```
gunzip -c Monitor_V7.0_AIX_64.tar.gz | tar xvf -
```

---

2. Use the fix pack images for the OS and extract them into `<fixpack_dir>`.

**Note:** Learn more about the latest fix packs for the WebSphere Process Server at:

<http://www-01.ibm.com/support/docview.wss?rs=802&uid=swg24026057>

3. Navigate to `<base_dir>/responsefiles/WBM` and locate the script and response files:
  - Script file: `run_templates`
  - Response file: `template_response.xml`
4. Make a backup of the original `run_templates` script and `template_response.xml` response files using the commands in Example 5-2.

*Example 5-2 Make a backup of original files*

---

```
mv run_templates monitor_binary_install
mv template_response.xml monitor_binary_install_template.xml
```

---

5. Edit the `monitor_binary_install` script in accord with Example 5-3. Sections that need to be edited are highlighted in **bold**.

*Example 5-3 Monitor install script*

---

```
#!/bin/sh
#####
#
# sample_run_templates
#
# Note: Before you run this script, make sure that you modify the
# parameters that follow this comment. Also make sure that you
# have modified all of the options in the response file template.
# If required also comment out steps that
```

```

# you do not need to perform (for example, comment out WAS install
if the product is already installed on your system).
#
# All templates are run relative to the directory in which this
script runs.
#####
#
# Set the directory name where this file is located.
curdir="`pwd`"
PROGDIR="`dirname "$0"`"
cd "${PROGDIR?}"
PROGDIR="`pwd`"
cd "${curdir?}"
TEMPDIR=/tmp/wbpm/install

##### PARAMETERS #####
WAS_IMAGE="${PROGDIR}"/../WAS
# AIX default WAS_LOCATION=/usr/IBM/WebSphere/MonServer
# HP-UX default WAS_LOCATION=/opt/IBM/WebSphere/MonServer
# SunOS default WAS_LOCATION=/opt/IBM/WebSphere/MonServer
# Linux default WAS_LOCATION=/opt/ibm/WebSphere/MonServer
WAS_LOCATION=/opt/IBM/WebSphere/MonServer
IM_IMAGE="${PROGDIR}"/../IM
KEYRING=
#####
# Where:
#   WAS_IMAGE = The path to the WebSphere Application Server
Network Deployment installation image
#   WAS_LOCATION = the path to the directory where WebSphere
Application Server Network Deployment will be installed to
#   IM_IMAGE = The path to the Installation Manager (IM)
installation image
#   KEYRING = The keyring file (if you need one) to use while
installing to an IM repository;
#           If you have no keyring file, do not include a value
for this parameter
#####

#####
# Install WebSphere Application Server Network Deployment using a
silent installation.
#
# Note: Comment out this section if WebSphere Application Server
Network Deployment is already installed
#####

```

```

"${WAS_IMAGE}"/install -silent -OPT
silentInstallLicenseAcceptance=true -OPT
allowNonRootSilentInstall=true -OPT disableOSPrereqChecking=true
-OPT disableNonBlockingPrereqChecking=true -OPT
installType=installNew -OPT profileType=none -OPT
feature=samplesSelected -OPT feature=languagepack.console.all -OPT
feature=languagepack.server.all -OPT
installLocation="${WAS_LOCATION}"

echo WAS rc: $?
#####
# To silently Install IBM WebSphere Business Monitor and
prerequisite products as non-root user.
#
# The example template runs the following procedures:
# 1. Install or update to IM v1.3.2
# 2. Synchronize the WebSphere Application Server Network
Deployment installation with IM
# 3. Install the WebSphere Application Server Feature Pack for XML
# 4. Install IBM WebSphere Business Monitor using IM
#
# To modify install options modify the template_response.xml file
#####
echo "${IM_IMAGE}"/userinst --launcher.ini
"${IM_IMAGE}"/user-silent-install.ini -input
"${PROGDIR}"/monitor_binary_install_template.xml -log
"${WAS_LOCATION}"/wbm/silent_install.log

    "${IM_IMAGE}"/userinst --launcher.ini
    "${IM_IMAGE}"/user-silent-install.ini -input
    "${PROGDIR}"/monitor_binary_install_template.xml -log
    "${WAS_LOCATION}"/wbm/silent_install.log

exit $?

```

- 
6. Edit the `monitor_binary_install_template.xml` file as follows. The sections that need editing are highlighted in **bold**.
    - a. Edit the repository section to add fix pack repositories.

**Note:** WebSphere Business Monitor V7.0.0.2 Interim Fix JR36571 is mandatory for WebSphere Business Monitor V7.0.0.2. Learn more about the iFix at:

<http://www-01.ibm.com/support/docview.wss?rs=802&uid=swg24027017>

For this publication, a single response file is used to install base, fix pack, and iFix binaries.

- b. Add the location of local repositories that have been downloaded and extracted in the repository section (Example 5-4).

*Example 5-4 Monitor the install template*

---

```
<server>
  <!-- ##### IM Repository Location
#####-->
  <repository location='../IM/' temporary='true' />
  <!-- ##### WebSphere Application Server Import
Repository Location #####-->
  <repository location="../WAS_SYNC/" />
  <!-- ##### WebSphere Application Server Feature
Pack for XML Repository Location #####-->
  <repository location="../repository/" />
  <repository location="/opt/srceimg/monitor/fp/xml.1.0.0.5.fp/"
/>
  <!-- ##### WebSphere Business Monitor
#####-->
  <repository location="../repository/" />
  <repository
location="/opt/srceimg/monitor/fp/7.0.0-WS-WBM-FP0000002/" />
<repository
location="/opt/srceimg/monitor/monifix/7.0.0.2-WS-WBM-IFJR36571/"
/>
  <!-- ##### WebSphere Application Server Live
Update Repository #####-->
  <!--<repository
location="http://public.dhe.ibm.com/software/websphere/repositori
es/" /> #####-->
</server>
```

---

- c. Edit the Installation Manager installation location (Example 5-5).

**Note:** For this publication, the response file has been modified to specify that the installation manager be installed in /opt/IBM/IM/eclipse and the cache be installed in /opt/IBM/M/eclipseCache.

*Example 5-5 Edit the location of the installation manager*

---

```
<!--
#####
####
This profile node defines where IBM Installation Manager (IM)
is/or will be installed.

If you want to modify where IM is installed modify both the
installLocation and eclipseLocation values to specify the correct
directory
#####
#####-->
<profile kind='self' installLocation='/opt/IBM/IM/eclipse'
id='IBM Installation Manager'>
  <data key='eclipseLocation' value='/opt/IBM/IM/eclipse' />
</profile>
<!--
#####
####
```

---

- d. Edit the profile install location. References to the profile in the installation manager refer to the binary installation location, not the WebSphere Application Server profiles (Example 5-6).

*Example 5-6 Profile install location*

---

```
<!--
#####
#####This profile node defines where IBM WebSphere Application
Server Network Deployment is installed
Modify the installLocation and eclipseLocation values to the
proper to specify the correct directory where WebSphere
Application Server Network Deployment is installed.
If the specified profile ID exists, you must also change the
profile ID.If you would like to create the default profile
uncomment and provide valid values for the ID and password
properties below
```

```
#####
#####
# AIX default
#installLocation/eclipseLocation='/usr/IBM/WebSphere/MonServer'
# HP-UX default
installLocation/eclipseLocation='/opt/IBM/WebSphere/MonServer'
# SunOS default
installLocation/eclipseLocation='/opt/IBM/WebSphere/MonServer'
# Linux default
#installLocation/eclipseLocation='/opt/ibm/WebSphere/MonServer'
-->
<profile installLocation='/opt/IBM/WebSphere/MonServer' id='IBM
WebSphere Application Server - ND'>
  <data key='eclipseLocation'
value='/opt/IBM/WebSphere/MonServer' />
  <data key="cic.selector.nl" value="en" />
  <data key="user.cic.imported,com.ibm.websphere.ND.70"
value="WAS" />
  <!-- #####
  <data key='user.bpm.admin.username' value='admin' />
  <data key='user.bpm.admin.password' value='admin' />
  #####-->
</profile>
```

---

- e. Edit the command to import WebSphere Application Server Network Deployment to the installation manager. If the profile ID in Example 5-6 has changed, the profile ID must be changed in this command, as well as in Example 5-7.

*Example 5-7 import WebSphere Application Server*

```
#####
#####-->
<import profile="IBM WebSphere Application Server - ND"
type="WAS" />
<!--
#####
```

---

7. Install the required prerequisite products along with WebSphere Business Monitor. If the profile ID in Example 5-6 has changed, the profile ID must be changed in this command as well. Note that the profile in the installation manager refers to the location of the binary file (Example 5-8).

*Example 5-8 Add prerequisites*

---

```
#####
#####-->
<install>
  <offering profile="IBM WebSphere Application Server - ND"
  id="com.ibm.websphere.XML.v10" />
  <offering profile="IBM WebSphere Application Server - ND"
  id="com.ibm.ws.WBM" />
</install>
<!--
#####
```

---

8. Because this installation is for fix pack updates from local artifacts and the base install, change the values in the response file as shown in Example 5-9.

*Example 5-9 Add fix packs*

---

```
<!--
#####
##
Modifying the properties in this section depends upon your type of
install and might be required if you are installing updates along
with the base install .
#####
#####-->
<preference value="true"
name="offering.service.repositories.areUsed" />
<preference value="false"
name="com.ibm.cic.common.core.preferences.searchForUpdates" />
```

---

### 5.3.2 Executing script to install WebSphere Business Monitor Server

Start the installation process by running the `monitor_binary_install` script that was edited in Example 5-3.

#### About this task

This script needs to be run on all the systems that need to be configured for the cluster (DMGR and node machines).



The script performs the following tasks:

- ▶ Installs WebSphere Application Server Network Deployment
- ▶ Installs IBM Installation Manager if it is not already installed or updates it to the appropriate version
- ▶ Imports WebSphere Application Server Network Deployment into Installation manager
- ▶ Installs the required base products and WebSphere Business Monitor using a response file created by the user
- ▶ Installs the required fix packs for WebSphere Business Monitor and XML
- ▶ Automatically configures the installation with the location of the repository that contains the product packages

## Running the script

Install WebSphere Business Monitor Server as follows:

1. Log in to the AIX system as a non-root user.

**Note:** Note the following information:

- ▶ All installation source directories, including the fix pack repositories, should be owned by the non-root user.
- ▶ All installation source directories require write permissions for the non-root user.
- ▶ All installation destination directories require write permissions for the non-root user.

