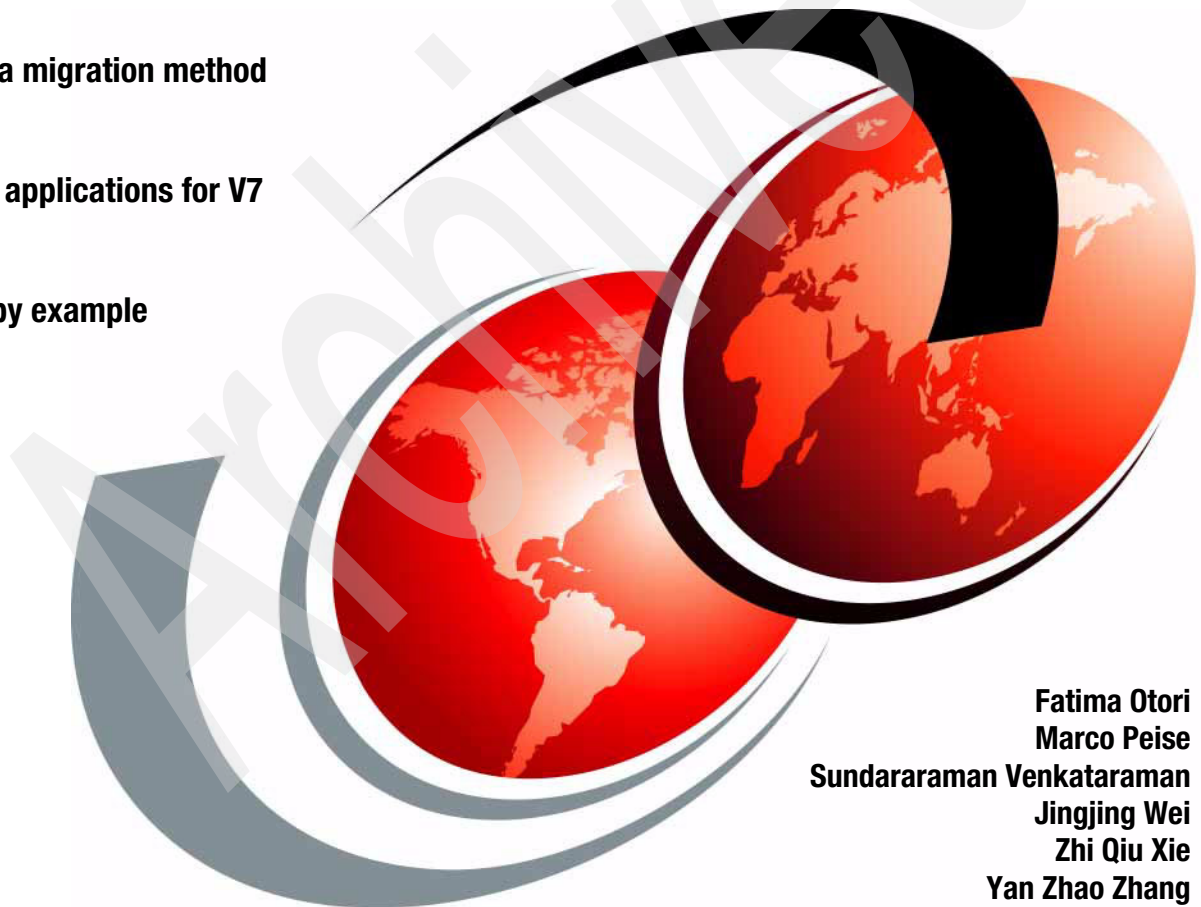IBM

Version-to-Version Migration to IBM WebSphere Dynamic Process Edition V7

Select a migration method

Enable applications for V7

Learn by example

Fatima Otori
Marco Peise
Sundararaman Venkataraman
Jingjing Wei
Zhi Qiu Xie
Yan Zhao Zhang

Redbooks

International Technical Support Organization

Version-to-Version Migration to IBM WebSphere Dynamic Process Edition V7

June 2010

Note: Before using this information and the product it supports, read the information in "Notices" on page xiii.

First Edition (June 2010)

This edition applies to WebSphere Dynamic Process Edition V7.0.

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Preface

This IBM® Redbooks® publication provides concepts, details, and examples related to the migration process for Business Process Management (BPM) products. It describes three migration patterns for migrating earlier versions (Version 6.0.2, Version 6.1, Version 6.1.2, and Version 6.2) of the following BPM products to IBM WebSphere® Dynamic Process Edition:

► IBM WebSphere Process Server
► IBM WebSphere Enterprise Service Bus
► IBM WebSphere Business Modeler
► IBM WebSphere Business Monitor
► IBM WebSphere Business Services Fabric
► IBM WebSphere Adapters

This book includes planning information and leading practices for the migration of these products. It provides information about the steps required to perform the migration, and includes two scenarios that walk you through example migrations on distributed and IBM z/OS® platforms.

The team who wrote this book

This book was produced by a team of specialists from around the world working at the International Technical Support Organization, Rochester Center.
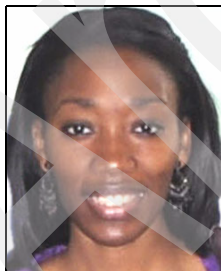
Fatima Otori is an IBM System z® WebSphere IT Specialist based in Chicago, IL. In her current role, Fatima is actively engaged in implementing critical success paths to SOA for several major clients, particularly in the areas of Application Modernization, Application Integration, and overall Business Process Improvement and Management. Fatima holds a Bachelor of Science degree from Tulane University and a Master of Science degree from the University of Michigan Ann Arbor, both for Electrical Engineering.
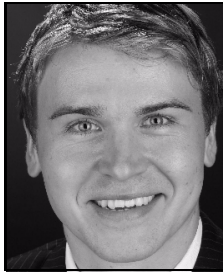
Marco Peise is an IT Specialist working for IBM Software Services for WebSphere in Germany. He has 10 years of experience in the application development field and 3 years of experience developing WebSphere Process Server applications with customers. He holds a diploma degree in Computer Science from the University of Rostock in Germany. His areas of expertise include application design and development as well as problem determination based on the IBM WebSphere product family. Marco is an IBM Certified Solution Developer for WebSphere Integration Developer and an IBM Certified System Administrator for WebSphere Process Server.

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stack products. Zhi Qiu is an IBM Certified SOA Solution Designer and an IBM Certified Administrator for SOA Solutions.

Yan Zhao Zhang is a Staff Software Engineer at the IBM Software Development Lab in China. He has 10 years of experience in the software field and more than 4 years of experience in the Business Process Management version to version migration field. He holds a Master's degree in Computer Science from Northwestern Polytechnical University in China. His areas of expertise include Software System Verification Testing, Project Management, and software automation test framework development. He is a Project Management Institute certified PMP and IBM Certified System Administrator - WebSphere Application Server, Network Deployment V6.1.

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Part 1

Migration

In this part, we introduce version-to-version migration concepts, and provide information about the three migration patterns.

1

1

Overview of migration strategy

There has been an increased interest among Business Process Management (BPM) customers to migrate to the latest version of the BPM products. In this book, we discuss the migration planning and execution steps that customers will follow for a version to version migration of Business Process Management products to IBM WebSphere Dynamic Process Edition Server V7.0.

In this chapter, we discuss the three migration methods available to the customers, and the ways to choose the right method. This chapter provides a sample migration planning checklist, which the customers will use during their migration phases. We also discuss different phases of the migration and the scenarios we are planning to cover in a step-by-step migration demonstration. This chapter also provides introductory information about the products packaged in WebSphere Dynamic Process Edition Server.

3

1.1 Product overview

This section provides information about the products in the scope of this book. Distributed platforms support all of the Business Process Management products discussed in this section, while IBM z/OS supports WebSphere Process Server, WebSphere Enterprise Service Bus, and WebSphere Business Fabric.

1.1.1 WebSphere Dynamic Process Edition Server

WebSphere Dynamic Process Edition Server is a comprehensive offering of the IBM BPM Suite. It provides end-to-end BPM capabilities for businesses to adapt and response dynamically to changes in today's rapidly changing business environments. WebSphere Dynamic Process Edition V7.0 includes the following products:

► WebSphere Dynamic Process Edition Tool and Testing Pack
  – IBM WebSphere Business Modeler Advanced V7.0
  – IBM WebSphere Business Services Fabric Tool Pack V7.0 (bundles WebSphere Integration Developer V7.0 and WebSphere Business Monitor Development Toolkit V7.0)
► WebSphere Dynamic Process Edition Server
  – IBM WebSphere Business Services Fabric Foundation Pack V7.0 (bundles WebSphere Process Server V7.0)
  – IBM WebSphere Business Monitor V7.0

More information about WebSphere Dynamic Process Edition Server can be found at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib m.wdpe.doc/Welcome/ic-homepage.html

1.1.2 IBM Business Space powered by WebSphere

Business Space provides a customizable and collaborative environment for monitoring, reviewing, and administering common business processes, such as human task flows, modeling, and performance indicators. Business Space is a browser-based graphical user interface that lets business users interact with content from products in the WebSphere Business Process Management portfolio.

Business users can view the content they want to see in the way they want to see it by creating *mashups*, which are combinations of Web applications (widgets) configured on the pages of a business space that provides content from multiple sources.

The Business Space powered by WebSphere framework encompasses the following Version 7 BPM products:

► IBM WebSphere Process Server
► IBM WebSphere Business Monitor
► IBM WebSphere Business Modeler
► IBM WebSphere Business Modeler Publishing Server
► IBM WebSphere Business Services Fabric
► IBM WebSphere ESB
► IBM WebSphere Integration Developer

More information about Business Space is available at the following URL:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.bspace.ic.main.doc/welcome/bspace_welcome.html

1.1.3 WebSphere Business Modeler

WebSphere Business Modeler helps you document, visualize, and analyze your business processes using industry standards and leading Business Process Management (BPM) powered by Smart Service-Oriented Architecture (SOA) technologies.

More Information about the product is available at the following addresses:

► http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.btools.modeler.basic.inst.doc/installing/t_launch_platform.html

► http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.btools.modeler.advanced.main.doc/welcome/dochome_adv.html

1.1.4 WebSphere Integration Developer

WebSphere Integration Developer is a development environment for end-to-end integration of your service-oriented application. It is the Eclipse-based tool for building SOA-based business process management (BPM) and integration solutions across WebSphere Process Server, WebSphere Enterprise Service Bus, and WebSphere Adapters.

More information about the WebSphere Integration Developer product is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.wbit.help.mainwelcome.doc/topics/welcome.html

1.1.5 WebSphere Business Compass

WebSphere Business Compass provides a comprehensive set of tools for business process modeling, BPM design, and modeling collaboration. This product was introduced in Version 7.0.

More information about the product is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.btools.help.modeler.collab.publish.doc/welcome/home.html

1.1.6 WebSphere Business Monitor

WebSphere Business Monitor is a comprehensive business activity monitoring tool that provides a 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 in the WebSphere Process Server runtime environment. This information is then presented in personalized dashboards for business users.

WebSphere Business Monitor V7.0 has added the ability to link strategic organization 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.

More information about WebSphere Business Monitor is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.btools.help.monitor.doc/home/home.html

1.1.7 WebSphere Process Server

WebSphere Process Server is a business process integration server that has evolved from proven business integration concepts, application server technologies, and the latest open standards. WebSphere Process Server is a high-performance business engine to help form processes to meet business goals.

More information about the WebSphere Process Server product is available at the following addresses:

► Distributed platforms:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
  .ibm.websphere.wps.doc/welcome_wps.html

► z/OS

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
  .ibm.websphere.wps.z.doc/doc/welcome_wps_tun.html

1.1.8 WebSphere Enterprise Service Bus

WebSphere Enterprise Service Bus (WebSphere ESB) provides the capabilities of a standards-based enterprise service bus. It is available as a stand-alone product, and is also included in WebSphere Process Server.

WebSphere ESB manages the flow of messages between service requesters and service providers. Mediation modules within the ESB handle mismatches between requesters and providers, including protocol or interaction-style, interface, and quality of service mismatches. In an Service Component Architecture (SCA) based solution, mediation modules are a type of SCA module. The mediation modules perform a special role, and therefore have slightly different characteristics from other components that operate at the business level.

Mediation components operate on messages exchanged between service endpoints. In contrast with regular business application components, they are concerned with the flow of the messages through the infrastructure and not just with the business content of the messages. Rather than performing business functions, they perform routing, transformation, and logging operations on the messages. The information that governs their behavior is often held in headers flowing with the business messages. The IBM SOA programming model introduces the service message object (SMO) data structure to support this pattern.

WebSphere ESB supports advanced interactions between service endpoints on three levels:

► Broad connectivity
► A spectrum of interaction models and qualities of interaction
► Mediation capabilities

The product supports connectivity between endpoints through a variety of protocols and application programming interfaces (APIs).

More information about the product is available at the Information Center at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.websphere.wesb.doc/doc/welcome_wps_ovw.html
```

1.1.9 WebSphere Business Services Fabric

WebSphere Business Services Fabric provides an end-to-end platform to rapidly assemble, deliver, and govern industry-focused composite Business Services in a SOA environment. A Business Service represents a business function whose behavior can be adapted at run time based on the current business situation and policy. These Business Services are assembled into modules whose life cycle is separated from the core processes, making manageability of complex BPM projects easier.

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

► IBM Business Services Foundation Pack

The Foundation Pack contains a runtime business service policy enforcement and building engine that enables dynamic assembly of intelligent Business Services. It is based upon WebSphere Process Server.

► IBM Business Services Tool Pack

The Tool Pack is integrated into the WebSphere Integration Developer, and includes a visual assembly environment for creating and managing intelligent Business Service models and policies.

More information about the WebSphere Business Services Fabric product can be found at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.ws.fabric.icmaster.doc/ic-homepage.htm
```

1.1.10 WebSphere Adapters

An important aspect of today's business integration requirements is the need to use existing Enterprise Information System (EIS) assets in a heterogeneous, integrated enterprise. Whether the business need is to share business data across disparate EIS assets, automate business processes across EISs, connect new e-business applications to existing EISs, or provide users with access to EIS business data, there is a common requirement to provide interfaces to EISs. Adapters play a key role in the integration of applications by providing these interfaces using open standards.

The IBM WebSphere Adapter portfolio is a generation of adapters based on the Java™ 2 Platform, Enterprise Edition (J2EE) standard. They enable managed, bidirectional connectivity and data exchange between EIS resources and J2EE components. WebSphere Adapters V7.0 are J2EE Connector Architecture (JCA) 1.5 and Enterprise Metadata Discover (EMD) 1.2 compliant

The IBM WebSphere Adapter portfolio includes the following application and technology adapters:

► IBM WebSphere Application Adapters

  – JD Edwards EnterpriseOne
  – Oracle E-Business Suite
  – PeopleSoft Enterprise
  – SAP Software
  – Siebel Business Applications

► IBM WebSphere Technology Adapters

  – Email
  – File Transfer Protocol (FTP)
  – Flat Files
  – IBM
  – JDBC
  – Lotus® Domino®

More information about the WebSphere Adapters can be found at the following address:

http://www-01.ibm.com/software/integration/wbiadapters/library/infocenter/

1.2 Terminology

This section provides a description of some of the terminology that is helpful in understanding the information in this book:

Migration versus upgrade

Migration refers to the movement of a group of objects from one installation environment to another environment. This is required when delivering major new features, profile updates, and enhancements. This also applies to first and second digit release number changes. The new version must be installed side-by-side to the old version of the product.

Upgrade refers to the replacement of a product with a newer version of that same product (also known as an in-place upgrade) This includes updates or fixes to the existing components. This applies to third and fourth digit release number changes (interim fixes, refresh packs, and Fix Packs). The new version is installed on top of the existing installation of the previous release. See 3.1.2, "Runtime migration versus an in-place upgrade" on page 85 for more details.

Migration methods

There are three types of migration methods recommended by IBM. They are discussed in detail in 1.3, "Migration methods" on page 11.

Current cell

The pre-migration deployment environment, which uses the earlier product version.

Target cell

The post-migration deployment environment, which uses the later product version.

WAS_Install_root

The root directory where WebSphere Application Server is installed.

BPM_home

The root directory where WebSphere BPM products are installed.

Product databases	This item refers to the databases used by the WebSphere BPM products.
Application databases	The databases used by user applications.
Network deployment environment	In this environment, the BPM components are configured in a high availability clustered environment. This can be set up as a single cell topology or a cross-cell topology.
Artifacts	This item includes the customer application with source and associated packages. All of them are imported into the new tooling environment to migrate them to the newer version of the product.

1.3 Migration methods

There are three types of version-to-version migration methods to choose from:

► Runtime migration

The runtime migration process replicates the source production configuration into the target environment. During the migration process, the target production environment replaces the source production environment, so the two environments are never operated in parallel.

► Manual migration

In this method, you are free to create a parallel target production environment that is configured from scratch differently than the source production environment. Applications can then be selectively redeployed from the source production environment to the target production environment. The redeployed applications create their own database tables and application data in the parallel production environment so they do not have access to the application data stored in the databases configured for the source production environment.

► Artifact migration

Artifact migration method is similar to the manual migration method in terms of the configuration of the parallel target production environment, but instead of the applications being manually redeployed from the source environment directly into the target production environment, they are imported into the development environment and migrated by the development tools. The application can then be tested and deployed to the parallel target production environment. Consistent with the manual migration method, when the applications are deployed to the target production environment, they create a new set of database tables, so they do not have access to the application data stored in the databases configured for the source production environment

1.3.1 Runtime migration

In production environments, the runtime migration procedures and tools provided by the BPM products can be utilized to migrate topology configuration, applications, and databases to the new version. The runtime migration procedures and tools support both stand-alone and network deployment environment migrations, as well as variants that include:

► Migration to a remote system (stand-alone environments only)

► Migration while an operating system is being upgraded to a version (stand-alone environments only)

► Network deployment variants to support full downtime migration and minimal downtime migration.

The runtime migration process replicates the source production configuration into the target environment. During the migration process, the target production environment replaces the source production environment, so the two environments are never operated in parallel.

When to use this migration method
The runtime migration procedures and tools should be used in the following scenarios:

► You want to move your applications to the new version without having a dependency on the development tools and the development environment.

► You want to automatically have your source production environment configuration and applications replicated in the target production environment.

► You have long-running processes or human task instances that have started in the source environment and need to complete in the target environment.

► You have product data in queues or failed events in product databases that were created in the source environment and need to survive the migration and be managed in the target production environment.

► You can tolerate a production environment downtime window to perform the migration.

> **WebSphere Adapters:** If you use any WebSphere Adapters for Version 6.0.2 or WebSphere Adapter for SAP Versions 6.0.2, 6.1.0, 6.1.2, and 6.2.0, see 2.6.3, "Known limitations for WebSphere Adapters" on page 79.

Task overview

The high level tasks involved in runtime migration are:

1. Install the new product version.

2. Back up all production profiles and databases.

3. Migrate each source environment profile to the target environment.

4. Migrate or upgrade the product databases.

5. Migrate the product database data.

1.3.2 Manual migration

An alternative to using the migration procedures and tools is to use the manual version-to-version migration process. With the manual migration process, you create a parallel target production environment that is separate from the source production environment. Applications can then be selectively re-deployed from the source production environment to the target production environment. The re-deployed applications use new database tables and application data in the parallel production environment, so they do not have access to the application data stored in the databases configured for the source production environment.

When to use this migration method

The manual runtime migration method should be used in following scenarios:

► You want to move your applications to the new version without depending on the development tools and the development environment.

► You want to reconfigure your topology as part of the process of migrating.

► You do not have long running process instances and human tasks.

- You do have long running process instances, but can run parallel production environments while you drain the process instances and human tasks in the source environment as new instances are started in the target production environment.

- You have application data in queues or failed events in product databases that were created in the source environment that can be managed to completion in the source production environment while new messages and events are routed in parallel to the target production environment.

- You cannot incur any downtime in your production environment and can concurrently manage parallel source and target production environments.

- You want to selectively redeploy applications from your source production environment to your target production environment.

Task overview

The high level tasks involved in manual migration are:

1. Install the new product version.

2. Configure your desired parallel production environment.

3. Manually deploy applications from the source environment to the target production environment.

4. Optional: Run both environments in parallel so business process instances and human task instances that are in progress finish in the source environment and new instances start in the target environment.

1.3.3 Artifact migration

The artifact migration process is similar to the manual migration process in terms of the configuration of the parallel target production environment, but instead of the applications being manually redeployed from the source environment directly into the target production environment, they are imported into the development environment and migrated by the development tools. This process results in applications whose artifacts can be modified to exploit the new capabilities delivered by Version 7.0. The application can then be tested and deployed to the parallel target production environment.

As with the manual migration process, when the applications are deployed to the target production environment, a new set of database tables are created. The applications do not have access to the application data stored in the databases configured for the current production environment. The database will have historical application data. Based on the schema changes in the user applications, the developers need to evaluate if the historical data can be imported into the new/target user application database.

When to use this migration method

The artifact migration method should be used in the following scenarios:

► You want to use the development tools to migrate the application artifacts to the new version and validate the compatibility of your applications.

► You want to use the development tools to update your applications to exploit a new capability delivered by Version 7.0.

► You want to reconfigure your topology as part of the process of migrating to the new version, or you can manually duplicate your source production environment configuration in your parallel production environment.

► You do not have long running process instances and human tasks, or you can run parallel production environments while you drain the process instances and human tasks in the source environment as new instances are started in the target production environment.

► You have application data in queues or failed events in product databases that were created in the source environment. These can be managed to completion in the source production environment while new messages and events are routed in parallel to the target production environment.

► You cannot incur any downtime in your production environment and can concurrently manage parallel source and target production environments.

► You want to selectively migrate applications from your source production environment to Version 7.0 with the development tools and selectively deploy those applications to your target production environment.

Task overview

The high level tasks involved in artifact migration are:

1. Install the new product version.

2. Configure your desired parallel production environment.

3. Import the applications from the source production environment into development tools and migrate the applications according to the development tool's migration procedures.

4. Optional: Update the migrated applications to exploit new capability delivered in Version 7.0.

5. Manually deploy the migrated applications from the development tools to the target production environment.

6. Optional: Run both environments in parallel so business process instances and human task instances that are in progress finish in the source environment and new instances start in the target environment.

1.3.4 Choosing the right migration method

This section contains information about how to decide the best migration method for a given customer situation. The analysis of cost, benefits, and risk analysis for the three migration methods is shown in Table 1-1.

Table 1-1   Migration cost benefit and risk analysis

Method	Benefits	Cost	Risks
Runtime migration[a]	► Old configuration moved/updated. ► Old applications moved as is. ► Uses existing databases, updated for new version. ► Migration tools available. ► Can be used with long running processes.	► Requires downtime. ► Dependency on migration tools. ► All applications moved together. ► No exploitation of new features. ► Cannot be used for parallel production environment..	► Rollback might be needed in case of failures. ► Existing applications might not work because of upgraded JDK versions or due to the use of unsupported BPM product APIs.

Manual Migration	► No dependency on migration tooling.
	► Can utilize existing configuration scripts.
	► Allows a parallel production environment.
	  – Selective application move.
	  – No downtime.
	► Enables extensive testing of new environment.
	► Regression tests are adequate.
		► Cannot be used for in-flight long running processes.
		► Needs a new database, and the old data is not brought into the new one.
		► No exploitation of new features.
		► Requires updates to client applications.
		► Additional licenses and hardware cost (if running parallel).
			► Existing applications might not work because of updated JDK version or due to use of removed BPM product APIs.

Method	Benefits	Cost	Risks
Artifact Migration	► Can exploit new features. ► No dependency on migration tooling. ► Can utilize existing configuration scripts. ► Allows a parallel production environment – Selective application move. – No downtime. ► Enables extensive testing of new environment.	► Cannot be used for in-flight long running processes. ► Needs a new database, and the old data is not brought into the new one ► New tests for updated applications. ► Requires updates to client applications. ► Additional licenses and hardware cost (if running parallel).	► Applications might not be interoperable with applications at older versions (EMF to XCI).

a. If you use any WebSphere Adapters for Version 6.0.2 or WebSphere Adapter for SAP Versions 6.0.2, 6.1.0, 6.1.2, and 6.2.0, see 2.6.3, "Known limitations for WebSphere Adapters" on page 79.

The flow chart shown in Figure 1-1 can be used to help you decide which migration method will be suitable for your circumstances. WebSphere Business Process Management products have added several features in Version 7.0. You should read about these features in the Information Center to see how they apply to your situation. It is also a good idea to install the new version in a test environment to understand the differences between your current product versions and Version 7.0. This will help you with your decision making process for migration.
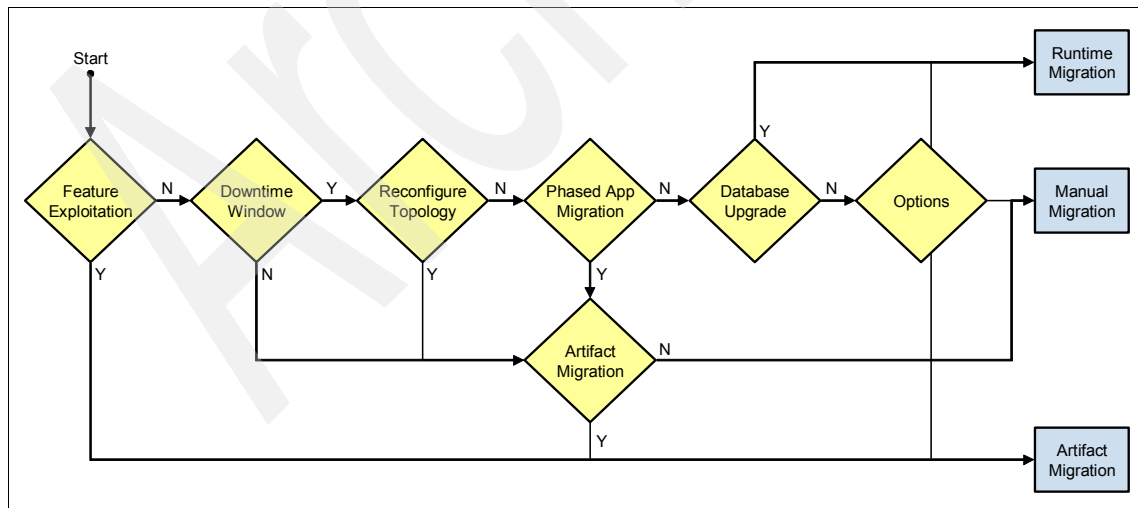
Figure 1-1   Migration method decision flow chart

1.4 Scenarios demonstrated

Because the number of version to version migration scenarios is very large, we have selected known and tested combinations and present them in 1.5, "Migration best practices" on page 18.

To illustrate a typical migration process, we provide two scenarios in this book. Both will show a migration from Version 6.1.2 BPM products to WebSphere Dynamic Process Edition V7.0. The first scenario, shown in Chapter 6, "Migrating BPM V6.1.2 to WebSphere Dynamic Process Edition V7.0" on page 195, shows the migration of a broader range of BPM products on a distributed base. The second scenario, shown in Chapter 7, "Migrating WebSphere Process Server V6.1.2 to V7.0 on a z/OS system" on page 341, shows the migration of WebSphere Process Server on a z/OS system.

Both scenarios illustrate a migration where the pre-migration topology and the post-migration topology are the same. The topology used for the z/OS example is different from the topology used for the distributed example.

We chose Version 6.1.2 for our scenarios because many customers are using this release. It has the additional advantage of allowing us to illustrate the migration of some of the newer products to Version 7.0, including Adapters and Business Space.

1.4.1 Assumptions and what is not covered in this book

The scenarios use a runtime migration method where the migration will be completed in-place on the same hardware, to the same topology. The scenarios also assume that all the products will be migrated to WebSphere Dynamic Process Edition Server V7.0

1.5 Migration best practices

This section provides best practices for different phases of the migration project.

1.5.1 Planning

The migration planning phase is very critical. It is usually longer than the migration execution phase. The time spent in collecting the necessary data will ensure a successful migration project. The best practices for the planning phase include:

1. Always plan ahead. Start the planning phase as early as possible in order to have time to collect all the relevant data.

2. Collect information about the new features added since the current version of your product was installed.

3. Install the new version of the product in a test environment to understand the differences and advantages.

4. Prepare the migration planning checklist shown in 1.6, "Migration questionnaire" on page 21 and complete it as you progress through the project.

5. Designate a focal point for the migration project, who can involve the right people during migration phases.

6. Use the "skills needed" list discussed in 1.7.4, "Identify skills" on page 43 to identify the key needs. Plan to use IBM Education Assistance or other education services provided by IBM. Consider involving IBM software Services teams, who have a lot of experience in migrating WebSphere products. Plan ahead for their on-site and off-site assistance based on the availability of the systems.

7. To ensure quick problem resolution, keep the focus on issues specific to migration. IBM provides a Management Alert facility, through which e-mails are sent to the support organization when IBM customers are performing a migration project.

8. Keep a comprehensive test plan and execute the test plan before production migration and after production migration.

1.5.2 Migration execution

This section lists the best practices for the execution phase of the migration:

1. Document migration procedures. Keep track of the logs and FFDCs that will be part of the must-gather documents for problem determination.

2. If you decide to use the runtime migration method, keep application migration as a separate migration project.

3. Keep track of the migration steps performed, scenarios executed, and the associated migration logs.

4. Back up all the artifacts and profiles that are to be migrated. Keep the backups until the migration is complete and post migration tests are completed satisfactorily.

5. Develop contacts in the IBM Software services team, IBM support teams, and among IBM Business Partners. Those qualified for migration projects will have access to the key contacts for migration questions.

6. Keep the logs for the start of all JVMs and product install logs separate, so that it will be easier for problem determination.

7. Start the migration project by evaluating and eliminating unused and depecated applications.

8. BPM products come with sample applications and diagnostic applications, which, when installed, can help isolate any issues in the new environment. If you have a test application, use it after every phase of the migration. Build a list of verification tests to be run at different phases of the migration project and use them to verify the progress.

9. All the operating systems support the silent migration procedures, while the GUI procedures are supported only on select platforms. In most of the production environments, only the silent procedure is allowed.

10. Minimize human induced errors. You can use automation procedures using silent migration procedures. The script file thus built will have all the necessary migration steps and will ensure the sequence of the migration steps.

11. Use the roll back options to switch back to the earlier version, when needed. In early phases of the migration, you might need to switch back and forth quickly between versions in development or test environments.

12. Create migration documents from the check list and early tests. Use them for the production environment migration.

1.5.3 Post migration testing

After the migration:

1. Keep the test and development environments as similar to the production environment as possible.

2. Performance tuning and testing are key phases of the migration project. To learn more about performance tuning information, refer to the following IBM Redpapers™ publications:

   – *WebSphere Business Process Management and WebSphere Enterprise Service Bus V7 Performance Tuning*, REDP-4664

   – *WebSphere Business Process Management 6.2.0 Performance Tuning*, REDP-4551

   – *IBM WebSphere Business Process Management V6.1 Performance Tuning*, REDP-4431

1.6 Migration questionnaire

This section contains different check lists that are used for planning a migration. This list is based on a WebSphere Process Server migration check list that can be found at the following address:

http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg27015595

The objective of the questionnaire is to help you determine your readiness to migrate and to point out areas where you might need additional help.

> **Examples:** Examples of completed check lists that make up this questionnaire can be found in Appendix A, "Migration checklist" on page 453.

1.6.1 Reasons for migration

The questions in Table 1-2 are intended to help you decide if you want to migrate or upgrade, and to determine the type of migration that is appropriate.

Table 1-2   Migration goal questions

Migration goal questions	Actions
Do you want to use the features or functions provided in Version 7.0 of the product? What are the features you want to use?	If you are planning to use the new features, you might need to perform an artifact migration. The list of features will also be a factor in deciding the type and time frame for the artifact migration.
Do you want to be as up-to-date as possible with the latest of Business Process Management product versions and fixes?	if you want a specific product fix or a Fix Pack, an upgrade will be more suitable. This implies that you are planning to use new features. You can choose to do.
Are you migrating due to a current problem with any of the products? If so, what problem and what product?	If the problem involves new features and if it involves changing the applications, then you will choose profile, application, and artifacts migration.
What are the other reasons for migrating?	This is another item to consider when deciding on the type of migration method.

1.6.2 Experience with migration

The questions in Table 1-3 will help you determine the available skills level on hand and to plan for any additional help. At the end of this exercise, you should come up with a contact list of experts who can be contacted to answer questions about specific areas. You also should have a list of best practices based on previous migration experiences.

Table 1-3   Migration experience questions

Migration experience questions	Actions
Is this the first migration project for your team?	If this is your first time to perform this migration, pay close attention to your planning. As you do not have historical data to compare, consult the Information Center and IBM's migration best practice documentation to determine the timeline for the migration steps. We also recommend installing the product in a test environment to understand the new features and gain experience with the new version of the product.
What WebSphere products have you migrated before?	The migration strategy for BPM products is designed to be similar, so experience with earlier migrations of BPM products will help.
What difficulties did you experience last time? What mitigation strategies are planned for this migration project?	The lessons learned from previous migration experience can be used to avoid similar issues.
What best practices from last time will you want to reuse in this migration project?	The migration procedure for all products are similar and the best practices from a previous migration will be of great help in the current migration project.
List of people with experience with WebSphere products, topology, business applications, security strategy, and migration experience.	You need to build the list of Subject Matter Experts and administrators and their contact information to be used during execution phase. You can use the same list for a communication plan during the project.

1.6.3 Migration project plan

Table 1-4 contains a list of questions that can help you determine the migration project milestones. Based on the information collected, negotiate an acceptable time frame to perform the migration.

Table 1-4   Migration time frame

Migration time frame related questions	Actions
What is the target date for starting the migration project?	By this date, you must have completed any database upgrades or operating system upgrades needed for the migration project. By this date, the required hardware must also be made available.
What is the target date for completing the migration project?	This date, along with the start date, helps calculate the feasibility of the migration project. The available time should include migration of all the environments, testing, and performance tuning.
Do you have a go live date, dictated by commitments to your customers?	This item is important in planning the migration project. All the testing needed for the go live action needs to be completed by this date.
What is the maximum downtime that is allowed for the migration?	You need this information to determine the right migration method.
Will the database and security administrators and application experts be available during the downtime period?	These stakeholders have to be available during the migration time. DBAs and security administrators are key. Many enterprises follow a strict change management procedure. If this is in place, the approval process during the migration time is critical to avoid any delay.

1.6.4 Types of migration

The answers to the questions in Table 1-5 will help you determine exactly what you will be migrating. These answers can influence the migration strategy to be used. They can also help you calculate the time needed for the different migration tasks. Use Table 1-5 to build a list of items to migrate and when they need to be done.

Table 1-5   What to migrate

Questions about what to migrate	Actions
Profiles	
1. Do you have applications that can be migrated as is? Can all of your applications be migrated without upgrades? 2. Do you have the current and target environment on the same hardware? 3. Do you have to migrate the deployment environment, including deployed applications? 4. Have you verified that the operating system used, database used, and their release levels are supported by both current and target environment?	If you answered "yes" to the first three questions, use runtime migration. Verify that your target migration environment is a supported operating environment. This includes the hardware platform, the operating system, and the database. Download all the product install images and the latest fix packs. Validate that there is sufficient storage on the system.
Deployed applications	
1. Do you have applications that can be migrated as is? These are applications that will not be using any new features in the new release. 2. Do you have long running business processes? 3. Do you have human tasks? 4. How many applications are used in the system? 5. How many applications are business critical? 6. How many applications can be deprecated? 7. How many applications will have to be updated to use new features of the product? 8. How many Monitor Models are deployed? 9. How many Fabric associate applications are deployed?	If there are applications that can be migrated as is, you should use the runtime migration method for them. Answers to questions 3 to 7 help with planning and scheduling during migration.