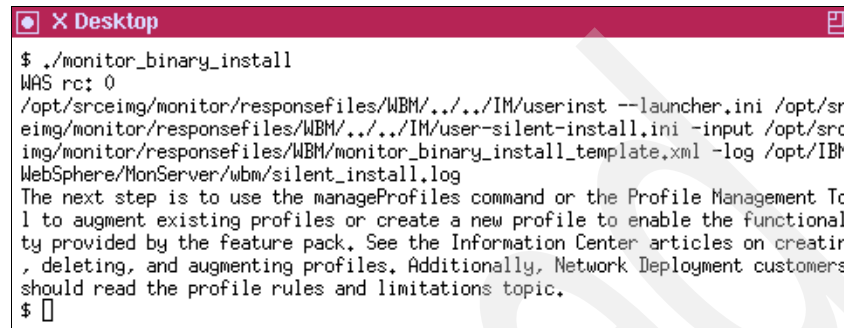
2. Run the script by typing `./monitor_binary_install` in the AIX terminal and pressing Enter. This launches the script to install WebSphere Business Monitor binaries and completes the installation.

## Verifying the binary installation

Always verify the installation in accord with the following steps:

1. Verify that the `INSTCONFSUCCESS` message displays in the `WAS_LOCATION/logs/install/log.txt` file to indicate that WebSphere Application Server was installed.

2. Check the `WAS_LOCATION/logs/wbm/silent_install.log` to verify that WebSphere Business Monitor was installed. Following a successful install, a message similar to that in Figure 5-3 displays. This message also displays in the shell that you used to run the `monitor_install_binary` script.



```
$ ./monitor_install_binary
WAS rc: 0
/opt/srceimg/monitor/responsefiles/WBM/../../IM/userinst --launcher.ini /opt/srceimg/monitor/responsefiles/WBM/../../IM/user-silent-install.ini -input /opt/srceimg/monitor/responsefiles/WBM/monitor_install_binary_install_template.xml -log /opt/IBM/WebSphere/MonServer/wbm/silent_install.log
The next step is to use the manageProfiles command or the Profile Management Tool to augment existing profiles or create a new profile to enable the functionality provided by the feature pack. See the Information Center articles on creating, deleting, and augmenting profiles. Additionally, Network Deployment customers should read the profile rules and limitations topic.
$
```

Figure 5-3 Successful install message on console output

If IBM Installation Manager is installed as a non-root user, the `/var/ibm/InstallationManager` folder is created in the user's home directory, `/home/user/var/ibm/InstallationManager`. If this is installed as a root user, this folder is created directly in the `/var/ibm/InstallationManager` directory. This is the agent data location that holds information about installation manager and the packages that it handles.

**Note:** The binaries must be installed on all systems that need to be configured for the cluster (DMGR and node machines). Return to “Running the script” on page 83 and do so on all such systems.

## 5.4 Configuring WebSphere Business Monitor profiles

A profile defines a unique runtime environment, with separate command files, configuration files, and log files. Profiles define the following types of environments on WebSphere Business Monitor systems:

- ▶ Stand-alone server
- ▶ Deployment manager
- ▶ Managed node

Using profiles, you can have more than one runtime environment on a system, without having to install multiple copies of the WebSphere Business Monitor binary files.

Use the profile management tool or the **manageprofiles** command-line utility to create profiles. In this publication, profiles are created using response files.

### 5.4.1 Creating the deployment manager profile

The following steps describe how to create a WebSphere Business Monitor deployment manager profile using the **manageprofiles** command:

1. Log in to the AIX system as a non-root user.
2. Create a response file named `dmgr.resp` in the `<base_dir>v` directory. Change the values to suit your installation (sample response files are provided in Appendix A, “Additional material” on page 135) (Example 5-10).

*Example 5-10 dmgr.resp*

---

```
create
templatePath=/opt/IBM/WebSphere/MonServer/profileTemplates/wbmonitor
/dmgr
profilePath=/opt/IBM/WebSphere/MonServer/profiles/mondmgr
profileName=mondmgr
cellName=moncell
nodeName=mondmgrnode
enableAdminSecurity=true
adminUserName=monadmin
adminPassword=Bpmadmin01
wbmDBType=Oracle11g
wbmDBDelayConfig=true
wbmDBSchemaName=WBM_MONUSER
wbmDBName=bpm7ora
wbmDBUserId=WBM_MONUSER
wbmDBPassword=WBM_MONUSER
wbmDBJDBCClasspath=/opt/oracle11g/jdbc
wbmDBHostName=webifyaix4.austin.ibm.com
wbmDBServerPort=1521
wbmDBDriverType=4
```

---

3. Run the **manageprofiles** command from your product install location:  
`<install_dir>/bin/manageprofiles.sh -response /<base_dir>/dmgr.resp`

4. When installation is complete, a message displays (Figure 5-4).

A terminal window titled "X Desktop" with a red title bar. The window contains the following text:

```
$ ./manageprofiles.sh -response dmgr.resp
INSTCONFSUCCESS: Success: Profile mondmgr now exists. Please consult /opt/IBM/WebSphere/MonServer/profiles/mondmgr/logs/AboutThisProfile.txt for more information about this profile.
$
```

Figure 5-4 Deployment manager profile creation success

## 5.4.2 Creating and configuring the WebSphere Business Monitor database objects

Before the DMGR profile is started and installation is verified, the database objects used by the DMGR profile at startup need to be created and configured.

DDLs are generated as part of deployment manager profile creation process. They are located on the deployment manager system at `<WBM_HOME>/profiles/<Dmgr profile>/dbscripts/Monitor/Oracle/`. To create and configure these objects:

1. Log in to the database server with an Oracle user ID, and create a file system on the database server for `dbscripts`.
2. Copy all database scripts from the deployment manager system to the database server, in the `<WBM_HOME>/profiles/<Dmgr profile>/dbscripts/Monitor/Oracle/` directory.
3. Verify that the scripts have execute permissions.
4. Set the `ORACLE_HOME` and `ORACLE_SID` variables. Start the `createTables.sql` script from the created directory on the Oracle host by executing the following command as an Oracle user:

```
./sqlplus sys/<password>@<ORACLE_SID> as sysdba
@/opt/app/oracle/dbscripts/monitor/createTables.sql
```

Example 5-11 shows this command with variables incorporated.

### Example 5-11 Create tables

---

```
sqlplus sys/Bpm7admin@bpm7ora as sysdba
@/opt/app/oracle/dbscripts/monitor/createTables.sql
```

---

5. Verify that the database objects were created properly by querying the database as follows:
  - a. Start sqlplus with the `./sqlplus WBM_MONUSER/WBM_MONUSER@bpm7ora` command.
  - b. Run the following command at the sqlplus prompt:
 

```
select * from tab;
```

Successful object creation is verified when results show 80 tables '80 rows selected.'

### 5.4.3 Starting the deployment manager and verification

To do this:

1. Start the deployment manager from `<WBM_HOME>/profiles/<profile name>/bin` by running the `./startManager.sh` command.
2. Verify the logs in `<WBM_HOME>/profiles/<Dmgr profile>/logs/dmgr/` and ensure that there are no errors on startup.
3. Open the WebSphere Business Monitor Integrated Solutions console and verify the installed version:
  - a. Open a browser and go to:
 

```
http://<hostname/ip>:<port>/admin
```
  - b. Log in with the administrative user name and password.
  - c. The welcome screen displays the installed versions (Figure 5-5).

Suite Name	Version
<a href="#">WebSphere Application Server</a>	7.0.0.7
<a href="#">WebSphere Business Monitor</a>	7.0.0.2

Figure 5-5 Installed versions

### 5.4.4 Configuring Microsoft Active Directory as user account registry

Follow the instructions provided in 4.3.4, “Configuring Microsoft Active Directory as user account registry” on page 50.

## 5.4.5 Creating and configuring custom profiles

The following steps describe how to create and federate a WebSphere Business Monitor custom profile using the `manageprofiles` command.

1. Log in to the AIX system as a non-root user.
2. Create a response file `node.resp` in the `<base_dir>` directory with content similar to that shown in Example 5-12. Change the values to suit your installation (sample response files are provided with this publication).
3. Ensure that the user password is the one used in the user repository. Because the Active Directory was configured as the repository, that password is used in the response file shown in Example 5-12.

*Example 5-12 node.resp*


---

```
create
templatePath=/opt/IBM/WebSphere/MonServer/profileTemplates/wbmonitor
/managed
profileName=monnode2
nodeName=monnode2
wbmDBType=Oracle11g
federateLater=false
dmgrAdminUserName=monadmin
dmgrAdminPassword=Bpadmin01
dmgrHost=webifyaix2.austin.ibm.com
dmgrPort=8879
wbmDBJDBCClasspath=/opt/oracle11g/jdbc
```

---

4. Run the `manageprofiles` command from the product install location:  
`<install_dir>/bin/manageprofiles.sh -response <base_dir>/node.resp`

With the installation complete, the INSTCONFSUCCESS message displays (Figure 5-6).



```
/opt/IBM/WebSphere/MonServer/bin
$ ./manageprofiles.sh -response node.resp
Jun 25, 2010 5:50:40 PM null null
INFO: ssl.disable.url.hostname.verification.CWPKI0027I
Jun 25, 2010 5:50:43 PM null null
AUDIT: Self Signed Certificate: notBefore time: Thu Jun 24 17:50:43 CDT 2010 not
After time: Fri Jun 20 17:50:43 CDT 2025
Jun 25, 2010 5:50:45 PM com.ibm.ffdc.osgi.ProviderTracker AddingService
INFO: FFDC1007I: FFDC Provider Installed: com.ibm.ffdc.EmptyProvider(silent)
Jun 25, 2010 5:50:45 PM null null
WARNING: ADMC0046W
Jun 25, 2010 5:50:46 PM null null
INFO: Client code attempting to load security configuration
Jun 25, 2010 5:50:48 PM null null
INFO: Client code attempting to load security configuration
Jun 25, 2010 5:50:57 PM null null
AUDIT: Self Signed Certificate: notBefore time: Thu Jun 24 17:50:57 CDT 2010 not
After time: Fri Jun 20 17:50:57 CDT 2025
Jun 25, 2010 5:50:57 PM null null
WARNING: ADMC0046W
INSTCONFSUCCESS: Success: Profile monnode2 now exists. Please consult /opt/IBM/W
ebSphere/MonServer/profiles/monnode2/logs/AboutThisProfile.txt for more informat
ion about this profile.
$
```

Figure 5-6 Monitor custom node creation success message from console

**Note:** Repeat this process for all the nodes in the WebSphere Business Monitor cluster. Change the necessary parameters in the script (profileName, nodeName, and so on) for each node.

Ensure that the custom profiles were successfully created and federated into the Deployment Manager. To do this, start the Integration Solutions Console and navigate to **System Administration** → **Node Agents**. The node agents display as started (Figure 5-7).

Select	Name	Node	Host Name	Version	Status
You can administer the following resources:					
<input type="checkbox"/>	<a href="#">nodeagent</a>	monnode1	webifyaix2.austin.ibm.com	ND 7.0.0.7 WBM 7.0.0.2	➔
<input type="checkbox"/>	<a href="#">nodeagent</a>	monnode2	webifyaix5	ND 7.0.0.7 WBM 7.0.0.2	➔
Total 2					

Figure 5-7 Monitor nodeagent startup verification

## 5.4.6 Creating and generating the WebSphere Business Monitor deployment environment

This section describes how to create and generate a WebSphere Business Monitor topology based on the Remote Messaging, Support, and Web topology pattern.

We use the Deployment Environment wizard, from the Integrated Solutions Console, to set up the Remote Messaging, Support, and Web topology, which then creates WebSphere Business Monitor components.

1. Log in to the Integrated Solutions Console and navigate to **Servers** → **Deployment Environments**.
2. Click **New** to start the Deployment Environment Creation wizard.
3. Click **Create a deployment environment based on pattern**.
4. Enter WBM RMSW for the deployment environment name.



5. Click **Detailed: Show all steps** (Figure 5-8), and then click **Next**.

**Create Deployment Environment**

Create a deployment environment based on a pattern

Create a deployment environment based on an imported design

File path

\* Deployment environment name

Fast path: Show only needed steps

Detailed: Show all steps

Figure 5-8 Create deployment environment

6. Verify that **WBM** is selected and click **Next**.
7. Choose the topology. WebSphere Business Monitor only supports Single Cluster and the Remote Messaging, Support, and Web topology. Select that option and click **Next**.

- Click the check box for each node that will be part of the deployment environment (Figure 5-9), and click **Next**.

**Step 1: Select Nodes** **Select Nodes**

Select the nodes to use for the development environment. The *Remote Messaging, Remote Support, and Web* deployment environment *WBMRMSW* requires at least **1 node**. For high-availability and failover environments, select two nodes. For scalability, select more than two nodes.

Select	Node	Version	Host
<input checked="" type="checkbox"/>	monnode1	WBM 7.0.0.2	webifyaix2.austin.ibm.com
<input checked="" type="checkbox"/>	monnode2	WBM 7.0.0.2	webifyaix5

Number of required nodes: 1  
Number of selected nodes: 2

Figure 5-9 Select nodes

9. On the next page, leave the defaults to create a four-cluster topology on the two nodes (Figure 5-10). Click **Next**.

**Cluster Members**

Map the clusters to the listed nodes by indicating the number of cluster members to configure.

Node	Version	Application Deployment Target	Messaging Infrastructure	Supporting Infrastructure	Web Applications
monnode1	WBM 7.0.0.2	1	1	1	1
monnode2	WBM 7.0.0.2	1	1	1	1

Previous Next Cancel

Figure 5-10 Cluster Members

10. The next panel is concerned with the virtual host in a load-balanced environment. This topic is covered in Chapter 7, “Configuring an HTTP server for load balancing” on page 119. For now, accept the defaults in this panel (Figure 5-11) and click **Next**.

[Step 1: Select Nodes](#)   **System REST Service Endpoints**

[Step 2: Clusters](#)

→ [Step 3: System REST Service Endpoints](#)

[Step 4: Import database configuration](#)

[Step 5: Database](#)

[Step 6: Security](#)

[Step 7: Summary](#)

Use this page to configure service endpoints for Representational State Transfer (REST) system interfaces. If you want widgets to be available in Business Space, you must configure the REST service endpoints for those widgets. For each REST service endpoint, specify the host or virtual host and port that a client uses to communicate with your cluster. If you leave the host and port fields empty, the values default to those of a cluster member host and its HTTP port. For a load-balanced environment, you must later change the default values to the virtual host name and port of your environment.

**REST services**

Protocol:

Host name or virtual host in a load-balanced environment:

Port:

Context root:

Figure 5-11 REST endpoint

11. Provide a database configuration file if it was generated using the database design tool (DDT). We have not used the DDT, and instead configured the schema using scripts. We leave the defaults (blanks) in this section and continue to the next page.



12. Change the database parameters to match the schema name, user name, password, and server name (Figure 5-12). Click **Next**.

The screenshot shows the 'Database' configuration window. On the left, a navigation pane lists steps: Step 1: Select Nodes, Step 2: Clusters, Step 3: System REST Service Endpoints, Step 4: Import database configuration, Step 5: Database (highlighted), Step 6: Security, and Step 7: Summary. The main area is titled 'Database' and contains the text 'Edit the database parameters for the data sources that are needed by this deployment environment.' Below this are buttons for 'Edit...', 'Reset', and 'Edit Provider...'. A toolbar with icons for copy, paste, add, and delete is present. The main table has the following data:

Select	Component	Database Name	Schema	Create Tables	User Name	Password	Server	Provider	Description
<input type="checkbox"/>	Business Monitor Messaging Engine	bpm7ora	WBM_MSGU	<input type="checkbox"/>	WBM_MSGU	.....	webifyaix4.i	Oracle	Business Monitor messaging engine data source
<input type="checkbox"/>	Business Space	bpm7ora	WPS_BSPUS	<input type="checkbox"/>	WBM_MSGU	.....	webifyaix4.i	Oracle	Business Space data source
<input type="checkbox"/>	Common Event Infrastructure	bpm7ora	WBM_CEIMS	<input type="checkbox"/>	WBM_CEIMS	.....	webifyaix4.i	Oracle	CEI Messaging Engine data source

At the bottom of the window are buttons for 'Previous', 'Next', and 'Cancel'.

Figure 5-12 Database properties

13. Accept the default values for configuring the security alias for the CEI and WBPM\_Alphablox. Click **Next**.
14. Review the options on the summary page and click **Finish**. Do not click Finish and Generate Environment, as the changes need to be synchronized with the nodes before generating the deployment environment.
15. Save the changes and synchronize the changes with the nodes. The deployment environment has been created.
16. Optional: Click **Export** to export the deployment environment into an XML file. Exported deployment environment files can be used to set up similar environments or to automate the deployment environment creation.
17. Generate the deployment environment. Click the **WBMRMSW** link in the Deployment Environment list.
18. In the next panel, click **Generate Environment**. This starts generating the environment. When the message The configuration has ended displays, click **Save Changes**.
19. Click **Save**.
20. Click **Synchronize** to synchronize the changes with the nodes. The deployment environment has been created.
21. Ensure that the deployment environment generation has been completed successfully and saved, and that the nodes have been synchronized properly.
22. Restart the deployment manager.

## 5.4.7 Verifying the configuration

Verify that the configuration was successful:

1. In the Integrated Solutions Console, navigate to **Servers** → **WebSphere Business Monitor configuration**.
2. On the WebSphere Business Monitor configuration page, verify that all components have a green icon (Figure 5-13).

### Configure WebSphere Business Monitor

For your WebSphere Business Monitor environment to work properly, you must configure multiple components. The following tables show the status of the components that make up a complete WebSphere Business Monitor environment.

#### Configure WebSphere Business Monitor

To view the details of a component or to modify a configuration, click the component name.

**Required components:**

All components must display a green check mark for your WebSphere Business Monitor environment to work properly.

	Component	Status
✓	<a href="#">Outbound CEI event service</a>	Configured using the event service on WBM RMSW2.Support
✓	<a href="#">Messaging engine</a>	Deployed on WBM RMSW2.Messaging
✓	<a href="#">Action services</a>	Deployed on WBM RMSW2.Support
✓	<a href="#">Monitor scheduled services</a>	Deployed on WBM RMSW2.Support

**Optional components:**

To configure an optional component, click the component name. Components that are already configured display a green check mark.

	Component	Status
✓	<a href="#">Alphablox</a>	Deployed on WBM RMSW2.WebApp
✓	<a href="#">Dashboards for mobile devices</a>	Deployed on WBM RMSW2.WebApp
✓	<a href="#">Inbound event emitter services (JMS and REST)</a>	Deployed on WBM RMSW2.Support

**Shared components:**

Components that are already configured display a green check mark. Removing these components might affect other products.

	Component	Status
✓	<a href="#">REST Services Gateway</a>	Deployed on WBM RMSW2.WebApp
✓	<a href="#">Business Space</a>	Deployed on WBM RMSW2.WebApp

Figure 5-13 WebSphere business monitor components

3. Before starting the environment, check database connectivity to ensure that the deployment environment has been generated correctly. Follow these steps to verify database connectivity:
  - a. Log in to the administrative console and navigate to **Resources** → **JDBC** → **JDBC Providers** → **Data Sources**.
  - b. Ensure that **All Scopes** is selected.
  - c. Select all of the data sources.
  - d. Click **Test Connection** to check connectivity. A message displays confirming this.

### 5.4.8 Starting and verifying the deployment environment

To start and verify the deployment environment:

1. Start the deployment environment from the Integrated Solutions Console.
2. Navigate to **Servers** → **Deployment Environments**.
3. Click the **WBMRMSW** check box, and click **Start**.
4. To verify that the creation of the deployment environment was successful, each of the clusters must be started. Starting the clusters also starts the application servers and enterprise applications deployed on those servers.
5. With the clusters started, check the `SystemOut.log` file for each of the servers to verify that there are no errors. The `SystemOut.log` file is in the logs folder for each profile. For example, the `SystemOut.log` file for the messaging cluster on the `monnode1` node is in the folder named `/opt/ibm/WebSphere/MonServer/profiles/monnode1/logs/WBMRMSW.Messaging.monnode1.0/`.

### 5.4.9 Setting up cross-cell queue bypass

In a multiple-cell environment, if WebSphere Business Monitor is not installed on the remote cell that is emitting events, the deployment manager and CEI servers in the remote cell must be configured so that they emit events to the queue bypass tables.

## Configuring deployment manager and CEI servers

To set up cross-cell queue bypass:

1. In the `app_server_root/scripts.wbm/crossCell` directory of the local WebSphere Business Monitor server installation, locate the `monitorCommunicationWithWAS70BasedCells.tar` file.
2. Copy the file to the `app_server_root/plugins` directory on every WebSphere Application Server installation in the remote cell that hosts a CEI target and extract the contents.
3. On each WebSphere Application Server installation to which the contents of the file were extracted:
  - a. Shut down all Java Virtual Machines (JVMs) that are using `app_server_root/java/bin/java`, including node agents, servers, deployment managers, and `wsadmin` prompts.
  - b. Run `profile_root/bin/osgiCfgInit` for every profile on the WebSphere Application Server installation.
  - c. Restart all node agents and servers.