Questions about what to migrate	Actions
Application source	
1. Do you need to migrate the source for any applications? 2. Are these user applications included in the production critical time line? 3. Do you have deprecated features? A list of these features is available at the following address: http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.doc/doc/gmig_deprecationlist.html	1. Migrating the application source requires artifact migration. If you want to use the new features available in the new version of the product, you need to import the source to IBM WebSphere Integration Developer V7.0 and make the necessary modifications. 2. If applications that are marked for artifact migration can be migrated on a separate time line, the migration project can be separated accordingly. 3. If your applications have deprecated features, we recommend using artifact migration and also follow the procedures indicated in the Information Center, which can be found at the following address: http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.doc/doc/cmig_vtv_migtypes.html
Profile, deployed applications, application source, Monitor data migration	**Profile, application, data migration**
You might have a combination of needs that require manual migration of profiles, applications, and other artifacts.	There will definitely be a need for manual migration in this case. Discover what items can use the migration APIs. It is also important to evaluate what can be done in parallel.

1.6.5 Migration downtime

Use Table 1-6 and the information in this section to decide upon the downtime planned for your migration.

Table 1-6   Downtime questions

Downtime questions	Actions
Do you have business critical applications that need to be run continuously?	If you have such applications, you should look at migration methods with minimum downtime.
What is the maintenance window for such applications?	Migration execution can be planned based on the maintenance window.
Do you have long running processes in these applications?	If you have business critical applications that require a minimal downtime and have a long running process, you need to choose the manual migration method.

Downtime means that work has been quiesced and the servers are stopped. Among BPM products, the following products are more affected by downtime than other products:

► WebSphere Process Server will be impacted the most, because mission critical applications run on WebSphere and the users expect minimum or no downtime. WebSphere Enterprise Service Bus has similar issues.

► WebSphere Business Monitor and the associated Business Space will have downtime when the servers are down. The impact is that there are no dashboards displayed. Events might accumulate, and you need to plan for the consumption of these events after the migration is complete.

► The impact to WebSphere Business Fabric is similar to WebSphere Business Monitor and Business Space.

WebSphere Integration Developer, WebSphere Business Modeler, and WebSphere Compass Server are not affected by downtime very much, because they are tools and their use can be staggered.

The manual migration method uses parallel environments, both running concurrently in the same hardware. The applications are not modified, so with both environments running, this method has the least downtime.

The artifact migration method uses parallel environments, both running concurrently in the same hardware. While both environments are active, the client applications can be modified and we can arrange for the right version to handle proper routing. Although it requires additional work to prepare applications, this methodology minimizes downtime.

The manual and artifact migration methods will not use the same hardware. The target environment can be prepared while the current environment is active. The current database tables are updated and used for the target cell. There will be downtime to update the database table and this downtime can be incurred all at once or it can be phased.

Migrating with full downtime

Full downtime means that all the JVMs (the deployment manager, all node agents, all cluster members, and all servers) and all applications are stopped. The migration is performed, all of the database tables are updated, and then all the JVMs are restarted in the recommended sequence. This is the more common scenario. You can learn more about this migration by going to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.websphere.wps.doc/doc/tmig_vtv_ndfull.html

Migrating with minimal downtime

When migrating with minimal downtime, the goal is to minimize the amount of time the entire system is down. This procedure involves spacing out actions across multiple maintenance windows. Initially, part of the clusters are migrated; the rest of the nodes can be migrated at a later point of time, after the first set of nodes is up and running successfully. This action requires that each cluster have at least two members. This action impacts performance and throughput and needs to be negotiated with the customers. You can learn more about this migration by going to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.websphere.wps.doc/doc/tmig_vtv_ndmin.html

1.6.6 System maintenance procedures

As a part of your migration planning, you should document the normal system shut down and restart procedures and schedule. This will help plan downtime during migration. Table 1-7 helps you collect the relevant information.

Table 1-7   System maintenance questions

System maintenance questions	Actions
Is the system maintained on a regular schedule?	If the answer is "yes", this scenario gives you an opportunity to do migration procedures during this time and minimize downtime.
What is the schedule?	Make sure all the stake holders and other resources are available during this window, which can be used for migration.
How is the system shut down? What is the procedure and in what order are the components shut down?	The recommended shutdown sequence is: 1. Dashboard clusters. 2. Application clusters. 3. Support clusters. 4. Message engine clusters. 5. Node agents. 6. Deployment manager.
How is the system restarted? What is the procedure and in what order are the components restarted?	The recommended start sequence is: 1. Verify that the database is available. 2. Start the deployment manager. Verify by checking `SystemOut.log`. 3. Start the node agents. Verify. 4. Start the message engine cluster. Verify. 5. Start the support cluster. Verify. 6. Start the applications cluster. Verify. 7. Start the dashboard clusters.
Will the DBA be available during this scheduled maintenance? Is any special security clearance required for executing database scripts?	Because we need the help of the DBA, the availability and approval of the DBA to run database scripts is necessary.
Will the security administrator be available during this maintenance window?	You will need assistance from the security administrator.
Will the network administrator be available and can the ports needed for BPM components and applications be opened during this period?	New ports might be needed based on your applications, so we need clearance to complete this task.

1.6.7 Resource availability

It is important to identify the resources for the migration project. The resources include:

► Subject matter experts
► Database administrators
► Security experts
► Network administrators
► Migration experts
► Application experts
► Migration documents
► Hardware
► Product licenses
► Architecture and topology information
► Sample and diagnostic models
► A test plan

Table 1-8 is an example of the information that needs to be updated and maintained during the migration process.

Table 1-8   Resource availability

Resource question	Identified resource	Resource availability
Who will be the dedicated resource for the migration project?	Migration project manager	
Do you have reusable assets from previous migration efforts?	Automated migration test bucket	
Who are the dedicated resources for:	Migration method	
	Migration testing	
	Environment creation	
	Applications	
	Profiles	
	Database	
	Operating systems	
	Network and firewall	
	Your software process	

Resource question	Identified resource	Resource availability
Name of the migration expert or consultant		
Hardware resource (Verify that there is adequate hardware.)	Cell name	
	System type	
	Memory	
	Operating system	
	Disk space	
	IP address	
	Remote access capability	
Software licenses	For IBM products and others	

1.6.8 Product versions

You need to document the current and target versions of the products that will be migrated. This information can be entered into Table 1-9.

Table 1-9   Products and versions

Product	Current version	Target version
WebSphere Dynamic Process Edition server		
WebSphere Process Server		
WebSphere Application Server associated with WebSphere Process Server		
WebSphere Integration Developer		
WebSphere Business Modeler		
WebSphere Business Fabric		
WebSphere Business Monitor		
WebSphere Application Server associated with WebSphere Business Monitor		
WebSphere Compass Server		
WebSphere Enterprise Service Bus		
Business Space		

Product	Current version	Target version
WebSphere Portal Server		
WebSphere Service Registry and repository		
Database		
Operating System		
JDBC version		

1.6.9 Product maintenance

It is important to apply the latest available Fix Pack for the target release and also any important ifixes.

Table 1-10 shows where the latest IBM recommended Fix Packs and fixes are located.

Table 1-10   Product maintenance information

Product	Fix Pack information
WebSphere Dynamic Process Edition server	http://www-01.ibm.com/support/docview.wss?uid=swg21415947
WebSphere Process Server	http://www-01.ibm.com/support/docview.wss?uid=swg27006649
WebSphere Application Server	http://www-01.ibm.com/support/docview.wss?uid=swg27014463
WebSphere Integration Developer	http://www-01.ibm.com/support/docview.wss?rs=2308&uid=swg27006685
WebSphere Business Modeler	http://www-01.ibm.com/support/docview.wss?rs=4186&uid=swg27017432
WebSphere Business Fabric	http://www-01.ibm.com/support/docview.wss?uid=swg21404766
WebSphere Business Monitor	http://www-01.ibm.com/support/docview.wss?uid=swg27010921
WebSphere Compass Server	http://www-01.ibm.com/support/docview.wss?rs=4186&uid=swg24025514
WebSphere Enterprise Service Bus	http://www-01.ibm.com/support/docview.wss?uid=swg27007485
Business Space	No separate interim fix or Fix Pack. It will be included in the base component.

Product	Fix Pack information
WebSphere Portal Server	http://www-01.ibm.com/support/docview.wss?uid=swg27014411

1.6.10 System requirements

Identify the system requirements for the current cell and the target cell and mitigate any issues. The team should check the versions of the software products used by different BPM products and check for compatibility.

Use Table 1-11 to track the version of the software products used by BPM products.

Table 1-11   System requirements

Software type	BPM product	Detail	Current version	Target version
Database	WebSphere Process Server	Common DB (WPRCSDB), BPC tables (BPEDB), Message Engine DB (MEDB), and Common Event Infrastructure tables (EVENT)	Depends on the current version	DB2® V9.5 or V9.7
	WebSphere Business Monitor	Monitor database	Depends on the current version	DB2 V9.5 or V9.7
	WebSphere Service Registry and Repository	WebSphere Service Registry and Repository database	Depends on the current version	
	WebSphere Business Service fabric	WebSphere Business Service Fabric database	Depends on the current version	
Operating system	Server environment			
	Tooling Environment			
	Database node			

Software type	BPM product	Detail	Current version	Target version
Light weight Directory Access Protocol (LDAP)	WebSphere Process Server			
	WebSphere Business Monitor			
	WebSphere Business Fabric			
Web server	WebSphere Process Server			
	WebSphere Business Monitor			
	WebSphere Business Fabric			
Java Message Service (JMS) provider				
WebSphere Portal				

1.6.11 Workload characteristics of the current environment

It is important to identify the workload of the environment. This information will help you discover the relevant Information Center information, Fix Packs, or APAR information, and also help you with performance tuning. Some of the information might affect the migration methodology discussed in 1.6.4, "Types of migration" on page 25. The data is collected in Table 1-12.

Table 1-12   Workload characteristics

Category	Characteristic	Description
Functionality	Business Process Execution Language (BPEL)	Number of applications and details
	Number of long running processes	
	BPEL microflows	
	Human tasks	
	Business State machines	
	SCA modules	
	Maps	
	Mediations	
	Business rules	
	Common Event Infrastructure used for WebSphere Business Monitor	
	Common Event Infrastructure used for Business Process Choreographer Observer function	
	Other Common Event Infrastructure usage	
	Web Services	
	Adapters: (SAP)	
	Adapters: (JDBC)	
	Adapters: (File)	
	Adapters (Siebel)	
	Adapters (Others)	
	Other functions used	

Category	Characteristic	Description
Interaction styles	Web services: JMS	
	Web services SCA	
	Interactions: Synchronous	
	Interactions: Asynchronous	
Dependencies and sharing	Dependencies among deployed Module	
	Do you use a shared library?	
Workload volume	Number of new process instances started per second, minute, or day	
	Duration of average long running process instance	
	Number of users supported by the system	
	Number of transactions per second, minute, or day	
	Number of monitor models	
	Number of KPIs	
	Number of measures	
	Number of counters	
	Number of cubes	
	Amount of historical data	
	Usage of REST service	
	Dashboard usage	
	Other	
Quality of service (QOS)	Quality of service considerations	

Category	Characteristic	Description
Current Performance tuning settings	WebSphere Application Server	
	WebSphere Process Server	
	WebSphere Enterprise Server Bus	
	WebSphere Business Monitor	
	WebSphere Business Fabric	
	WebSphere Business Compass	
	Other products	

1.6.12 Deployment environment topology

The topology recommended by each product has changed in some releases. Depending on which release you are migrating from, the topology differences might be significant. Use the current best practices. The information for WebSphere Business Process Management V7.0 Production Topologies is available in *WebSphere Business Process Management V7 Production Topologies*, SG24-7854. You can also find this boo at the following address:

http://www.redbooks.ibm.com/redpieces/abstracts/sg247854.html?Open

Other information related to the topology should be gathered for migration planning and execution, as shown in Table 1-13.

Table 1-13   Topology

Topology questions	Details
Profile	
What type of topology is used?	Stand-alone or network deployment environment? Description of the topology used.
What is the name (host name) of the system of deployment manager node?	
What are the names (host names) of the systems hosting the other nodes?	
What is the type of hardware used for the deployment manager node?	
What is the type of hardware used for the deployment manager node?	

Topology questions	Details
What are the profiles to be migrated?	
Where are the backups for the current profiles?	
Where are the backups for database backup?	
Cluster	
Do you have a WebSphere Process Server support cluster? (name and nodes for cluster members)	
Do you have a WebSphere Process Server message engine cluster? (name and nodes for cluster members)	
Do you have WebSphere Process Server application clusters? (name and nodes for cluster members)	
Do you have a WebSphere Business Monitor support cluster? (name and nodes for cluster members)	
Do you have a WebSphere Business Monitor message engine cluster? (name and nodes for cluster members)	
Do you have WebSphere Business Monitor application clusters? (name and nodes for cluster members)	
Do you have WebSphere Business Monitor Web clusters? (name and nodes for cluster members)	
Security	
What security strategy issued?	
Other	
Do you have proxy servers?	
Firewall or other security information.	
Ulimit setting.	

1.7 Migration road map

This section describes the different phases of migration and the steps for each of them. We use the flow chart shown in Figure 1-2 to describe the migration road map.
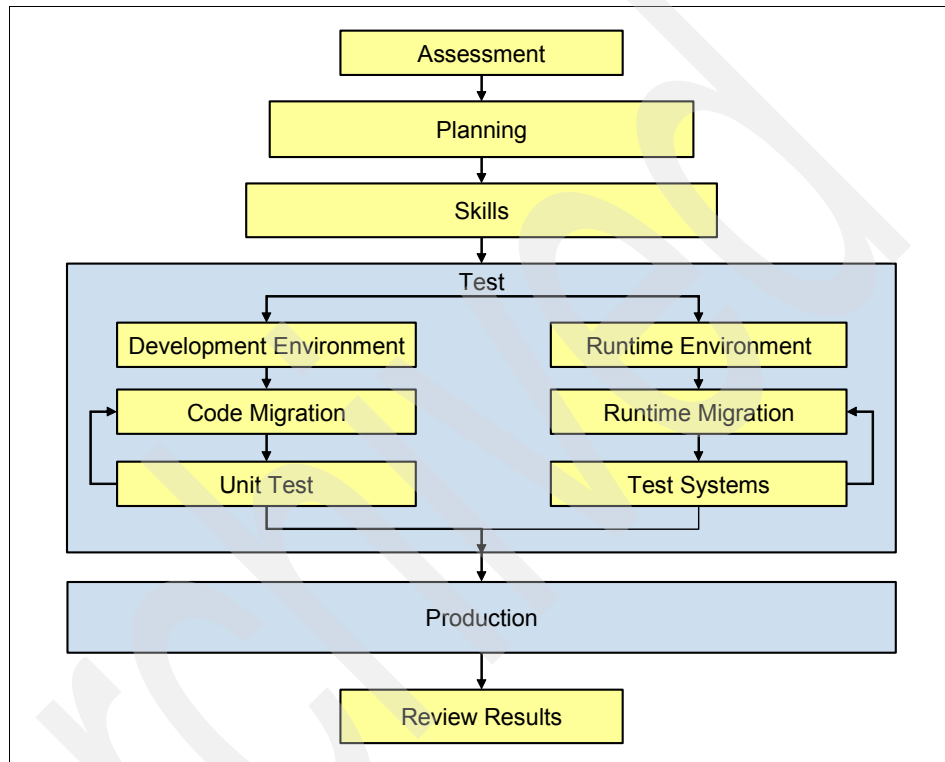
Figure 1-2   Migration road map

The road map has the following phases and steps:

1. The preparation and planning phase will include the following actions:
    –   Assessment
    –   Choosing the migration method
    –   Identify the resources needed
    –   Identify skills

2. The testing phase includes the migration of the test environment and completing the tests to ensure that the test migration is successful.

   – Test run of migration (proof of concept)

3. After the test run of migration, the production migration is planned:

   – Production migration

4. Finally, the verification phase includes:

   – Verification of production and review

We also recommend an analysis phase, where the best practices of the migration and the lessons learned are documented for future use.

1.7.1 Assessment

The assessment phase includes activities that help you determine your migration objectives, perform a system analysis, and assess your topology.

Migration objectives

Before you decide to migrate, complete a set of assessment questions (see Table 1-2 on page 22). This action will help you decide the migration method. Initially, you need to analyze the objectives of the migration.

If you want to use the new features available in Version 7.0 and you need those features immediately, then you need to include artifact migration in your plan.

If you do not need the new features, or at least not immediately, then you can migrate using other methods and plan to update the applications to use the new features at a later date. Applications can be updated one at a time to minimize the downtime.

System analysis

► Hardware requirements

   – You can use existing hardware with upgrades or you must use new hardware.

► Software requirements

   – There might be changed specifications.

   – There might be dependencies between applications.

   – There might be API deprecation or removal and JDK changes.

   – There might be vendor applications and WebSphere products J2EE/JDK/Process Server version requirements.

Next, you need to look at your hardware requirements. This step will help you plan the hardware resources. Operating system upgrades might be necessary as a prerequisite to migration. You also need to download the product software and allocate sufficient hardware. You will also need to download the latest Fix Packs for the new system. Table 1-14 provides the URLs to the system requirements for all the BPM products.

Table 1-14   System requirements

Product	Requirement information URL
WebSphere Dynamic Process Edition server	http://www-01.ibm.com/software/integration/wdpe/requirements/
WebSphere Process Server	http://www-01.ibm.com/support/docview.wss?uid=swg27006205
WebSphere Application Server	http://www-01.ibm.com/support/docview.wss?rs=180&uid=swg27006921
WebSphere Integration Developer	http://www-01.ibm.com/support/docview.wss?rs=2308&uid=swg27006409
WebSphere Business Modeler	http://www-01.ibm.com/support/docview.wss?rs=2025&uid=swg27008331
WebSphere Business Fabric	http://www-01.ibm.com/software/integration/wbsf/sysreqs/
WebSphere Business Monitor	http://www-01.ibm.com/support/docview.wss?rs=802&context=SSSRR3&uid=swg27008414
WebSphere Compass Server	http://www-01.ibm.com/support/docview.wss?rs=2331&uid=swg27008946
WebSphere Enterprise Service Bus	http://www-01.ibm.com/support/docview.wss?uid=swg27006912
WebSphere Portal Server	http://www-01.ibm.com/support/docview.wss?uid=swg27007791

Topology assessment

► Runtime environment configuration

► Long-running processes

► Downtime tolerance

It is important to make an assessment of topology needs in the target environment. The migration questionnaire in 1.6, "Migration questionnaire" on page 21 can help you collect data about the topology needs, how the products are used, and what your strategy should be for downtime during migration. You will identify migration needs, decide what can be done in parallel, and assess resource availability during this process.

The migration best practices recommends keeping a copy of the old tooling environment until all the applications are versioned using the new tooling environment.

You should plan and perform backups of all the profiles and the database of the current environment.

1.7.2 Choosing the migration method

Choosing the migration method to be used is a critical step in the migration process. If you decide to use the same hardware and OS used in the current version of the products, and if you want to migrate configuration, data, and applications, then you should choose runtime migration (discussed in detail in 3.1, "Overview" on page 82).

If you want to use new hardware for the target environment, or if you want to change the topology in the target environment, choose manual migration (discussed in detail in Chapter 4, "Manual migration" on page 117). In this case, there will be not be any database or process instance migration. There will not be any profile migration.

Artifact migration is needed if you want to use the new features in the new release. The options available to execute this method are discussed in detail in Chapter 5, "Artifact migration" on page 123

1.7.3 Identify the resources needed

In this phase, you assemble a core migration team. This team includes a migration coordinator or project manager, migration experts, product experts, application experts, system administrators, database administrators, key developers, performance experts, testing experts, security experts, and system maintenance experts. If, during this resource planning, you identify any skill gaps, work with the IBM team to arrange any education needed, or involve IBM software services.

You need to plan for the hardware resources needed, any software prerequisites, and software upgrades. Plan for backups and develop a rollback plan. Other resources to plan for include time line charts, standard practices, automation scripts, regression testcases, system maintenance windows, and procedures.

1.7.4 Identify skills

In this section, we list some of the common skills needed for migration. Additional skills might be needed based on the project and environment.

Table 1-15   Skills Inventory

Skills	Needed (Y/N)	Contact
Migration methodologies		
Installation of BPM products		
Configuration of BPM products		
Hardware expertise		
Operating system expertise		
Network configuration expertise		
Database expertise		
Application expertise		
WebSphere Dynamic Process Edition expertise		
WebSphere Process Server expertise		
WebSphere Integration Developer expertise		
WebSphere Business Compass expertise		
WebSphere Application Server expertise		
WebSphere Business Modeler expertise		
WebSphere Business Fabric expertise		
WebSphere Business Monitor expertise		
WebSphere Enterprise Service Bus expertise		
WebSphere Adapter expertise		
Business Space expertise		
Security experts		
System maintenance experts		
Test experts		

1.7.5 Test run of migration (proof of concept)

Perform migration in the development environment or test environment before performing the migration in the production environment. The development or test environment should be similar to the production environment.

During the test run phase, after performing the migration on the development or test environment, test your applications in a new environment first. Practice your rollback plan on a test system. If applicable, migrate the test systems iteratively. Complete all the planned post migration on this environment and document the results of the test cases. The document containing the test results will be used for comparison during the migration of production.

Measure the time needed for each step of the test migration. This data can be used to verify the plans for production migration.

1.7.6 Production migration

After completing the test run of the migration, make any modifications necessary in the migration plan. If there are any schedule changes based on the migration time measured in the test migration, verify the availability of the resources in the new time schedules. Complete the migration using the planned method and the migration document created or updated during the test migration.

After the production migration, run a quick set of regression tests to verify the success, and, if necessary, execute rollback procedures.

1.7.7 Verification of production and review

At this stage, you are done with the migration process and need some verification before starting the production environment:

► Review the results of the migration.

► Check the migration logs to make sure that there are no errors.

► Complete any performance tuning needed after migration.

► Complete all your standard test processes.

► Perform rollback, if necessary. If the rollback is performed, consider that any new data stored after migration will be lost (for example, newly created business processes).

1.8 Post migration

After migration, run a series of tests to ensure that the migration was successful. This is necessary before going into production mode. In addition, each of the BPM products has a set of post migration steps.

1.8.1 Post-migration steps for WebSphere Process Server

Information about post-migration steps for each product component can be found in the appropriate Information Center article:

► Information about post migration tasks for WebSphere Process Server is located in the Information Center at the following address:

    http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
    .ibm.websphere.wps.doc/doc/tmig_vtv_post.html

► Information about post migration tasks for WebSphere Business Choreographer is located in the Information Center at the following address:

    http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
    .ibm.websphere.wps.doc/doc/tmig_vtv_post.html

► Information about post migration tasks for Business Space powered by WebSphere is located in the Information Center at the following address:

    http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
    .ibm.websphere.wps.doc/doc/tmig_vtv_post_bspace.html

► Information about post migration tasks for WebSphere Enterprise Service Bus is located in the Information Center at the following address:

    http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
    .ibm.websphere.wesb.doc/doc/tmig_vtv_post.html

1.8.2 Post-migration steps WebSphere Business Fabric

The post-migration steps for WebSphere Business fabric for distributed platform is available at the following address:

    http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
    m.ws.fabric.migr.doc/migr70/task/t_verifymig.html

The post-migration steps for WebSphere Business Fabric on the z/OS platform is available at the following address:

    http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
    m.ws.fabric.migr.doc/migrzos70/task/t_verifymig.html

2

Release-specific information

In this chapter, we discuss migration process differences based on your current version of the Business Process Management (BPM) product. We also discuss any known limitations when migrating from a previous release.

2.1 Product availability table

Table 2-1 gives information about the availability of each WebSphere Business Process Management product. It provides a mapping of the BPM release and product availability.

Table 2-1   Product and version matrix

Product	V6.0.2	V6.1	V6.1.2	V6.2	V7.0
WebSphere Application Server	Yes	Yes	Yes	Yes	Yes
WebSphere Process Server	Yes	Yes	Yes	Yes	Yes
WebSphere Integration Developer	Yes	Yes	Yes	Yes	Yes
WebSphere Business Monitor	Yes	Yes	Yes	Yes	Yes
WebSphere Business Monitor Toolkit	Combined with WebSphere Business Monitor	Combined with WebSphere Business Monitor	Combined with WebSphere Business Monitor	Combined with WebSphere Business Monitor	Yes
WebSphere Business Modeler	Yes	Yes	Yes	Yes	Yes
WebSphere Enterprise Service Bus	Yes, part of WebSphere Process Server	Yes, part of WebSphere Process Server	Yes, part of WebSphere Process Server	Yes, part of WebSphere Process Server	Yes, part of WebSphere Process Server
WebSphere Business Services Fabric	Yes	Yes	Yes	Yes	Yes
WebSphere Business Compass	No	Modeler Publishing Server	Modeler Publishing Server	Modeler Publishing Server	WebSphere Business Compass

Product	V6.0.2	V6.1	V6.1.2	V6.2	V7.0
Business Space	No	No	Yes	Yes	Yes
WebSphere Dynamic Process Edition	No	No	No	Yes	Yes

2.2 Special considerations for migration from V6.0.2

This section contains information specific to migrating from BPM V6.0.2 to WebSphere Dynamic Process Edition V7.0. Each section contains specific information pertaining to a BPM product for a Version 6.0.2 to Version 7.0 migration.

2.2.1 IBM Business Space powered by WebSphere

The Business Space product was not available in Version 6.0.2. Portal-based dashboards were used instead. There are procedures required to either upgrade WebSphere Portal Server or to configure Business Space to use Portal's dashboards or web-based dashboards provided by Business Space. Information about configuring Business Space is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.websphere.wbpm.bspace.config.doc/doc/tcon_config_bspace.html

2.2.2 WebSphere Business Modeler

WebSphere Business Modeler requires only artifact migration. To migrate projects exported from Version 6.0.x, 6.1.x, or 6.2.x (the .mar files), you can use the IBM WebSphere Business Modeler Version 7.0 import function. For more information , go to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.btools.modeler.basic.inst.doc/migrating/importv6project.html

The steps for importing and migrating models can be found in 5.2, "Migrating WebSphere Business Modeler models" on page 125.

Migrating projects stored in a team repository

When you use IBM WebSphere Business Modeler Version 7.0 to check earlier Version 6 projects out from your version control system (for example, CVS), WebSphere Business Modeler automatically migrates such projects.

> **Important:** Before migrating, make sure that no Version 7.0 projects have the same name as the project that you want to migrate. If any Version 7.0 project's name matches the name of the project in the earlier version's team repository, you will not be able to connect to the earlier version's project to migrate it. The online help has additional information about setting up and using team repositories for versioning projects.

When you migrate a Version 6.x project stored in the version control repository, WebSphere Business Modeler creates a copy of the project in your workspace and migrates that copy. The original project remains unaffected.

To migrate the Version 6.x project stored in a team repository, perform the following steps:

1. Right-click anywhere in the Project Tree view of WebSphere Business Modeler Version 7.0 and select **Version** → **Check Out Project**. The Check Out Project wizard opens.

2. Expand the CVS or ClearCase® node.

3. Expand the repository that contains the project that you want to migrate.

4. Select the project.

5. Click **Finish**. A window opens, prompting you to confirm that you want to migrate the project. Click **Yes**. A local copy of the project is created and migrated for use with Version 7.0

In case errors were introduced during migration, use the Errors view to validate the process models. If any errors occurred, fix the errors.

A migrated copy of the project now resides in the workspace on your computer. Note that there is no connection between the migrated project and the original project in the team repository. In addition, you cannot add a connection, because the projects were made by different versions of WebSphere Business Modeler.

If you want to continue sharing the migrated project, rename it and share it again using a new repository.

> **Tip:** Set up separate team repositories for projects created with earlier and later versions of WebSphere Business Modeler. Earlier versions of WebSphere Business Modeler cannot access process models that have been shared using a later version of the product. A Version 7.0 project can be shared only using WebSphere Business Modeler V7.0.

Migrating projects from a workspace

The first time IBM WebSphere Business Modeler V7.0 accesses a workspace that contains projects created in an earlier version, IBM WebSphere Business Modeler V7.0 automatically migrates the entire workspace and its projects to Version 7.0.

During this migration, a backup of the original workspace is created, and you can access the original process models again, if needed.

Note that after migrating the workspace to WebSphere Business Modeler V7.0, the workspace cannot be accessed again using an earlier version. In addition, any projects shared using a team repository have their connection to that repository broken.

To migrate projects stored in your workspace, perform the following steps:

1. Start the WebSphere Business Modeler product.

2. When prompted to specify a workspace, specify the workspace that you want to migrate.

3. Click **OK** to open the Migrate Workspace window.

   Note that WebSphere Business Modeler Basic V7.0 cannot migrate a workspace that contains projects created with earlier versions of WebSphere Business Modeler Advanced.

4. Specify a backup location for the workspace. Ensure that the location you specify has enough space to store the backup copy. Otherwise, the migration will fail. If the migration fails because a backup cannot be created, the original workspace is not affected.

5. Optional: If you are working on a system that has English as its language and want to save space, select **Backup as compressed file**.

> **Important:** If any of the paths in your workspace contain non-English characters, including accented English characters, do not use the Backup as compressed file option. Non-English characters cause problems when extracting the backup files. If you do not know whether your workspace paths contain any non-English characters or not, use the default backup option. After the workspace migration completes, you can compress the backup files using the program of your choice.

6. Click **OK**. The migration is now complete and the program restarts, accessing the newly migrated workspace. A window opens, listing both the projects that migrated successfully and the ones that did not. Messages are provided for any problems with migrating projects.

7. To make sure no errors were introduced into your models during the migration, use the Errors view. If any errors occurred, fix the errors.

Your workspace and all its projects are now migrated for use with WebSphere Business Modeler V7.0.If you have another Version 6.x workspace that you want to migrate, restart WebSphere Business Modeler V7.0 and access that workspace to migrate it.

2.2.3 WebSphere Business Compass

The following information is available in the Information Center at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.btools.help.modeler.collab.publish.mig.doc/mig/migrate_602.html
```

After installing WebSphere Business Compass, you can use the scripts that are provided to help you migrate your data from WebSphere Business Modeler Publishing Server V6.0.2.

Before beginning the migration, verify that the following tasks have been completed:

► Back up the following LotusDomino databases:

   – WBICOLWIPComment.nsf
   – WBICOLWIPModel.nsf
   – WBICOLReleaseModel.nsf

► Ensure that the LotusDomino server is running.

► Create the PUBSERV database.

Only databases that contain the project and comment data for WebSphere Business Compass can be migrated. The scripts that are provided will not migrate access right data (WBICOLWIPUser.nsf and WBICOLReleaseUser.nsf).

Perform the following steps:

1. Edit the `migration-run.bat` or the `migration-run.sh` file in the `publishing_server_install_root`\scripts.wbps\migration\domino folder. In the file, set the following values:

   – DOMINO_HOST=: The fully qualified host name, short host name, or IP address of the Lotus Domino server. For example:

     `DOMINO_HOST=dominoserver.myco.com`

   – DOMINO_PORT=: The Domino server port.

   – DOMINO_USER=: The user ID of the Domino server administrator.

   – DOMINO_PASSWORD=: The password for the Domino server administrator.

   – DB_URL=jdbc:db2://[host]:[port]/pubserv: The URL of the DB2 server. The [host] is the fully qualified DNS (for example, `dominoserver.myco.com`), short DNS, or IP address of the DB2 server and [port] is the port used by the server.

   – DB_USER=: The user ID of the DB2 administrator.

   – DB_PASSWORD=: The password for the DB2 administrator.

   – SPACE_ID=: The ID for the Process Editor Space in the Spaces table in the database.

   For Windows®:

   – JAVA_EXEC=[java home path]\bin\java.exe.

   For Linux®:

   – JAVA_EXEC=/user/lib/java/jre/bin/java: The path to a Java Virtual Machine (JVM), Version 1.5.0_06 or higher. You can download JVM into a Java Runtime Environment (JRE) by going to the following address:

     `http://java.sun.com/javase/downloads/index.jsp`

   When you have finished editing the file, save it.

2. Run the migration tool:

   a. Open a command prompt.

   b. Change directories to the folder containing the saved file.

c. Enter the following command:

- For Windows, use `migration-run.bat`.
- For Linux, use `./migration-run.sh`.

When the tool finishes, it displays the results of the migration. You can also view the log files for the migration in the folder in which you ran the migration tool. If you ran the tool from its folder, the log files are in the `publishing_server_install_root`\scripts.wbps\migration\domino folder:

— `wps-migration-user.log` contains the messages displayed in the command window when the migration tool was running.

— `wps-migration-details.log` contains the same information that is in the `wps-migration-user.log` plus additional information.

> **Note:** If the migration tool encounters a problem with a project element, it abandons migrating that project and starts migrating the next project. The migration tool does not migrate any part of the project. If you think that a single element might be causing the problem, launch WebSphere Business Modeler Publishing Server Version 6.0.2 and use the Draft or Release administration to delete the element. You can then rerun the migration tool. If the element you deleted was the only element causing the problem, the migration tool can now migrate the project.

3. Uninstall WebSphere Business Modeler Publishing Server. For more information about uninstalling the product, see the *IBM WebSphere Business Modeler Publishing Server Installation Guide Version 6.0.2 Installation Guide*, which you can access by going to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/v6rxmx/topic/com.i
bm.btools.help.modeler.collab.publish.doc/doc/reference/publishing_i
nstall.pdf

4. Uninstall WebSphere Portal (optional).

5. Uninstall WebSphere Application Server (optional).

6. Launch WebSphere Business Compass in a Web browser and verify that the data was migrated.

2.2.4 WebSphere Integration Developer

When you want to use the new features of the products, and delete the deprecated features, you use source artifacts migration using WebSphere Integration Developer.

Migrating source artifacts requires knowledge of new features available in WebSphere Dynamic Process Edition V7.0. If choosing artifact migration, there is no Version 6.0.2 specific migration required. The migration of a previous version of WebSphere Integration Developer is documented at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib m.wbit.help.migr.doc/topics/tmwid.html

If you are planning to have mixed levels of WebSphere BPM products, you will need to use relevant versions of WebSphere Integration Developer for future changes to the applications. If you use the required plug-ins, you could use the lower version of WebSphere Integration Developer, but you will not be able to use the enhancements available in the newer versions

Special considerations for version to version migration can be found at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib m.wbit.help.migr.doc/topics/cwidcon.html

When migrating from a previous version of WebSphere Integration Developer to Version 7.0, most of the migration is done automatically. However, there are a number of considerations to be aware of that might require additional manual configuration. The considerations given in the following sections are intended to assist in the version-to-version migration process.

Validations

With each new release of WebSphere Integration Developer, validators for various components, such as business objects, human tasks, and XSLT maps, are improved. After importing the artifacts to a newer version of WebSphere Integration Developer, there might be validation errors that the previous validator did not catch.

Java validation

When using the Service Data Objects (SDO) API to create a data object, there is an additional Java validation in WebSphere Integration Developer.

SDO programming tips

From WebSphere Integration Developer V6.0.x to WebSphere Integration Developer V6.1, there are package name changes for a few classes, such as BOXMLSerializer, that can cause compilation errors. It is a best practice not to reference those classes directly, but to use Service Manager to locate the service.

Circular dependencies

A newer version of WebSphere Integration Developer might detect circular dependencies of the modules or projects as errors, while an older version of WebSphere Integration Developer does not.

To quickly resolve this issue, you can change the compiler option in your workspace references. Select **Windows** → **Preference** → **Java** → **Compiler** → **Building**. Under the build path problems section, select the **Warning** option for Circular dependencies. Depending on the version of WebSphere Integration Developer that you are using, you might need to go to the Java perspective and open the preference window to see the Java option in the preferences list.

The applications with circular dependencies might be running without a problem in the new environment. Although there are no current issues, it is necessary to check the project dependencies again. To avoid future issues, circular dependencies must be detected and removed. Use refactoring if you need to change the name of a component or its target namespace because they are invalid, and use the refactoring capabilities instead of simply changing the name or namespace in one place. If you do not use refactoring, you might encounter problems, as the name or target namespace of a component might be referenced by other artifacts. Refactoring those values would preserve the relationships.

For example, a namespace must be an absolute Uniform Resource Identifier, for example, starting with http://. You should refactor the target namespace by pressing Alt+Shift+R on the target namespace field of the Properties page.

XPath

XPath can be used in mediation flows and business processes. Prior to WebSphere Integration Developer V6.1, a distinction was not made between business object attributes defined as xsd:element and those defined as xsd:attribute. If XPATH is used, you might see the following message in the problems view after migrating:

```
The <attribute_name> schema element was not found in the
<xpath_expression> XPATH.
```

To fix this error, put an "@" symbol in front of the attribute name, or reselect the XPATH in the XPATH Expression Builder.

For example, there is a business object called MyBO that has an attribute "myAttribute" defined as xsd:attribute.

The XPATH expression created in Version 6.0x is:

```
/MyBO/myAttribute
```

Change it to:

`/MyBO/@myAttribute`

Component-specific considerations

This section provides information specific to components.

Business object map

For WebSphere Integration Developer V6.1.2 or after, if you have mappings that include an inherited type, you might receive the following warning message:

`CWLAT0064W: The 4 transform includes an inherited type, which might`
`produce unwanted side effects when the map runs.`

Business object maps can work on generalizations of types. This warning is raised to indicate that the transform will still execute even if the inherited type comes in as part of the instance document. This becomes more of a concern when mapping elements are involved in a substitution group. Typically, if the element is not involved in a substitution group, you do not need to be concerned about the warning.

XSLT mapper

There was a major change in XSLT mapper for WebSphere Integration Developer V6.1.

You can easily identify whether maps are created prior to Version 6.1 using the file extension. The file extension of the old Version 6.0.x XSLT map files is .xmx, and the one for the new ones is .map.

If XSLT map files are created using Version 6.0.x, they continue to work in Version 6.1 or after. Therefore, WebSphere Integration Developer does not migrate those files automatically, and migration is not mandatory, but the maps need to be migrated for further enhancement.

In addition, it is highly recommended to migrate the old .xmx files to benefit from the performance improvement in the new XSLT map architecture.

To migrate the XSLT maps, double-click the file, which will open the mapping migrator editor, and perform the following steps:

1. (Optional) Click the **Find All Old Mappings** button to find other old mappings in the workspace.
2. Select and deselect primitives to migrate in the table.
3. (Optional) Select the **Utilize existing XSL file for custom mappings** option.

4. (Optional) Deselect the **Backup existing xmx and associated xsl files** option.

5. Press the **Migrate** button.

To optimize the process, note the following items:

▶ This mapping migrator discovers all the old map files (.xmx files) in the workspace. You can select to migrate them all at once.

▶ Before launching the migrator, disable the automatic build. During the migration, there are many file changes that kick off auto-build frequently. Disabling it will shorten the migration time. After the mapping migration is completed, enable the auto-build again.

2.2.5 WebSphere Process Server

For all earlier releases (Version 6.0.2, Version 6.1, Version 6.1.2, and Version 6.2), information about migration to Version 7.0 is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.doc/doc/welcome_wps_mig.html

Special consideration for WebSphere Process Server for z/OS

We discuss considerations for z/OS in Chapter 7, "Migrating WebSphere Process Server V6.1.2 to V7.0 on a z/OS system" on page 341. Additional information about version to version migration for z/OS is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.z.doc/doc/welcome_bpm_mig.html

2.2.6 WebSphere Enterprise Service Bus

For all earlier releases (Version 6.0.2, Version 6.1, Version 6.1.2, and Version 6.2), the information about migration is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wesb.doc/doc/welcome_wps_mig.html

If the source version is Version 6.0.2, the profile has to be created using the profile management tool (PMT) and not the migration command BPMCreateTargetProfile.

Migration information for WebSphere Enterprise Service Bus on z/OS is available at the following addresses:

► `http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.i bm.websphere.wesb.zseries.doc/doc/cmig_vtv_bpmmig_ovw.html`

► `http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.i bm.websphere.wesb.zseries.doc/doc/welcome_wps_mig.html`

2.2.7 WebSphere Business Service Fabric

WebSphere Business Service Fabric-specific profiles (and PMT support) was introduced in Version 6.2. Prior to that version, WebSphere Business Service Fabric applications were installed on WebSphere Process Server-only profiles. For that reason, the standard V2V migration tooling support for WebSphere Business Service Fabric, introduced in Version 7.0, is supported (and tested) only for Version 6.2 to Version 7.0.

For versions prior to Version 6.2, if WebSphere Business Service Fabric is part of the stack being migrated, you can still achieve migration using the V2V migration tooling, with the use of some workarounds as follows. The migration tooling provides automatic procedure to help migrate fabric applications.

Migrating the IBM WebSphere Business Services Fabric involves migrating the Foundation Pack and Tool Pack, configuring security, and updating WebSphere Business Service Fabric applications to use the new functions.

For WebSphere Business Services Tool Pack, perform the following steps:

1. Migrate the Composition Studio project.
2. Migrate the WebSphere Business Service Fabric in a unit test environment (UTE).

For WebSphere Business Services Foundation Pack, migrate the WebSphere Business Service Fabric application from Version 6.0.2 to 6.1.

Information regarding WebSphere Business Service Fabric migration from Version 6.0.2 release is available in the Information Center at the following address:

`http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib m.ws.fabric.migr.doc/migr602/concept/c_introwbsf.html`

The general steps involved in migration are:

1. Export the WebSphere Business Service Fabric FCA (ontology content) archive and dependency archives for your current release projects that you need to migrate using the WebSphere Business Service Fabric administrative console.

2. Install the Version 7.0 stack, including WebSphere Business Service Fabric, with no profiles.

3. Migrate from releases prior to Version 6.2 using the standard V2V tool. This will migrate the WebSphere Business Service Fabric applications on that WebSphere Process Server profile, because the WebSphere Business Service Fabric migration script would be executed.

4. Augment the existing profiles from DMGR and managed nodes with WebSphere Business Service Fabric DMGR and managed nodes using WebSphere Business Service Fabric profiles. This action is required to use the Profile branding capability introduced in Version 7.0 (like displaying WebSphere Business Service Fabric in the servers list in the administrative console).

5. Import the data exported from Step 1 into WebSphere Business Service Fabric V7.0 using the WebSphere Business Service Fabric administrative console.

6. Drop the current WebSphere Business Service Fabric database, as it is no longer used in Version 7.0. All WebSphere Business Service Fabric repository data, is stored in WebSphere Process Server common database (WPSCRDB).

2.2.8 WebSphere Business Monitor

The procedures for migrating from Version 6.0.2 of WebSphere Business Monitor to Version 7.0 can be found in the Information Center found at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.btools.help.monitor.mig.doc/mig/mig_602.html

Migrating from WebSphere Business Monitor V6.0.2 to V7.0 involves two main tasks: migrating models and migrating data.

► Model migration involves converting and deploying models.

► Data migration involves using the WebSphere Business Monitor V7.0 Migration Wizard (referred to in the documentation as the migration utility).

> **Important:**
>
> If you are using WebSphere Business Monitor V6.0.1, you must first migrate to Version 6.0.2 before migrating to Version 7.0.
>
> If you are using WebSphere Business Monitor V6.0.2.1, you must install Interim Fix 5 for WebSphere Business Monitor V6.0.2.1 before beginning the migration process.

The Version 7.0 Monitor Model editor automatically converts WebSphere Business Monitor V6.0.2 models. After a model is converted to the Version 7.0 format, you can deploy it using the WebSphere Business Monitor V7.0 administrative console.

You can migrate Version 6.0.2 monitor models to the Version 7.0 format either in the Monitor Model editor or by using a batch file that does not require an Eclipse environment. Monitor models in Version 6.1 format are already compatible with Version 7.0.

Migration task list

Migration from WebSphere Business Monitor V6.0.2 to V7.0 occurs in the following order:

1. Migrating the Adaptive Action Manager data

   Migrate the Adaptive Action Manager data. Using the migration utility to perform this task, the Adaptive Action Manager data migration migrates all the action services' configuration and uncompleted alerts.

2. Migrating Version 6.0.2 models

   Migrate your WebSphere Business Monitor V6.0.2 monitor models. Migrate monitor models using the Monitor Model editor (a component of the WebSphere Business Monitor V7.0 development toolkit) and the WebSphere Business Monitor V7.0 administrative console.

3. Migrating context instance data

   Migrate all of the completed context instances, model by model. You use the migration utility to perform this task, and migrating context instance data involves exporting all of the completed instances for the selected models from the Version 6.0.2 data mart database, converting the instances into the Version 7.0 format, and importing them into the Version 7.0 database.

4. Migrating data for models with "partially exported" status

   When all WebSphere Business Monitor V6.0.2 monitoring context instances have completed, you can use the migration utility to complete the data migration for models with "partially exported" status.

5. Migrating action services data again

   Migrate action services' data again to capture any new alerts.

In Version 6.0.2, WebSphere Business Monitor used cross-cell, which was the only way to configure communication. In Version 7.0, you can use queue bypass. Migration will use the strategy used in the current release, which is a queue-based approach. If you want to configure queue bypass, you need to configure it after migration. The information about configuring queue bypass is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.btools.help.monitor.inst.doc/inst/cfg_qb.html

2.2.9 Migrating WebSphere Business Modeler and WebSphere Business Compass data

After migrating the WebSphere Business Modeler projects, follow the procedure documented for data migration for WebSphere Business Modeler and WebSphere Business Compass, which can be found at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.btools.help.modeler.collab.publish.mig.doc/mig/migrate_602.html

2.3 Special considerations for migration from Version 6.1

This section contain migration information specific to migrating from Version 6.1 to Version 7.0 of WebSphere Dynamic Process Edition Server.

2.3.1 Business Space powered by WebSphere

Business Space was not available in Version 6.1. For a new Version 7.0 installation, you can find the Business Space configuration procedure outlined in the Information Center at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wbpm.bspace.config.doc/doc/tcon_config_bspace.html

For information about configuring Business Space on WebSphere Portal server, go to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wbpm.bspace.config.doc/doc/tcfg_bsp_portal.html

2.3.2 WebSphere Business Modeler

The procedure to migrate from Version 6.1 is the same as that for migrating from Version 6.0.2 to WebSphere Dynamic Process Server Edition V7.0 (see 2.2.2, "WebSphere Business Modeler" on page 49).

There are no special considerations for migrating from Version 6.1 of the WebSphere Business Modeler. The migration information is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.btools.modeler.advanced.inst.doc/migrating/migrateprojects.html

2.3.3 WebSphere Business Compass

Version 6.1 of the product was called WebSphere Modeler Publishing Server. The procedure for migration to Version 7.0 of the product is outlined at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.btools.help.modeler.collab.publish.mig.doc/mig/migrate_db26-1-1.html

2.3.4 WebSphere Integration Developer

Migrating from Version 6.1 to Version 7.0 of WebSphere Integration Developer is a straight forward procedure that is documented at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.wbit.help.migr.doc/topics/tmwid.html

Special considerations for version to version migration are documented in the Information Center at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.wbit.help.migr.doc/topics/cwidcon.html

2.3.5 WebSphere Process Server

For all earlier releases (Version 6.0.2, Version 6.1, Version 6.1.2, and Version 6.2), the information about migration to Version 7.0 is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.websphere.wps.doc/doc/welcome_wps_mig.html

Special consideration for WebSphere Process Server for z/OS

We have discuss considerations for z/OS in Chapter 7, "Migrating WebSphere Process Server V6.1.2 to V7.0 on a z/OS system" on page 341. Additional information about version to version migration for z/OS is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.websphere.wps.z.doc/doc/welcome_bpm_mig.html

2.3.6 WebSphere Enterprise Service Bus

For all earlier releases (Version 6.0.2, Version 6.1, Version 6.1.2, and Version 6.2), the information about migration is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.websphere.wesb.doc/doc/welcome_wps_mig.html

2.3.7 WebSphere Business Service Fabric

Note: To migrate from Version 6.1, you need to migrate to Version 6.1.2 and then to Version 6.2 before migrating to Version 7.0.

The information about migrating from Version 6.1 to Version 6.1.2 is documented at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.ws.fabric.migr.doc/migr612/concept/c_introwbsf612.html

Migrating the WebSphere Business Services Fabric application involves migrating the Foundation Pack, Tool Pack, configuring security, and the WebSphere Business Services Fabric application to use the functionality of Version 6.1.2.

Moving from one version of WebSphere Business Services Fabric to a newer release or a higher release level of WebSphere Business Services Fabric is referred to as *version-to-version migration*. Version-to-version migration occurs when you install a new version of a product, such as WebSphere Business Services Fabric and then copy relevant application and configuration data from the old installation to the new installation.

Pre-migration considerations

It is important to follow the procedure detailed below before you begin the process of migrating to WebSphere Business Services Fabric V6.1.2:

► For Foundation Packs

- Back up the WebSphere Business Services Fabric database using database utilities.

- Back up the WebSphere Process Server profile where WebSphere Business Services Fabric is installed using the application server backup utilities, such as backup config.

► For Tool Packs

- Back up the Derby database by copying it to a different location.

> **Note:** Before you migrate WebSphere Business Services Fabric from Version 6.1 to Version 6.1.2, you need to first install and configure WebSphere Process Server V6.1.2 and WebSphere Integration Developer V6.1.2.

2.3.8 WebSphere Business Monitor

The information about migrating from WebSphere Business Monitor V6.1 and V6.1.2 is the same. This information is documented at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib m.btools.help.monitor.mig.doc/mig/mig_61.html

Migrating from WebSphere Business Monitor V6.1.x to V7.0 requires you to migrate your existing profiles, upgrade the database, deploy the Monitor scheduled services, migrate the Alphablox® repository, update configurations, and migrate the dashboards.

General sequence of events

The migration path for each environment that includes WebSphere Business Monitor will be unique, but the three common areas of migration include applications, data, and profiles.

> **Note:** Starting with WebSphere Business Monitor V7.0, the Alphablox repository is in the WebSphere Business Monitor database by default. Regardless of the previous WebSphere Business Monitor version implemented, you must migrate the existing Alphablox repository to the WebSphere Business Monitor V7.0 database repository. During migration, the existing database repository contents is moved to the MONITOR schema-based repository.

The general sequence of events for migrating from Version 6.1.x to Version 7.0 is similar to the following list:

1. Back up existing profiles, the database, and the Alphablox repository.

2. Perform the prerequisite tasks for portlet-based dashboards.

3. Install the prerequisite software.

4. Install WebSphere Business Monitor V7.0 on the same machine as the existing version from which you are migrating.

5. Migrate existing profiles to the new version.

6. Upgrade the Version 6.1.x or Version 6.2.x database to the Version 7.0 schema using a utility or the .ddl file directly.

7. Deploy the WebSphere Business Monitor scheduled services.

8. Migrate the Alphablox repository.

9. Update the WebSphere Business Monitor configuration.

10.Migrate the dashboards.

Database migration

Database migration should take place after stand-alone profile migration or deployment manager profile migration (but before migrating managed nodes). You can migrate (upgrade) the WebSphere Business Monitor database by using Data Definition Language (DDL) files or by using the database upgrade utility. To manually upgrade the database and for some other situations listed below, you can use the DDL files that are provided.

Deploying the WebSphere Business Monitor scheduled services

The deploying WebSphere Business Monitor scheduled services task takes place after profile migration and database migration. In a stand-alone installation, the WebSphere Business Monitor scheduled services will be deployed during migration. In a network deployment environment (ND), model migration requires that you deploy the WebSphere Business Monitor scheduled services manually.

Deploying the WebSphere Business Monitor scheduled services creates the WebSphere Application Server scheduler resource that calls the Data Memory System (DMS) and KPI history and prediction for each model.

Alphablox migration

Migrating a WebSphere Business Monitor V6.1.x or V6.2.x installation with Alphablox to a WebSphere Business Monitor V7.0 installation involves the creation of the WebSphere Business Monitor - Alphablox repository database tables, the installation of Alphablox and configuration of server properties, and the transfer of the old repository contents to the MONITOR schema-based repository. The Alphablox repository database tables are created during the database migration. The installation of Alphablox and the configuration of server properties are done during WebSphere Business Monitor V7.0 installation and profile migration. So here, only the Alphablox repository is migrated. When the Alphablox repository of the Version 6.1 or Version 6.2 profile is in the same WebSphere Business Monitor database using the same WebSphere Business Monitor schema, the Alphablox migration happens by default and no manual steps are required.

Updating the WebSphere Business Monitor configuration

Updating the WebSphere Business Monitor configuration takes place after profile migration, database migration, WebSphere Business Monitor scheduled services deployment, and Alphablox repository migration. You can complete this task by running the monConfigurationUpgrade script. Updating the WebSphere Business Monitor configuration is a required task, regardless of whether Alphablox is installed.

Migrating the dashboards

To maintain your dashboard configurations from a previous release, you must migrate the dashboards. This step takes place after finishing the profile migration, database migration, and Alphablox repository migration.

2.4 Special consideration for migration from Version 6.1.2

This section contains migration information specific to migrating from a Version 6.1.2 release to Version 7.0 of WebSphere Dynamic Process Edition Server. Each section contains specific information pertaining to a Business Process Management product for a Version 6.1.2 to Version 7.0 migration.

Business Space and WebSphere Business Monitor have different requirements that depend on what servers need to be running during migration, which then depends on your topology. In Chapter 6, "Migrating BPM V6.1.2 to WebSphere Dynamic Process Edition V7.0" on page 195, we describe the sequence for a high availability cluster topology.

2.4.1 Business Space powered by WebSphere

Business Space is first available in Version 6.1.2. Migration involves to Version 7.0 involves the following actions:

► Migrate the Business Space database schema. Information about this task can be found at the following address:

   http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
   .ibm.websphere.wps.doc/doc/tmig_vtv_upg_bsdb.html

► Migrate the Business Space database data. Information about this task can be found at the following address:

   http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
   .ibm.websphere.wps.doc/doc/tmig_vtv_upg_bspacedb_mig.html

► Migrate dashboards:

   Information about each type of dashboard can be found at the following addresses:

   – Web dashboards:

     http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/
     com.ibm.btools.help.monitor.mig.doc/mig/mig_dash_bspace.html

   – Portal based dashboard:

     http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/
     com.ibm.btools.help.monitor.mig.doc/mig/mig_dash_portal.html

2.4.2 WebSphere Business Modeler

The procedure to migrate from Version 6.1.2 is the same as that for migrating from Version 6.0.2 to WebSphere Dynamic Process Server Edition V7.0 (see 2.2.2, "WebSphere Business Modeler" on page 49).

There are no special considerations for migrating from Version 6.1.2 of the WebSphere Business Modeler. The migration information is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.btools.modeler.advanced.inst.doc/migrating/migrateprojects.html

2.4.3 WebSphere Business Compass

If you are using Version 6.1.2 of the BPM products, the WebSphere Business Compass migration is divided into four different categories:

► Migrating WebSphere Business Compass (WebSphere Business Modeler Publishing Server) only. Information about this task can be found at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.btools.help.modeler.collab.publish.mig.doc/mig/migrate_standalo
ne.html
```

► Migrating when WebSphere Business Compass is running the same profile as WebSphere Business Monitor or WebSphere Process Server. Information about this task can be found at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.btools.help.modeler.collab.publish.mig.doc/mig/migrate_with_wps
_or_mon.html
```

► Migrating when WebSphere Business Modeler Publishing Server is running in a high availability environment without WebSphere Business Monitor or WebSphere Process Server. Information about this task can be found at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.btools.help.modeler.collab.publish.mig.doc/mig/migrate_standalo
ne_clus.html
```

► Migrating when WebSphere Business Compass is running in a high availability environment with WebSphere Business Monitor or WebSphere Process Server. Information about this task can be found at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.btools.help.modeler.collab.publish.mig.doc/mig/migrate_clus_wit
h_wps_or_mon.html
```

2.4.4 WebSphere Integration Developer

Migrating from Version 6.1.2 to Version 7.0 of WebSphere Integration Developer is a straight forward procedure that is documented at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.wbit.help.migr.doc/topics/tmwid.html
```

Special considerations for version to version migration is documented in the Information Center at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.wbit.help.migr.doc/topics/cwidcon.html

2.4.5 WebSphere Process Server

For all earlier releases (Version 6.0.2, Version 6.1, Version 6.1.2, and Version 6.2), the information about migration to Version 7.0 is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.doc/doc/welcome_wps_mig.html

Special consideration for WebSphere Process Server for z/OS

We have discuss considerations for z/OS in Chapter 7, "Migrating WebSphere Process Server V6.1.2 to V7.0 on a z/OS system" on page 341. Additional information about version to version migration for z/OS is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.z.doc/doc/welcome_bpm_mig.html

2.4.6 WebSphere Enterprise Service Bus

For all earlier releases (Version 6.0.2, Version 6.1, Version 6.1.2, and Version 6.2), the information about migration is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wesb.doc/doc/welcome_wps_mig.html

2.4.7 WebSphere Business Service Fabric

Note: To migrate from Version 6.1.2, you need to migrate to Version 6.2 before migrating to Version 7.0.

Information about migrating from Version 6.1.2 to Version 6.2 is documented at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.ws.fabric.migr.doc/migr620/concept/c_introwbsf620.html

This section has information about how to migrate the WebSphere Business Services Fabric V6.1.2 environment to V6.2.

Migrating is the process of moving from one version of WebSphere Business Services Fabric to another while minimizing changes to configurations and user applications. This allows the existing application and configuration data to be used in the next version.

With WebSphere Business Services Fabric migration, the new WebSphere Business Services Fabric version is installed alongside the older WebSphere Business Services Fabric version. The data in the form of Fabric Content Archives (FCAs) is copied from the old version to the new version. Migrating is different from updating, where out-of-date files or data in an existing installation are replaced with current information. Refresh packs, interim fixes, and fix packs are examples of updates.

WebSphere Business Services Fabric supports only data migration and does not support profile migration in Version 6.2. If you are migrating a WebSphere Process Server profile (containing WebSphere Business Services Fabric) from Version 6.1.2 to Version 6.2, uninstall the WebSphere Business Services Fabric configuration and applications from the WebSphere Process Server profile. Migrate the WebSphere Process Server profile to Version 6.2 and augment the profile with WebSphere Business Services Fabric.

To migrate WebSphere Business Services Fabric from Version 6.1.2 to Version 6.2, complete the following high level steps:

1. Commit all the WebSphere Business Services Fabric data (applications and projects created in WebSphere Business Services Fabric) to the repository.

2. Export all the data as Fabric Content Archives (FCA) from WebSphere Business Services Fabric V6.1.2.

3. Uninstall the WebSphere Business Services Fabric configuration and applications from the Version 6.1.2 profile.

4. Create a backup of the fabricdb database and drop the database. The database will be created as a part of the augmentation process.

5. Migrate the WebSphere Process Server V6.1.2 profile to WebSphere Process Server V6.2.

6. Augment the WebSphere Process Server V6.2 profile to WebSphere Business Services Fabric V6.2.

7. Import the data into WebSphere Business Services Fabric V6.2.0.

2.4.8 WebSphere Business Monitor

Information about migrating from WebSphere Business Monitor V6.1 and V6.1.2 is the same. It is documented at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.btools.help.monitor.mig.doc/mig/mig_61.html

2.5 Special consideration for migration from Version 6.2

This section contains migration information specific to migrating from Version 6.2 to Version 7.0 of WebSphere Dynamic Process Edition Server. Each section contains specific information pertaining to a Business Process Management product for a Version 6.2 to Version 7.0 migration.

Business Space and WebSphere Business Monitor have different requirements that depend on what servers need to be running during migration, which then depends on your topology. In Chapter 6, "Migrating BPM V6.1.2 to WebSphere Dynamic Process Edition V7.0" on page 195, we describe the sequence for a high availability cluster topology.

2.5.1 Business Space powered by WebSphere

Information about how to migrate Business Space widgets from Version 6.2 to Version 7.0 is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.bspace.help.devt.doc/doc/migrating/migrating62widgets.html

You must migrate widgets developed for Version 6.2 of Business Space into widgets that run in Version 7.0 of Business Space. If you do not migrate these widgets, they will not work in Version 7.0.

The migration documentation assumes that you have experience in developing iWidgets for Business Space V6.2. For information about developing iWidgets, see the Version 6.2 documentation found at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.bspace.620.help.devt.doc/doc/concepts/business_space_devt/coverview.html

To migrate Version 6.2 widgets, perform the following steps:

1. Migrate the profile containing the custom widgets.

2. Uninstall the custom widget EAR.

3. If your Version 6.2 widgets use the IBM Dojo Toolkit, upgrade them to use Dojo V1.3.2. For information about how to upgrade to Dojo 1.3.2, go to the following address:

   http://www.dojotoolkit.org/

   In Business Space V7.0, the instance of the IBM Dojo Toolkit is based on V3.2 of the Dojo Toolkit. However, this bundled version will be updated as needed over time. This could include entirely new Dojo versions, as well as specific defect fixes. The compatibility of future Dojo versions is defined by the Dojo project.

4. If your widgets need to support multiple languages, update the iWidget XML by adding localized event descriptions. To add localized event descriptions, add one <iw:alt> element for each language. The <iw:alt> element is a new child of the <iw:Description> element:

```
<iw:eventDescription
   title="{ title }"
   lang=" en "
   ...>
   <iw:alt
      description="{ description }"
      title="{ title }"
      lang="{ languages }" />
   ...
</iw:eventDescription>
```

5. Package the widgets.

   a. Create an EAR directory. Copy the EAR files containing the migrated widget definition files and widget implementation files. Copy the EAR files into an EAR directory.

   b. Create a catalog directory and copy the catalog XML (widget registration) files into it.

   c. Create an endpoints directory and copy the endpoint registration files into it if there are any endpoint registration files.

   d. Optional: Create a templates directory and copy template ZIP files into it if there are any template ZIP files. The template definitions in the ZIP files must be in the Lotus Mashups template format.

   e. Create a help directory and copy the help plug-ins into it if there are any help plug-ins.

f. Compress the ear, catalog, endpoints, templates, and help directories. Check that the structure of the compressed file contains the following items:

- `ear\widgets_name.ear` (one or more EAR files)

- `catalog\catalog_name.xml`

- `endpoints\*.xml`

- `templates\*.zip`

- `help\eclipse\plugins\*`

6. At a command prompt, change directories to the *profile_root*/bin directory.

7. Enter **wsadmin.bat -conntype NONE** and then enter the appropriate command:

   – For migrating the widgets into a non-clustered environment, run **$AdminTask installBusinessSpaceWidgets {-nodeName node -serverName server -widgets *fullpath*}**.

   – For migrating the widgets into a clustered environment, run **$AdminTask installBusinessSpaceWidgets {-clusterName cluster -widgets *fullpath*}**.

   Fullpath is the name and location of the ZIP file or parent folder you created.

8. Enter `Exit`.

9. Restart the server or cluster.

Changes to the widget and endpoint registration files

The migration process automatically migrates the widget registration XML and endpoint registration XML files to the Version 7.0 format by making the changes listed in this topic.

2.5.2 WebSphere Business Modeler

The procedure to migrate from Version 6.2 is the same as that for migrating from Version 6.0.2 to WebSphere Dynamic Process Server Edition V7.0 (see 2.2.2, "WebSphere Business Modeler" on page 49). There are no special considerations for migrating from WebSphere Business Modeler V6.2. The migration information is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.btools.modeler.advanced.inst.doc/migrating/migrateprojects.html

2.5.3 WebSphere Business Compass

If you are using Version 6.2 of the BPM products, the WebSphere Business Compass migration is approached differently depending on the topology:

► Migrating WebSphere Business Compass (WebSphere Business Modeler Publishing Server) only. Information about this task can be found at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.btools.help.modeler.collab.publish.mig.doc/mig/migrate_standalo
ne6202.html
```

► Migrating when WebSphere Business Compass is running the same profile as WebSphere Business Monitor or WebSphere Process Server. Information about this task can be found at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.btools.help.modeler.collab.publish.mig.doc/mig/migrate_with_wps
_or_mon6202.html
```

► Migrating when WebSphere Business Modeler Publishing Server is running in a high availability environment without WebSphere Business Monitor or WebSphere Process Server. Information about this task can be found at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.btools.help.modeler.collab.publish.mig.doc/mig/migrate_standalo
ne_clus6202.html
```

► Migrating when WebSphere Business Compass is running in a high availability environment with WebSphere Business Monitor or WebSphere Process Server. Information about this task can be found at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.btools.help.modeler.collab.publish.mig.doc/mig/migrate_clus_wit
h_wps_or_mon-6202copy.html
```