## Setting up a data source on the remote cell

To consume events from a remote WebSphere Process Server cell using queue bypass event delivery mode, we must set up a data source on the remote cell that points to the WebSphere Business Monitor database. Additionally, as WebSphere security is enabled on both sides, we also must exchange the LTPS token and SSL certificate.

To route the datasource creation:

1. Navigate to the `/opt/ibm/WebSphere/ProcServer/util/WBM` directory on the WebSphere Process Server Deployment Manager node.
2. Copy the `configureQueueBypass.py` script to `myConfigureQueueBypass.py`.
3. Edit the file and change the parameters in accord with Table 5-1.

Table 5-1 `myConfigureQueueBypass.py`

Parameter	Value
<code>cellName</code>	<code>moncell</code>
<code>dbType</code>	<code>oracle</code>
<code>jdbcProvider</code>	<code>Oracle JDBC Driver (XA)</code>
<code>driverType</code>	<code>4</code>
<code>dbName</code>	<code>bpm7ora</code>



Parameter	Value
dbServerName	HostName
dbServerPort	1521
securityParm	-user WBM_MONUSER -password WBM_MONUSER

4. Navigate to the `/opt/IBM/WebSphere/ProcServer/bin` directory and execute the following script:

```
./wsadmin.sh -user wpsadmin -password Bpmadmin01 -lang jython -f
../util/WBM/myConfigureQueueBypass.py
```
5. Log in to the Integrated Solutions Console, navigate to **Resources** → **JDBC** → **Data sources**, and verify that the data source `Monitor_monCell_Routing_Database` has been created.
6. Click the **Select** check box to the left of the data source.
7. Click **Test Connection** to verify that the connection can be established with the WebSphere Business Monitor database.

### Exchanging the LTPA token and SSL certificates

To exchange these security settings with the remote cell:

1. Export the LTPA token from the WebSphere Process Server Deployment Manager:
  - a. Log in to WebSphere Process Server Integrated Solutions Console and navigate to **Security** → **Global Security** → **Authentication** and click **LTPA**. In the Cross-Cell Single Sign-On area of the panel, enter the administrator password.
  - b. Enter `<path_to_directory>/ltpa.key` in the fully qualified key file name field, then click **Export Keys**.
  - c. Copy the key into a directory in the WebSphere Business Monitor server deployment manager location.

2. Import the LTPA token and WebSphere Process Server SSL signer certificate of the deployment manager SOAP connector into WebSphere Business Monitor Server:
  - a. Log in to WebSphere Business Monitor Integrated Solutions Console, navigate to **Security** → **Global Security** → **Authentication**, and click **LTPA**. In the Cross-Cell Single Sign-On section area of the panel, enter the administrator password.
  - b. Enter `<path_to_directory>/ltpa.key` in the fully qualified key file name field, then click **Import Keys**.
  - c. Navigate to **SSL certificate and key management** → **Key stores and certificates** → **NodeDefaultTrustStore** → **Signer certificates**.
  - d. Click **Retrieve from port** and enter the WebSphere Process Server connection parameters as in Table 5-2.

Table 5-2 WPS connection parameters

Parameter	Value
Host	Host name of WebSphere Process Server Deployment Manager
Port	SOAP connector Port
Alias	WPS

- e. Click **Retrieve Signer Information**. Review the SSL information, and click **OK** to import the certificate into the trust store.
- f. Save and synchronize the changes.
- g. On the Monitor DMGR machine, start a terminal window and navigate to `MONITOR_HOME/bin`.
- h. Run the following command:
 

```
./wsadmin.sh -conntype RMI -host <WPSCELL_DMGR_HOSTNAME> -port <RMI_BOOTSTRAP_PORT>
```

 e.g. `./wsadmin.sh -conntype RMI -host webifyaix4.austin.ibm.com -port 9809`
- i. With the connection established, you are prompted to add the signer to the trust store. Type `y`.
- j. A prompt displays, asking for the realm/cell name. The realm name was assigned when LDAP was configured. The realm name for this installation is `BPMAD`.
- k. Enter the administrative user name and password of the WebSphere Process Server cell, in this case, `wpsadmin`.

- l. Run steps (g) through (k) on the WebSphere Process Server DMGR machine.
- m. Change all parameters to point to the WebSphere Business Monitor DMGR machine. In doing so, this sets up reverse connections from both machines. Also, the cross certificates are being retrieved and stored.
- n. Stop, then start, the deployment environment, node agents, and deployment managers on both cells.

**Note:** If there is a different security realm in each cell, add the WebSphere Process Server realm name to the trusted authentication realm, or, if CSiv2 security settings have been changed, verify these settings:

1. In the Integrated Solutions Console, navigate to **Security** → **Global Security**. Under RMI/IIOP security, click **CSiv2 Outbound Communications**.
2. Click **Trusted authentication realms** → **outbound**. Select **Trust realms**.

Verify the identity assertion settings in both cells:

- ▶ In the WebSphere Process Server cell, verify the following settings:
    - a. On the navigation panel, click **Security** → **Global security**.
    - b. Under RMI/IIOP security, click **CSiv2 Inbound Communications**.
    - c. Click the **Use identity assertion** check box, and ensure that trusted identities is set to an asterisk (\*).
  - ▶ On the WebSphere Business Monitor cell, verify the following settings:
    - a. Under RMI/IIOP security, click **CSiv2 Outbound Communications**.
    - b. Click the **Use identity assertion** check box, and ensure that Use server trusted identity is selected.
3. Click **Add External Realm** and add the realm of the remote cell.
  4. Click **Apply**.

#### 5.4.10 Verifying the topology using a sample application

As a last step, validate all of the components by deploying the HelloWorld sample application provided in Appendix A, “Additional material” on page 135. Chapter

8, “Verifying installations using sample applications” on page 125, describes the steps for installing and testing the HelloWorld application.

Archived



# **WebSphere Business Services Fabric: Remote Messaging and Remote Support topology**

This chapter provides instructions for extending a current WebSphere Process Server: Remote Messaging and Remote Support topology to WebSphere Business Services Fabric.

## 6.1 Topology summary

In this environment, a Remote Messaging and Remote Support topology is deployed to two nodes. This pattern of an Remote Messaging and Remote Support topology consists of three clusters. These clusters and components are:

- ▶ Remote Messaging cluster
  - Service Component Architecture (SCA) application bus members
  - SCA system bus members
  - Business Process Choreographer (BPC) bus members
  - Common event infrastructure (CEI) bus members
- ▶ Remote Support cluster
  - CEI server application
  - Business rules manager
  - BPC components
  - Business Space components
- ▶ Application deployment cluster
  - Application deployment target
  - BPC container
  - WebSphere Business Services Fabric Container

## 6.2 Installing WebSphere Business Services Fabric binaries

Install the WebSphere Business Services Fabric binaries in *silent installation mode* and as a *non-root user*. When silent installation is used, the user interface (UI) is not available. Instead, a response file is used to input the commands that are required to install the product package. This procedure presumes that the prerequisite base products for the WebSphere Business Services Fabric are installed. Prerequisite products include the installation manager, WebSphere Application Server Network Deployment, WebSphere Application Server Feature Pack for XML, WebSphere Application Server Feature Pack for SCA with the Service Data Objects (SDO) feature, and WebSphere Process Server.

Prior to starting the installation, the operating system (OS) needs to be prepared as described in 3.4, “Preparing an AIX operating system” on page 19. Also, ensure that the software repository is available as discussed in 3.6, “Creating a software repository” on page 35.

## 6.2.1 Preparing response files to install WebSphere Business Services Fabric as a non-root user

The response file and script that install WebSphere Business Services Fabric binaries are located at `extract_root/responsefiles/WBI` and are named as follows:

- ▶ Script file: `run_templates`
- ▶ Response file: `template_response.xml`

The steps are:

1. Extract the product image (`CZAQ9ML.tar.gz`) for your OS to `<base_dir>` (Example 6-1).

*Example 6-1 Uncompress product image to <base\_dir>*

---

```
gunzip -c CZAQ9ML.tar.gz | tar xvf -
```

---

2. Download and extract the fix pack images for your OS into the `<fixpack_dir>` directory from fix pack central.

**Note:** Learn more about the latest WebSphere Business Services Fabric fix packs at:

<http://www-01.ibm.com/support/docview.wss?uid=swg24026479>

3. Make a backup of the original `run_templates` script and `template_response.xml` response file using the commands in Example 6-2.

*Example 6-2 Make a backup of files*

---

```
$ mv run_templates wps_binary_install
$ mv template_response.xml wps_binary_install_template.xml
```

---

4. Verify and edit the section highlighted in bold in the `wps_binary_install` script (Example 6-3).

*Example 6-3 Verify the WAS\_LOCATION value and others*

---

```
#!/bin/sh
#####
#
#
# sample_run_templates
#
# Note: Before you run this script, make sure that you modify the
parameters that follow this comment. Also make sure that you
```

```

# have modified all of the options in the response file template.
# If required also comment out steps that
# you do not need to perform (for example, comment out WAS install
# if the product is already installed on your system).
#
# All templates are run relative to the directory in which this
# script runs.
#
#####
#
# Set the directory name where this file is located.
curdir="`pwd`"
PROGDIR="`dirname "$0"`"
cd "${PROGDIR?}"
PROGDIR="`pwd`"
cd "${curdir?}"
TEMPDIR=/tmp/wbpm/install

##### PARAMETERS #####
WAS_IMAGE="${PROGDIR}/../..//WAS
# AIX default WAS_LOCATION=/usr/IBM/WebSphere/DynProcSrv7
# SunOS default WAS_LOCATION=/opt/IBM/WebSphere/DynProcSrv7
# Linux default WAS_LOCATION=/opt/ibm/WebSphere/DynProcSrv7
WAS_LOCATION=/opt/IBM/WebSphere/ProcServer
IM_IMAGE="${PROGDIR}/../..//IM
KEYRING=

#####
# Where:
#   WAS_IMAGE = The path to the WebSphere Application Server
#               Network Deployment installation image
#   WAS_LOCATION = the path to the directory where WebSphere
#               Application Server Network Deployment will be installed to
#   IM_IMAGE = The path to the Installation Manager (IM)
#               installation image
#   KEYRING = The keyring file (if you need one) to use while
#               installing to an IM repository;
#               If you have no keyring file, do not include a value
#               for this parameter
#####

#####