2.5.4 WebSphere Integration Developer

Migrating from Version 6.2 to Version 7.0 of WebSphere Integration Developer is a straight forward procedure that is documented at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.wbit.help.migr.doc/topics/tmwid.html
```

Special considerations for version to version migration is documented in the Information Center at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.wbit.help.migr.doc/topics/cwidcon.html

2.5.5 WebSphere Process Server

For all earlier releases (Version 6.0.2, Version 6.1, Version 6.1.2, and Version 6.2), the information about migration to Version 7.0 is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.doc/doc/welcome_wps_mig.html

Special consideration for WebSphere Process Server for z/OS

We discuss considerations for z/OS in Chapter 7, "Migrating WebSphere Process Server V6.1.2 to V7.0 on a z/OS system" on page 341. Additional information about version to version migration for z/OS is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.z.doc/doc/welcome_bpm_mig.html

2.5.6 WebSphere Enterprise Service Bus

For all earlier releases (Version 6.0.2, Version 6.1, Version 6.1.2, and Version 6.2), the information about migration is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wesb.doc/doc/welcome_wps_mig.html

2.5.7 WebSphere Business Service Fabric

Information about how to migrate from WebSphere Business Server Fabric V6.2 to Version 7.0 is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.ws.fabric.migr.doc/migr70/concept/c_intrompandzos.html

Migration consideration for z/OS

Information about migration considerations for z/OS can be found at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.ws.fabric.migr.doc/migr70/concept/c_intrompandzos.html

2.5.8 WebSphere Business Monitor

Information about how to migrate from WebSphere Business Monitor V6.2 to WebSphere Business Monitor V7.0 is available at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib m.btools.help.monitor.mig.doc/mig/mig_62_ov.html

Migrating from WebSphere Business Monitor V6.2.x to Version 7.0 requires that you migrate your existing profiles, upgrade the database, migrate the Alphablox repository, and migrate the dashboards.

2.5.9 General sequence of events

The migration path for each environment that includes WebSphere Business Monitor will be unique, but the three common areas of migration include applications, data, and profiles.

> **Note:** Starting with WebSphere Business Monitor V7.0, the Alphablox repository is in the WebSphere Business Monitor database by default. Regardless of the previous WebSphere Business Monitor version implemented, you must migrate the existing Alphablox repository to the WebSphere Business Monitor V7.0 database repository. During migration, the existing database repository contents is moved to the MONITOR schema-based repository.

The general sequence of events for migrating from Version 6.2.x to Version 7.0 is similar to the following list:

1. Back up existing profiles, the database, and the Alphablox repository.

2. Perform prerequisite tasks for portlet-based dashboards.

3. Install the prerequisite software.

4. Install WebSphere Business Monitor V7.0 on the same machine that the existing version you are migrating from is installed.

5. Migrate existing profiles to the new version.

6. Upgrade the Version 6.1.x or Version 6.2.x database to the Version 7.0 schema using a utility or the .ddl file directly.

7. Migrate the Alphablox repository.

8. Migrate the dashboards.

Preparing for migration

Before getting started with your WebSphere Business Monitor migration, there are several tasks that you should complete. The following tasks should serve as your pre-migration checklist.

Profile migration overview

Profile migration involves profile creation and the migration of configurations and applications. Before you can begin profile migration, you should have completed the remaining tasks in this section that are relevant to your system environment.

Database migration overview

Database migration should take place after stand-alone profile migration or deployment manager profile migration. You can migrate (upgrade) the WebSphere Business Monitor database by using Data Definition Language (DDL) files or by using the database upgrade utility. To manually upgrade the database and for some other situations listed below, you can use the DDL files that are provided.

Alphablox migration overview

Migrating a WebSphere Business Monitor Version 6.1.x or Version 6.2.x installation with Alphablox to a WebSphere Business Monitor V7.0 installation, involves the creation of the WebSphere Business Monitor - Alphablox repository database tables, the installation of Alphablox and configuration of server properties, and the transfer of the old repository contents to the MONITOR schema-based repository. The Alphablox repository database tables are created during the database migration. The installation of Alphablox and configuration of server properties are done during WebSphere Business Monitor V7.0 installation and profile migration. So here, only the Alphablox repository is migrated. When the Alphablox repository of the Version 6.1 or Version 6.2 profile is in the same WebSphere Business Monitor database using the same WebSphere Business Monitor schema, the Alphablox migration happens by default and no manual steps are required.

Migrating the dashboards

To maintain your dashboard configurations from a previous release, you must migrate the dashboards. This step takes place after finishing the profile migration, database migration, and Alphablox repository migration.

2.6 Known limitations

If the customer chooses to migrate only part of the stack, then the profile migration steps will have to be done manually.

If WebSphere Process Server and WebSphere Business Monitor are kept in different release levels, there will be a need to keep the tool kit for both the levels to make any modifications later. In this scenario, use separate cells for WebSphere Business Monitor and WebSphere Process Server. The communication strategy to be used will be a cross-cell configuration. This will be true if your use a queue-based approach or queue-bypass approach (recommended).

2.6.1 Known limitations for WebSphere Process Server

The following article in the Information Center lists known compatibility issues when migrating to WebSphere Process Server V7.0:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.doc/doc/cmig_vtv_compat.html

2.6.2 Known limitations for WebSphere Business Fabric

WebSphere Business Fabric supports version to version migration from Version 6.2 onwards. Please contact IBM software support if your WebSphere Business Fabric version is either Version 6.0.2, Version 6.1, or Version 6.1.2. WebSphere Business Fabric does not support a non-root installation.

2.6.3 Known limitations for WebSphere Adapters

All WebSphere Adapters for V6.0.2 and WebSphere Adapter for SAP V6.0.2, V6.1.0, V6.1.2, and V6.2.0 are not supported on WebSphere Process Server V7.0. This set of adapters has to be updated to Version 7.0 before any applications using them can be deployed on WebSphere Process Server V7.0. This means that you cannot use runtime migration for modules with these adapters.

This has special implications for long running processes that have imports or exports that use one of these adapters. The preferred method for migrating long running processes is the runtime migration, because the data associated with the long running process is carried to the target environment.

We expect this issue to be resolved in a future Fix Pack when the runtime migration will be updated to support the migration of these adapters and their related configuration. If this fix is not available when you perform your migration, you can use one of the following approaches:

► Option 1: If you plan to use runtime migration, perform the following steps:

   a. In source version, split the adapter with its export or import into a separate business integration module.

   b. During migration, uninstall this application from the source environment.

   c. Perform the runtime migration.

   d. After the runtime migration, use WebSphere Integration Developer V7.0 to update the module to Version 7.0.

   e. Install the application on the target environment.

► Option 2: Use the manual or artifact migration methods.

   These methods use parallel production environments, allowing you to drain the old process instances from the pre-migration environment, and start new instances on the target environment with the migrated application.

2.7 Troubleshooting

Information about troubleshooting migration errors can be found in the Information Center at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.doc/doc/tmig_vtv_bpmtroublesht.html

This article has information about the following errors:

► Application installation error.
► Application server error.
► Business Rules manager is not automatically migrated.
► Communication with deployment manager error.
► Connector Exception.
► Database connectivity exceptions.
► Out of memory error.
► Profile creation error.
► Servlet error.
► Synchronization error.
► WebSphere Process Server client migrations
► WSDL validation exception.

3

Runtime migration

This chapter addresses general considerations when migrating a Business Process Management (BPM) runtime to BPM Version 7.0. In this chapter, we discuss the runtime migration of the WebSphere Process Server, WebSphere Enterprise Service Bus, WebSphere Business Monitor, WebSphere Business Services Fabric, and WebSphere Dynamic Process Edition products. This chapter contains the following sections:

- ► "Overview" on page 82
- ► "Existing data consideration for runtime migration" on page 94
- ► "Rollback from migration failure" on page 94
- ► "Runtime migration general steps" on page 95
- ► "Runtime migration for specific BPM products" on page 105

3.1 Overview

This section provides an overview for BPM version-to-version runtime migration.

3.1.1 Runtime migration concepts

With each new version, BPM products provide major functional improvements over previous versions. Typically, customers have a large investment in the configuration of their previous release profiles and they want to preserve that investment when moving to the latest release. In these circumstances, customers should perform a runtime migration, in particular if existing data is to be reused, for example, long-running BPEL instances, failed events, and so on. (Figure 3-1).
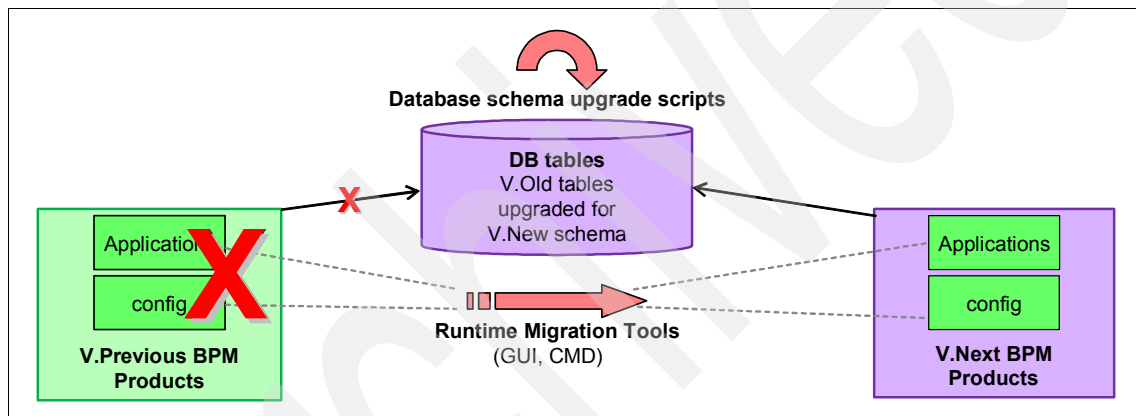
Figure 3-1   BPM version to version runtime migration

For those customers that simply want to reuse the applications and do not care about the existing profile configuration or the existing data, then a runtime migration is not necessary. An artifact migration (see Chapter 5, "Artifact migration" on page 123) or manual migration (see Chapter 4, "Manual migration" on page 117) can be done instead. If you have change in topology for the target version of the product, runtime migration might not be applicable.

Runtime migration is profile-based, which means that you migrate profiles one by one, with the deployment manager (in network deployment environments) as the first profile to be migrated.

The target profile should not contain any user configuration or applications prior to migration if possible, as this can cause conflicts. When the migration detects a conflicting configuration between the old and new profile, the settings from the source profile are favored. If an application to be migrated is already installed on the target configuration, it will not be migrated.

During version-to-version runtime migration, the existing product database schema also needs be updated with scripts provided by the product.

Notes:

1. Reducing a profile's functionality during a migration is not supported, for example, migrating a WebSphere Process Server profile to a WebSphere Enterprise Service Bus profile is not supported, regardless of release.

2. For runtime migration, the target profile must have the exact same cell name and node name as those of the source profile.

Runtime migration is done typically by using the following sequence:

1. Install the latest release of the product (beside the old version, *not* in place of).

2. Run the migration wizard or command-line scripts to migrate each profile.

3. Run the migration command to migrate any clusters that exist in the source environment.

4. Update the product databases schema or data with provided scripts.

Runtime migration involves profile migration and product database migration, and BPM products provide utilities to facilitate these migration tasks. You can migrate all of the profiles to latest version. Alternatively, you can just migrate some of the profiles, which will result in a mix-node (different level nodes co-existing) situation. Mixed-clusters (cluster members of the same cluster residing on different level nodes) is not supported.

Profile migration

Profile migration includes configuration migration and application migration.

Configuration migration

BPM runtime migration utilities automatically apply the configuration from a previous profile to the new profile.

Application migration

In the context of the runtime migration method, application migration means installing an enterprise application from a previous profile to the new profile during the runtime migration process. Applications are installed *as is* during migration. Do not confused this migration with the artifact / application migration described in Chapter 5, "Artifact migration" on page 123.

There are four types of applications to consider:

► Sample application

   Sample applications provided with BPM products for demonstration purposes will not be migrated on a stand-alone topology, but will be migrated in a network deployment environment.

► System application

   System applications refer to those applications under the *<BPM_HOME>*/systemApps directory. Runtime migration will never migrate those system applications; instead, the new system applications will be used.

► Product application

   Examples of product applications are Business Rule Manager and Business Process Choreographer. These applications will be migrated automatically.

► User application

   User applications refer to those applications developed by the enterprise. Those applications will be migrated automatically.

Refer to the following Information Center articles for more information at the following addresses:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.websphere.wps.doc/doc/cmig_vtv_bpmmig_ovw.html
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.websphere.wps.doc/doc/cmig_vtv_whatgets.html

Product database migration

In general, the migrated environment still uses the previous product databases and the existing data can be consumed by the migrated environment.

In general, you do not need to create a new product database for the migrated environment manually, except in a data-only migration. However, the product database schema and product database structure might be updated if required and the data location might be changed from one table to another; these updates are done with the utilities shipped with BPM products.

BPM products provide scripts that perform product database migration. Some scripts can be invoked automatically when you start the migrated environment, but some scripts need to be invoked manually. As a best practice, run these product database migration scripts manually.

After migration, the data source configuration on the migrated environment will be updated to point to the previous product databases.

Some products, for example, WebSphere Business Monitor, support data-only migration for specific versions. For data-only migration, the existing data will be transferred from one product database to another product database with scripts provided by the product. If this is the case, you need to create new product databases for the new environment, as discussed in 3.5, "Runtime migration for specific BPM products" on page 105.

3.1.2 Runtime migration versus an in-place upgrade

In addition to runtime migration, there is another approach that allows you to use the new features of BPM products; it is called *in-place upgrade* or upgrade. An in-place upgrade refers to the replacement of a product with a newer version of that same product. Whether in-place upgrade is an option or not depends on the old and new product versions, as discussed in 3.5, "Runtime migration for specific BPM products" on page 105.

You can do an in-place upgrade before or after version to version runtime migration, but you cannot do them both against one specific product version number pair. In-place upgrade is not part of version-to-version runtime migration. Table 3-1 compares the two options.

Table 3-1   Runtime migration versus an in-place upgrade

Item	Runtime migration	In-place upgrade
New version product installation style	The new version product is installed side-by-side the old release or on another machine (for stand-alone profile only).	The new version product is installed on top of the old release under the same installation directory.
Version number	Applies to the first and second nd digit release number (count from left) changes, for example, 6.1 to 6.2 or 6.2 to 7.0.	Applies to third and fourth digit release number (count from left) changes (interim fixes, refresh packs, and fix packs), for example, 6.1 to 6.1.2 or 6.1.2.1 or 6.1.2.3.

Item	Runtime migration	In-place upgrade
Tools	Use runtime migration specific tools (command or GUI wizard).	Use WebSphere Application Server Update Installer or Installation Manager.
Operation unit	Repeat the migration procedure against each profile. Only the applications and configurations under that profile are migrated.	Repeat the upgrade procedure against each installation directory, then all profiles under that installation will be upgraded.

3.1.3 Runtime migration tools

One of the major improvements in BPM V7.0 is that it delivers one new set of common commands and a user interface for version to version migration utilities across WebSphere Dynamic Process Edition, WebSphere Business Services Fabric, WebSphere Process Server, WebSphere Enterprise Service Bus, and WebSphere Business Monitor.

Runtime migration command-line tools

BPM V7.0 delivers a set of runtime migration command-line tools that can automatically identify the source profile template and migrate the profile (Figure 3-2).
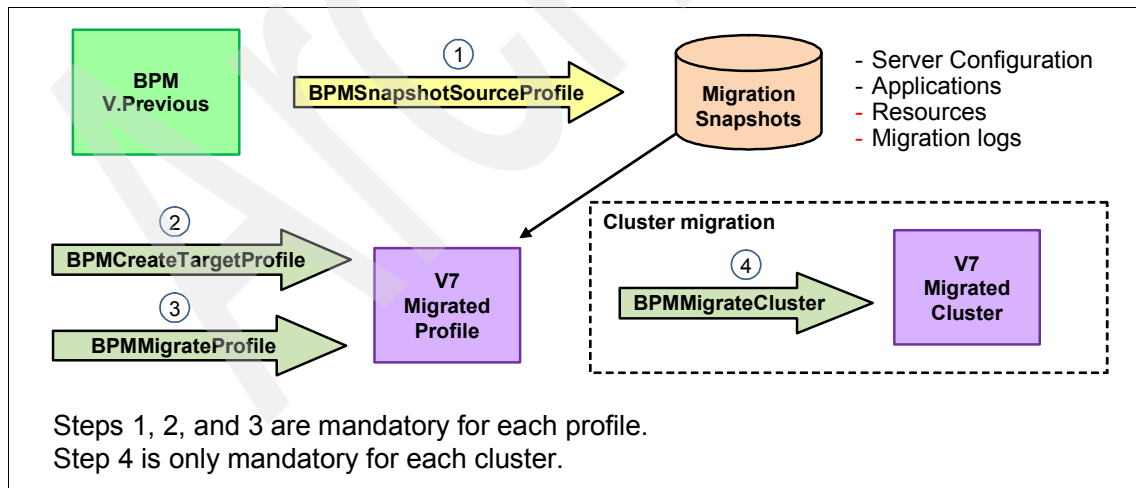
Figure 3-2   Runtime migration command sequence

Runtime migration command-line tools are available on both distributed and z/OS platforms. Refer to the Information Center for all supported platforms at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/index.jsp?topic=/com.ibm.websphere.wps.doc/welcome_wps.html

Table 3-2 lists all of the migration command line tools. For more detailed information about these commands, go to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.doc/doc/rmig_vtv_bpmsnapshot.html

Table 3-2   Runtime migration commands

Commands	Description
`BPMSnapshotSourceProfile`	The `BPMSnapshotSourceProfile` command copies the configuration files in the source profile to a snapshot directory.
`BPMCreateTargetProfile`	The `BPMCreateTargetProfile` command creates a new profile that will be the migration target. The target profile is created with the same cell name, node name, and host name as specified in the source profile.
`BPMMigrateProfile`	The `BPMMigrateProfile` command migrates the source profile from the snapshot directory to the target profile.
`BPMMigrateCluster`	The `BPMMigrateCluster` command migrates cluster scope applications and configurations. You must execute this command for each cluster from the deployment manager node.
`BPMMigrationStatus`	The `BPMMigrationStatus` command displays the migration status. This command is not mandatory

These commands only migrate applications and configurations under migration source profiles. They do not operate on data in the product databases. In order to complete the migration procedure, you must run additional product database upgrade scripts provided with the BPM products, as discussed in 3.4, "Runtime migration general steps" on page 95.

Notes:

- ► On z/OS, you should not invoke these commands directly, but instead create customized jobs.

- ► The migration command-line tools (WBIPreUpgrade, WBIPostUpgrade, WBIProfileUpgrade.ant, WBMPreUpgrade, WBMPostUpgrade) are still shipped with BPM V7.0, but they are deprecated.

- ► The commands in Table 3-2 on page 87 are not applicable to WebSphere Business Compass migration.

- ► You should always create the target profile using either the `BPMCreateTargetProfile` command or GUI migration tool (see "Runtime migration GUI wizard" on page 88), except in the following circumstances:

  - – You are migrating from WebSphere ESB V6.0.2.x, in which case you should use the Profile Management tool. You can learn more about this tool by going to the following address:

    `http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wesb.doc/doc/tmig_vtv_sidebysidecommandline.html`

  - – For the z/OS platform, the target profile is created with a customized job.

Runtime migration GUI wizard

BPM V7.0 also delivers a new GUI migration tool (Figure 3-3 on page 89). This tool is available for 32-bit BPM products on all distributed platforms. For 64-bit BPM products, it is available on Windows AMD-64, Windows x86-64, Linux x86-64, and HP-UNIX IA-64 platforms. The GUI migration tool is not available on the z/OS platform.

You can invoke the GUI migration tool with the BPMMigrate script, found in the `BPM_HOME`/bin directory. The BPMMigrate GUI collects the relevant information from the user and executes the `BPMSnapshotSourceProfile`, `BPMCreateTargetProfile`, and `BPMMigrateProfile` commands in sequence.

The GUI migration tool is provided for your convenience, making it easier for you to walk through the steps needed for migration. The GUI migration tool provides two modes for providing migration parameters (Figure 3-3). The Typical migration mode performs the migration using a set of default values. The Custom migration mode provides more flexibility. If you want to specify the snapshot directory, target profile name, or assign port number for the target profile, then you need use the Custom migration mode.
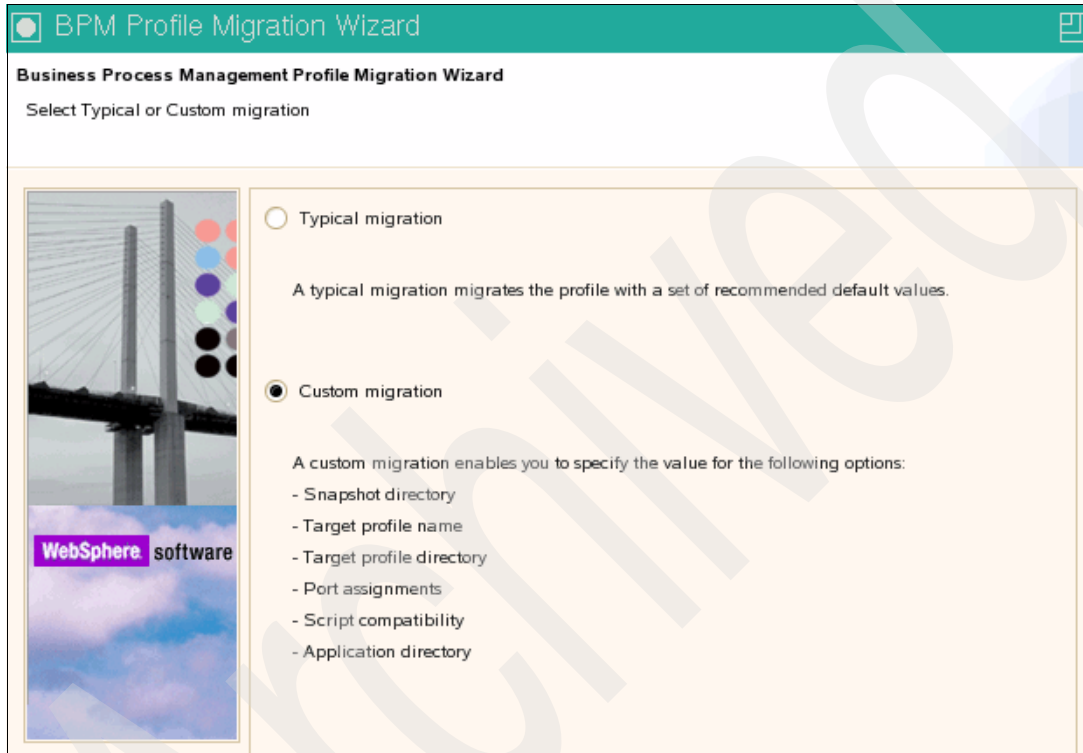
Figure 3-3   BPM runtime migration GUI wizard

3.1.4 Runtime migration pattern

When you plan your runtime migration, you can use full a downtime migration or minimal downtime migration approach. Migration without any downtime (also known as *light-on migration*) is not supported.

Full downtime migration

For full downtime migration, you need shut down the whole cell, including all application servers, all node agents, and the deployment manager, before you begin the migration procedure. No requests will be handled during the migration procedure. The length of the downtime depends on the number of nodes, number of applications, and the amount of data stored in the product databases.

Full downtime migration is applicable to all source versions. You can do a consistent backup and restore for the source environment under full downtime migration.

Minimal downtime migration

For minimal downtime migration, the deployment manager is migrated first. While deployment manager migration is taking place, the application servers on other nodes are still available.

After the migrated deployment manager has been migrated and started, migrate the nodes.

If there are no clusters in the migration source environment, you can migrate each custom node, one at a time. As each node is migrated, the applications that run on the servers on that node will be out of service.

If clusters exist in the migration source environment, you can migrate each cluster in phases if your cluster topology is suitable for this action. Stop and migrate the profiles for the nodes of half of the members for each cluster. While this migration is taking place, the second half of the cluster is available.

When the first half is migrated, stop all the nodes with members in the cluster. Then migrate the cluster scope configuration and the databases. During this step, the applications on the cluster will be out of service.

After the cluster migration, start the migrated nodes and cluster members, but keep the second half of the nodes stopped until you migrate them to Version 7.0.

When you plan a minimal downtime migration, take the following factors into consideration.

► The overall application unavailability time will be kept to a minimum. In the case of multiple clusters, the migration process can be spread over multiple maintenance windows:

  – Migration can be done for each cluster independently if their members are on different nodes.

  – Carefully analyze your topology for dependencies between clusters.

- In order to maintain some degree of application availability, some administrative restrictions must be put in place during the migration:
  - Do not install, update, or uninstall any applications that contain business processes, human tasks, or both.
  - Do not perform configuration activities for the Business Process Choreographer on the back level nodes.
- There will be capacity restrictions. At times, a subset of the servers and clusters will be stopped, with only a subset of servers or clusters running. This can create:
  - A temporary reduction of availability.
  - Limited or no failover capabilities.
- There are considerations for backup and restore. When performing the migration, the product databases might be used continuously. This means:
  - Consistent backup and rollback are more complicated.
  - Data created after the backup might be lost if a rollback is necessary.

3.1.5 Runtime migration types

This section describes the migration types.

Side-by-side migration

For side-by-side migration (Figure 3-4), the source product and the target product are located on the same system. Side-by-side migration is the typical migration type. You can do side-by-side migration for both stand-alone topologies and network deployment topologies.
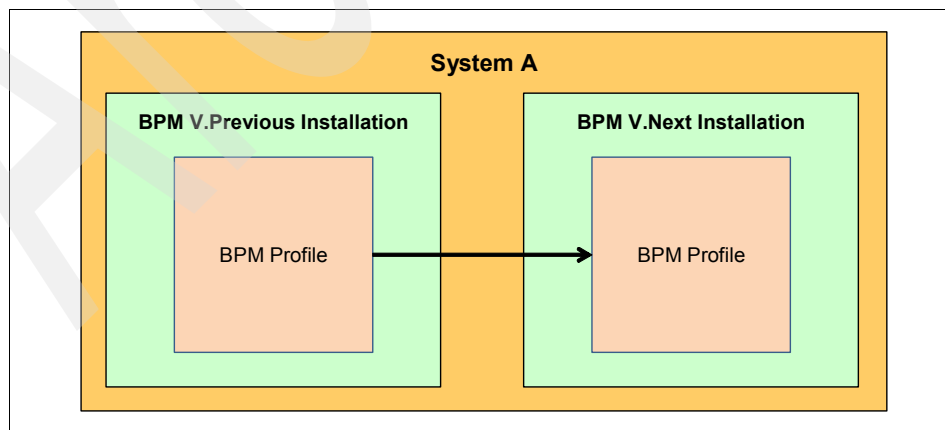
Figure 3-4   Side-by-side migration

Remote migration

Remote migration (Figure 3-5) refers to the situation when the source product and the target product are located on different systems. Remote migration often involves cross machine remote migration.

Note: Remote migration is only supported for stand-alone topologies on distributed platforms.
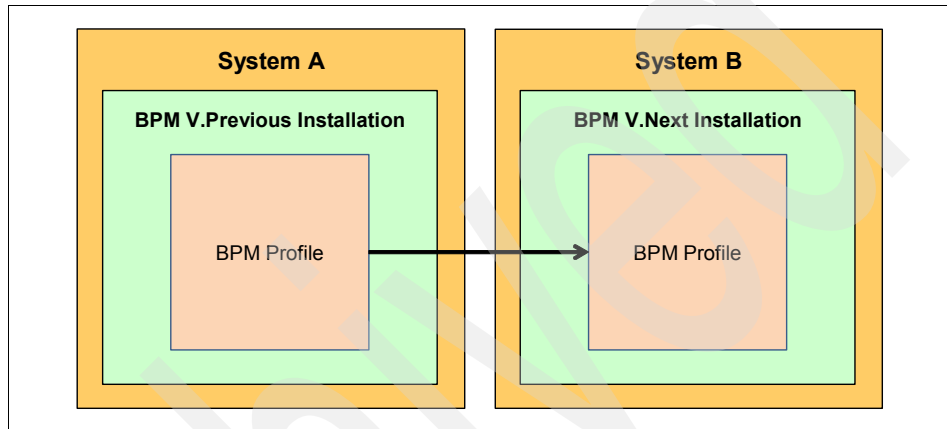
Figure 3-5   Remote migration

3.1.6 Runtime migration from 32-bit products to 64-bit products

This section describes the migration from 32-bit BPM products to 64-bit BPM products in cases where the target product has a 64-bit build.

The operating system is already a 64-bit platform

In this scenario, you simply need to install the 64-bit target product on the existing operating system and do a side-by-side migration.

The operating system is 32-bit, and is easily switched to 64-bit

For some operating systems, for example, AIX®, you can easily switch from 32-bit mode to 64-bit mode. If that is the case, you need to switch the operating system from 32-bit mode to 64-bit mode first, then do a side-by-side migration with the 64-bit product.

The operating system is 32-bit and must be re-installed as 64-bit

This scenario is much more complicated. First, you need to install a new 64-bit operating system. For a stand-alone environment, you need to perform the following steps:

1. Generate the remote migration utilities with the BPMCreateRemoteMigrationUtilities tool on a 32-bit system with the newer version 32-bit product.

2. With the generated remote migration utilities, on the 32-bit system with the old version of the product, run the `BPMSnapshotSourceProfile` command to generate the snapshot directory.

3. On the 64-bit system with the newer version 64-bit product, perform the migration with the generated snapshot directory.

For network deployment environments, this type of migration is not supported, because it involves remote migration. The recommended approach in this case is to do a manual migration.

3.1.7 Runtime migration with a non-root user

If you set up the previous version environment with the root user, but now plan to use a non-root user for the setup of the Version 7.0 products, then you need take special consideration when you plan your runtime migration.

Basically, the `BPMSnapshotSourceProfile` command needs access to the previous version's profile directory to back up the configurations and applications. If the non-root user does not have access to the original file structure, you will see a migration failure.

Grant the non-root user read access to the *<vPrevious_Installation>* and *<vPrevious_Profile_Root>* directories. Also, you should grant the non-root user write access to the *<vPrevious_Profile_Root>*/config directory.

Example commands are shown in Example 3-1.

Example 3-1   Granting the proper access to the non-root user

```
chown -R nonroot_user <vPrevious_Installation>
chown -R nonroot_user <vPrevious_Profile_Root>
```

Note: WebSphere Business Services Fabric V7.0 does not support non-root installation, so you cannot migrate to WebSphere Business Services Fabric V7.0 using a non-root user.

3.2 Existing data consideration for runtime migration

After the runtime migration, data generated before the migration is still used. For example, long-running BPEL process instances are converted into new schema and automatically continue running, previous failed events can be resubmitted after migration, and previous WebSphere Business Services Fabric content archives can be used.

As best practice, resolve all in-doubt transactions, handle all in-flight messages where possible, and clean up all exceptions in the log before starting your migration.

3.3 Rollback from migration failure

As a best practice, take a full backup before the runtime migration. Full backup means a backup of all profiles and all product databases. Such a backup is mandatory for a rollback from a migration failure. As another best practice, take backups often during the migration procedure for a quick rollback.

In general, if there is a failure when you execute one migration command, you need to roll back to a specific backup point and rerun all of the migration commands after that backup point. You should not rerun the migration command against an environment that has a migration failure. However, if the failure happens when you execute the `BPMMigrationCluster` command, you can rerun the command multiple times without a rollback.

For more backup and restore information, refer to the following items:

► For distributed systems, go to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.doc/doc/tmig_vtv_rollback.html

► For z/OS systems, go to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wps.z.doc/doc/tmig_vtv_rollback.html

3.3.1 Rollback for full downtime migration

For a full downtime migration, it is easy to take a full backup. Perform the following steps:

1. Use a `tar` command to back up the entire installation directory for the old products. If the profiles or other artifacts are located in a directory other than the installation directory, be sure to back them up as well. Other artifacts include transaction log files on a shared disk, external jars, and any other external files used.

2. Back up all product databases with database tools, for example, `db2 backup db` *db_name* for a DB2 database.

If there is a failure during the migration, simply restore these backups and redo your migration.

See 6.3.9, "Back up the source environment" on page 218 for an backup example.

3.3.2 Rollback for minimal downtime migration

For a minimal downtime migration, it is not easy or might even be impossible to find a point to back up the product databases, because the databases will be used continuously during the migration and the data might be updated. Data created after the backup might be lost.

3.4 Runtime migration general steps

This section describes the runtime migration general steps with a sample topology. The following general steps apply to WebSphere Process Server, WebSphere Enterprise Service Bus, WebSphere Business Monitor, WebSphere Business Services Fabric, and WebSphere Dynamic Process Edition. Different products or different versions of the same product might have slight differences in the migration steps. Also refer to 3.5, "Runtime migration for specific BPM products" on page 105 and Chapter 2, "Release-specific information" on page 47.

3.4.1 Runtime migration for a stand-alone profile

This section describes the general runtime migration steps for migrating a stand-alone profile topology.

Sample topology

Figure 3-6 shows the details of a stand-alone profile topology.
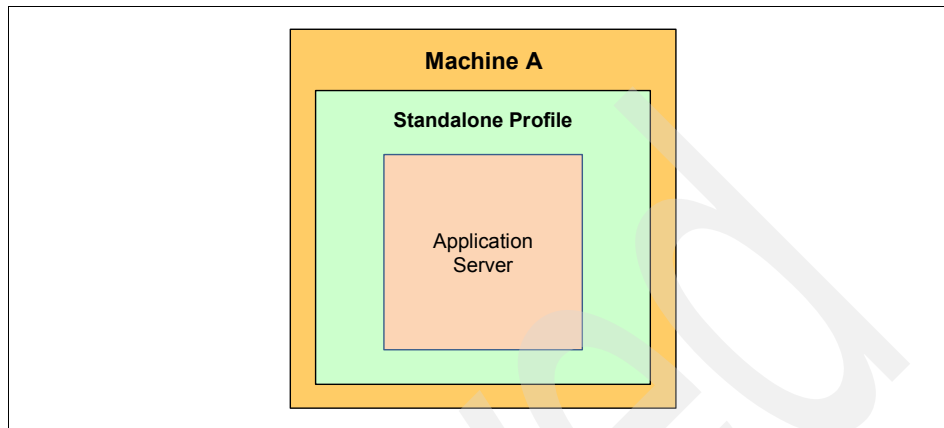
Figure 3-6   Stand-alone profile topology

The key details of this topology are that there is one stand-alone profile, no node agents, and no clusters.

The topology described in Figure 3-6 only supports a runtime migration with full downtime. However, it supports both side-by-side migration and remote migration.

High level steps for side-by-side migration

In order to migrate the stand-alone profile topology side-by-side, you need to perform these general steps:

1. Check the Information Center for BPM products to collect the system requirements for the Version 7.0 products, including the operating system and product database levels required. See 3.5, "Runtime migration for specific BPM products" on page 105 for the system requirement link for your specific product.

2. Stop the migration source stand-alone application server.

3. Back up the migration source environment, including product databases.

4. If necessary, upgrade the operating system and product database level according to the system requirement information collected from step 1.

5. Back up the product databases of the migration source environment again if you upgraded the product database level.

6. Install the migration target product(s) side-by-side with the migration source product(s).

7. Invoke the BPM runtime migration tools in the following order to migrate the stand-alone profile. See 3.1.3, "Runtime migration tools" on page 86 for more details:

   a. BPMSnapshotSourceProfileBPM

   b. CreateTargetProfile

   c. BPMMigrateProfile

   > **Note:** Alternatively, you also can use the BPMMigrate GUI migration tool to migrate the stand-alone profile.

8. Copy the product database upgrade scripts from the target machine to the product database server. See 6.5.2, "Upgrade common database schema" on page 250 for an example.

9. On the product database server, execute the product database upgrade scripts to update the product database schema and data.

10. Update the JDBC driver on each BPM V7.0 installation according to your product database type and level. By default, BPM products only provides a JDBC driver for DB2 databases.

11. If you have manually placed artifact files (for example, jar files and scripts) in your migration source environment, then you need to copy them to your migration target environment manually.

12. Complete the post-migration tasks. Refer to the Information center found at the following address:

    http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/index.jsp

13. The information found there gives the post-migration tasks against a specific product and version.

14. Back up the migration target environment, including profiles and product databases. This step is not necessary but recommended.

15. Start the migration target environment.

16. Verify the migration target environment.

High level steps for remote migration

> **Note:** BPM products do not support:
> - Remote migration for the z/OS platform.
> - The GUI migration tool for remote migration.

In order to migrate the stand-alone profile topology remotely, you need to perform these general steps:

1. Check the Information Center for BPM products to collect the system requirements for the Version 7.0 products, including the operating system and product database levels required. See 3.5, "Runtime migration for specific BPM products" on page 105 for the system requirement link for your specific product.

2. Install the new system according to the system requirements collected in step 1.

3. Install the migration target product(s) on the new system.

4. On the new system, generate the remote migration utilities image with the `BPMCreateRemoteMigrationUtilities` command. Refer to 3.1.3, "Runtime migration tools" on page 86 for more information.

5. Copy the remote migration utilities image to the migration source environment.

6. Stop the stand-alone application server of the migration source environment.

7. Back up the migration source environment, including product databases.

8. On the migration source environment, invoke the `BPMSnapshotSourceProfile` command to generate a profile snapshot. The command is contained in the remote migration utilities image. Refer to 3.1.3, "Runtime migration tools" on page 86 for more information.

9. Copy the generated profile snapshot directory from the migration source environment to the migration target environment.

10. On the migration target environment, execute the `BPMCreateTargetProfile` and `BPMMigrateProfile` commands against the profile snapshot directory to migrate the profile.

11. On the product database server, execute the product database upgrade scripts to update the product database schema and data.

12. Update the JDBC driver on each BPM Version 7.0 installation according to your product database type and level. By default, BPM products only provide JDBC drivers for DB2 databases.

13. If you have manually placed artifact files (for example, jar files or scripts) in your migration source environment, then you need copy them to your migration target environment.

14. Complete the post-migration tasks. Check the Information Center at the following address for the specific product and version:

    http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/index.jsp

15. Back up the migration target environment, including profiles and product databases. This step is not necessary but recommended.

16. Start the migration target environment.

17. Verify the migration target environment.

3.4.2 Runtime migration for network deployment with cluster

This section describes the general runtime migration steps for migrating a network deployment topology with clusters.

Sample topology

Figure 3-7 shows the details of the sample network deployment topology with a single cluster.
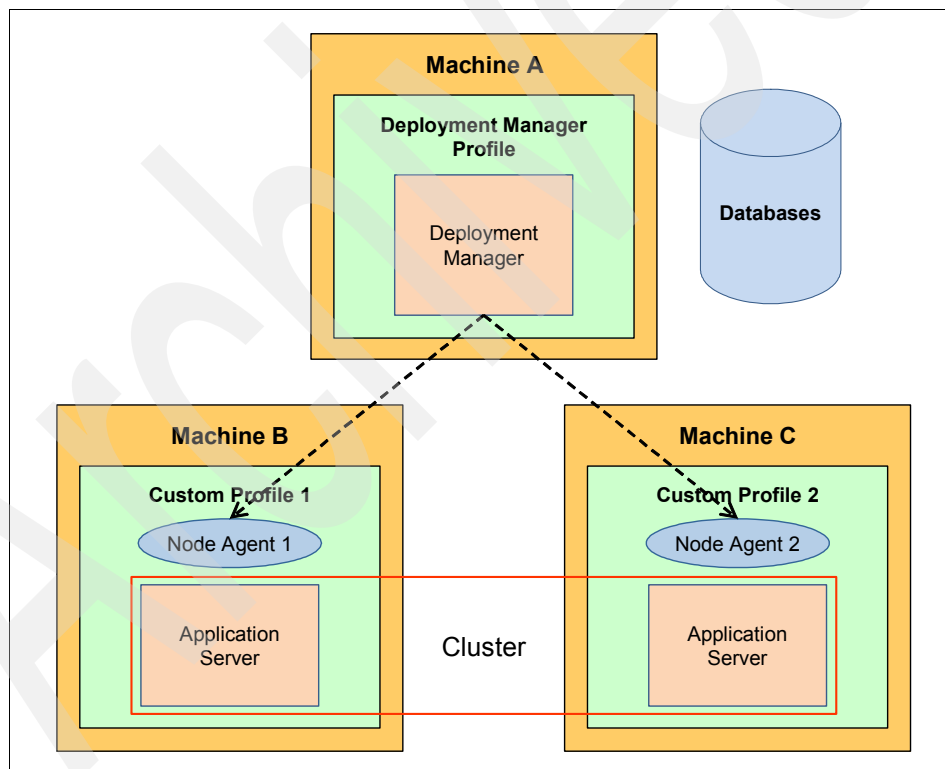
Figure 3-7   Network deployment environment with a cluster

Note that:

- ► There is one deployment manager profile with two custom profiles. This diagram has been simplified to show the concepts of migration. In a typical environment, there can be more custom profiles.

- ► The topology is comprised of multiple application servers and node agents.

- ► There is one cluster with business applications.

This topology supports both runtime migration with full downtime and runtime migration with minimal downtime.The topology described in Figure 3-7 on page 99 only supports the side-by-side migration type.

High level steps for runtime migration with full downtime

In order to migrate the topology described in Figure 3-7 on page 99 in a full downtime manner, perform the following steps:

1. Check the Information Center for BPM products to collect the system requirements for the Version 7.0 products, including the operating system and product database levels required. See 3.5, "Runtime migration for specific BPM products" on page 105 for the system requirement link for your specific product.

2. Stop the deployment manager, all node agents, and all application servers in the migration source environment.

3. Back up the whole migration source environment, including all installation directories, all profile directories, and all product databases.

4. If necessary, upgrade all of the operating systems and product database levels according to the system requirement information collected from step 1.

5. Back up the product databases of the migration source environment again if you upgraded the product database level.

6. Install the migration target product(s) side-by-side with the migration source product(s) on machine A. This machine hosts the deployment manager profile.

> **Note:** For a network deployment environment, the deployment manager profile must be migrated first before any other profiles.

7. Invoke the BPM runtime migration tools in the following sequence to migrate the deployment manager profile. See 3.1.3, "Runtime migration tools" on page 86 for more information:

    a. BPMSnapshotSourceProfile

    b. BPMCreateTargetProfile

c. BPMMigrateProfile

> **Note:** Alternatively, you also can use BPMMigrate GUI migration tool to migrate the profile.

8. Copy the product common database upgrade scripts from the BPM target machine to the product database server. See 6.5.2, "Upgrade common database schema" on page 250 for an example.

9. On the product database server, execute the product database upgrade scripts to update the schema of the common database.

10. Update the JDBC driver on each BPM V7.0 installation according to your product database type and level. By default, BPM products only provide JDBC drivers for DB2 databases.

11. If you have manually placed artifact files (for example, jar files and scripts) in your migration source environment, then copy them to your migration target environment.

12. Start the deployment manager in the migration target environment.

13. Install the migration target product(s) side-by-side with the migration source product(s) on machine B. This machine hosts one of the custom profiles.

> **Note:** If there are pure WebSphere Application Server custom profiles in your topology, migrate those custom profiles before others. You can use the migration tool to migrate those custom profiles.

14. Invoke BPM runtime migration tools in the following sequence to migrate the custom profile on machine B. See 3.1.3, "Runtime migration tools" on page 86 for more information:

    a. BPMSnapshoutSourceProfile

    b. BPMCreateTargetProfile

    c. BPMMigrateProfile

> **Note:** Alternatively, you can use the BPMMigrate GUI migration tool to migrate the custom profile.

15. Repeat steps 13 through 15 to migrate the next custom profile on machine C, and each additional machine where you have custom profiles.

16. From the migration target deployment manager, execute the `BPMMigrateCluster` command against each cluster to migrate the cluster scope configuration. If you have multiple clusters, then repeat the `BPMMigrateCluster` command against each cluster, one by one.

17. Back up the migration target profiles. This backup will be needed if you run into errors, such as an OutOfMemory exception in the next step.

18. For each migration target custom node that hosts cluster members, execute the *<BPM_ROOT>*`/bin/syncNode` command to synchronize the node configuration with the target deployment manager.

19. On the product database server, execute the product database upgrade scripts to update the product database schema and data for other product databases, for example, the database for Business Process Choreographer and the database for Business Space. See 6.5.13, "Update the BPC database" on page 289 for an exact example.

20. Update the JDBC driver on each BPM V7.0 installation on the custom node machines B and C. By default, BPM products only provide JDBC drivers for DB2 databases.

21. If you have manually placed artifact files (for example, JAR files and scripts) in your migration source environment, then copy them to your migration target environment.

22. Complete the post-migration tasks. Please check the Information Center for the specific product and version at the following address:

    http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/index.jsp

23. Back up the migration target environment, including profiles and product databases. This step is not necessary but is recommended.

24. Start the migration target environment.

25. Verify the migration target environment.

High level steps for runtime migration with minimal downtime

In order to migrate the topology described in Figure 3-7 on page 99 in a minimal downtime manner, perform the following steps:

1. Check the Information Center for BPM products to collect the system requirements for the Version 7.0 products, including the operating system and product database levels required. See 3.5, "Runtime migration for specific BPM products" on page 105 for the system requirement link for your specific product.

2. For each cluster, identify the profiles that need be migrated to the same level and categorize them into several groups. Divide the profiles that contain servers that contribute to the cluster into two roughly equivalent sized groups, group A and group B.

   In this example, group A consists of the servers and node agents on machine B. Group B consists of the application servers and node agents on machine C.

3. Use the administrative console on the source deployment manager to disable synchronization for all nodes. This step is mandatory for minimal downtime migration.

4. Stop the deployment manager and keep all of the other node agents and application servers running.

5. Back up the source deployment manager profile and common database.

6. If necessary, upgrade the operating system of machine A and product database level according to the system requirement information collected from step 1.

7. Back up the common database just in case you have upgraded the product database level.

8. Install the migration target product(s) side-by-side with the migration source product(s) on machine A, which hosts deployment manager profile.

   Note: For a network deployment environment, the deployment manager profile must be migrated before any other profiles.

9. Invoke the BPM runtime migration tools in the following sequence to migrate deployment manager profile. See 3.1.3, "Runtime migration tools" on page 86 for more information:

   a. BPMSnapshotSourceProfile

   b. BPMCreateTargetProfile

   c. BPMMigrateProfile

   Note: Alternatively, you can use GUI migration tool BPMMigrate to migrate the profile.

10. Copy the provided product database upgrade scripts for the product database used by the target deployment manager from the BPM profile machine to product database server.

11. On the product database server, execute the product database upgrade scripts to update the schema of the product database used by the target deployment manager.

12. Update the JDBC driver on each BPM Version 7.0 installation on machine A. By default, BPM products only provide JDBC drivers for DB2 databases.

13. If you have manually placed artifact files (for example, JAR files and scripts) in your migration source environment, copy them to your migration target environment.

14. Start the deployment manager in the migration target environment.

15. Stop the application servers and node agents in group A (the application servers and node agents on machine B).

16. Back up the custom profile in group A.

17. If necessary, upgrade the operating system for the machine that hosts group A profiles and the product database level used by the applications in group A according to the system requirement information collected from step 1.

18. Install the migration target product(s) side-by-side with the migration source product(s) on machine B.

19. Invoke BPM runtime migration tools in the following sequence to migrate Custom Profile 1 on in group A. See 3.1.3, "Runtime migration tools" on page 86 for more information:

    a. BPMSnapShotSourceProfile

    b. BPMCreateTargetProfile

    c. BPMMigrateProfile

    Note: Alternatively, you can use the GUI migration tool BPMMigrate to migrate the profile.

20. If you have manually placed artifact files (for example, JAR files and scripts) in your migration source environment, copy them to your migration target environment.

21. If there are more custom profiles in group A, repeat steps 15 through 20.

22. Stop all application servers and node agents in group B. At this point, you have complete downtime of your applications.

23. From the migration target deployment manager, execute the `BPMMigrateCluster` command against the cluster that contains the group A custom profiles. This will migrate the cluster scope configuration.

24. From the administrative console of the migration target deployment manager, enable synchronization for all nodes in the migrated cluster (both group A and group B).

25. Back up the migrated profiles in group A; for this example, it is custom profile 1.

26. For each migration target custom profile in group A, execute the `syncNode` command against the migration target deployment manager.

27. Copy the provided product database upgrade scripts for the product databases (used by the cluster that has just been migrated) from the BPM profile machine to the product database server.

28. On the database server, execute the database upgrade scripts to update the schema for the product databases used by migrated cluster.

29. Update the JDBC driver on each BPM Version 7.0 installation for group A. By default, BPM products only provide JDBC drivers for DB2 databases.

30. Complete the post-migration tasks for group A profiles. Please check the Information Center for the specific product and version at the following address:

    http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/index.jsp

31. Start the migrated node agent and application servers in group A; for this example, it is the application servers and node agents on machine B.

32. For the custom profiles in group B, repeat steps 15 through 20 to migrate them.

33. Back up the migrated profiles in group B; for this example, it is custom profile 2.

34. For each migration target custom profile in group B, execute `syncNode` against the migration target deployment manager.

35. Start the migrated node agents and application servers in group B.

36. If there are more clusters in your environment, repeat steps 15 through 35 to migrate those clusters one by one.

3.5 Runtime migration for specific BPM products

This section describes product specific runtime migration information.

> **WebSphere Adapters:** If you use any WebSphere Adapters for Version 6.0.2 or WebSphere Adapter for SAP V6.0.2, V6.1.0, V6.1.2, and V6.2.0, see 2.6.3, "Known limitations for WebSphere Adapters" on page 79 for more information.

For z/OS installations, you might also find the following documents useful when planning for your migration:

► WebSphere Application Server for z/OS Migration Performance Study, found at the following address:

http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP10158 9

► Migrating to WebSphere z/OS V7.0, found at the following address:

http://www-03.ibm.com/support/techdocs/atsmastr.nsf/WebIndex/WP10132 9

3.5.1 Runtime migration for WebSphere Process Server

WebSphere Process Server environments running Version 6.0.2.x, Version 6.1.0.x, Version 6.1.2.x, or Version 6.2.0.x can migrate to Version 7.0 directly with either full downtime migration or minimal downtime migration. Alternatively, you can migrate WebSphere Process Server to Version 7.0 indirectly, that is, you migrate an existing WebSphere Process Server to a pre-Version 7.0 version first, then further migrate to Version 7.0. WebSphere Process Server does not support data-only migration.

WebSphere Process Server V6.1 is the first version to support runtime migration capability. WebSphere Process Server V6.2.0.x and V6.2.x do not support minimal downtime migration from Version 6.0.2.x.

If you are migrating to WebSphere Process Server V7.0 in a minimal downtime approach and your applications use mediation flow components or business calendar, then before the nodes that host such applications are migrated to Version 7.0, those applications cannot start; this is a known limitation.

Check the information in the following links before you start the migration:

► WebSphere Process Server system requirement, which can be found at the following address:

http://www-01.ibm.com/support/docview.wss?uid=swg27006205

► Runtime pre-migration checklist for distributed platform, which can be found at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com .ibm.websphere.wps.doc/doc/cmig_vtv_premigchecklist.html

- Deprecated features for distributed platform, which can be found at the following address:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
  .ibm.websphere.wps.doc/doc/gmig_deprecationlist.html

- Known compatibility issues for distributed platform, which can be found at the following address:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
  .ibm.websphere.wps.doc/doc/cmig_vtv_compat.html

- Runtime pre-migration checklist for z/OS, which can be found at the following address:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
  .ibm.websphere.wps.z.doc/doc/cmig_vtv_premigchecklist.html

- Deprecated features for z/OS, which can be found at the following address:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
  .ibm.websphere.wps.z.doc/doc/gmig_deprecationlist.html

- Known compatibility issues for z/OS, which can be found at the following address:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
  .ibm.websphere.wps.z.doc/doc/cmig_vtv_compat.html

- Recommended fixes for WebSphere Process Server, which can be found at the following address:

  http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg27006649

- Recommended interim fixes for installing WebSphere Process Server V7.0.0.0.0, which can be found at the following address:

  http://www-01.ibm.com/support/docview.wss?uid=swg21414253

Table 3-3 shows the migration matrix for WebSphere Process Server. As a best practice, use the latest versions of WebSphere Process Server for migration purposes.

Table 3-3   WebSphere Process Server migration matrix

To From	Version 6.0.2.y[a]	Version 6.1.0.y	Version 6.1.2.y	Version 6.2.y	Version 7.0.0.y
Version 6.0.1.x	Upgrade	Migrate	Migrate	[b]	[b]
Version 6.0.2.x	Upgrade	Migrate	Migrate	Migrate	Migrate
Version 6.1.0.x	N/A	Upgrade	Upgrade	Migrate	Migrate
Version 6.1.2.x	N/A	N/A	Upgrade	Migrate	Migrate
Version 6.2.x	N/A	N/A	N/A	Upgrade	Migrate
Version 7.0.0.x	N/A	N/A	N/A	N/A	Upgrade

a. The number represented by y is larger than the number represented by x.

b. To get from Version 6.0.1.x to Version 6.2.x or Version 7.0, you must first upgrade from Version 6.0.1.x to Version 6.0.2.x, then migrate Version 6.0.2.x to Version 6.2.x or Version 7.0. You cannot directly migrate WebSphere Process Server Version 6.0.1.x to Version 6.2.x or Version 7.0.0.x.

3.5.2 Runtime migration for WebSphere Enterprise Service Bus

WebSphere Enterprise Service Bus environments running Version 6.0.2.x, Version 6.1.0.x, Version 6.1.2.x, or Version 6.2.0.x can migrate to Version 7.0 directly with either full downtime migration or minimal downtime migration. Alternatively, you can migrate WebSphere Enterprise Service Bus to Version 7.0 indirectly. WebSphere Enterprise Service Bus does not support data-only migration.

For minimal downtime migration, applications that exploit business calendars or mediation flow components will remain stopped automatically until the node is migrated to Version 7.0. This means that during minimal downtime migration, your applications that have business calendars or mediation flow components cannot remain up on the un-migrated half of the cluster members and they will be out of service for a period of time.

Check the following information before you start the migration:

► WebSphere Enterprise Service Bus system requirement, which can be found at the following address:

  `http://www-01.ibm.com/support/docview.wss?uid=swg27006912`

► Runtime pre-migration checklist for distributed platform, which can be found at the following address:

  `http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wesb.doc/doc/cmig_vtv_premigchecklist.html`

► Deprecated features for distributed platform, which can be found at the following address:

  `http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wesb.doc/ref/rwesb_deprecationlist.html`

► Known compatibility issues for distributed platform, which can be found at the following address:

  `http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wesb.doc/doc/cmig_vtv_compat.html`

► Runtime pre-migration checklist for z/OS, which can be found at the following address:

  `http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wesb.zseries.doc/doc/cmig_vtv_premigchecklist.html`

► Deprecated features for z/OS, which can be found at the following address:

  `http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wesb.zseries.doc/ref/rwesb_deprecationlist.html`

► Known compatibility issues for z/OS, which can be found at the following address:

  `http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.websphere.wesb.zseries.doc/doc/cmig_vtv_compat.html`

► Recommended fixes for WebSphere Enterprise Service Bus, which can be found at the following address:

  `http://www-01.ibm.com/support/docview.wss?uid=swg27007485`

Table 3-4 shows the migration matrix for WebSphere Enterprise Service Bus. As a best practice, use the latest versions of WebSphere Enterprise Service Bus for migration purposes.

Table 3-4   WebSphere Enterprise Service Bus migration matrix

To From	V6.0.2.y[a]	V6.1.0.y	V6.1.2.y	V6.2.y	V7.0.0.y
V6.0.1.x	Upgrade	Migrate	Migrate	[b]	[b]
V6.0.2.x	Upgrade	Migrate	Migrate	Migrate	Migrate
V6.1.0.x	N/A	Upgrade	Upgrade	Migrate	Migrate
V6.1.2.x	N/A	N/A	Upgrade	Migrate	Migrate
V6.2.x	N/A	N/A	N/A	Upgrade	Migrate
V7.0.0.x	N/A	N/A	N/A	N/A	Upgrade

a. The number represented by y is larger than the number represented by x.

b. To get from Version 6.0.1.x to Version 6.2.x or Version 7.0, you first upgrade from Version 6.0.1.x to Version 6.0.2.x, then migrate Version 6.0.2.x to Version 6.2.x or Version 7.0. You cannot directly migrate WebSphere Enterprise Service Bus Version 6.0.1.x to Version 6.2.x or Version 7.0.0.x.

3.5.3 Runtime migration for WebSphere Business Monitor

If you are migrating WebSphere Business Monitor V6.0.2 to Version 7.0, then you need do both artifact migration to migrate the monitor models and data-only runtime migration to migrate the existing data to a new product database. For more information about this topic, go to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.btools.help.monitor.mig.doc/mig/mig_602.html

You can also migrate WebSphere Business Integration Monitor V4.2.4 FDL models and historical runtime data to Version 7.0. For more information about this topic, go to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.btools.help.monitor.mig.doc/mig/mig_424.html

Starting with WebSphere Business Monitor V7.0, the Alphablox repository is in the WebSphere Business Monitor product database by default. Regardless of the previous WebSphere Business Monitor version implemented, you must migrate the existing Alphablox repository to the WebSphere Business Monitor V7.0 product database repository.

To migrate WebSphere Business Monitor V6.1.x to Version 7.0, go to the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.btools.help.monitor.mig.doc/mig/mig_61.html
```