```



```

# Install WebSphere Application Server Network Deployment using a
silent installation.
#
# Note: Comment out this section if WebSphere Application Server
Network Deployment is already installed
#####
# "${WAS_IMAGE}"/install -silent -OPT
silentInstallLicenseAcceptance=true -OPT
allowNonRootSilentInstall=true -OPT disableOSPrereqChecking=true
-OPT disableNonBlockingPrereqChecking=true -OPT
installType=installNew -OPT profileType=none -OPT
feature=samplesSelected -OPT feature=languagepack.console.all -OPT
feature=languagepack.server.all -OPT
installLocation="${WAS_LOCATION}"

echo WAS rc: $?

#####
# Install WebSphere Process Server and prerequisite products.
#
# The example template runs the following procedures:
# 1. Install or update to IM v1.3.2
# 2. Synchronize the WebSphere Application Server Network
Deployment installation with IM
# 3. Install the WebSphere Application Server Feature Pack for XML
# 4. Install the WebSphere Application Server Feature Pack for SCA
# 5. Install WebSphere Process Server using IM
# 6. Install IBM WebSphere Business Monitor using IM
# 7. Install WebSphere Dynamic Process Edition
#
# To modify install options modify the template_response.xml file
#####
echo "${IM_IMAGE}"/userinst --launcher.ini
"${IM_IMAGE}"/user-silent-install.ini -input
"${PROGDIR}"/wbsf_binary_install_template.xml -log
"${WAS_LOCATION}"/logs/wbsf/silent_install.log

"${IM_IMAGE}"/userinst --launcher.ini
"${IM_IMAGE}"/user-silent-install.ini -input
"${PROGDIR}"/wbsf_binary_install_template.xml -log
"${WAS_LOCATION}"/logs/wbsf/silent_install.log

exit $?

```

---

5. Edit the `wbsf_binary_install_template.xml` file:
  - a. Edit the repository section to add fix pack repositories of WebSphere Business Services Fabric, XML, and SCA. This is the location of the local repositories that have been downloaded and extracted in the repository section (Example 6-4).

*Example 6-4 Change the location of fix pack repositories*

---

```

<server>
  <!-- ##### IM Repository Location
  #####-->
  <repository location='.././IM/' temporary='true' />
  <!-- ##### WebSphere Application Server Import
  Repository Location #####-->
  <repository location=".././WAS_SYNC/" />
  <!-- ##### WebSphere Application Server Feature
  Pack for XML Repository Location #####-->
  <repository location=".././repository/" />
  <!-- ##### WebSphere Application Server
  Feature Pack for SCA Repository Location #####-->
  <repository location=".././repository/" />
  <!-- ##### WebSphere Process Server and WebSphere
  Enterprise Service Bus Repository Location #####-->
  <repository location=".././repository/" />
  <!-- ##### WebSphere Business Monitor
  #####-->
  <repository location=".././repository/" />
  <!-- ##### IBM Foundation Pack for WebSphere Business
  Services Fabric #####-->
  <repository location=".././repository/" />
  <!-- ##### WebSphere Application Server Live
  Update Repository #####-->
  <!-- <repository
  location="http://public.dhe.ibm.com/software/websphere/repositori
  es/" /> -->

  <repository
  location="/opt/srceimg/wps/FP/fabric.7002.repository" />
  <repository
  location="/usr/srceimg/wps/FP/xml.1.0.0.5.fp/xml.1.0.0.5.fp" />
  <repository
  location="/usr/srceimg/wps/FP/sca.1.0.1.3.fp/sca.1.0.1.3.fp" />
</server>

```

---

- b. Edit the Installation Manager installation location (Example 6-5).

**Note:** For this publication, the response file has been modified to specify that the installation manager be installed in /opt/IBM/IM/eclipse and the cache be installed in /opt/IBM/M/eclipseCache.

*Example 6-5 Change the location of the installation manager*

---

```
<!--
#####
####
This profile node defines where IBM Installation Manager (IM)
is/or will be installed.
If you want to modify where IM is installed modify both the
installLocation and eclipseLocation values to specify the correct
directory
#####
#####-->
<profile kind='self' installLocation='/opt/IBM/IM/eclipse'
id='IBM Installation Manager'>
  <data key='eclipseLocation' value='/opt/IBM/IM/eclipse' />
</profile>
```

---

- c. Edit the command to import WebSphere Application Server Network Deployment to the Installation Manager (Example 6-6).

*Example 6-6 Edit command*

---

```
<!--
#####
####
This command directs IM to import WebSphere Application Server
Network Deployment, whose location is specified in the previous
section, into IM.
If you changed the profile ID above, you must also change the
profile ID here.
#####
#####-->
<import profile="IBM WebSphere Application Server - ND"
type="WAS" /
```

---

- d. Edit the command to add a valid offering ID for the fix pack to the installation manager (Example 6-7).

*Example 6-7 Edit command*

---

```
<!--
#####
#####
This command directs IM to import WebSphere Application Server
Network Deployment, whose location is specified in the previous
section, into IM.
If you changed the profile ID above, you must also change the
profile ID here.
#####
#####-->
<install>
<offering profile="IBM WebSphere Application Server - ND"
id="com.ibm.wbsf.fp" />
</install>
```

---

- e. Because we are installing fix pack updates from local artifacts along with the base install, change values in the response file in accord with Example 6-8.

*Example 6-8 Response file modifications*

---

```
<!--
#####
#####
Modifying the properties in this section depends upon your type
of install and might be required if you are installing updates
along with the base install .
#####
#####-->
<preference value="true"
name="offering.service.repositories.areUsed" />
<preference value="false"
name="com.ibm.cic.common.core.preferences.searchForUpdates" />
```

---

## 6.2.2 Executing the script to install WebSphere Business Services Fabric binaries

Start the installation process by running the `wbsf_binary_install` script that was edited in Example 6-3.

## About this task

This script is run on all systems that need to be configured for the cluster (DMGR and node machines).

The script performs the following tasks:

- ▶ Installs WebSphere Business Services Fabric binaries
- ▶ Installs IBM Installation Manager, if it is not already installed, or updates it to the appropriate version
- ▶ Imports WebSphere Application Server Network Deployment into the Installation Manager
- ▶ Automatically configures the installation with the location of the repository that contains the product packages

## Executing the script

To do this:

1. Log in to the AIX system as a non-root user.

**Note:** Note the following information:

- ▶ All installation source directories, including the fix pack repositories, should be owned by the non-root user.
- ▶ All installation source directories should have write permissions for the non-root user.
- ▶ All installation destination directories should have write permissions for the non-root user.

2. Type `./wbsf_binary_install` in the AIX terminal and press Enter. This launches the script to install WebSphere Process Server binaries and complete the installation.

## Verifying the binary installation

Always verify the installation:

1. Verify that the 'INSTCONFSUCCESS' message appears in the `WPS_HOME/logs/bpm/wbsf_install.FP7002/wbsf_installconfig_server_profileMaintenance.log` file to indicate that the WebSphere Business Services Fabric binaries were installed.
2. Check the `WPS_HOME/logs/wbsf/silent_install.log` to verify that there are no errors in the log.

## 6.3 Configuring WebSphere Business Services Fabric profiles

In this section, information is provided to augment the existing deployment manager and custom nodes to WebSphere Business Services Fabric.

For this publication, we describe how to augment a profile using `manageprofile` commands and response files.

### 6.3.1 Augmenting the deployment manager profile

In this section, information is provided to augment the deployment manager profile to WebSphere Business Services Fabric, using `manageprofiles` commands in a response file.

The following steps describe the procedure to augment a WebSphere Process Server deployment manager profile to WebSphere Business Services Fabric using the `manageprofiles` command:

1. Log in to the AIX system as a non-root user.
2. Create the response file `wbsf_dmgr.resp` in the `<base_dir>` directory with content similar to that in Example 6-9. However, modify the values to match your installation (sample response files are provided with this publication).

*Example 6-9 Response file wbsf\_dmgr.resp*

---

```
augment
templatePath=/opt/IBM/WebSphere/ProcServer/profileTemplates/dmgr.wbs
fabric
profilePath=/opt/IBM/WebSphere/ProcServer/profiles/wpsdmgr
profileName=wpsdmgr
cellName=wpscell
nodeName=wpsdmgrnode
enableAdminSecurity=true
adminUserName=wpsadmin
adminPassword=Bpmadmin01
dbType=ORACLE
dbSchemaName=WPS_CDBUSER
dbName=bpm7ora
dbUserId=WPS_CDBUSER
dbPassword=WPS_CDBUSER
dbJDBCClasspath=/opt/oracle11g/jdbc
dbHostName=webifyaix4.austin.ibm.com
```

```
dbServerPort=1521
dbDriverType=4
```

---

3. Run the **manageprofiles** command from  
`<install_dir>/bin/manageprofiles.sh -response`  
`<base_dir>/wbsf_dmgr.resp`.

When the installation is complete, the following message is displayed:

```
INSTCONFSUCCESS: Profile augmentation succeeded.
```

### 6.3.2 Augmenting the custom profiles to WebSphere Business Services Fabric

In this section, information is provided to augment both of the custom profiles to WebSphere Business Services Fabric, using the manage profiles command with a response file.

The following steps describe how to augment a WebSphere Process Server custom profile to WebSphere Business Services Fabric using the manage profiles command.

1. Log in to the AIX system as a non-root user.
2. Create a response file `wbsf_node.resp` in the `<base_dir>` directory with content similar to that shown in Example 6-10. However, change the values to suit your product installation (sample response files are provided in Appendix A, “Additional material” on page 135). Ensure that the user password is the one being used in the user repository. Because the Active Directory was configured as the repository, that password needs to be used in the response file.

*Example 6-10 Response file wbsf\_node.resp*

---

```
augment
templatePath=/opt/IBM/WebSphere/ProcServer/profileTemplates/managed.
wbsfabric
profileName=wpsnode1
nodeName=wpsnode1
profilePath =/opt/IBM/WebSphere/ProcServer/profiles/wpsnode1
dmgrHost= webifyaix4.austin.ibm.com
dmgrPort=8879
dmgrAdminUserName=wpsadmin
dmgrAdminPassword=Bpadmin01
dbType=ORACLE
dbJDBCClasspath =/opt/oracle11g/jdbc
```

---

3. Run the **manageprofiles** command from the product install location,  
`<install_dir>/bin/manageprofiles.sh -response  
<base_dir>/wbsf_node.resp.`
4. When the installation is complete, verify that the following message displays:  
INSTCONFSUCCESS: Profile augmentation succeeded.

**Note:** Repeat this process for all nodes in the WebSphere Process Server cluster. Change the parameters in the script (profileName, nodeName, profilePath) for each node.

### 6.3.3 Deploying WebSphere Business Services Fabric applications

In this section, the WebSphere Business Services Fabric applications are deployed to the application target cluster using a script. This script is copied to the install location  
(WPS\_HOME/profileTemplates/dmgr.wbsfabric/actions/scripts/cluster/fabricAppDeploy.py) during the binary install phase.

To deploy the WebSphere Business Services Fabric applications using the script:

1. Log in to the AIX system as a non-root user.
2. Run the **wsadmin** command from WPS\_HOME/bin with the parameters shown in Example 6-11.

#### *Example 6-11 Deploy WBS Fabric applications*

---

```
wsadmin.sh -connType NONE -user wpsadmin -password Bpmsadmin01 -f  
/opt/IBM/WebSphere/ProcServer/profileTemplates/dmgr.wbsfabric/action  
s/scripts/cluster/fabricAppDeploy.py -cluster BPMRemote Messaging  
and Remote Support .AppTarget -toolsUserid wpsadmin  
Where:  
-f  
/opt/IBM/WebSphere/ProcServer/profileTemplates/dmgr.wbsfabric/action  
s/scripts/cluster/fabricAppDeploy.py is the location of the script.  
-cluster BPMRemote Messaging and Remote Support .AppTarget is the  
name of the Application target cluster.  
-toolsUserid wpsadmin is the administrative user ID to be used for  
Fabric Administration console. This user id should either be a WPS  
administrator or be a part of a group called FabricAdministrators.
```

---



3. When the installation is complete, verify that the message in Figure 6-1 displays.

```
Fabric enterprise applications installed.  
Please start the Fabric enterprise applications  
manually using WPS Administration console.  
$ █
```

Figure 6-1 WebSphere Business Services Fabric application install

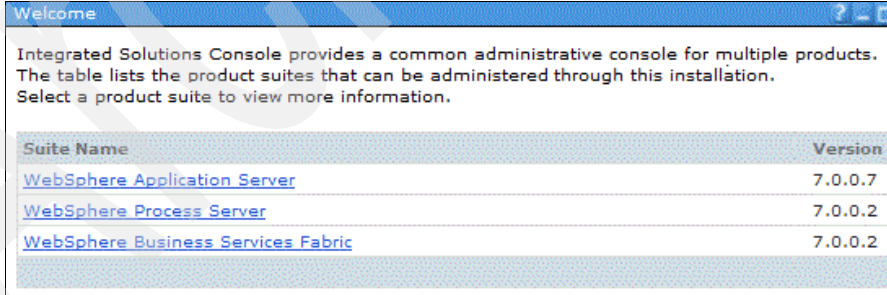
### 6.3.4 WebSphere Business Services Fabric installation verification

In this section we start the deployment manager and verify that the WebSphere Business Services Fabric binaries were successfully installed, the profiles were successfully augmented, and the applications were successfully installed in the application target.

We also verify that the applications start properly and that there are no errors in the application target logs on cluster startup.

The following steps describe how to verify WebSphere Business Services Fabric install:

1. Start all the node agents in the cluster.
2. Start the deployment manager.
3. Log in to the integrated solutions console to display the Welcome panel with the WebSphere Business Services Fabric version (Figure 6-2).



Welcome

Integrated Solutions Console provides a common administrative console for multiple products. The table lists the product suites that can be administered through this installation. Select a product suite to view more information.

Suite Name	Version
<a href="#">WebSphere Application Server</a>	7.0.0.7
<a href="#">WebSphere Process Server</a>	7.0.0.2
<a href="#">WebSphere Business Services Fabric</a>	7.0.0.2

Figure 6-2 WebSphere Business Services Fabric welcome panel

4. Navigate to **Applications** → **Application types** → **WebSphere Enterprise applications** and verify that the Fabric applications were successfully installed (Figure 6-3).

<input type="checkbox"/>	<a href="#">Fabric Catalog_BPMRMRS.AppTarget</a>	✘
<input type="checkbox"/>	<a href="#">Fabric Tools_BPMRMRS.AppTarget</a>	✘
<input type="checkbox"/>	<a href="#">Fabric Trace_BPMRMRS.AppTarget</a>	✘
<input type="checkbox"/>	<a href="#">HTM_PredefinedTaskMsg_V700_BPMRMRS.AppTarget</a>	✘
<input type="checkbox"/>	<a href="#">HTM_PredefinedTasks_V700_BPMRMRS.AppTarget</a>	✘
<input type="checkbox"/>	<a href="#">HumanTaskManagementWidgets_BPMRMRS.Support</a>	✘
<input type="checkbox"/>	<a href="#">REST_Services_Gateway</a>	✘
<input type="checkbox"/>	<a href="#">REST_Services_Gateway_Dmgr</a>	➔
<input type="checkbox"/>	<a href="#">RemoteAL61</a>	✘
<input type="checkbox"/>	<a href="#">TaskContainer_BPMRMRS.AppTarget</a>	✘
<input type="checkbox"/>	<a href="#">mm.was_BPMRMRS.Support</a>	✘
<input type="checkbox"/>	<a href="#">persistentLkMgr</a>	✘
<input type="checkbox"/>	<a href="#">sca.sib.mediation</a>	✘
<input type="checkbox"/>	<a href="#">webWidget_BPMRMRS.Support</a>	✘
<input type="checkbox"/>	<a href="#">widgets_fabric_BPMRMRS.Support</a>	✘

Figure 6-3 Fabric Applications deployed

5. Navigate to **Servers** → **Clusters** → **WebSphere Application Server clusters**.
6. Select the three clusters and click **RippleStart**.

**Note:** Ensure that the first cluster startup after installing the WebSphere Business Services Fabric applications is a RippleStart startup. This means that all the nodes in a cluster start in sequence and not in parallel. This ensures a clean WebSphere Business Services Fabric bootstrap to the database.

7. The startup takes time. Monitor the node, apptarget, messaging, and support logs and ensure that there are no errors in the application target logs of all the nodes. These logs are located at:

```
</WPS_HOME>/profiles/<node_profile>/logs/<topology_name>.AppTarget<profile_name>1.0
```

8. After the logs have been verified for errors, return to **Servers** → **Deployment Environment**, where the status of the deployment environment displays as started.
9. Navigate to **Applications** → **Application types** → **WebSphere Enterprise applications** and verify that the Fabric applications were successfully started.
10. Open a new browser and navigate to:  
`http://<dmgr_hostname>:<apptarget_port>/fabric/app`
11. Use the login ID used as the toolsUserID in Example 6-11, and verify that you are able to log in to the WebSphere Business Services Fabric Administrative Console.

**Note:** After the topology has been configured and the clusters are running, verify the installation by running the WebSphere Business Services Fabric installation verification application. This is discussed in Chapter 8, “Verifying installations using sample applications” on 125. With the steps in this chapter carried out, the application can be run now, or it can be run after all other components have been configured.

This concludes the WebSphere Business Services Fabric install and configuration.

Archived

## Configuring an HTTP server for load balancing

This section introduces using the IBM HTTP Server for load balancing in a production topology. It contains the following sections:

- ▶ “Introduction” on page 120
- ▶ “Installing IBM HTTP Server” on page 120
- ▶ “Adding the IBM HTTP server to the cell” on page 121
- ▶ “Enabling SSL on the HTTP server” on page 122

## 7.1 Introduction

The IBM HTTP Server is a web server based on Apache HTTP Server with IBM enhancements. The IBM HTTP Server plug-in provides (among other functionality) a load-balancing capability that can be closely integrated with the WebSphere topology in the environment.

The HTTP server's responsibility is to distribute load among cluster members. IBM HTTP Server is designed to handle HTTP load that comes from thousands of users, and is a key component for high-volume scenarios.

The topologies described in this book use this load-balancing functionality to route requests from Business Space widgets to the Representational State Transfer (REST) gateway services, from the BPCEXplorer UI to the BPE Container and HTM Container REST services. Essentially, this is to decouple the web UI interfaces from the backend data requests by acting as a HTTP sprayer.

## 7.2 Installing IBM HTTP Server

To install IBM HTTP Server, perform the following steps:

1. Log in to the system on which to install IBM HTTP Server.
2. Create a file named `ihs.resp` in the `<base_dir>/IHS/IHS` (or use the one provided in Appendix A, "Additional material" on page 135) with the contents shown in Example 7-1, adapting it to your location values.
3. Run the installation silently:

```
cd /software/IHS/IHS
./install -options ihs.resp -silent
```

*Example 7-1 IBM HTTP server response file*

---

```
-OPT silentInstallLicenseAcceptance="true"
-OPT allowNonRootSilentInstall=true
-OPT disableOSPrereqChecking="true"
-OPT installLocation="/opt/IBM/HTTPServer"
-OPT httpPort="8080"
-OPT adminPort="8008"
-OPT createAdminAuth="true"
-OPT adminAuthUser="bpmosadm"
-OPT adminAuthPassword="bpmosadm"
-OPT adminAuthPasswordConfirm="bpmosadm"
-OPT runSetupAdmin="true"
```

```
-OPT createAdminUserGroup=true
-OPT setupAdminUser="bpmosadm"
-OPT setupAdminGroup="bpmadm"
-OPT installPlugin="true"
-OPT webserverDefinition="bpmwebsrvr"
-OPT
washostname="webifyaix4.austin.ibm.com"
```

---

**Note:** When running a non-root silent install, use a port number above 1024 on UNIX platforms. For this book, we use 8080 as the HTTP port.

**Note:** After installing IBM HTTP Server 7.0.0.0, update it to 7.0.0.11. This is a mandatory upgrade on AIX and it fixes certain bugs. Download the update from:

<http://www-01.ibm.com/support/docview.wss?uid=swg24026852>

## 7.3 Adding the IBM HTTP server to the cell

This section explains how to add the IBM HTTP server to the deployment manager. Make sure that the deployment manager is running before beginning this procedure.

During the installation of the IBM HTTP server plug-in, a `configureWebserver` script is produced by the install process on the web server. In this environment, this file is located at:

```
/opt/IBM/HTTPServer/Plugins/bin/configurebpmwebsrvr.sh
```

To configure an IBM HTTP server called `bpmwebsrvr` to the deployment environment, perform the following steps:

1. From the deployment manager, copy this script to the bin directory of the deployment manager profile. In our environment, copy this script from the IBM HTTP Server server to the following directory:

```
/opt/IBM/WebSphere/ProcServer/profiles/wpsdmgr/bin
```

2. Run the `configureWebserver` script to configure the web server by entering:

```
cd /opt/IBM/WebSphere/ProcServer/profiles/wpsdmgr/bin
```

```
./configurebpmwebsrvr.sh -profileName wpsdmgr -user wpsadmin
-passwd Bpmadmin01 -ihsAdminPassword bpmosadm
```

**Note:** The `configureWebserver` script automatically maps all web application modules to the web server. Otherwise, you must manually map these web modules.