To migrate WebSphere Business Monitor version 6.2.x to Version 7.0, go to the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.btools.help.monitor.mig.doc/mig/mig_62_ov.html
```

See Chapter 6, "Migrating BPM V6.1.2 to WebSphere Dynamic Process Edition V7.0" on page 195 for a detailed migration example.

Check the following resources for information before you start the migration:

► WebSphere Business Monitor system requirement, which can be found at the following address:

```
http://www-01.ibm.com/support/docview.wss?rs=802&context=SSSRR3&uid=
swg27016838
```

► Recommended fixes for WebSphere Business Monitor, which can be found at the following address:

```
http://www-01.ibm.com/support/docview.wss?uid=swg27010921
```

Table 3-5 shows the migration matrix for WebSphere Business Monitor. As a best practice, use the latest versions of WebSphere Business Monitor for migration purposes.

Table 3-5   WebSphere Business Monitor migration matrix

To From	Version 6.0.2.y	Version 6.1.0.y	Version 6.1.2.y	Version 6.2.y	Version 7.0.0.y
Version 6.0.1.x	Upgrade	Migrate	Migrate	a	a
Version 6.0.2.x[b]	Upgrade	Migrate	Migrate	Migrate	Migrate
Version 6.1.0.x	N/A	Upgrade	Upgrade	Migrate	Migrate
Version 6.1.2.x	N/A	N/A	Upgrade	Migrate	Migrate
Version 6.2.x	N/A	N/A	N/A	Upgrade	Migrate
Version 7.0.0.x	N/A	N/A	N/A	N/A	Upgrade

a. To get from Version 6.0.1.x to Version 6.2.x or Version 7.0, you first upgrade from Version 6.0.1.x to Version 6.0.2.x, then migrate Version 6.0.2.x to Version 6.2.x or Version 7.0. You cannot directly migrate WebSphere Enterprise Service Bus Version 6.0.1.x to Version 6.2.x or Version 7.0.0.x.

b. If you are using WebSphere Business Monitor V6.0.2.1, you must install interim fix 5 or higher for WebSphere Business Monitor V6.0.2.1 before beginning the migration process. For more information, go to the following address:
    http://www-01.ibm.com/support/docview.wss?uid=swg27010921#602

WebSphere Business Monitor does not support z/OS.

3.5.4 Runtime migration for WebSphere Business Services Fabric

The standard runtime migration tooling support for WebSphere Business Services Fabric was introduced in Version 7.0. WebSphere Business Services Fabric-specific profiles and Profile Management Tool support were introduced only in Version 6.2. In versions prior to Version 6.2, WebSphere Business Services Fabric applications was installed on a WebSphere Process Server-only profile.

For WebSphere Business Services Fabric V6.1.2.x, if it is part of the stack being migrated, you could still migrate WebSphere Business Services Fabric using the runtime migration tool (see 3.1.3, "Runtime migration tools" on page 86) with some workarounds.

To implement these workarounds, perform the following steps:

1. Export the WebSphere Business Services Fabric ontology content archive and dependency archives for your prior projects that you need to migrate using the WebSphere Business Services Fabric administrative console.

2. Install WebSphere Business Services Fabric V7.0 with no profiles.

3. Migrate from earlier releases (prior to Version 6.2) using the standard runtime migration tool. This would migrate WebSphere Business Services Fabric applications also on that WebSphere Process Server profile.

4. Augment the migration target profiles that host WebSphere Business Services Fabric product applications. This is required to get the profile branding capability introduced in Version 7.0.

5. Import the data exported from Step 1 into WebSphere Business Services Fabric V7.0 using the WebSphere Business Services Fabric administrative console.

6. Drop the previous WebSphere Business Services Fabric product database, as that product database is no longer used since Version 6.2. All WebSphere Business Services Fabric repository data is stored in the WebSphere Process Server common product database now.

If you are migrating WebSphere Business Services Fabric V6.0.2.x to Version 7.0, you should migrate the Version 6.0.2.x runtime to Version 6.1.x first, as detailed in the following steps, and then migrate the Version 6.1.x runtime to Version 7.0 with the above workaround.

Perform the following steps:

1. Migrate WebSphere Business Services Fabric database manually as documented in the Information Center found at the following address:

   `http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com`
   `.ibm.ws.fabric.migr.doc/migr602/concept/c_migfabricdbfrom6.0.2to6.1.`
   `html`

2. Run the FabricDBMigrationUtility utility.

3. Install the new WebSphere Business Services Fabric V6.1.x runtime.

4. Install the WebSphere Business Services Fabric V6.1.x applications and create the required artifacts manually. For more information about this topic, go to the following address:

   `http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r1mx/topic/com.i`
   `bm.ws.fabric.install612.doc/fpi/concept/c_wbsf_packaging.html`

5. Remove the LDAP configuration by using the WebSphere Business Services Fabric administrative console. For more information about this topic, go to the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.ws.fabric.migr.doc/migr602/concept/c_migfabricdbfrom6.0.2to6.1.
html
```

Please check the following information before you start the migration:

► WebSphere Business Services Fabric system requirement, which can be found at the following address:

```
http://www-01.ibm.com/software/integration/wbsf/sysreqs/index.html
```

► Recommended Fixes for WebSphere Business Services Fabric, which can be found at the following address:

```
http://www-01.ibm.com/support/docview.wss?uid=swg27008650
```

3.5.5 Runtime migration for WebSphere Dynamic Process Edition

Before Version 7.0, a typical WebSphere Dynamic Process Edition network deployment topology consisted of a WebSphere Process Server profile, a WebSphere Business Monitor profile, and a WebSphere Business Services Fabric profile. To migrate such a topology, you need to complete the migration for each of those profile types and perform the post-migration tasks for each of involved products. See Chapter 6, "Migrating BPM V6.1.2 to WebSphere Dynamic Process Edition V7.0" on page 195 for an example of such a migration.

Please check the following resource for information before you start the migration:

► WebSphere Dynamic Process Edition system requirement, which can be found at the following address:

```
http://www-01.ibm.com/software/integration/wdpe/requirements
```

Table 3-6 shows the migration matrix for WebSphere Dynamic Process Edition.

Table 3-6   WebSphere Dynamic Process Edition migration matrix

To From	Version 6.1.2.y	Version 6.2.y	Version 7.0.0.y
Version 6.1.2.x	Upgrade	Migrate	Migrate
Version 6.2.x	N/A	Upgrade	Migrate
Version 7.0.0.x	N/A	N/A	Upgrade

3.5.6 Runtime migration for WebSphere Business Compass

IBM WebSphere Business Compass is the new name for IBM WebSphere Business Modeler Publishing Server. This new offering combines the reviewing and publishing function of WebSphere Business Modeler Publishing Server with the business design authoring collaboration function of the WebSphere Business Modeler Publishing Server V6.2 Feature Pack. Business Compass provides a single, comprehensive authoring and reviewing environment for business users.

If you have installed Version 6.2.x, Version 6.1.x, or Version 6.0.2.x of WebSphere Business Modeler Publishing Server, then you can migrate to WebSphere Business Compass V7.0.

WebSphere Business Compass V7.0 only supports data only migration.

See the Information Center for more information by going to the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.btools.help.modeler.collab.publish.mig.doc/mig/migrate.html
```

4

Manual migration

This chapter addresses general considerations when manually migrating a Business Process Management (BPM) runtime to BPM V7.0. In this chapter, we will discuss the manual migration of WebSphere Process Server, WebSphere Enterprise Service Bus, WebSphere Business Monitor, WebSphere Business Services Fabric, and WebSphere Dynamic Process Edition products.

This chapter contains the following sections:

- ► "Manual migration concepts" on page 118
- ► "Manual migration steps" on page 120

4.1 Manual migration concepts

If you require the same configuration in your target environment as your source environment, then the runtime migration method is typically more appropriate, because it will automatically replicate the source environment's topological configuration to the target environment. However, if you need to reconfigure the target environment configuration to be completely different than your source environment, you must either do it before or after version-to-version migration as an independent exercise, or use the manual method if you plan to do it concurrent with the version-to-version migration.

The parallel environments provided by the manual migration method enables a target production environment that is completely independent of the source environment that is serving the existing consumers enabling the target environment to be rigorously tested before going live in a production setting. You can greatly mitigate certain risks associated with other migration methods because your current source environment is "untouched" when using manual migration.

If you have a situation where you do not want to migrate all your applications in a single downtime window to the target version, you should consider the manual approach. This approach provides support for two parallel environments, the source and the target, and supports selective or phased deployment of the migrated applications to the target environment. In contrast, the runtime migration method migrates all applications from the source environment to the target environment.

4.1.1 Benefits

The benefits of manual migration include:

► This pattern offers a much easier method for version rollback, should this become necessary during or after the migration. Because the previous version is completely unmodified, including the databases, system configuration, and applications, it can be restored relatively easily.

► The target production environment can be configured differently than the source production environment because the configuration is not automatically migrated from the source to the target.

► If you have only non-persistent applications, then this method can be simpler than performing the version-to-version migration.

- It is easier to modify the WebSphere Process Server ND topology in this case, because there is no relationship between the new and existing environments. For example, you can use different hardware, add clusters or custom nodes, or redistribute applications among the runtime targets in the Version 7.0 environment without producing any detrimental impact on the pre-migration topology.

- There is no dependency on the migration tools.

- Parallel production environment is supported:
    - Selective application migration can be performed.
    - No downtime is required.

- You have the ability to perform extensive testing before migrating to the production environment, but usually regression testing is enough.

4.1.2 Costs

The costs of manual migration include:

- Existing data is not moved; new database tables are created.

- New features are not enabled automatically and are sometimes unavailable without migrating the application artifacts using artifact migration.

- Manual (scripted) deployment of applications is required.

- Updates to client applications might be required.

- Hardware and software licenses might need to be evaluated for any additional licenses required when running in parallel.

4.1.3 Risks

There are also certain risks that come with a manual migration:

- Existing user applications should continue to execute in the new runtime at the same level of function they had in the old runtime. In some cases, however, there might be a change in the code that the application depends on, such as a JDK change, which might have a negative impact on the unchanged application.

- The migration process relies entirely on the user to maintain the integrity and viability of the WebSphere environment during the upgrade to the new version. The user must ensure that the new topology includes all of the functionality and configuration settings established in the existing environment. The user is responsible for profile and cluster creation, BPC configuration, system configuration, and application reinstall.

- This process is not feasible for systems with applications that maintain active data, such as long-running process instances. There are no pragmatic means of transferring existing data from the pre-migration topology to the Version 7.0 topology. In other words, all active BPC long-running processes or human tasks will be lost after activity resumes on the Version 7.0 environment. In order to complete these processes, the data must be processed on the pre-migration topology.

- Long running process instances and failed events in the source environment are not moved to the target environment with the redeployment of applications. Consider running both environments in parallel so that instances in the pre-migration environment finish their work (dry out) and new instances are started in the Version 7.0 environment.

  Alternatively, consider the runtime method of migration, as it replicates the source environment *as is* on the target environment, including in-flight long running processes and failed events.

4.2 Manual migration steps

Although many users consider this a form of migration, there is technically no migration here. The environment is simply recreated with new versions of the BPM products. After applications are reinstalled on the Version 7.0 topology, the pre-migration system is brought down and traffic resumes on the new system. The entire topology is recreated from top to bottom, which means that the new environment can have a different ND configuration from the previous topology if desired. New databases are created, and none of the existing data from the pre-migration topology is retained in the new Version 7.0 topology. Because all applications are reinstalled and no existing data is retained, any long-running process instances or applications running with persistent data will be permanently lost. Likewise, any configuration data from the pre-migration topology will need to be reconfigured by the user.

The new version of the product is installed as is done with a traditional migration. However, instead of using migration scripts to migrate the existing profiles and configuration parameters from the pre-migration topology, the new, parallel environment is created by the user. The node agents, clusters, and system parameters are entirely reconfigured by the user. The pre-migration environment does not need to be shut down while the new environment is created, because there is no correlation between the two environments. The applications are redeployed and reinstalled on the new environment.

You should perform the following, general actions:

▶ Install the new hardware, operating systems, and product versions.

  See "System analysis" on page 40 for a list of Web sites that contain the system requirements for the BPM products.

▶ Configure your desired parallel production environment.

  Your target production environment is completely independent of your current source environment in this scenario. As a result, you might want to configure a new production topology based on new requirements. Refer to the following book for further examination of the options for WebSphere Process Server V7.0 production topologies:

  – *WebSphere Business Process Management V7 Production Topologies*, SG24-7854

  – *z/OS: WebSphere Business Process Management V7 Production Topologies*, SG24-7831

▶ Manually deploy applications from the source environment to the target production environments.

  Re-deploy application binaries *as is*. With the manual migration option, you do not have to re-architect your current applications; however, be aware that this might mean that your applications will not make use of any added features and functions in WebSphere Process Server V7.0. (Consider the artifact migration option otherwise.)

▶ Optional: Run both environments in parallel so business process instances and human tasks instances that are in progress finish in the source environment and new instances start in the target environment

The following sections in this book can provide information that you will find useful in a manual migration:

▶ "Migration road map" on page 39

▶ "Post migration" on page 45

▶ "Release-specific information" on page 47

5

Artifact migration

With artifact migration, applications are imported into the development environment and migrated by the development tools before deployment to the Version 7.0 target runtime environment. This enables the applications to exploit the new capabilities offered by Version 7.0. The necessity of this migration procedure depends on your migration strategy and your use of adapters. When using artifact migration, a new Version 7.0 runtime environment is set up and run in parallel with the previous version. As the artifacts are migrated, they are deployed to the target environment.

Artifact migration can also be combined with runtime migration or manual migration for a hybrid approach. The runtime or manual migration can be performed, resulting in a new Version 7.0 target environment. Then artifact migration can be used to update some or all of the applications. The concepts in this chapter will apply to any migration approach that includes application migration to Version 7.0.

This chapter provides an overview of considerations when using artifact migration. It also describes methods and procedures for using WebSphere products to migrate applications and the associated tools to use.

In addition, this chapter shows the migration of a sample application that was developed in WebSphere Integration Developer V6.1.2 and will be migrated to Version 7.0.

5.1 General artifact migration considerations

Artifact migration provides several benefits:

► It allows you to maintain 100% availability of all the applications in the production systems.

► It provides you the opportunity to use the new features in Version 7.0 and to perform extensive testing before using the applications in the new environment.

► It allows you to select the applications to be migrated. Not all applications must be migrated or enhanced with new features.

► Artifact migration is not dependent on runtime migration tooling.

Note that even with a successful runtime migration, artifact migration will be necessary in the future as you apply changes to existing applications that were developed with a previous version of the development tools.

5.1.1 Development tools

Use the following development tools for migrating applications and for future design and development. Information about these tools can be found in their respective Information Center:

► IBM WebSphere Integration Developer V7.0, which can be found at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/index.jsp
?topic=/com.ibm.wbit.help.mainwelcome.doc/topics/welcome.html
```

► IBM WebSphere Dynamic Process Edition Tool and Testing Pack, which can be found at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/index.jsp
?topic=/com.ibm.wdpe.install.tool.doc/wdpe_intro/concept/client_intr
o.html
```

5.1.2 Deprecated features

This section briefly points to the Information Center page where all features that are deprecated in Version 7.0 are listed:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.websphere.wps.doc/doc/gmig_deprecationlist.html
```

5.2 Migrating WebSphere Business Modeler models

This section discusses the migration of WebSphere Business Modeler artifacts from previous releases to Version 7.0.

5.2.1 Migrating models

Projects that were created with previous versions of IBM WebSphere Business Modeler (Version 6.0.x, Version 6.1.x, and Version 6.2.x) can be migrated to WebSphere Business Modeler V7.0.

To migrate an exported version (*.mar) from Version 6.0.x, Version 6.1.x, or Version 6.2.x, perform the following steps:

1. Right-click anywhere in the Project Tree view of WebSphere Business Modeler.

2. Select **Import** from the context menu. The Import wizard opens.

3. Select **WebSphere Business Modeler import** under WebSphere Business Modeler.

4. Click **Next**. The Select type window opens.

5. Select the WebSphere Business Modeler project that has to be migrated (it will have either a .mar or .zip extension).

6. Click **Next**. The Import options window opens.

7. Click **Browse**. The Browse For Folder window opens.

8. Navigate to the folder containing the .mar file that should be imported, select the folder, and click **OK**.

9. In the Files list, select the .mar file containing the project that you want to migrate.

10. Optional: If you do not want to import the simulation snapshots from the earlier version of the project, clear the **Include simulation snapshots** option. Choosing not to import your simulation snapshots significantly increases the migration speed.

11. After specifying the import options, click **Finish**. The import process begins.

12. When the import completes, a window opens with the results. If any errors or warnings occurred during the import process, click **Details**. To save the error log to a text file, click **Save Details**. Click **OK**.

13. If migrations errors occurred during the migration process, use the Errors view to validate your process models.

14. Fix any errors that you find. The migration process is now complete.

Repeat this process for each .mar project file that you want to import.

5.2.2 Migrating a team repository

WebSphere Business Modeler V7.0 does not support the coexistence of model elements that are created using different versions of WebSphere Business Modeler. Projects that are shared in a team repository must be of the same version as that of WebSphere Business Modeler. So when you use WebSphere Business Modeler V7.0 to check out Version 5 or earlier projects from your version control system, such as CVS, WebSphere Business Modeler automatically migrates those projects to the current version. As a result, earlier versions of WebSphere Business Modeler can no longer use a project that is shared by a team repository after the project is migrated and committed to the repository.

WebSphere Business Modeler V7.0.2 provides continuity from earlier product versions and ensures that connections stay intact upon migration, with a built-in procedure to perform a smooth transition of your shared project to a new version of WebSphere Business Modeler.

Details about sharing projects of an earlier version with a new version of WebSphere Business Modeler can be found at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.btools.modeler.basic.inst.doc/migrating/migratev6repository.html

5.2.3 Migrating a workspace

IBM WebSphere Business Modeler V7.0 automatically migrates a workspace that contains projects created in an earlier version when it accesses the workspace the first time. It also creates a backup of the original workspace, which can be accessed by the previous versions.

In addition to the restriction that the new migrated workspace can only be accessed with WebSphere Business Modeler V7.0, any project that is shared in a team repository will have a broken connection to the established repository.

To migrate an existing project in the current workspace, complete the following steps:

1. Start the WebSphere Business Modeler Version 7.0 development environment. This could be a stand-alone WebSphere Business Modeler application, an integrated view in WebSphere Integration Developer, or one of the supported Rational® products.

2. Specify the workspace to be migrated.

3. When prompted to specify a backup location for the workspace, make sure that this location has enough space to store the backup copy, otherwise the migration will fail (in which case, the original workspace is not affected).

4. Optional: You can save space by selecting the **Backup as compressed file option**. However, if any of the paths in the workspace contain non-English characters, do not use this option.

5. Click **OK**. After a automatic restart of the application, it accesses the migrated workspace and opens a window that lists successful and not successful migrated projects with corresponding messages for any problems.

6. Use the Error view to ensure that no errors were generated in your migrated models. If any errors appear, correct them.

Repeat these steps for each workspace you want to migrate.

For more information concerning WebSphere Business Modeler migration, go to the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/index.jsp?to
pic=/com.ibm.btools.modeler.basic.inst.doc/migrating/migratev6project.h
tml
```

5.3 Migrating WebSphere Process Server applications

The migration of a previous version of WebSphere Integration Developer to Version 7.0 is mostly automatic, but might require additional configuration within the migration procedure. This section contains the steps to perform an artifact migration as well as some of the considerations a developer has to keep in mind.

5.3.1 Artifact migration

The term *artifact migration* describes the process of migrating a project that was created with an older version of WebSphere Integration Developer. The steps for migration include the export of the project from the previous version of WebSphere Integration Developer as an integration module and the import of this integration module into WebSphere Integration Developer V7.0.

In our example, we used the WebSphere Integration Developer V6.1.2 with Fix Pack 005 to export the integration module. If you export the integration module with another version, you might see slight differences. You can see how to export the integration module with the following Information Center links:

- Version 6.0.2:

  https://publib.boulder.ibm.com/infocenter/dmndhelp/v6rxmx/topic/com.ibm.etools.j2eeapp.doc/topics/tjsharingexport.html

- Version 6.1.0:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r1mx/topic/com.ibm.wbit.610.help.runtime.doc/topics/tintrchg.html

- Version 6.2:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.wbit.620.help.runtime.doc/topics/tintrchg.html

Export the project from the source version

Perform these steps to export the projects from WebSphere Integration Developer V6.1.2:

1. In WebSphere Integration Developer V6.1.2, export the artifacts as integration module files by selecting **File** → **Export** from the menu. In the next window, select **Business Integration** → **Integration module**, as shown in Figure 5-1.
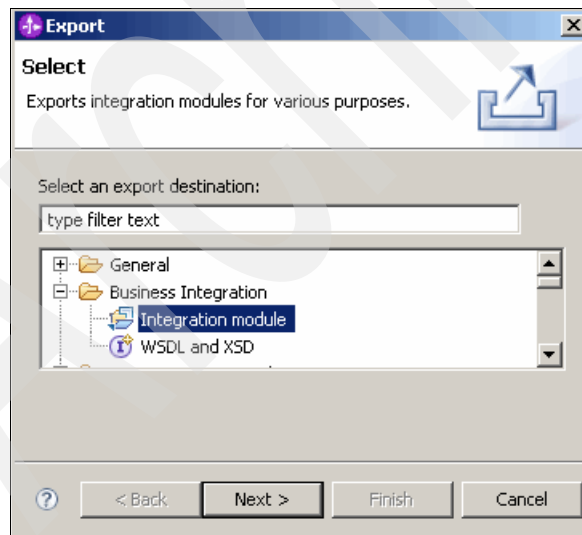
Figure 5-1   Export an integration module

2. Click **Next** in the Integration Module Export window and select the modules or component to export. Under this section, select the **Project interchange for sharing modules between workspaces** option and click **Next**.
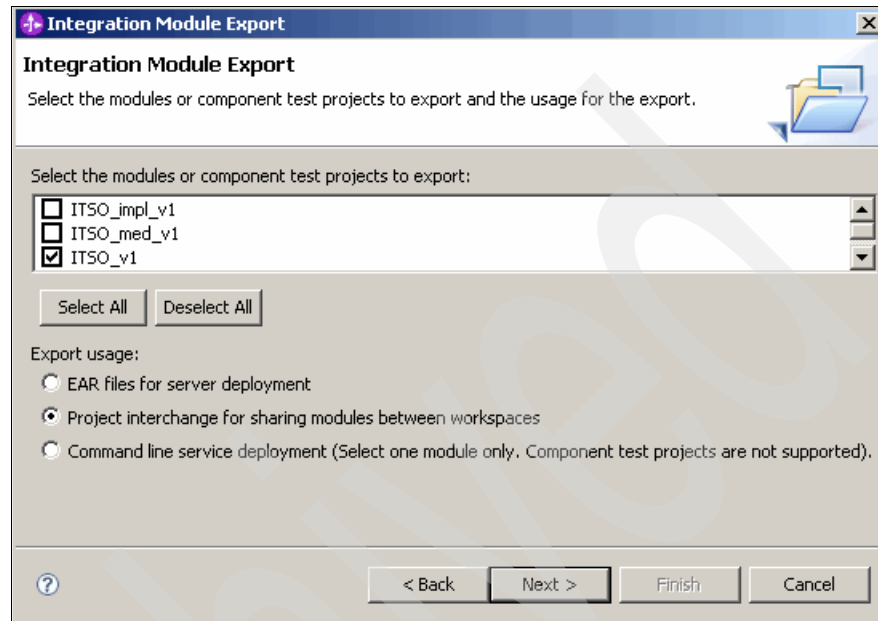
Figure 5-2   Export Integration Module: Select modules

3. In the next window, shown in Figure 5-3, select the destination to store the Project Interchange and select the **Include dependent projects from workspace** option. Click **Finish**.
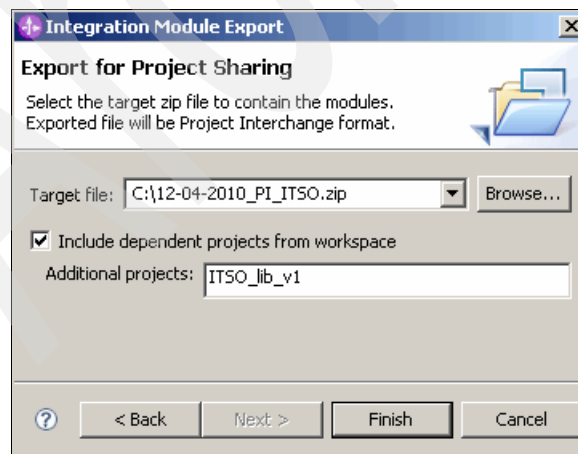
Figure 5-3   Export Interaction Module: Select location

Import the projects into Version 7.0

Perform the following steps to import the Project Interchange file into your new workspace in Version 7.0:

1. Open WebSphere Integration Developer V7.0 and select **File → Import** from the Main menu. Expand **Other** and select **Project Interchange**, as shown in Figure 5-4.
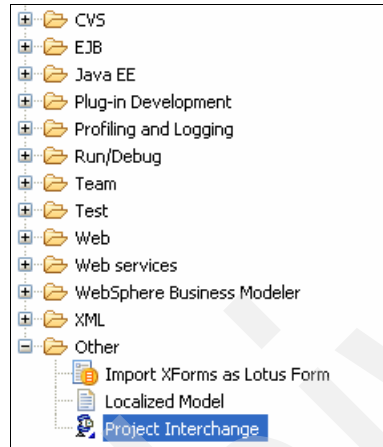
Figure 5-4 Import the Project Interchange file into Version 7.0: Select Import

2. In the next window, shown in Figure 5-5, browse to your Project Interchange file and select it. Click **Select All** and then click **Finish**.
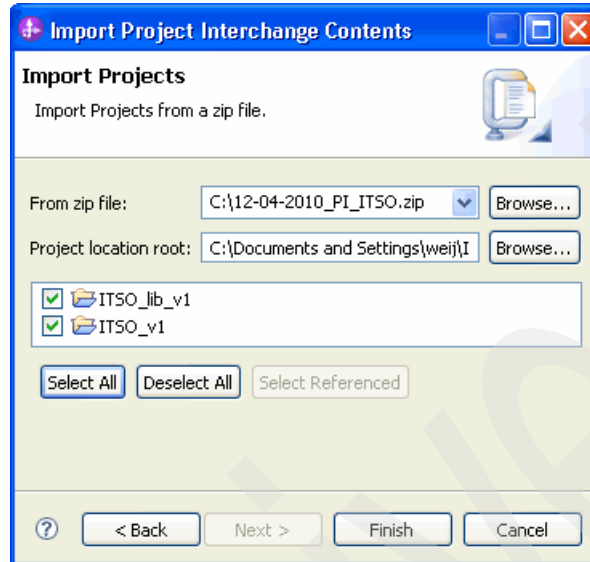
Figure 5-5   Import the Project Interchange file into Version 7.0: Select the Project Interchange file from the file system

3. A new window for migrating the imported projects will appear (Figure 5-6). Click **Next**.
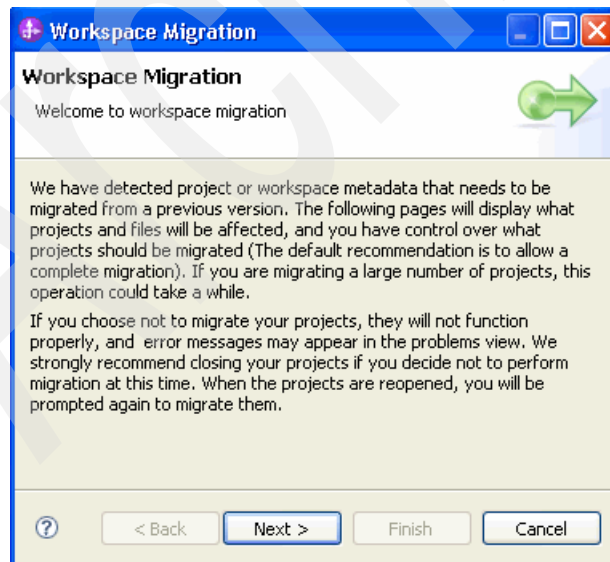
Figure 5-6   Workspace Migration Wizard: Introduction

4. In the next window, shown in Figure 5-7, you need to select the projects you want to migrate. Make sure you select all the referenced libraries and projects and click **Next**.
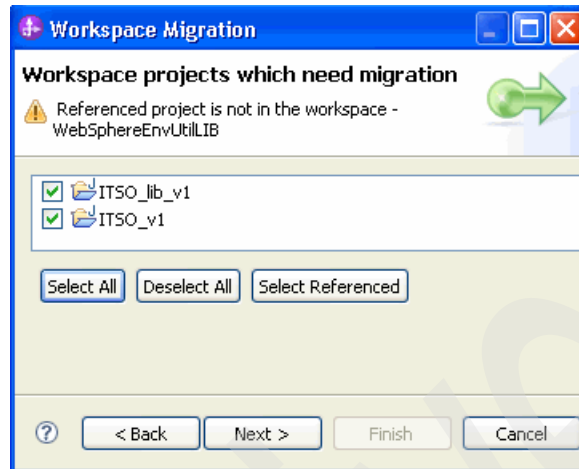
Figure 5-7   Workspace Migration Wizard: Select projects

5. A warning might show you the files that may be modified by the migration, as shown in Figure 5-8. Click **Next**.
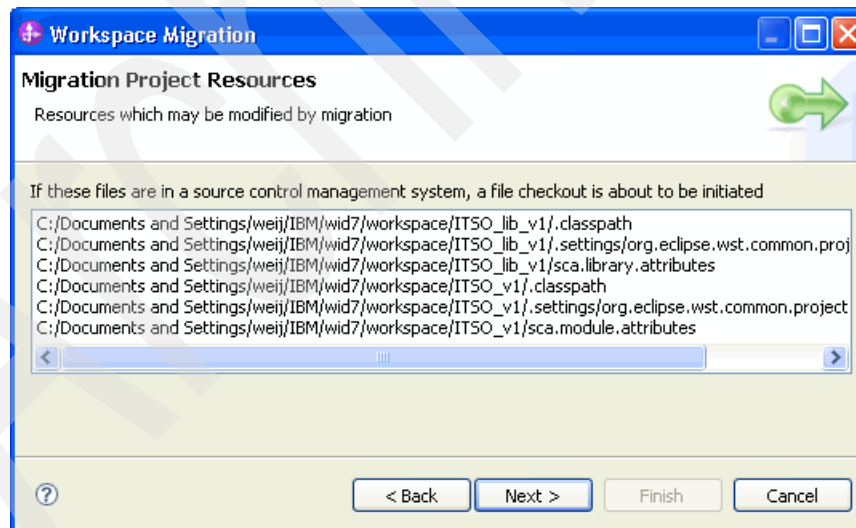
Figure 5-8   Workspace Migration Wizard: Note changes to resources

6. The next window, shown in Figure 5-9, show that the current targeted server runtime is not defined in your current workspace. By default, it sets the new targeted Server Runtime to WebSphere Process Server V7.0. Make sure that all of your migrated projects are selected so that you can change them to the new server runtime. Click **Next**.
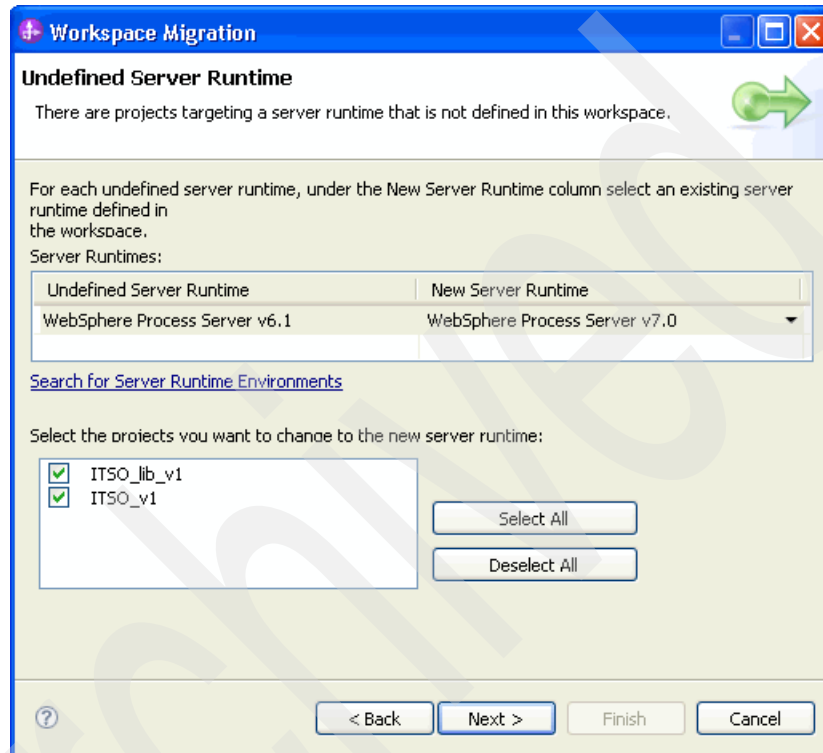
Figure 5-9   Workspace Migration Wizard: Select server runtime and projects

7. Review the messages listed in the next window and make sure that any projects referenced by your workspace that are relevant to your application can be resolved without any errors. Click **Finish**.

8. If the migration process ends successfully, you should see the message shown in Figure 5-10.
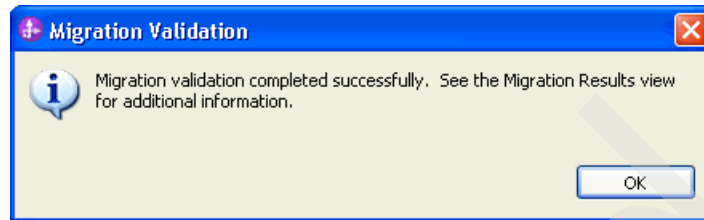
Figure 5-10   Workspace Migration Wizard: Successful completion

9. To see more details regarding the migration steps, you can open the Migration Results view from the main menu by selecting **Window** → **Show View** → **Other** and selecting **Migration** → **Migration Results**.

5.3.2 Artifact migration considerations

When migrating artifacts from previous versions, some of the new features and improvements in WebSphere Integration Developer V7.0 will affect your workspace. This section provides information about the types of errors you might see and how they can be resolved. It is divided into two parts:

- ► Validation
- ► Component specific considerations

Validation considerations

Validation errors in the new version often result from improvements and new features. These errors were not present in the previous versions and need to be resolved manually. These errors will appear in the Problems view and can be associated with various components, such as human tasks, business objects, and XSLT maps.

Java validation

When using the SDO API to create a data object, there is an added Java validation in WebSphere Integration Developer.

Table 5-1 lists some of these error messages and provides a description.

Table 5-1   Java validation problems

Error message in the Problem view	Description
A BO with namespace <namespace> and name <BO name> cannot be found.	Business objects are now validated to determine if their given name and namespace exist.
Incompatible method argument type. The <BO attribute name> field is of type <actual attribute type>.	Based on the attribute type, the getter and setter methods are validated to determine if they are used correctly.
The field <BO attribute name> does not exist in the Business Object <BO name with namespace>.	The attributes referenced in the getter and setter methods are now validated to determine if they exist.

Java validation errors can occur in the following components:

- ► Java components
- ► Custom mediation primitive in mediation flows
- ► Java snippet activities in business processes
- ► Custom mappings in business object maps

In some cases, you can use the Quick Fix option to solve the error. Right-click the error or warning, and if the option Quick Fix is not grayed out, you can use it to fix the error (see Figure 5-11).
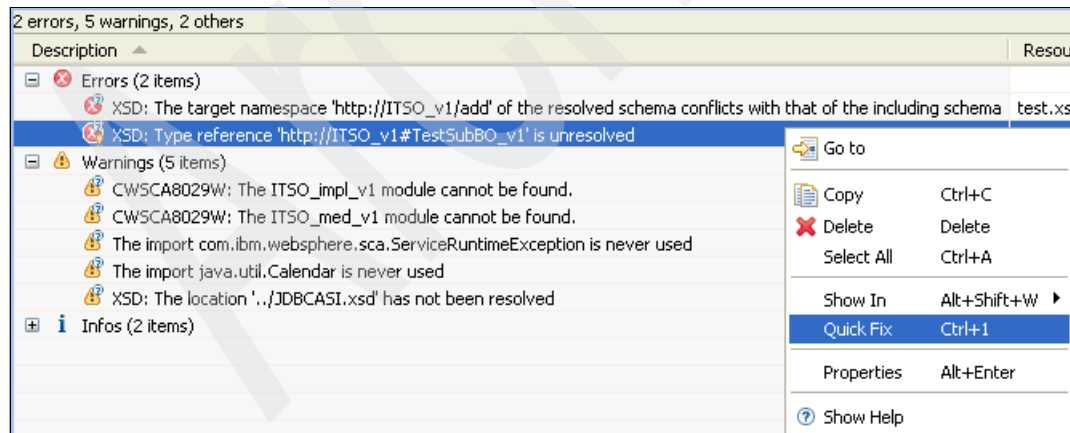
Figure 5-11   Problem view: Quick Fix option

SDO programming tips

For a few classes that are used in previous versions of WebSphere Integration Developer, the package names have changed. For example, in WebSphere Integration Developer V6.0, the BOXMLSerializer could be referenced, as shown in Example 5-1.

Example 5-1   BOXMLSerializer invocation in Version 6.0

```
com.ibm.websphere.bo.BOXMLSerializer serializer = new
com.ibm.websphere.bo.impl.BOXMLSerializerImpl();
```

In all versions, these classes must be located with the help of the Service Manager, as shown in Example 5-2.

Example 5-2   BOXMLSerializer invocation in Version 7.0

```
com.ibm.websphere.sca.ServiceManager srvMgr =
com.ibm.websphere.sca.ServiceManager.INSTANCE;
com.ibm.websphere.bo.BOXMLSerializer serializer = (BOXMLSerializer)
srvMgr.locateService("com/ibm/websphere/bo/BOXMLSerializer");
```

In general, it is a best practice to reference classes indirectly by using the Service Manager to locate the service. You can find more examples in the Business Process management samples and tutorials page (in the SDO Programming section) by going to the following address:

http://publib.boulder.ibm.com/bpcsamp/index.html

Circular dependencies

In previous versions of WebSphere Integration Developer, circular dependencies of modules or projects might not be marked as an error, but it might be recognized in Version 7.0 as an error. To ignore this circular dependency, you can change the building preferences by performing the following steps:

1. Open the preferences window by selecting **Windows** → **Preferences** and expand the **Java** and **Compiler** entries.

2. Click **Building** and expand the **Build path problems** section.

3. You will find a drop-down menu next to the Circular Dependencies entry. Select **Warning** from the drop-down menu (Figure 5-12).
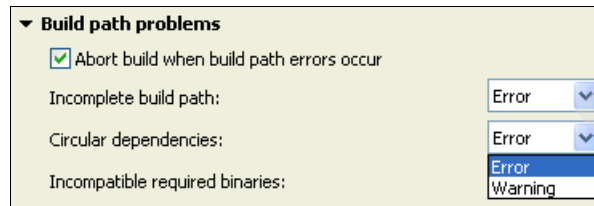
Figure 5-12   Resolve circular dependencies within build path preferences

In WebSphere Integration Developer V7.0, the Java preferences might not be visible from all perspectives. Therefore, open the Java perspective by selecting **Window** → **Open Perspective** → **Other** and clicking **Java**. Now open the preference window again. Although the applications might be running fine, it is necessary to check the project dependencies again.

Refactoring

Consider using the refactoring capabilities if you have to change the artifact names or namespaces instead of changing them in one place. Otherwise, artifacts referencing the changed artifact might encounter problems. Refactoring preserves these relationships. You can either right-click the artifact in the Business Integration Explorer and select **Refactor or Analyze Impact** → **Rename** (Figure 5-13) or press the Alt+Shift+R keys while in the name box of a artifact name or namespace.
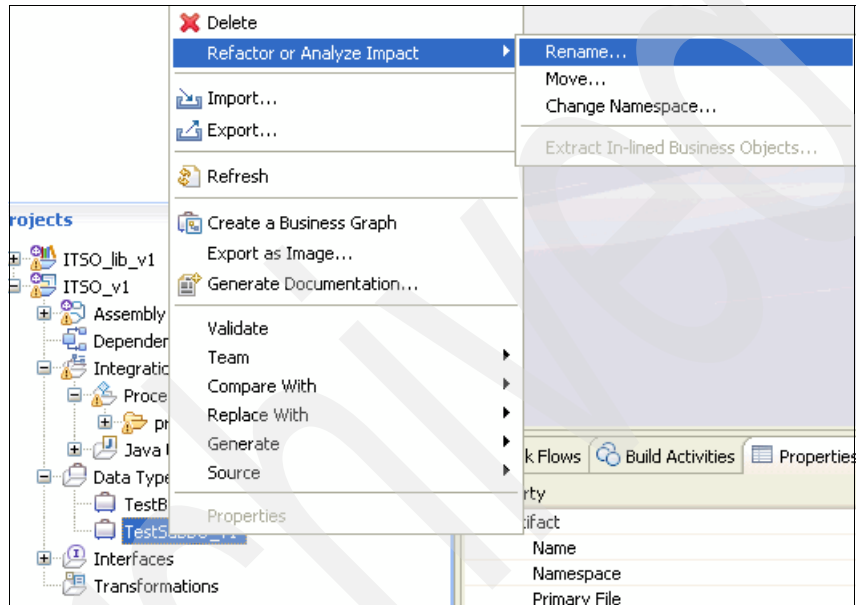
Figure 5-13   Refactoring for artifact name and namespace

> **Attention:** If you refactor and are using a team repository, do not forget to check in all the changes that occur due to the refactoring.

XPath

For XPath expressions defined in Version 6.0 and earlier, there was no distinction between business object attributes defined as xsd:attribute and those defined as xsd:element. If you migrate XPath expressions from Version 6.0, you might see the error shown in Example 5-3.

Example 5-3   Possible XPath error in Version 7.0

```
The <attributen_name> schema element was not found in the
<xpath_expression> XPATH.
```

Since Version 6.1, the "@" symbol has been used to define a xsd:attribute, so you need to change the XPath expression from `/SampleBO/sampleAttribute` to `/SampleBO/@sampleAttribute`.

Component specific considerations

Some components, such as business object maps, the XSLT mapper, and the MQ bindings require special consideration during migration.

Business object maps

When using substitution groups within business object maps in WebSphere Integration Developer V6.1.2 or later (including Version 7.0), you might get the warning shown in Example 5-4 while migrating.

Example 5-4   Warning message after migration in business object maps

```
CWLAT0064W: The <mapping_number> transform includes an inherited type,
which might produce unwanted side effects when the map runs.
```

Although this transformation will still execute even if the inherited type comes in as part of the instance document, you should resolve the issue. If you are not using substitution groups or the element with the warning is not involved in a substitution group, this warning should not concern you.

XSLT mapper

A major change in the XSLT mapper for WebSphere Integration Developer V6.1 makes it necessary to take a closer look when migrating from Version 6.0 to Version 7.0.

When migrating from Version 6.0 to Version 7.0, be aware that the file extension for XSLT maps in Version 6.0 was *.xmx. This extension changed in Version 6.1 to *.map. However, XSLT map files created using Version 6.0 still work in Version 6.1 and later (including Version 7.0).

The current Version 7.0 XML map editor supports custom mapping. This enables you to reuse custom XSL code, submaps, and in-line maps that were created before. If you want to use the performance improvements in the new XSLT map architecture or you want to add logic to your current maps, you have to migrate the modules using the old format *.xmx with the help of WebSphere Integration Developer V7.0.

You can use one of the following ways to migrate your old maps:

1. The first option for migration is available if you are using XSL Transformations in Version 7.0 that were created with WebSphere Integration Developer V6.0. You will see a warning in the Properties view indicating that the mapping file is an old format (Figure 5-14). Right-click this warning and click **Migrate** to convert the file to the new format.
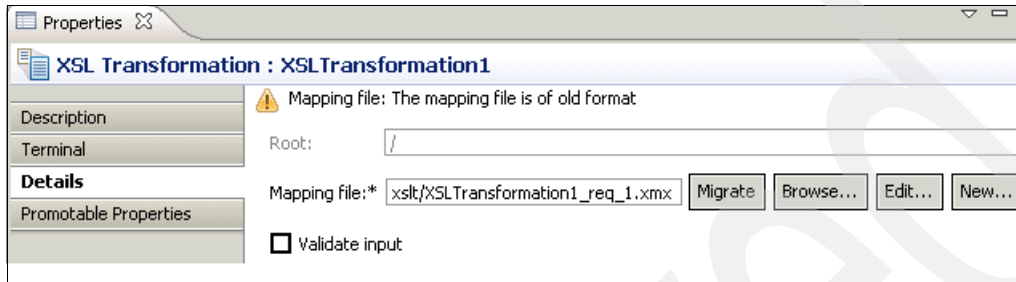
Figure 5-14   Properties view of old XSL transformation to migrate

2. The second option for migrating old maps occurs when loading a mediation module or library that was created with a previous version of WebSphere Integration Developer into your workspace. The load will create a warning message in the Problems view, as shown in Example 5-5:

Example 5-5   Warning produced during mediation module load

```
The <XSLTransformationFileName.xmx> XML map file that is associated
with the XSLT node <XSLTransformation_Name> is in the old format.
```

You can resolve the warning by performing the following steps:

a. Right-click the warning message and select **Quick Fix**.
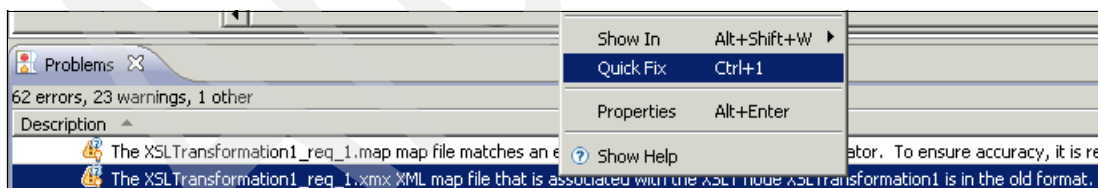
Figure 5-15   Selection of Quick Fix option for old XSL transformation formats

Optional: If you have multiple warning messages regarding old format maps, right-click one message and click **Similar Problems** to see a list of maps that also need to be converted.

b. After selecting Quick Fix, the first window of the Migrate Old Mapping Wizard opens (Figure 5-16). Select **migrate old mapping to a new format** and click **Finish**.
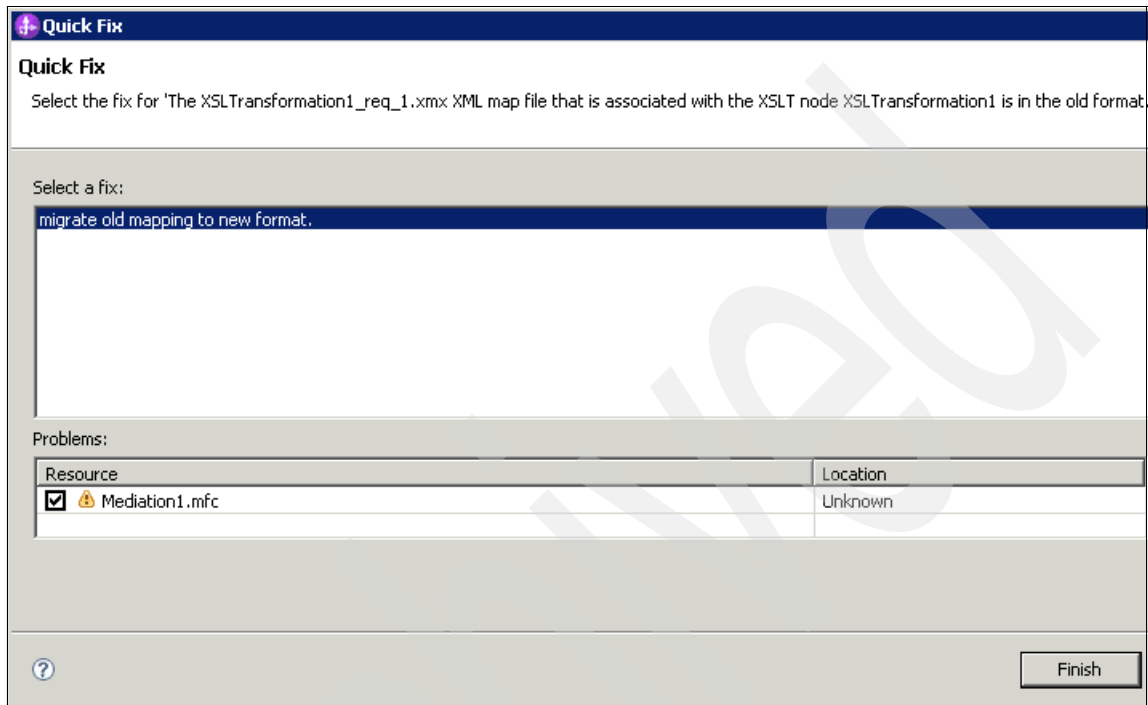
Figure 5-16   Selection of problems to fix

c. The Migrate Old Mapping to New Format window opens (Figure 5-17).
    Select the migration flow that has to be changed and click **OK**.
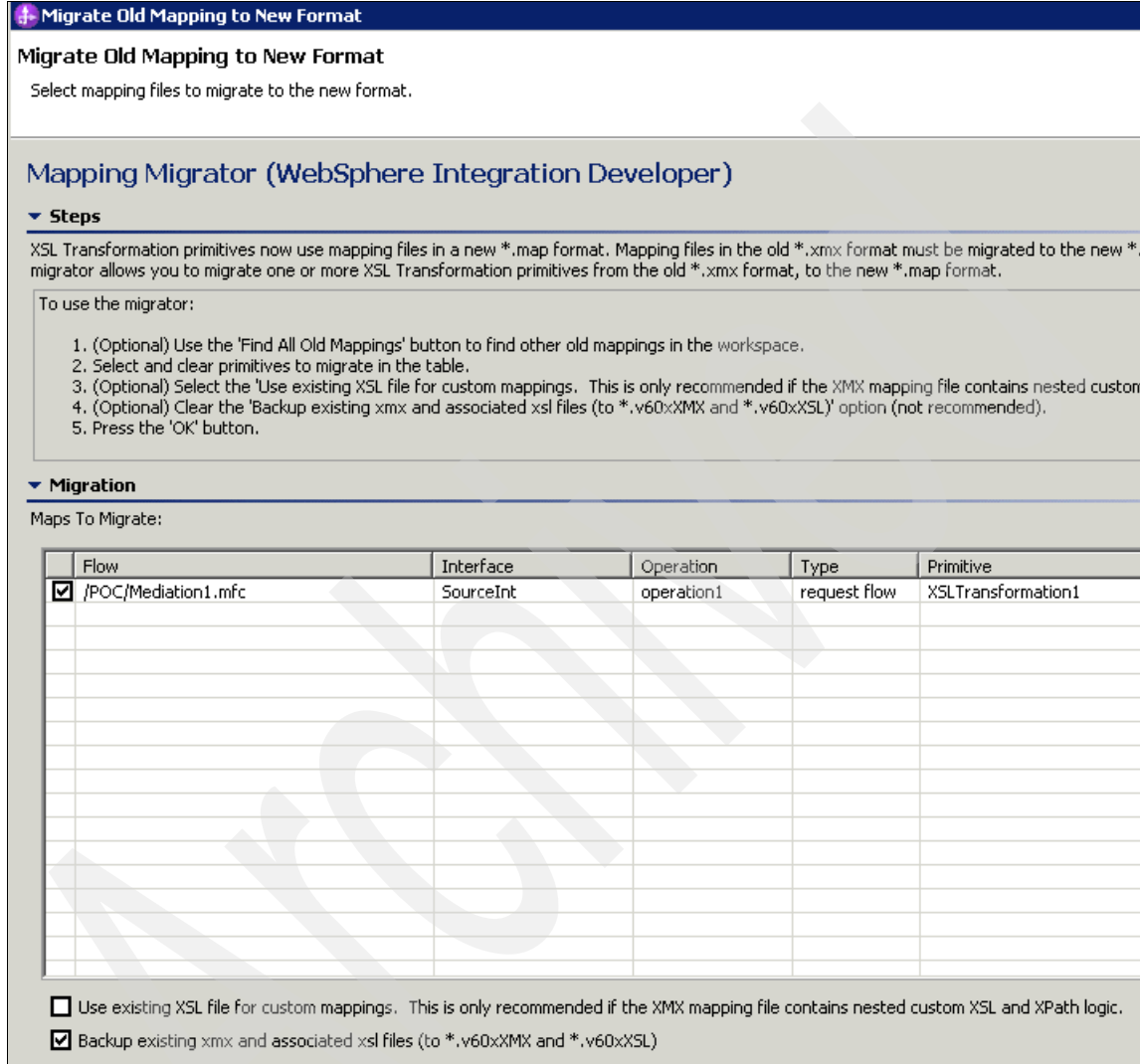
Figure 5-17   Migration wizard for old XSL transformation

d. As soon as the migration is completed, a message appears and shows you the result (Figure 5-18).
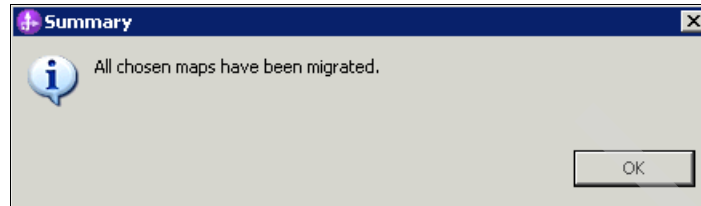
Figure 5-18   Success message for migrating old formats into a new one

3. The third migration option is to double-click an old map file in the Business Integration view. This opens the Mapping Migrator window (Figure 5-19). Select all that maps that you want to migrate from the *.xmx file format to the *.map file format and click **Migrate**.
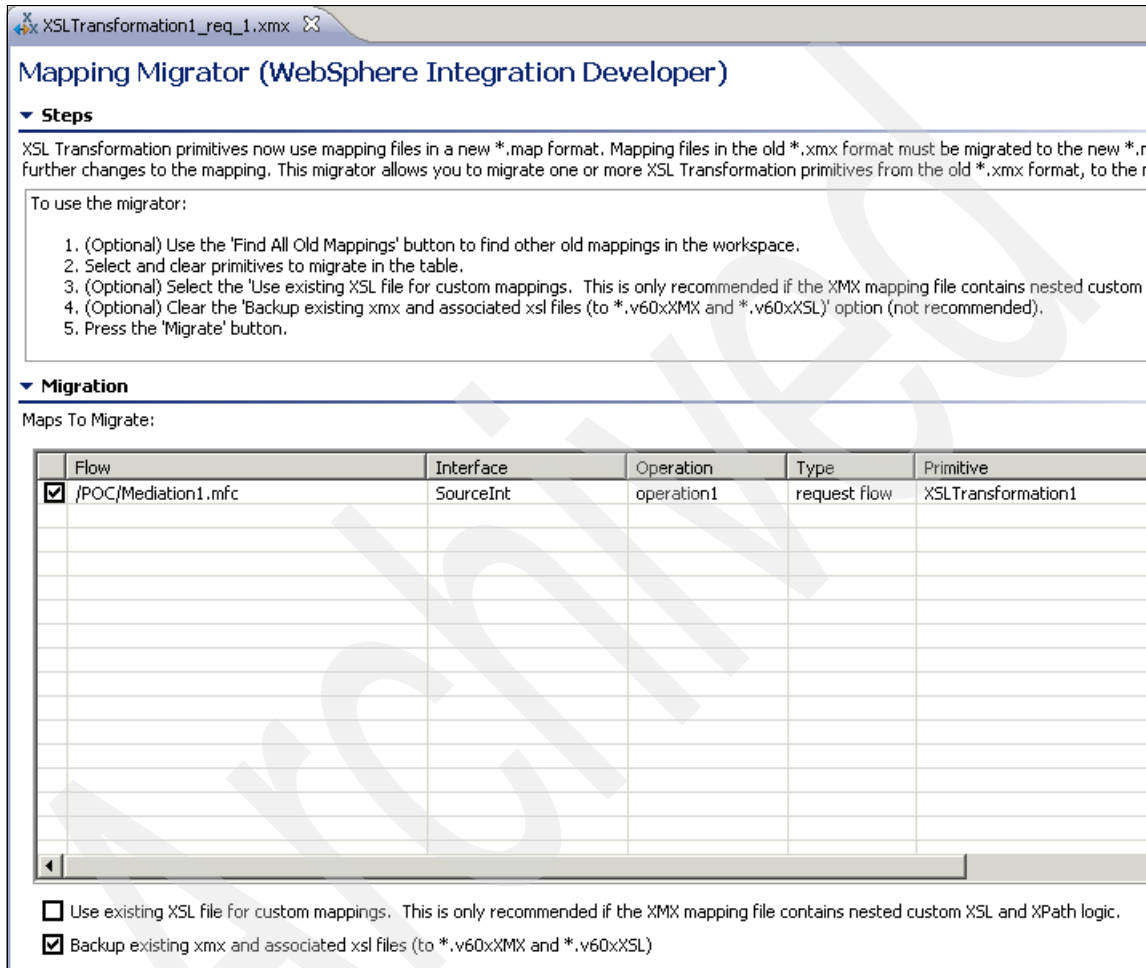
*Figure 5-19   Mapping Migrator for migrating the old *.xmx file format into the *.map format*

Note: If you want to shorten the migration time, disable the automatic build in the preferences. During the migration, there are many file changes that will start frequent automatic builds. After the migration is done, you can enable the automatic build in the preferences again.

For more updated information regarding XSLT migration, see the Information Center at the following addresses:

► http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.i
  bm.wbit.help.mediation.doc/topics/txslmigrate.html

► http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.i
  bm.wbit.help.migr.doc/topics/cwidcon.html

MQ bindings

If you are using applications that have MQ bindings on imports or exports, you need to update the binding configuration. This is necessary because the new bindings now use an ActivationSpec class in their configuration rather than a listener port.

The update process of the binding configuration includes defining an additional activation specification JNDI name in the endpoint configuration of the binding. Therefore, this JNDI name must refer to an already existing activation specification JMS resource within the environment.

If the connection factories for the MQ bindings have one of the following custom properties, they have to be removed:

► SENDEXIT
► RECEXIT
► SENDEXITINIT
► RECEXITINIT

In addition, the destination properties shown in Table 5-2 need to be added.

Table 5-2   Custom properties for WebSphere MQ queue destinations

Destination type	Property name	Property value	Property type
Send destination	MDWRITE	YES	java.lang.String
	MSGBODY	MQ	java.lang.String
Receive destination	MDREAD	YES	java.lang.String
	MSGBODY	MQ	java.lang.String

See the Information Center for more updated information at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/index.jsp?to
pic=/com.ibm.websphere.wesb.doc/doc/radm_migratingmqbindings.html

For more updated information regarding artifact migration, visit the Information Center at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.wbit.help.migr.doc/topics/cwidcon.html
```

5.3.3 Adapter migration considerations

Due to the amount of available adapters, this section only covers selected adapter migration considerations. You will find all the available adapters and their migration considerations within the Information Center. Look for the "Planning for adapter implementation" topic in each specific adapter section at the following address:

```
http://www-01.ibm.com/software/integration/wbiadapters/library/infocent
er/index.html#wsa70
```

You should also look at the current compatibility matrix of the WebSphere Adapters (JCA), which can be found at the following address:

```
http://www-01.ibm.com/support/docview.wss?rs=0&q1=compatibility+matrix:
&q2=compatibility+matrix+adapters&q3=compatibility+matrix:+Websphere+Bu
siness+Integration+Adapters+and+WebSphere+Adapters&uid=swg21252626&loc=
en_US&cs=utf-8&cc=us&lang=en
```

Currently using Version 6.0.2 or earlier

In general, if you are currently using Version 6.0.2 or earlier and your applications are using adapters, then you have to uninstall applications before runtime migration and use artifact migration to migrate these applications and their adapters manually (see 5.3.1, "Artifact migration" on page 127 and "Migrating applications" on page 153 for information about configuring the right adapter). This applies to embedded and stand-alone adapters at Version 6.0.2. For information about how to change your stand-alone adapter, see "Currently using Version 6.1" on page 147. After a successful runtime and artifact migration, you can deploy those applications on the migrated environment.