3. On the web server machine, start the IBM HTTP server administrative server:  
`/opt/IBM/HTTPServer/bin/adminctl start`
4. Verify that the new configured web server is in the deployment environment:
  - a. Log in to the Integrated Solutions Console as an administrator.
  - b. Click **Servers** → **Server Types** → **web servers**.
  - c. From the web servers pane, select the web server and click **Start**. The arrow turns green.

## 7.4 Enabling SSL on the HTTP server

By default, SSL is not enabled on the IBM HTTP server. SSL needs to be enabled on the web server first, and then communications between the web server and the appserver can be enabled.

To enable SSL on the web server, use the Integrated Solutions Console as follows:

1. In the Integrated Solutions Console, navigate to **Servers** → **Server Types** → **Web servers** to display the list of configured HTTP servers.
2. Click **httpserver** to display the IBM HTTP server configuration page.
3. Click **Configuration Settings** → **Web Server Virtual Hosts** to display the virtual host configuration page.
4. On the web server virtual host configuration page, click **New**.
5. On the first page of the new web server virtual host wizard, click **Security-enabled virtual host**, then click **Next**.

Continue by creating a new security-enabled virtual host. On the second page of the wizard, take the following steps:

1. In the Key Store File Name field enter `httpserver`.
2. In the Target Key Store Directory field, enter `${WEB_INSTALL_ROOT}/conf`.
3. In the Key Store Password and Verify Key Store Password fields, enter `itso4you`.
4. In the Certificate Alias field enter `selfSigned`. Click **Next**.



5. On the third page of the wizard, enter the IP address of the HTTP server in the IP Address field.
6. Change the default SSL port to 5443 (a non-root user does not have access to the 443 port). Click **Next**.
7. On the last page of the wizard, review the summary information.
8. Click **Finish**.
9. Click **Stop** then **Start** to activate the secured virtual host.

Enable SSL communication between the web server and the application server:

1. In the Integrated Solutions Console, navigate to **Security** → **SSL certificate and key management**.
2. Click **Manage Endpoint Security Configuration**.
3. In the local topology tree, inside Inbound>wpscell (CellDefaultSSLSettings.default), click one of the nodes, wpsnode1 or wpsnode2.
4. Click **Key Stores and Certificates**.
5. Click **CellDefaultKeyStore**.
6. Click **Personal Certificates**.
7. Select the default certificate and click **Extract**.
8. Enter a valid file path and file name with the extension .arm, leaving the data type as the default.
9. Click **OK** to save the file.
10. In the Integrated Solutions Console, navigate to **Servers** → **Server types** → **Web Servers**.
11. Click the web server name.
12. Click **Plug-in Properties**.
13. Click **Manage Keys and Certificates**.
14. Click **Signer Certificates**.
15. Click **Add**.
16. Enter an alias name.
17. Enter the name and path of the extracted .arm file. Click **OK**.
18. Restart the web server for the settings to take effect.

Archived

## Verifying installations using sample applications

This chapter describes how to verify the installation of products that were installed using this IBM Redbooks publication.

This chapter describes the following topics:

- ▶ “Installing and executing a WebSphere Process Server/WebSphere Business Monitor module” on page 126
- ▶ “Installing and executing WebSphere Business Services Fabric Module” on page 131

## 8.1 Installing and executing a WebSphere Process Server/WebSphere Business Monitor module

This section describes how to install and execute modules for WebSphere Process Server and WebSphere Business Monitor.

### 8.1.1 Installing the WebSphere Process Server modules

Install the WebSphere Process Server modules as follows:

1. Install the `CATOrderMgmtApp.ear` and `CATOrderMgmt_implApp.ear` files shipped in the `MonitorSample.zip` file through the WebSphere Process Server Integrated Solutions console. To do so:
  - a. Launch the Integrated Solutions console and click **Applications** → **Application Types** → **WebSphere enterprise application** → **Install**.
  - b. Enter the location of the file. Click **Next**.
  - c. Click the **Fast Path - Prompt only when additional information is required** radio button.
  - d. Click **Next** and accept the defaults in all the panels *except* for the Map modules to servers panel.
  - e. On the Map modules to servers panel, ensure that SimpleWeb is applied to `cluster=BPMRemote Messaging` and Remote Support `.AppTarget`.
2. Start the installed SimpleApp application by clicking **Start** on the Enterprise Applications panel and ensure that it starts.

### 8.1.2 Installing the WebSphere Business Monitor modules

Install the WebSphere Business Monitor modules as follows:

1. Install the `OrderHandlingMonitorApplication.ear` file shipped in the `MonitorSample.zip` file through the WebSphere Business Monitor Integrated Solutions console following these steps:
  - a. Launch the Integrated Solutions console and click **Applications** → **Application Types** → **WebSphere enterprise application** → **Install**.
  - b. Enter the location of the file. Click **Next**.
  - c. Click the **Detailed Path** radio button. Click **Next**.
  - d. In the next window, accept the defaults. Click **Next**.
  - e. In the next window, review the warning messages. Click **Next**.

- f. In the Map Modules to Servers window, select the check boxes next to the modules listed. Ensure that they are applied to cluster=BPMRemote Messaging and Remote Support .AppTarget.
- g. Click **Apply**. Click **Next**.
- h. For each of the following windows, accept the defaults and click **Next**. When you reach the Select Monitor model CEI options window, enter the following parameters:
  - i. Click the **Remote option** radio button.
  - ii. Enter the WebSphere Process Server Deployment Manager host name and the RMI Bootstrap port (for example, webifyaix4.austin.ibm.com, 9809).
  - iii. Enter the administrative user name and password of the WebSphere Process Server Deployment Manager (for example, wpsadmin).
  - iv. Click the Refresh button to list all of the available event group profiles.
  - v. Click the check box for the desired event group for which to select the event distribution mode.
  - vi. Click the radio button for the desired event distribution mode. The default is monitor model queue bypass. Click **Next**.
- i. In the Summary window, review the summary.
- j. Click **Finish**.
- k. After the above process finishes, review, save and synchronize the master configuration. It takes a few minutes for the monitor model to start automatically.
- l. Ensure that the model is started by navigating to **Applications** → **Monitor Models** and verifying that the “Order\_Handling\_CATOrderMgmt.Processes” model status is OK and that the start status is green:
  - i. Click the **Order\_Handling\_CATOrderMgmt.Processes** link.
  - ii. Click **Manage Schema**.
  - iii. Click **Export Create Schema Script**.
  - iv. Save the CreateSchema\_Order\_Handling\_CATOrderMgmt.Processes.ddl file locally, and transfer it to the database machine.
  - v. On the database machine, run the DDL with system user access.

- vi. After the DDL has been executed, return to previous window and verify that the Schema Created check box is green (Figure 8-1).

**Monitor Models > Order\_Handling\_CATOrderMgmt.Processes (2008-06-27T14:14:44)**

Use this page to tune and configure the error handling and KPI properties of this model version.

General

---

<p><b>General Properties</b></p> <p>Model <input type="text" value="Order_Handling_CATOrderMgmt.Processes"/></p> <p>Version <input type="text" value="2008-06-27T14:14:44"/></p> <p>Application <input type="text" value="Order Handling MonitorApplication"/></p> <p>CEI distribution mode <input type="text" value="Active (monitor model queue bypass)"/></p> <p>Active MC instances <input type="text" value="1"/></p> <p><b>Deployment</b></p> <p><input checked="" type="checkbox"/> Dashboards enabled</p> <p><input checked="" type="checkbox"/> Schema created</p> <p><input checked="" type="checkbox"/> Alphablox cubes created (optional)</p> <p><input type="checkbox"/> Data Movement Service enabled (optional)</p>	<p><b>Version Properties</b></p> <p><input type="checkbox"/> <a href="#">Manage schema</a></p> <p><input type="checkbox"/> <a href="#">Manage Alphablox Cubes</a></p> <p><input type="checkbox"/> <a href="#">Enable Data Movement Service</a></p> <p><input type="checkbox"/> <a href="#">Change CEI distribution mode</a></p> <p><input type="checkbox"/> <a href="#">Change runtime configuration</a></p> <p><input type="checkbox"/> <a href="#">View model</a></p> <p><input type="checkbox"/> <a href="#">Purge model version</a></p> <p><b>Manage Monitor Data</b></p> <p><input type="checkbox"/> <a href="#">Export Instance Data</a></p> <p><input type="checkbox"/> <a href="#">Purge and Archive Instance Data</a></p>
--	--

Figure 8-1 Monitor model install verification

### 8.1.3 Executing the WebSphere Business Monitor Module

Execute the WebSphere Business Monitor as follows:

1. Begin executing this module by instantiating the Business Process Choreographer (BPC) instance to emit events.
2. Launch the BPC Explorer from the WebSphere Process Server cell at `http://<HTTPSERVER_HOSTNAME>:/bpc`
3. In the left navigation pane of the BPC Explorer, click **All Versions**.
4. In the right pane, click **Order Handling**.

5. Click **Start Instance**.
6. In the next Process Input Message window, enter the following parameters:
  - Process name: Test1
  - Customer number: 1234
  - City: Austin
  - Country: US
  - Rating: 800
  - Available Credit: 800.0
  - Price: 100.0
  - Quantity: 1
  - Total price: 100.0
  - Order number: 2345
  - Order status: APPROVED
7. Click **Submit**. This instantiates the BPC instance, and the event is emitted to the monitor cell.
8. Navigate to **Task Instances** → **My To-dos**.
9. Click the **Ship Order to Customer** check box.
10. Click **Work on**.
11. Click **Complete** in the next window.

There are five different paths to take in this model. For each path, the following are sample data elements that will invoke the path:

- ▶ Approve without review, account in good standing, ship.
  - Start instance: rating – 800, available credit – 800, total price – 20
  - Ship task: no required elements
- ▶ Approve without review, account not in good standing, approve the order, ship.
  - Start instance: rating – 800, available credit – 100, total price – 200
  - Review task: order status – APPROVED
  - Ship task: no required elements
- ▶ Approve without review, account not in good standing, decline the order.
  - Start instance: rating – 800, available credit – 100, total price – 200
  - Review task: order status – DECLINED

- ▶ Do not approve without review, approve the order, ship.
  - Start instance: rating – 10, available credit – 10, total price – 900
  - Review task: order status – APPROVED
  - Ship task: no required elements
- ▶ Do not approve without review, decline the order.
  - Start instance: rating – 10, available credit – 10, total price – 900
  - Review task: order status – DECLINED

To see an alert in the alerts view of the dashboard, you the number of shipped orders must be less than 85% of the total number of orders. An easy way to achieve this is to process one DECLINED order, then before you add any other process instances, go to the dashboard section of this document and create a dashboard to view the alerts.

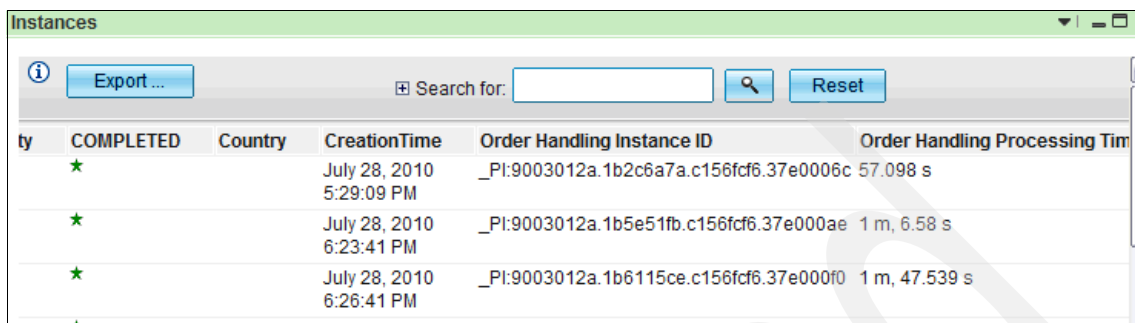
### 8.1.4 Verifying data in WebSphere Business Monitor dashboards

In this section we build a dashboard, add views to the dashboard, and configure them. To do this, log in to the Business Space instance on the WebSphere Business Monitor cell and create a new space with the following steps:

1. Click **Manage Spaces**.
2. Click **Create Space**.
3. Enter the name of the space, select a template of **Business Monitoring**, and click **OK**.
4. In the Manage spaces window, click the newly created space.
5. In the newly created space, click page **Operational**. Click **Edit page** in the left corner.
6. In Edit page mode, and on the Operational page, notice the *instances* widget, In the right corner of the instances widget, click the pull-down menu and click **Edit settings**.
7. Select the monitoring contexts by selecting the **Order Handling** module.
8. Click **Set as Default**.
9. Select all available columns and move them into the selected box by clicking the arrows.



10. Click **OK** to save the changes. The instances display along with a status (Figure 8-2).



ty	COMPLETED	Country	CreationTime	Order Handling Instance ID	Order Handling Processing Time
*			July 28, 2010 5:29:09 PM	_PI:9003012a.1b2c6a7a.c156fcf6.37e0006c	57.098 s
*			July 28, 2010 6:23:41 PM	_PI:9003012a.1b5e51fb.c156fcf6.37e000ae	1 m, 6.58 s
*			July 28, 2010 6:26:41 PM	_PI:9003012a.1b6115ce.c156fcf6.37e000f0	1 m, 47.539 s

Figure 8-2 Business Space instance widget verification

## 8.2 Installing and executing WebSphere Business Services Fabric Module

This section describes the steps to install and test a sample WebSphere Business Services Fabric application. The sample application consists of a WebSphere Enterprise Service Bus mediation flow containing the Fabric Context Extractor wired to a Fabric Dynamic Assembly Component. It also contains a set of WebSphere Business Services Fabric artifacts containing Business Services and policies. The sample application is packaged in a file named `FabricSample.zip` and can be downloaded from Appendix A, “Additional material” on page 135.

The steps to install the module are:

1. Launch the WebSphere Business Services Fabric Administration Console using the following URL:  
`http://<webserverhost_name>/fabric/login.jsp`
2. Log in into the console by entering the WebSphere Process Server admin user ID `wpsadmin` (in our environment) and password.
3. In the console, expand **Governance Manager** and click **Import/Export**.
4. Import the following files in the order listed below from the `FabricSample.zip` file:
  - a. `AppGlossary.zip` (contains the business vocabulary)
  - b. `BService.zip` (contains business services)
  - c. `SimpleApp.zip` (contains the business application)

5. For each file imported ignore the following message:  
Warning: Importing a Fabric Content Archive replaces all of the existing Namespaces included in the Fabric Content Archive.
6. These imports create new namespaces and projects artifacts. Verify that the App Simple (technical) and App-Simple (business) artifacts are created by clicking **Governance Manager** → **Configure Namespaces**.
7. Verify that the App-Simple and BService-Simple artifacts are created by clicking **Governance Manager** → **Configure Projects**.
8. Install the SimpleApp.ear file shipped in the FabricSample.zip file through the WebSphere Process Server Integrated Solutions Console following these steps:
  - a. Launch the Integrated Solutions Console and click **Applications** → **Application Types** → **WebSphere enterprise application** → **Install**.
  - b. Enter the location of the SimpleApp.ear file. Click **Next**.
  - c. Click the **Fast Path - Prompt only when additional information is required** radio button. Click **Next** and accept the defaults in all the panels except for the Map modules to servers panel.
  - d. On the Map modules to servers panel, ensure that the SimpleWeb is applied to cluster=BPMRemote Messaging and Remote Support .AppTarget.
  - e. Start the installed SimpleApp application by clicking **Start** on the Enterprise Applications panel and ensure that it is started.

Using SOAP UI, an open source web service testing tool, perform these steps:

1. Import the SimpleApp-soapui.xml file that represents a SOAP UI project from the FabricSample.zip.
2. Invoke a SOAP request against one of the WebSphere Business Services Fabric servers using the URL:

<http://<server>:<default>/SimpleWeb/sca/Simple-HTTP>

See Example 8-1.

*Example 8-1 SoapUI request*

---

```
<soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:sim="http://Simple/simpleInterface">
<soapenv:Header/>
<soapenv:Body>
<sim:operation1>
<input1>
```

```
<decimal>12.2</decimal>
<boolean>true</boolean>
<date1>2007-02-06-06:00</date1>
<text>hello world</text>
<integer>32</integer>
<enumeration>VALUE1</enumeration>
</input1>
</sim:operation1>
</soapenv:Body>
</soapenv:Envelope>
```

---

When a SOAP request is invoked, the context extractor extracts the context from the incoming request, processes it, and passes it on to the dynamic assembly component, which in turn selects the correct endpoint or service based on the business context or policies and sends back the appropriate response.

Specifically, the sample demonstrates two functions (that is, read and process the data types supported by the context extractor), and based on whether the input is passed as a date, it sends back the response as true or false (Example 8-2).

*Example 8-2 Results of SOAP request*

---

```
<soapenv:Envelope
xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
<soapenv:Body>
<in:operation1Response xmlns:in="http://Simple/simpleInterface">
<output1>true</output1>
</in:operation1Response>
</soapenv:Body>
</soapenv:Envelope>
```

---

A true response in `<output1>true</output1>` verifies that the WebSphere Business Services Fabric run time is functioning correctly. This completes the verification process.

Archived

## Additional material

This book refers to additional material that can be downloaded from the internet as described below.

### Locating the web material

The web material associated with this book is available in softcopy on the internet from the IBM Redbooks publication web server. Point your web browser to:

<ftp://www.redbooks.ibm.com/redbooks/SG247885>

Alternatively, you can go to the Redbooks publication website at:

[ibm.com/redbooks](http://ibm.com/redbooks)

Select **Additional materials** and open the directory that corresponds with the Redbooks publication form number, SG247885.

## Using the web material

The additional web material that accompanies this book includes the SG247885\_Artifacts.zip file, which contains the following scripts:

- ▶ Database scripts
- ▶ Silent install scripts
- ▶ Profile creation scripts
- ▶ Deployment environment scripts
- ▶ IVT applications

## System requirements for downloading the web material

The following system configuration is recommended:

<b>Hard disk space</b>	2.5 MB
<b>Operating system</b>	AIX/Windows

## How to use the web material

Create a subdirectory (folder) on your workstation, and uncompress the contents of the web material compressed file into this folder.

# Abbreviations and acronyms

<b>BPC</b>	Business Process Choreographer	<b>SCA</b>	Service Component Architecture
<b>BPCDB</b>	Business Process Choreographer Database	<b>SDK</b>	Software Development Kit
<b>BPM</b>	Business Process Management	<b>SDO</b>	Service Data Object
<b>CBE</b>	Common Business Events	<b>SMIT</b>	System Management Interface Tool
<b>CEI</b>	Common Event Infrastructure	<b>SOA</b>	Service-oriented Architecture
<b>CHRP</b>	Common Hardware Reference Platform	<b>TCO</b>	Total Cost of Ownership
<b>CICS</b>	Customer Information Control System	<b>UI</b>	User Interface
<b>CIM</b>	Centralized Installation Manager		
<b>CLI</b>	Command Line Interface		
<b>DDT</b>	Database Design Tool		
<b>FDCC</b>	Federal Desktop Core Configuration		
<b>GUI</b>	Graphic User Interface		
<b>IBM</b>	International Business Machines Corporation		
<b>IP</b>	Internet Protocol		
<b>ITSO</b>	International Technical Support Organization		
<b>JFS</b>	Journaled File System		
<b>JMS</b>	Java Message Service		
<b>JVM</b>	Java Virtual Machine		
<b>LDAP</b>	Lightweight Directory Access Protocol		
<b>OS</b>	Operating System		
<b>PMT</b>	Profile Management Tool		
<b>REST</b>	Representational State Transfer		
<b>ROI</b>	Return On Investment		

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# Related publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this book.

## IBM Redbooks publications

For information about ordering these publications, see “How to get Redbooks publications” on page 139. Note that some of the documents referenced here may be available in softcopy only.

- ▶ *WebSphere Business Process Management V7 Production Topologies*, SG24-7854
- ▶ *IBM HTTP Server (powered by Apache): An Integrated Solution for IBM eServer iSeries Servers*, SG24-6716
- ▶ *WebSphere Application Server Network Deployment V6: High Availability Solutions*, SG24-6688
- ▶ *WebSphere Business Process Management V6.1.2 Production Topologies*, SG24-7665

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This book addresses the following products and provides instructions for creating a production-level Remote Messaging and Remote Support environment using a deployment environment pattern:

- ▶ WebSphere Process Server V7.0.0.2
- ▶ WebSphere Business Monitor V7.0.0.2
- ▶ WebSphere Business Services Fabric V7.0.0.2

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