Currently using Version 6.1

If you are currently using Version 6.1 and if any of your applications embed any of the WebSphere Adapters (with the exception of SAP), then the adapter interim fix must be applied in the environment prior to starting the migration procedure. This can be done by performing the following steps:

1. Obtain the "Mandatory adapter fix for running 6.1 Adapters on WPS V7.0" for the WebSphere Adapter(s) the applications utilize. Use one of the options below to obtain the interim fix:

   a. If you are using WebSphere Integration Developer V6.1.2, download the WebSphere Integration Developer interim fix 005. This interim fix can be downloaded from the IBM Support page at the following address:

      http://www-01.ibm.com/support/docview.wss?uid=swg27017302

      After downloading the fix, extract the desired adapter RAR file from the WebSphere Integration Developer *<installation directory>*/ResourceAdapters directory and copy it to the environment where the current adapter is installed.

      > **Note:** Update your existing WebSphere Integration Developer to the new version by using Install Manager. This might also require a new version of your current Install Manager, which can be obtained from the IBM Support page at the following address:
      >
      > http://www-947.ibm.com/support/entry/portal/Overview/Software/Rational/IBM_Installation_Manager

   b. If you do not use the WebSphere Integration Developer or are using a version other than Version 6.1.2, contact the IBM Support team and request the "Mandatory adapter fix for running 6.1 Adapters on WPS V7.0" interim fix.

      You will receive the updated WebSphere Adapter RAR file as part of the interim fix.

      Copy it to the machine where the WebSphere Adapter instance has to be updated.

2. To perform the next steps, you have to know if the current WebSphere Adapter is embedded in the application or is installed at the node level in the runtime environment. Perform the following steps for your particular scenario:

   a. If your current WebSphere Adapter is embedded in the application:

      i. Use the administrative console to select the application and click the **Update** button.

ii. Select the **Replace or add a single module** option (Figure 5-20). In the "Specify the path beginning with the installed application archive file to the module to be replaced or added." field, point to the relative path where your WebSphere Adapter RAR file is located in your EAR file.

Figure 5-20   Updating adapter file within EAR

iii. Click **Browse** on the local file system to select the new RAR file that has the required adapter changes.

iv. Accept the default values in the remaining steps and click **Finish** (Figure 5-21). This prevents the current configuration from being changed. Only the JAR files are updated.
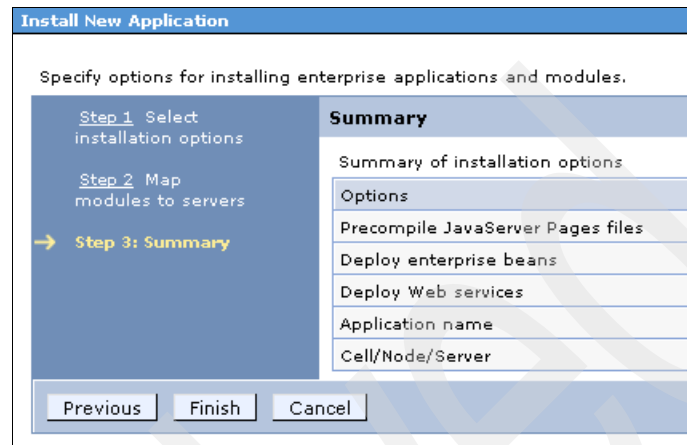
Figure 5-21   Update application with new adapter

v. Test your updated application very carefully before applying any other changes.

b. If your current WebSphere Adapter is installed at the node level:

i. In the administrative console, navigate to **Resources** → **Resource Adapters** → **Resource adapters**.

ii. Browse the resource adapter on each node and collect the following information.

Make note of all the managed connection factories configured for the adapter by clicking **J2C connection factories** in the Additional Properties section.

Select each connection factory associated with the Resource adapter and note all the activation specification instances configured for this WebSphere Adapter. To accomplish this task, click **J2C activation specifications** in Additional Properties and select each activation specification associated with this resource adapter.

You need this information about the connection factories and activation specifications to create these definitions again after you install the new adapter interim fix.

iii. In the administrative console, select **Resources** → **Resource Adapters** → **Resource adapters** and select the adapter. Click the **Delete** button to uninstall the adapter from the current node. Do the same for every node in which this adapter is installed.

iv. Install the new version of adapter. See the corresponding Information Center page for your adapter. Select **Deploying the module** → **Deploying the module for production** → **Installing the RAR file** on the relevant page.

v. Configure the managed connection factories and activation specification instances that were associated with the adapter you deleted.

> **Note:** If the dependent applications have a configuration for the managed connection factory and activation specification in the .import and .export files respectively, you can uninstall and re-install the application to recreate the configuration for the managed connection factory and activation specification.
>
> If the application uses a JNDI reference to configure the managed connection factory and activation specification, you must either manually recreate the instances documented in the steps in this section or use the wsadmin scripts described in the IBM developerWorks® article found at the following address:
>
> http://ltsbwass001.sby.ibm.com/cms/developerworks/websphere/library/techarticles/1001_yu/1001_yu.html

vi. Test your updated application very carefully before applying any other changes.

Currently using Version 6.2

If you are currently using Version 6.2 and if any of the applications in your environment embed any of the WebSphere Adapters (with the exception of the WebSphere SAP Adapter), then the adapter interim fix must be applied in the environment prior to starting the migration procedure.

Perform the following steps:

1. Obtain the interim fix for the WebSphere Adapter(s) that the applications utilize. You can accomplish this task by contacting the IBM Support team and requesting the "Mandatory adapter fix for running 6.2 Adapters on WPS V7.0" interim fix. You will receive the updated WebSphere Adapter RAR file as part of the interim fix. Copy it to the machine where adapter instance has to be updated.

2. Apply the same steps that are in "Currently using Version 6.1" on page 147. Start with step 2 on page 147.

WebSphere Adapter for SAP

If you use the WebSphere Adapter for SAP in your applications, you have to uninstall these applications prior to the migration. This is required by the runtime pre-migration checklist, which you can obtain from the Information Center at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib
m.websphere.wps.doc/doc/cmig_vtv_premigchecklist.html
```

The reason for this action is that the updated SAP SAPJCO library is incompatible with the prior Java Runtime Environment. The new SAPJCO library supports Java Runtime Environment Version 1.6. This means all applications using the prior WebSphere SAP Adapter in the new WebSphere Process Server Version 7.0 environment will fail. You have to perform the following steps to use the application after migrating the runtime:

1. Manually uninstall all applications that use or embed the WebSphere Adapter for SAP prior to the runtime migration, which is explained in Chapter 3, "Runtime migration" on page 81.

2. Optional: If you use the stand-alone WebSphere Adapter for SAP at node level, remove the WebSphere Adapter for SAP from your environment prior to your runtime migration. This will include all SAP Adapters at all nodes.

> **Note:** Remember to store all the information about your managed connection factory and activation specification instances configured for the WebSphere Adapter for SAP. To find this information, click **J2C activation specifications** in the Additional Properties section for the adapter and select each connection factory and activation specification associated with the adapter. You will need this information again after you install the new WebSphere Adapter for SAP in the migrated environment.
>
> Additionally, you can use the wsadmin scripts to automatically configure the managed connection factories and activation specifications, as described in the IBM developerWorks article found at the following address:
>
> ```
> http://ltsbwass001.sby.ibm.com/cms/developerworks/websphere/libra
> ry/techarticles/1001_yu/1001_yu.html
> ```

3. Update or migrate these applications with WebSphere Integration Developer.

4. Optional: If you used stand-alone WebSphere Adapter for SAP prior to your migration, manually install the new WebSphere Adapter for SAP Version 7.0 at your node levels, after successfully migrating the runtime environment.

5. Redeploy the updated or migrated application on your environment.

Updating or migrating applications containing or using the WebSphere Adapter for SAP

If you want to use the features of WebSphere Adapter for SAP Version 7.0, you have to migrate your applications with the migration wizard in WebSphere Integration Developer Version 7.0. If you do not want to use the new features, you can simply update your applications with WebSphere Adapter for SAP Version 7.0. This adapter is fully compatible with Version 6.0.2, Version 6.1.0, Version 6.1.2, and Version 6.2, and the application will not need any modifications other than updating the adapter. This means that if you have an application deployed in Version 6.0.2, Version 6.1.2, or Version 6.2, you can use WebSphere Integration Developer Version 7.0 to update this application with the Version 7.0 adapter and then deploy the EAR File to the Version 7.0 runtime environment.

If you need more information about updating or migrating your current application. see the corresponding Information Center topic at the following address:

`http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib m.wsadapters.jca.sap.doc/env/shared/rsha_migracons_jca.html`

If you decide to perform the migration, perform the steps provided by the Information Center, which are found at the following address:

`http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib m.wsadapters.jca.sap.doc/env/shared/tsha_perfmigration.html`

If you are planning to upgrade rather than migrate your project, use the steps provided by the Information Center for WebSphere Integration Developer Version 7.0, which are found at the following address:

`http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib m.wsadapters.jca.sap.doc/env/shared/tsha_perfupgrade.html`

WebSphere Adapter for JDBC

This section discusses how to handle applications that use the WebSphere Adapter for JDBC. We chose this adapter to discuss because our walkthrough scenarios in Part 2, "Examples" on page 193 use this adapter, but the information here can be used as a guideline for other adapters.

Review the requirements for each specific adapter, using the Overview topic in the Information Center for each adapter. Use the following page to find the appropriate Information Center:

http://www-01.ibm.com/software/integration/wbiadapters/library/infocenter/index.html#wsa70

Determine whether you plan to migrate or update the application. In general, you should migrate if you want to use the new features and updates of Version 7.0; otherwise, you can just update your application. If you are uncertain whether the new features and updates for the adapter could affect your existing adapter applications, read the Information Center topic found at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.wsadapters.jca.jdbc.doc/env/shared/rsha_migracons_jca.html

Migrating applications

If you plan to migrate your applications to use the new features and updates of the new WebSphere Adapter Version 7.0, perform the following steps:

1. Export the application from your workspace by right-clicking the application and selecting **Export**. In the window that opens, expand **Business Integration** and select **Integration Module**.

   > **Note:** In our example, we used Version 6.1.2 with Fix Pack 005 to export the Project Interchange file. If you export the Project Interchange file with another version, you might see slight differences. You can learn how to export the Project Interchange file in your version by referring to the following Information Center topics:
   >
   > ► For 6.0.2, refer to the following address:
   >
   >   https://publib.boulder.ibm.com/infocenter/dmndhelp/v6rxmx/topic/com.ibm.etools.j2eeapp.doc/topics/tjsharingexport.html
   >
   > ► For 6.1.0, refer to the following address:
   >
   >   http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r1mx/topic/com.ibm.wbit.610.help.runtime.doc/topics/tintrchg.html
   >
   > ► For 6.2, refer to the following address:
   >
   >   http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.wbit.620.help.runtime.doc/topics/tintrchg.html

2. Open WebSphere Integration Developer Version 7.0 and create a new workspace.

3. Import your Project Interchange file into your workspace.

4. Because your Project Interchange file was created with a earlier version of WebSphere Integration Developer, the migration wizard will start automatically and select the projects within your Project Interchange file to migrate. Complete the workspace migration by following the wizard. For more information about how to use the migration wizard, refer to the Information Center found at the following address:

```
http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.wbit.help.migr.doc/topics/tmigsrcart.html
```

5. Open the Java EE perspective and right-click your adapter project and select **Migrate connector project** (Figure 5-22 on page 155).

> **Note:** There are also other ways to launch the adapter migration wizard:
>
> ► In the Java EE perspective, right-click the project that contains the Import using the adapter and select **Migrate adapter artifacts**.
>
> ► In the Problem view, right-click a migration-specific message and select **Quick Fix** to correct the problem.
>
> If the adapter type is not supported or the adapter project has the latest version, then these options are not available for selection or the menus are disabled.
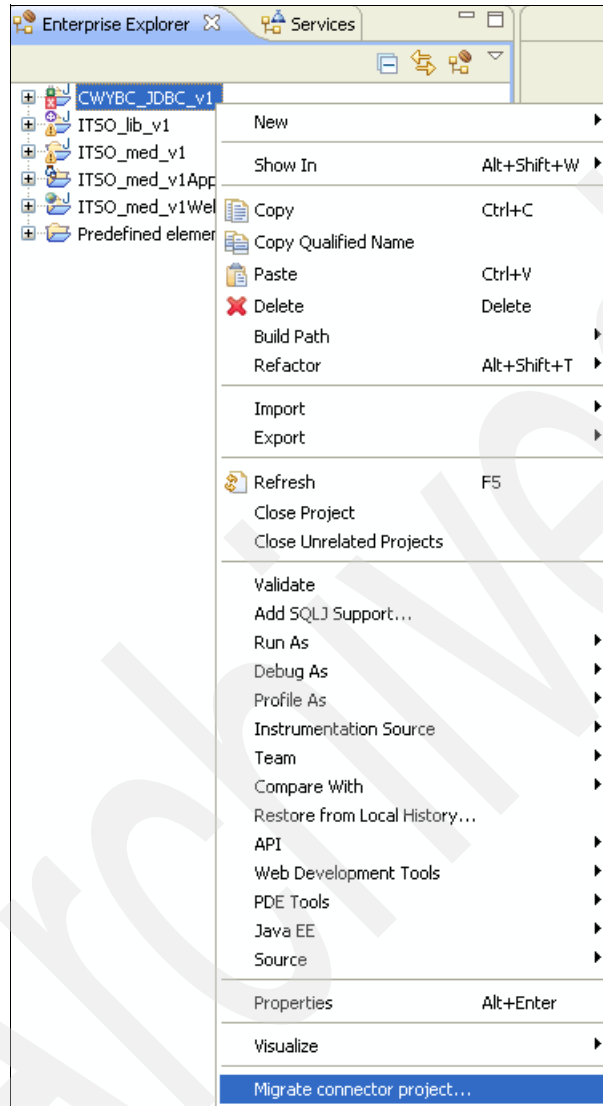
Figure 5-22   Select MIgrate connector project

6. In Figure 5-23, you will see four fields.
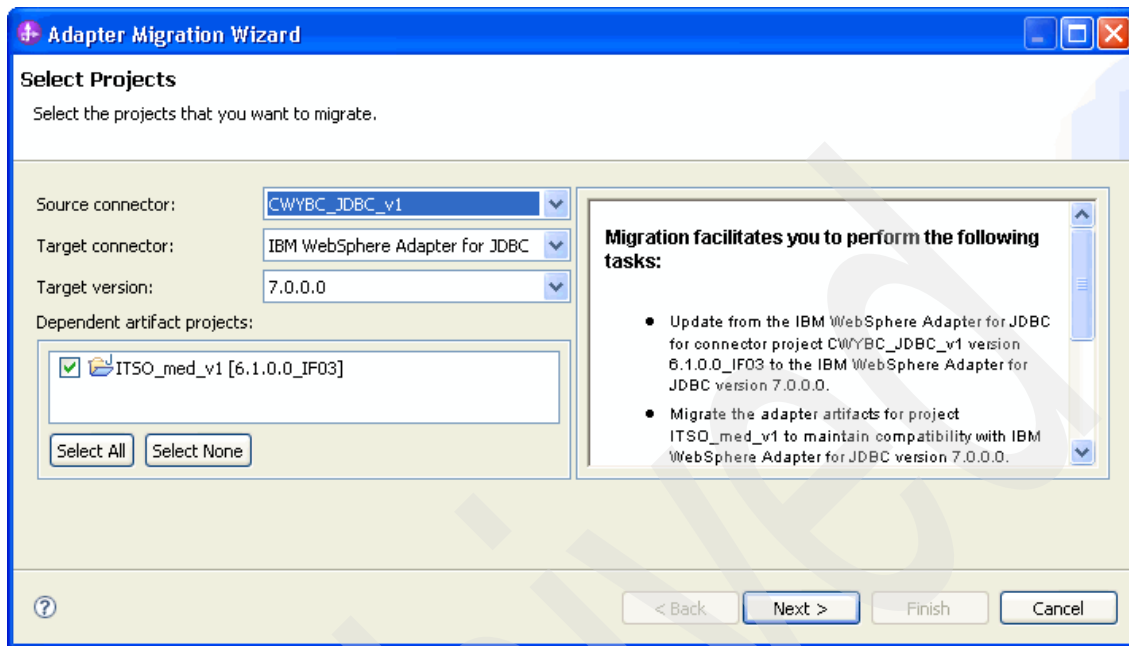
Figure 5-23   The Select Projects window

a. The Source connector field displays the name of your project that you want to migrate. If you want to migrate one adapter, select the source project from the list.

   If you want to migrate multiple adapters in one module and you want to migrate all of them, see the Information Center for the detailed steps to perform by going to the following address:

   http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/
   com.ibm.wsadapters.jca.jdbc.doc/env/shared/rsha_migracons_jca.htm
   l#mig_mul_adapters

b. The next field, the Target connector field, shows the name of the adapter you want to migrate. If you are working with more than one adapter in your project, select the adapter that you want to migrate.

c. In the Target Version field, select the adapter version to which you want to migrate.

d. A list of dependent projects are listed in the Dependent artifact project area. If you opened the Adapter Migration wizard by migrating a module project, you will find only the selected module project in this field. If you opened the Adapter Migration wizard by migrating the adapter module, you will find all the projects that reference the selected adapter project, including the adapter project itself.

> **Note:** By default, all of the dependent artifact projects are selected. You can deselect dependent projects to migrate them at a later time. Previously migrated projects, projects with the newest adapter version available, and projects containing errors cannot be migrated to the new adapter version. For more information about upgrading these projects versus migrating them, refer to the Information Center found at the following address:
>
> http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.wsadapters.jca.jdbc.doc/env/shared/tsha_perfupgrade.html

7. Click **Next**. A warning window opens (Figure 5-24). Click **OK**.
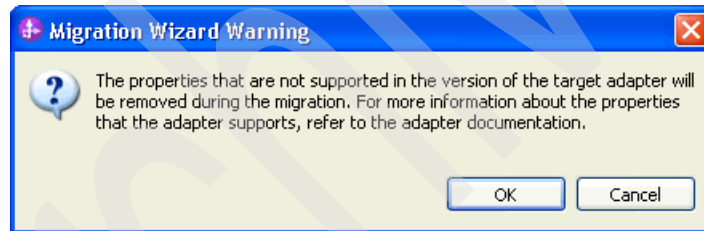
Figure 5-24   Adapter Migration Wizard Warning

8. In the next window (Figure 5-25), you can review the migration changes that will occur in each of the artifacts that will be migrated. You can expand each node to see the complete migration changes.
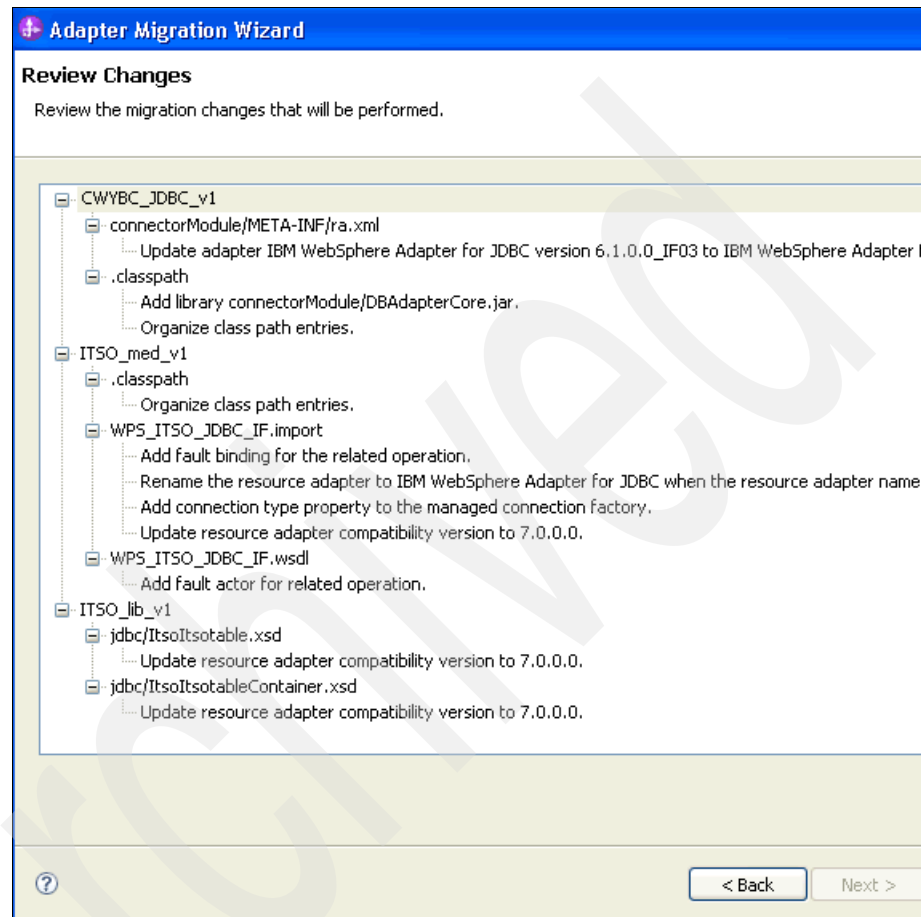
Figure 5-25   Review Changes within Adapter Migration Wizard

9. Click **Finish**.

> **Note:** After you migrate the project, it is no longer compatible with previous versions of WebSphere Process Server, WebSphere Enterprise Service Bus, or WebSphere Integration Developer.
>
> Before the adapter migration wizard runs the migration process, a backup of all projects affected by the migration is created in a temporary folder in the workspace. If you decide to cancel the migration before completion or the migration process fails for any reason, then the modified projects will be deleted and replaced with the projects stored in the temporary folder.
>
> After a successful adapter migration, all backup files in the temporary folder are deleted.

For more updated information. see the Information Center found at the following address:

`http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib`
`m.wsadapters.jca.jdbc.doc/env/shared/tsha_perfmigration.html`

Updating applications

If you plan to update the application versus migrating them, perform the following steps:

1. Follow steps 1 to 4 in "Migrating applications" on page 153 to migrate the applications.
2. Open the Java EE perspective, right-click the adapter project name, and select **Migrate connector project**.

3. In the Adapter Migration Wizard window, deselect every dependent artifact projects and click **Next** (Figure 5-26).
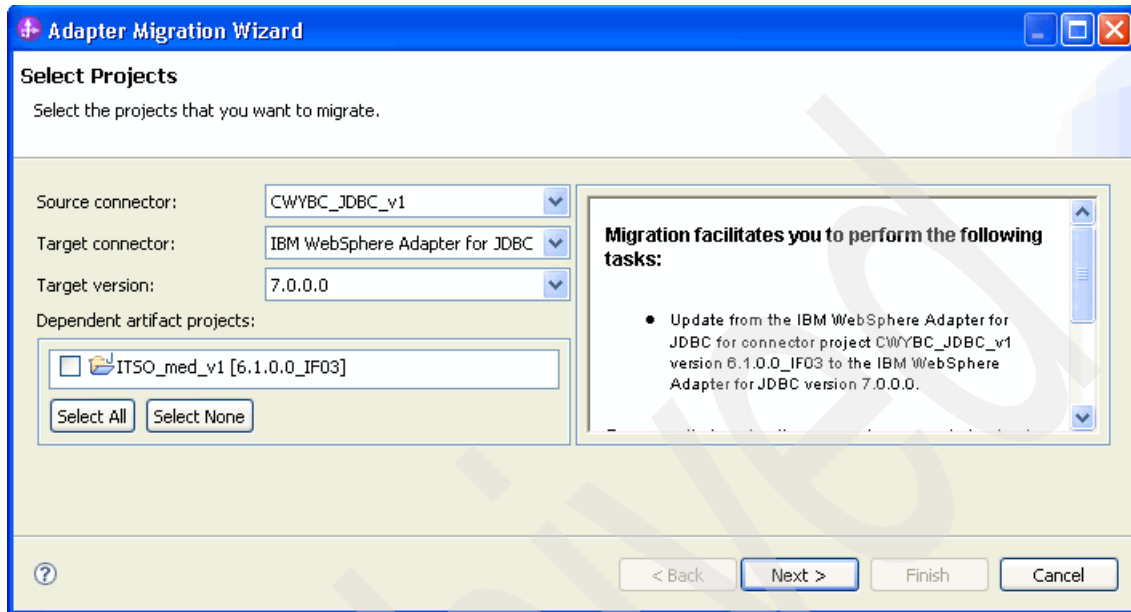
Figure 5-26   Deselect all dependent artifact projects

4. Click **OK** in the window where the following message is displayed:

"The properties that are not supported in the version of the target adapter will be removed during the migration."

5. Review the migration changes in the window that opens during the update of the adapter project (Figure 5-27). You can expand each node to view more change details. Click **Finish**.
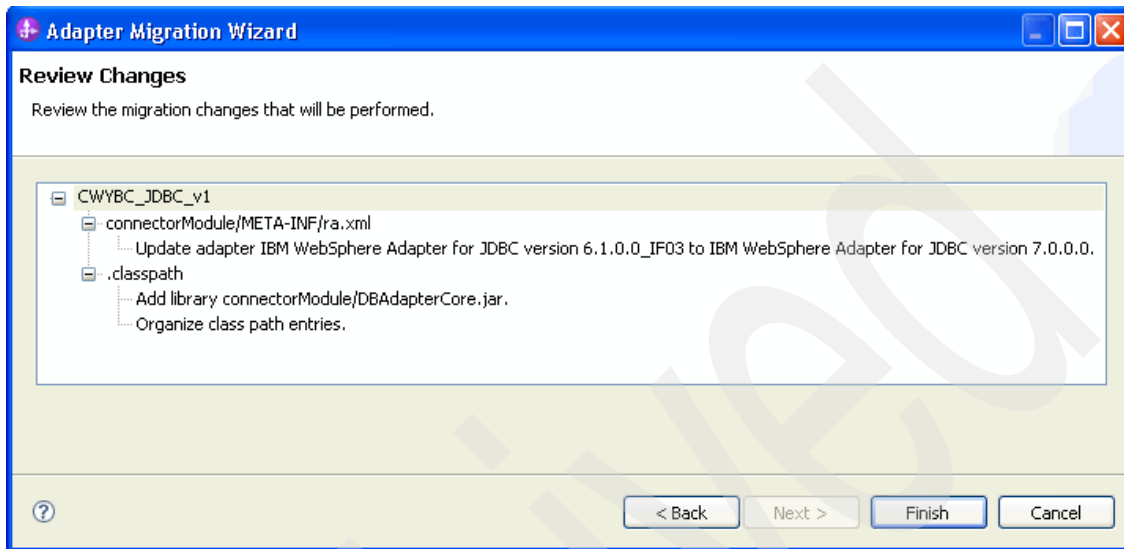
Figure 5-27   Review all migration changes

For the latest information about this topic, see the Information Center found at the following address:

`http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib m.wsadapters.jca.jdbc.doc/env/shared/tsha_perfupgrade.html`

Other adapters

You can either use the description of the WebSphere Adapter for JDBC migration/update as a basic guide for other adapters or see the equivalent pages in the Information Center.

The addresses for the respective Information Centers are shown in Table 5-3.

Table 5-3   Information Center links

Adapter name	Information Center link

WebSphere Adapter for Email	`http://publib.boulder.ibm.com/infocenter/dmndhel`
	`p/V7.0r0mx/topic/com.ibm.wsadapters.jca.email.do`
	`c/env/shared/stsha_migrate.html`

WebSphere Adapter for Flat Files	`http://publib.boulder.ibm.com/infocenter/dmndhel`
	`p/V7.0r0mx/topic/com.ibm.wsadapters.jca.ff.doc/e`
	`nv/shared/stsha_migrate.html`

WebSphere Adapter for FTP	`http://publib.boulder.ibm.com/infocenter/dmndhel`
	`p/V7.0r0mx/topic/com.ibm.wsadapters.jca.ftp.doc/`
	`env/shared/stsha_migrate.html`

WebSphere Adapter for IBM i	`http://publib.boulder.ibm.com/infocenter/dmndhel`
	`p/V7.0r0mx/topic/com.ibm.wsadapters.jca.iseries.`
	`doc/env/shared/stsha_migrateisa.html`

WebSphere Adapter for JDBC	`http://publib.boulder.ibm.com/infocenter/dmndhel`
	`p/V7.0r0mx/topic/com.ibm.wsadapters.jca.jdbc.doc`
	`/env/shared/stsha_migrate.html`

WebSphere Adapter for JD Edwards EnterpriseOne	`http://publib.boulder.ibm.com/infocenter/dmndhel`
	`p/V7.0r0mx/topic/com.ibm.wsadapters.jca.jde.doc/`
	`env/shared/stsha_migrate.html`

WebSphere Adapter for Oracle E-Business Suite	`http://publib.boulder.ibm.com/infocenter/dmndhel`
	`p/V7.0r0mx/topic/com.ibm.wsadapters.jca.oracleeb`
	`iz.doc/env/shared/stsha_migrate.html`

WebSphere Adapter for PeopleSoft Enterprise	`http://publib.boulder.ibm.com/infocenter/dmndhel`
	`p/V7.0r0mx/topic/com.ibm.wsadapters.jca.peopleso`
	`ft.doc/env/shared/stsha_migrate.html`

WebSphere Adapter for SAP Software	`http://publib.boulder.ibm.com/infocenter/dmndhel`
	`p/V7.0r0mx/topic/com.ibm.wsadapters.jca.sap.doc/`
	`env/shared/stsha_migrate.html`

WebSphere Adapter for Siebel Business Applications	`http://publib.boulder.ibm.com/infocenter/dmndhel`
	`p/V7.0r0mx/topic/com.ibm.wsadapters.jca.siebel.d`
	`oc/env/shared/stsha_migrate.html`

5.3.4 Migrating a process instance

One new feature of WebSphere Dynamic Process Edition Version 7.0 is the ability to migrate running process instances to a newer application version. This action might get mixed up with the artifact migration by someone who is new to this topic. These running process instances are already an artifact of Version 7.0. Therefore, you should keep in mind that this feature has nothing to do with migrating artifacts from previous WebSphere Integration Developer versions into artifacts for WebSphere Dynamic Process Edition Version 7.0.

For more information about migrating running, old process instances into a newer process version and how to set up process migration specifications, see the Information Center found at the following address:

`http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib`
`m.wbit.help.bpel.doc/topics/tversion.html`

5.4 Migrating WebSphere Business Monitor models

This section provides information about migrating WebSphere Business Monitor models created with a previous version of WebSphere Integration Developer. The previous versions include WebSphere Business Monitor V6.02, V6.1.0, V6.1.2, and V6.2 and WebSphere Business Integration Monitor V4.2.4.

5.4.1 Migrating WebSphere Business Integration Monitor V4.2.4 models

Before migrating a WebSphere Business Integration Monitor model from WebSphere Business Integration Monitor V4.2.4, make sure you have at least Fix Pack 3 of WebSphere Business Integration Monitor V4.2.4 installed.

In addition to migrating only WebSphere Business Integration Monitor models, you can also migrate process instances, activity instances, and business measure values that are associated with each model. For more details, see the Information Center found at the following address:

`http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib`
`m.btools.help.monitor.mig.doc/mig/mig_424.html`

The WebSphere Business Monitor V7.0 Migration Wizard is a component in WebSphere Integration Developer that allows the user to easily migrate modules that were created with previous versions of WebSphere Integration Developer.

Before you can use the Migration Wizard, you have to complete the following tasks:

1. Migrate your Version 4.2.4 FDL model structure to the new structure by using the "FDL to monitor model" utility for WebSphere MQ Workflow utility. For more information about how to generate a monitor model from an FDL file, see the Information Center found at the following address:

   `http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com`
   `.ibm.btools.help.monitor.dev.doc/mqwf/wmqwf_mm_gen.html`

2. Stop those applications that are emitting events for the models that you plan to migrate.

3. For processes in each FDL model, disable the database auditing (AUDIT_TO_DB).

4. For processes in each FDL model, enable the WebSphere MQ auditing (AUDIT_TO_MQ).

> **Note:** Follow these rules while generating the model for Version 7.0:
>
> ► Do not change the hierarchy of the monitor contexts.
>
> ► Do not remove monitor contexts.
>
> ► Do not modify the generated ID fields for monitor contexts.

To migrate your Version 4.2.4 models, use the Model Migration panel of the migration utility described in the Information Center found at the following address:

`http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib`
`m.btools.help.monitor.mig.doc/mig/model_mig.html`

5.4.2 Migrating WebSphere Business Integration Monitor V6.0.2 models

When migrating WebSphere Business Integration Monitor from Version 6.0.2 to Version 7.0, you have to concentrate on two tasks: migrating models and migrating data. This section only covers the migration of the monitor models, which involves converting and deploying models.

A complete migration task list is available in the Information Center found at the following address:

`http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ib`
`m.btools.help.monitor.mig.doc/mig/mig_602.html`

> **Important**: If you are using Version 6.0.1, you first have to migrate to Version 6.0.2.1 with interim fix 5 or later. This also applies to all previous versions to Version 6.0.2.1 interim fix 5. Make sure to update before performing any migration tasks.

In WebSphere Integration Developer Version V7.0 there is a WebSphere Business Integration Monitor Model editor that automatically converts WebSphere Business Monitor models. After migration to the Version 7.0 format, the model can be deployed to WebSphere Business Monitor Version 7.0 with the help of the administrative console. Alternatively, you can use a batch file that does not require an Eclipse environment.

For the migration of the WebSphere Business Integration Monitor model, you need to have either WebSphere Dynamic Process Edition Tool and Testing Pack or WebSphere Integration Developer V7.0, which already has the WebSphere Business Integration Monitor development toolkit included.

Before you migrate your WebSphere Business Integration Monitor model, you should have the Adaptive Action Manager data migrated. The Adaptive Action Manager is a component in WebSphere Business Monitor V6.0.2. It receives situation events emitted by applications, selects appropriate actions based on user-defined rules and policies, and invokes one or more actions. For more information about the Adaptive Action Manager, go to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/v6rxmx/topic/com.ibm.btools.help.monitor.doc/Doc/tasks/administration/am_actionmanager.html

For information about the migration for the Adaptive Action Manager, go to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.btools.help.monitor.mig.doc/mig/action_mgr_data_migration.html

Example migration for Version 6.0.2

Before migrating the models, you have to perform the following steps:

1. Stop all applications that are submitting events that are consumed by your WebSphere Business Integration Monitor model.

> **Note:** Incurring downtime for these applications is done to ensure that no events are missed during migration and that no duplication processing of events occurs.

2. Configure each Version 6.0.2 model in the administrative console of Version 6.0.2 so that it does not create more instances:

   a. Select **Applications** → **Monitor Models**. Choose your model and click the version value next to your model (Figure 5-28).

Figure 5-28   WebSphere Business Integration Monitor Model migration: Select the Version value of your model

   b. In the next window, look at the Version Properties section and click **Change CEI distribution mode** (Figure 5-29).
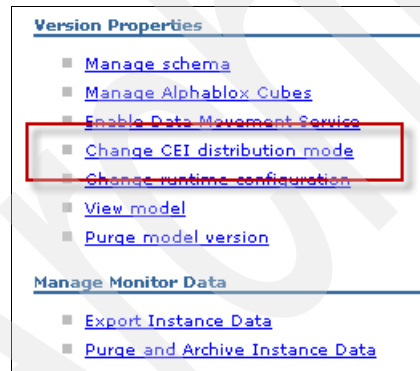
Figure 5-29   WebSphere Business Integration Monitor Model migration: Select Change CEI distribution mode

c. In the next window, select the **Active (monitor model queue-based, no new instances)** option and click **OK** (Figure 5-30).

> **Note:** Migration from WebSphere Business Monitor V6.0.2 to V7.0 requires artifact and data migration. Changing the monitor model state will ensure that no new instances are created in the Version 6.0.2 environment. New instances will be created only in the new Version 7.0 system.

Figure 5-30   WebSphere Business Integration Monitor Models: Monitor to Active with no creation of new MC instances

d. Save your changes to the master repository.

Perform the following steps to migrate a WebSphere Business Integration Monitor model from WebSphere Business Monitor Version 6.0.2 to Version 7.0:

1. Create a Project Interchange file containing your WebSphere Business Integration Monitor model in Version 6.0.2. Do not forget to include all the referenced projects and libraries (Figure 5-31).

   (Beginning with Version 6.1.2, you can click the **Select Referenced** option to automatically include your referenced sources.)
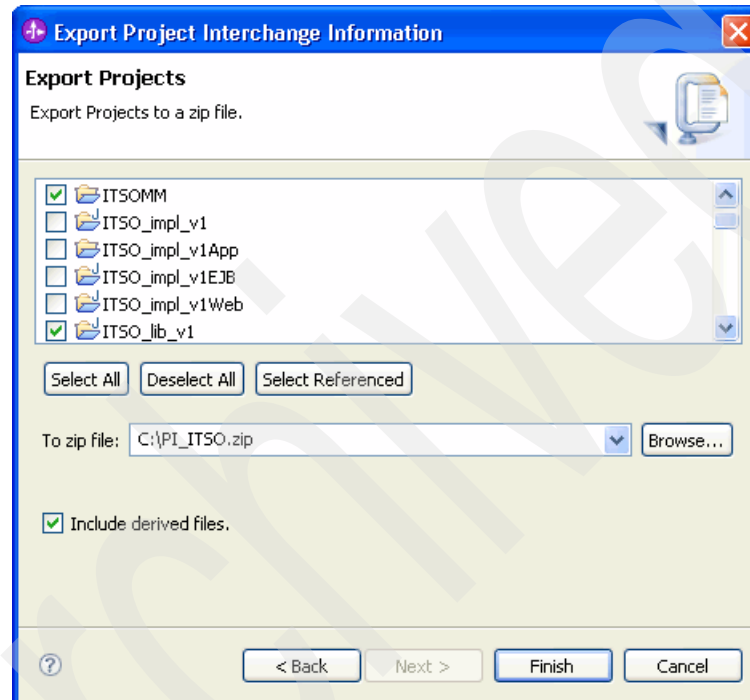
Figure 5-31   Export WebSphere Business Integration Monitor model Version 6.0.2 as a Project Interchange file

2. Open your WebSphere Integration Developer Version 7.0 and create a new workspace.

3. Open the Business Monitoring perspective (Figure 5-32).
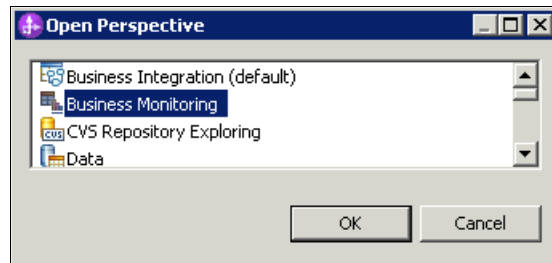
Figure 5-32   Open Business Monitoring Perspective in Version 7.0

4. Right-click in the Project Explorer view and select **Import**.

5. Expand the **Other** folder and select **Project Interchange** (Figure 5-33). Click **Next**.
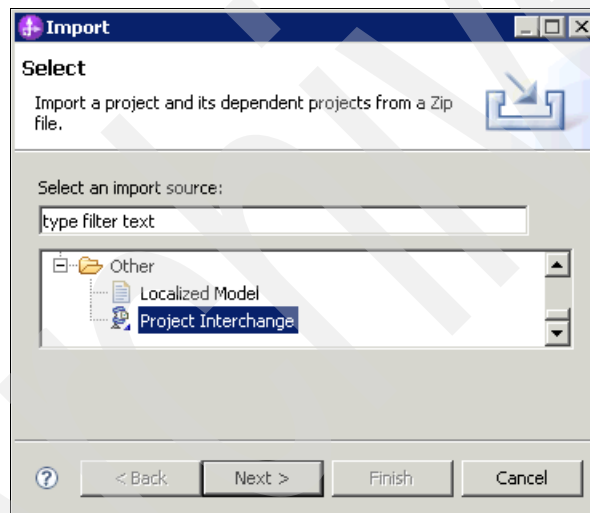
Figure 5-33   Select Project Interchange as Import

6. Browse to your Version 6.0.2 Project Interchange file and select it. Select your WebSphere Business Integration Monitor model and all the referenced projects and libraries (Figure 5-34). Click **Finish.**
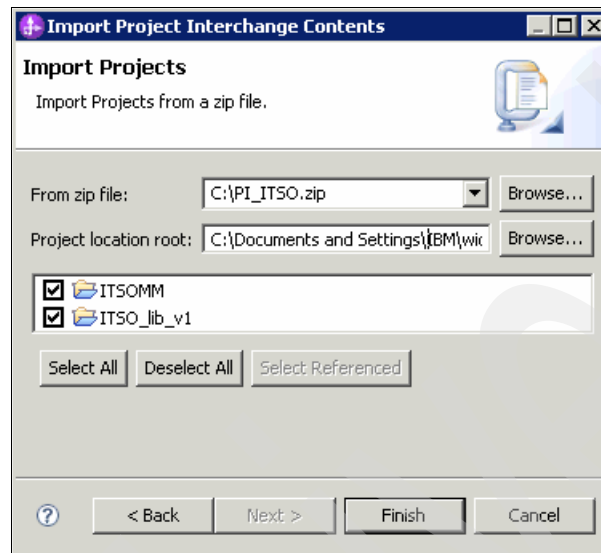
Figure 5-34   Import your WebSphere Business Integration Monitor model Project Interchange file

7. When the import is finished, the Workspace Migration Wizard automatically will start. Click **Next** (Figure 5-35).
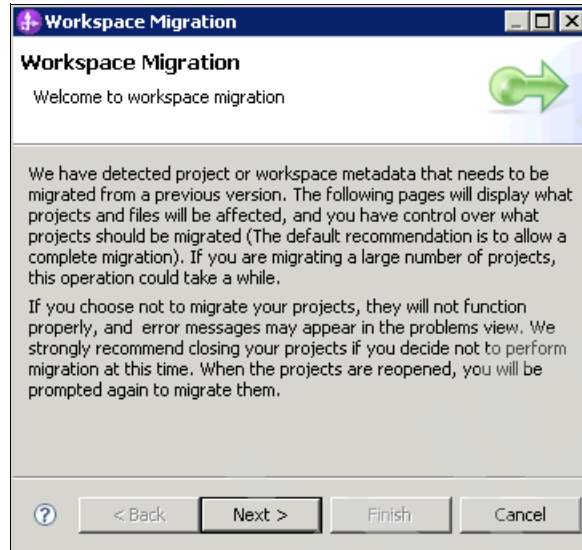
Figure 5-35   Workspace Migration wizard

8. Select all the projects and referenced projects to be migrated. Click **Next** (Figure 5-36).
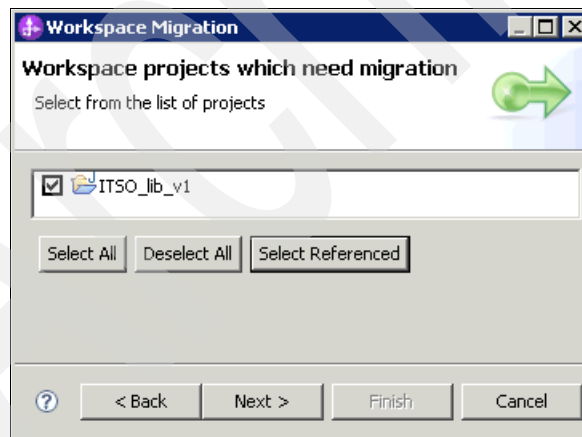
Figure 5-36   Select projects to migrate

9. Note the resources that might be modified by the migration and click **Next** (Figure 5-37).
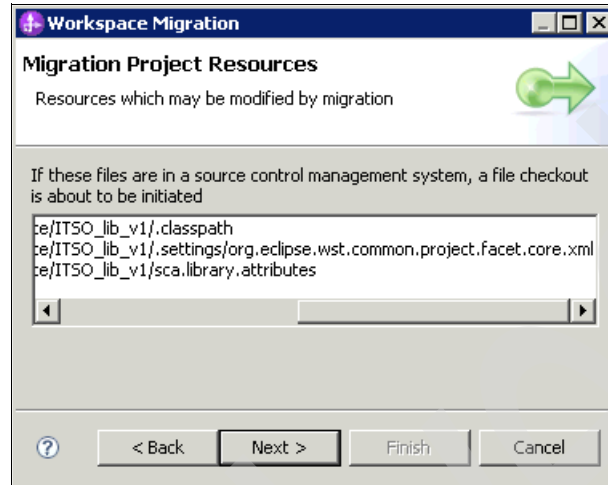
Figure 5-37   Migration note about which resources might be modified

10. Select the projects that target the new runtime environment and click **Next** (Figure 5-38).
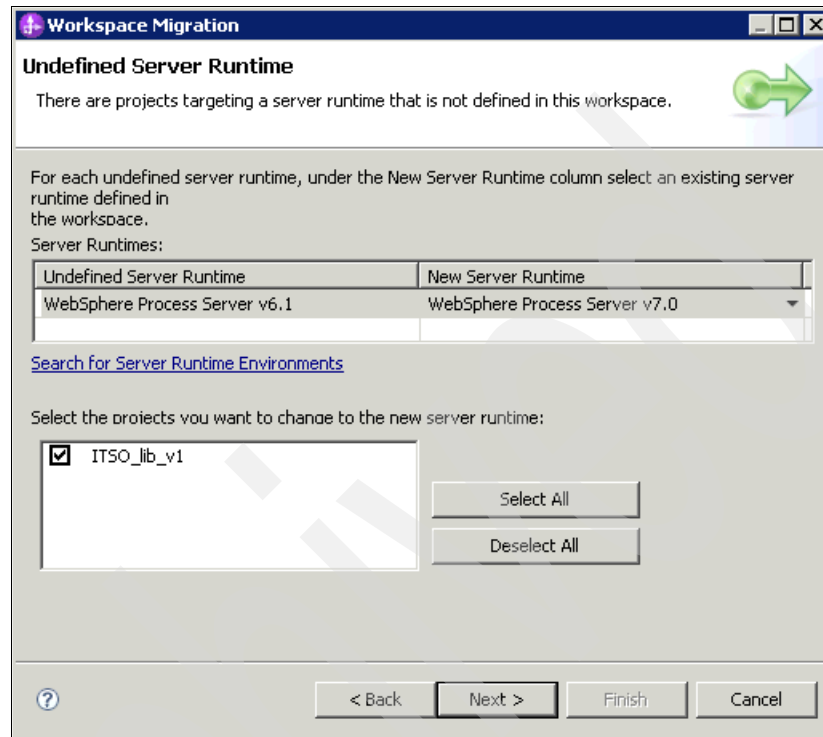
Figure 5-38   Select projects targeting the new runtime environment

11. Click **Finish** (Figure 5-39).
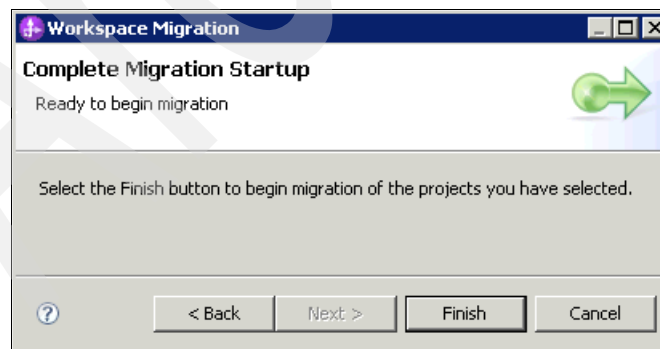
Figure 5-39   Begin migration

12. Your migration should finish with a success message (Figure 5-40).
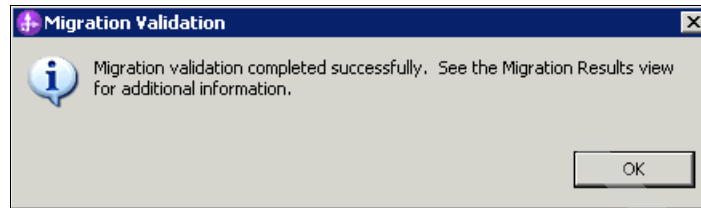
Figure 5-40   Migration success message

13. For a detailed view of the migration steps and errors, open the Migration Result view by selecting the **Migration Results** tab (Figure 5-41).
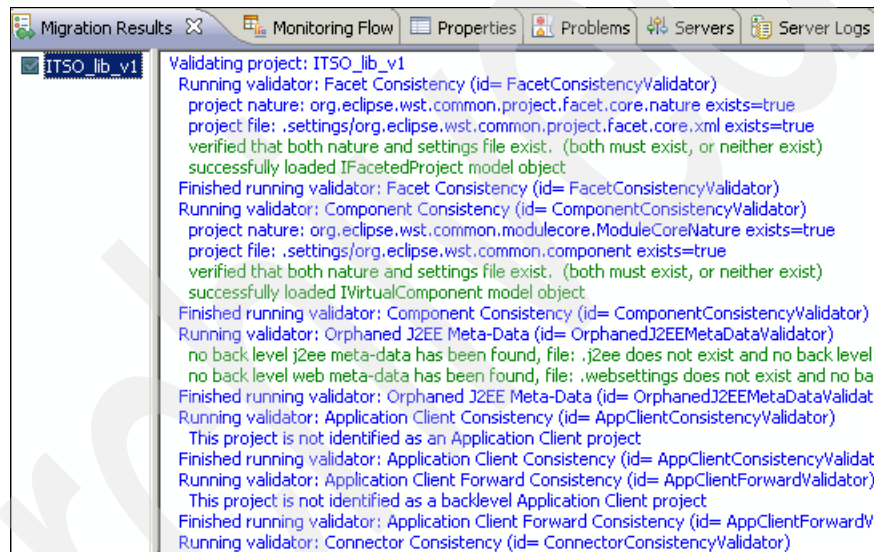
Figure 5-41   Migration result view

Now, you can deploy the migrated model by performing the following steps:

1. In the Project Explorer view, expand the WebSphere Business Integration Monitor model project and right-click the WebSphere Business Integration Monitor model. Select **Generate Monitor J2EE Projects**, which will generate application, moderator and model logic in your current environment.

2. To build a deployable EAR file for the Monitor Server, right-click the WebSphere Business Integration Monitor application project and select **Export** → **EAR file** (Figure 5-42).
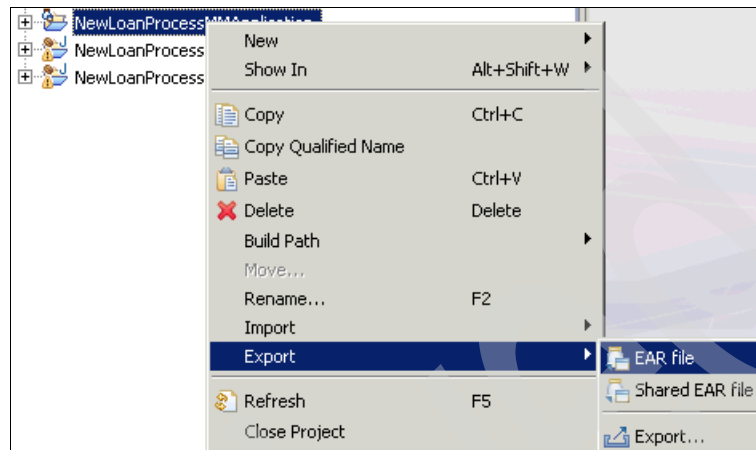
Figure 5-42   Exporting an EAR file for server deployment

3. Deploy the new EAR file using the WebSphere Business Monitor V7.0 administrative console. Once deployed, you can use the administrative console to set your model to one the following states:

   – Active (monitor model queue bypass)
   – Active (monitor model queue-based)
   – Inactive

4. Restart your event-emitting applications. If any old instances resume and send events to the new model, how your new model will respond to this event depends on its configuration. If your model is configured to generate an error for an event for which no instance is found, this event is sent to the error queue. This error event can be deleted in the WebSphere Business Integration Monitor administrative console.

5.4.3 Migrating WebSphere Business Integration Monitor V6.1.0, V6.1.2, and V6.2 models

WebSphere Business Integration Monitor models generated for WebSphere Business Monitor V6.1.0 or higher can be deployed on Version 7.0 in the WebSphere Business Monitor Runtime Migration. If you are performing a manual migration, you can simply deploy your modules on WebSphere Monitor Server V7.0.

For more information about how to deploy WebSphere Business Integration Monitor Models to the WebSphere Business Integration Monitor Server, refer to the Information Center found at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com.ibm.btools.help.monitor.dev.doc/mme/developingmonitormodels.html

5.5 Migrating Business Space widgets

This section briefly describes how to migrate Business Space widgets from Version 6.2 to Version 7.0. This section assumes that you have experience developing widgets for Business Space. For more documentation about developing widgets for Business Space V6.2, go to the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.ibm.bspace.620.help.devt.doc/doc/concepts/business_space_devt/coverview.html

Widgets that have been developed in Version 6.2 or earlier must be migrated into widgets for Version 7.0, or they will not work in Version 7.0.

To migrate the widgets, perform the following steps:

1. Migrate the runtime profile that has the custom widgets. This is required because widgets use the business space environment. A migrated business space is a prerequisite for widget migration.

2. Uninstall the custom widget EAR from the cluster.

3. If the custom widgets use Dojo, upgrade the Dojo installation in your runtime environment to Dojo V1.3.2. For more information about how to upgrade Dojo, go to the following address:

http://www.dojotookit.org

This upgrade is important because in Business Space V7.0, the IBM Dojo Toolkit is based on Dojo ToolkitV1.3.2. However, this bundled version will be updated as needed over time. This could include entire new Dojo versions, as well as specific defect fixes. Compatibility of future Dojo versions is defined by the Dojo project.

4. If your widget needs to support multiple languages, add localized event descriptions as an update to the widget XML in your development tool.

To add localized event descriptions, add one <iw:alt> element for each language. The <iw:alt> element is a new child of the <iw:Description> element:

```
<iw:eventDescription
    title="{ title }"
    lang=" en "
    ...>
    <iw:alt
        description="{ description }"
    title="{ title }"
    lang="{ languages }" />
    ...
    </iw:eventDescription>
```

5. To package the widget for deployment, perform the following steps:

   a. Create an `ear` directory and copy the EAR files containing the migrated widget definition files and widget implementation files into it.

   b. Create a `catalog` directory and copy the catalog XML (widget registration) files into it.

   c. Create a `endpoints` directory and copy the endpoint registration files into it (if they exist).

   d. Optional: Create a `templates` directory and copy the template ZIP files into it (if they exist). The template definitions in the ZIP files must be in the Lotus Mashups template format.

   e. Create a `help` directory and copy the help plug-ins into it (if they exist).

   f. Compress the `ear`, `catalog`, `endpoints`, `templates`, and `help` directories. Check that the structure of the compressed file contains the following items:

      • `ear\widgets_name.ear` (one or more EAR files)
      • `catalog\catalog_name.xml`
      • `endpoints\*.xml`
      • `templates\*.zip`
      • `help\eclipse\plugins\*`

6. At a command prompt, change directories to *profile_root*/bin.

7. Enter **wsadmin.bat -conntype NONE** and then enter the appropriate command:

   – For migrating the widgets into a non-clustered environment, run the following command:

   ```
   $AdminTask installBusinessSpaceWidgets {-nodeName node
   -serverName server -widgets fullpath}
   ```

– For migrating the widgets into a clustered environment, run the following command:

```
$AdminTask installBusinessSpaceWidgets {-clusterName cluster
-widgets fullpath}
```

In each case, *fullpath* is the name and location of the ZIP file or parent folder you created.

For more information about the `installBusinessSpaceWidgets` command, go to the Information Center found at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.websphere.wbpm.bspace.config.doc/doc/rref_installbusinessspace.
html

8. Enter `Exit`.

9. Restart the server or cluster.

5.6 Sample migration

This section provides a sample migration of an application that was developed in WebSphere Integration Developer V6.1.2 with Fix Pack 005 and is migrated to Version 7.0.

5.6.1 Sample application description

This section briefly describes the sample application.

Application

This application is based on the sample Business Process Execution Language (BPEL) applications that are shipped with *WebSphere Business Process Management V6.1.2 Production Topologies*, SG24-7665. You can download these applications at the following address:

ftp://www.redbooks.ibm.com/redbooks/SG247665/sg247665.zip

The altered application is the vehicle loan process of a fictional organization called ITSOBank. The goal of this business process is to collect and analyze a loan applicant's information and provide a suitable loan customized to the customer.

This application consist of the following modules:

► ITSO_v1 (containing a long running BPEL)

► ITSO_med_v1 (containing a mediation flow)

► ITSO_lib_v1 (containing interfaces and complex Business Objects)

► ITSO_impl_v1 (containing HTTP Exports and SCA Imports)

► CWYBC_JDBC_v1 (JDBC Adapter module)

► MM Model

5.6.2 Features included in the sample application

This section describes what features of WebSphere Process Server and WebSphere Business Monitor the sample application uses.

Features from WebSphere Process Server

Our sample application uses the following features:

► Long running process

We add a human task called "approvalTask" in the original BPEL. The human task was assigned as potential owners to a group called "ITSOApprover". Also, a user interface of Business Space type was generated for this human task.

► Human task escalation

Our human task in the BPEL contains a escalation logic that fires an escalation of Notification Type "Work item" after a certain period of time. This work item is assigned to a single user called "ITSOAdmin".

► Reusable Service Component Architecture

All of the Java implementations for business service are exported as web services with HTTP binding. They are reusable SCA components. In addition, we use SCA invocation between our modules.

► Business rules

We use one business rule group with a simple decision table for one rating service in the vehicle process.

► Business Object mapping

A simple Business Object mapping (BOMap) is added to pass a constant into a Business Object field value.

- Mediation flow

    To test the WebSphere Enterprise Service Bus, a mediation flow is added. Within this mediation flow, custom mediations (java snippets) and BOMaps are being used. The used mediation flow gets an ID value from the main process and queries this ID to the database, returning with the ID value.

- Outbound JDBC adapter

    The mediation flow executes the query and fetches the record through the JDBC adapter. A stand-alone JDBC adapter is deployed into the runtime.

Features from WebSphere Business Monitor

Our sample application uses the following features:

- Monitor detail model

    In the monitor detail model, we only created one monitoring context, 12 inbound events, 12 triggers, 20 metrics, one stopwatch, one counter, and one outbound event. In the context, we use string and int metrics to track the detailed properties of the loan and customer information. Stopwatches are used to track the process duration. Timeout outbound events will be sent out when the human task escalation event occurs.

- Dimensional model

    In the dimensional model, there are four dimensions and four measures.

- KPI model

    The KPI models hosts both calculation KPI and aggregation KPI. We also define two dynamic KPIs on the dashboard using the KPI manager.

- Visual model

    The monitor model also contains a monitoring context diagram and a KPI context diagram with actions on both diagrams. The SVG diagram comes from the WebSphere Business Modeler export. In the dashboard, we configure the cooperative mode for instances and diagram widgets so that the process execution status can be visually shown on the diagram.

- Tracking key for exporting value

    The tracking key from WebSphere Business Modeler export is set for one measure. Those tracking key will be used to export the supervising result from WebSphere Business Monitor into WebSphere Business Modeler. WebSphere Business Modeler can use these values to do simulation and optimization.

5.6.3 Export the projects

As described in 5.3.1, "Artifact migration" on page 127, depending on your current version of WebSphere Integration Developer, you might see slight differences while exporting your projects. See the Information Center for information about your current version (other than Version 6.1.2):

► For Version 6.0.2, go to the following address:

    https://publib.boulder.ibm.com/infocenter/dmndhelp/v6rxmx/topic/com.
    ibm.etools.j2eeapp.doc/topics/tjsharingexport.html

► For Version 6.1.0, go to the following address:

    http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r1mx/topic/com.i
    bm.wbit.610.help.runtime.doc/topics/tintrchg.html

► For Version 6.2, go to the following address

    http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/topic/com.i
    bm.wbit.620.help.runtime.doc/topics/tintrchg.html

Perform the following steps to export the projects:

1. In WebSphere Integration Developer V6.1.2, export the artifacts as Project Interchange files by selecting **File** → **Export**.

2. Select **Business Integration** → **Integration module**, as shown in Figure 5-1 on page 128.
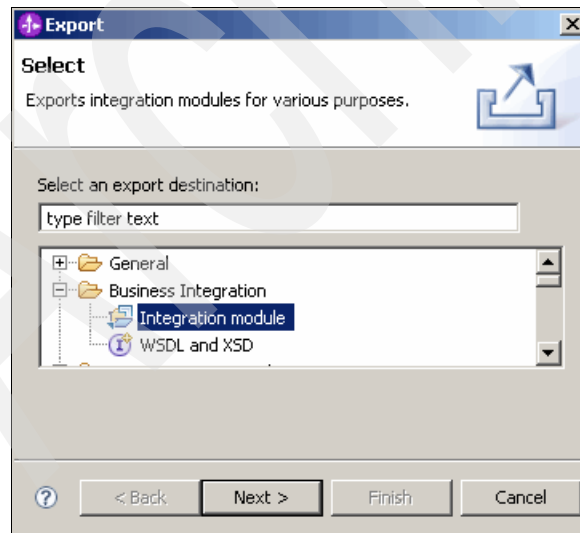
Figure 5-43   Export an integration module

Click **Next**.

3. in the Integration Module Export window, select all modules and libraries for export. Then select **Project interchange for sharing modules between workspaces** and click **Next** (Figure 5-44).
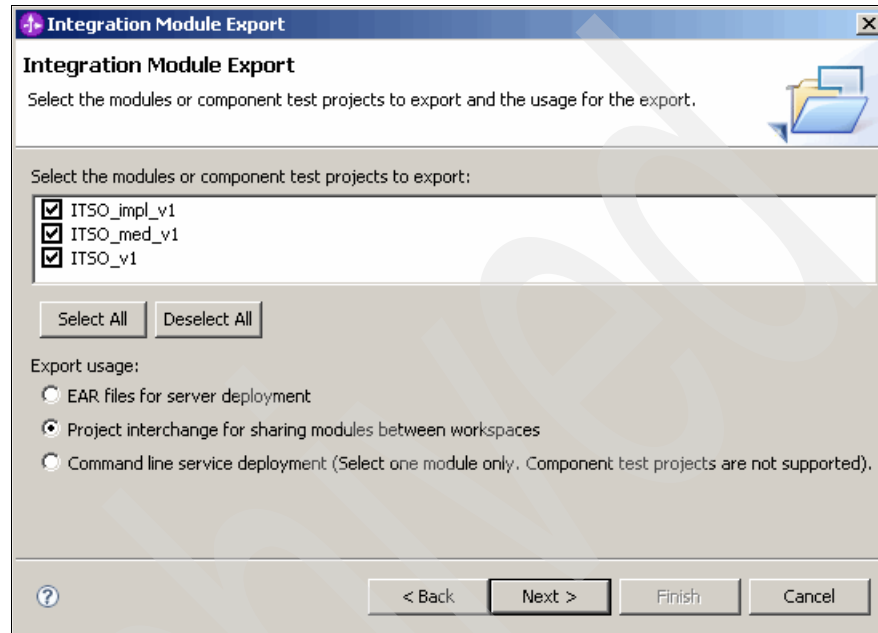
Figure 5-44   Sample application export selection

4. In the next window, select the destination to store the Project Interchange file and select **Include dependent projects from workspace** and click **Finish** (Figure 5-45).
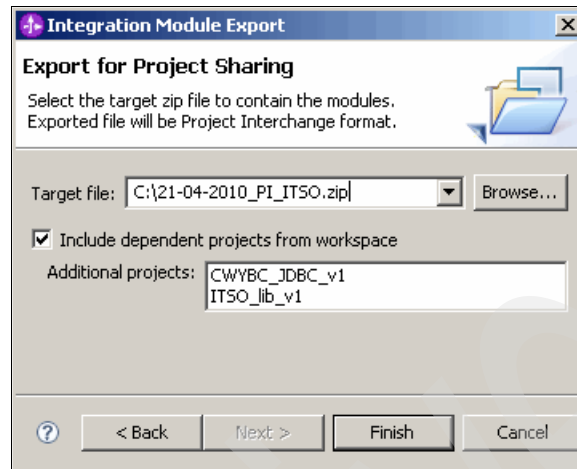
Figure 5-45   Sample application export description

5.6.4 Import the projects into Version 7.0 and migrate them

The next steps show how to import the Project Interchange file into your new workspace in Version 7.0. Perform the following steps:

1. Open WebSphere Integration Developer V7.0 and select **File** → **Import** from the Main menu. Expand **Other** and select **Project Interchange**, as shown in Figure 5-4 on page 130.
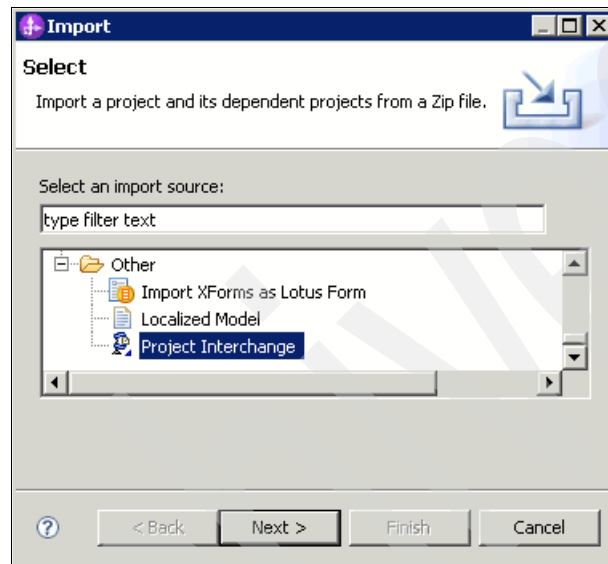
Figure 5-46   Sample application: Select Import source

2. In Figure 5-47 on page 185, browse to the Project Interchange file and select it. Select all the projects by clicking **Select All** and then click **Finish**.
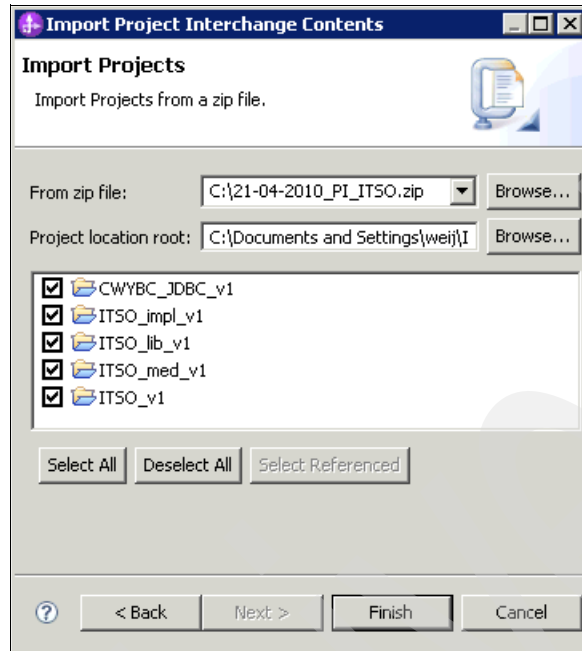
Figure 5-47   Sample application: Import selection

3. A new window for migrating the imported projects appears after the import of the PI is complete (Figure 5-48). Click **Next**.
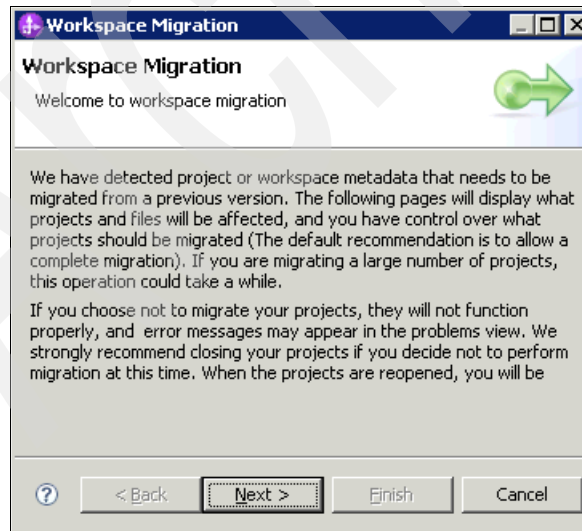
Figure 5-48   Sample application: Workspace Migration wizard

4. In Figure 5-49, select the projects to migrate. Make sure you select all the referenced libraries and projects and click **Next**.
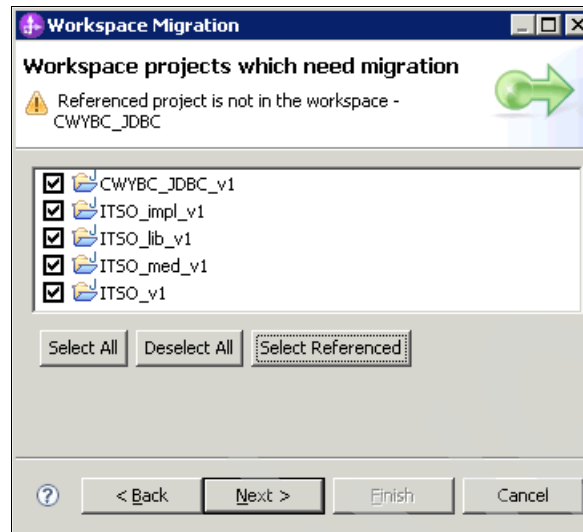
Figure 5-49   Sample application: Migration wizard project selection

5. A Warning shows the files that might have to be modified by the migration (Figure 5-50). Click **Next**.
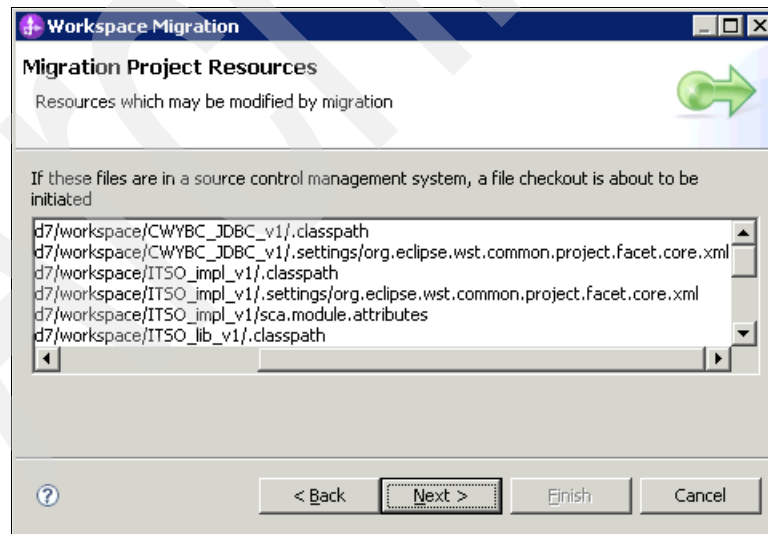
Figure 5-50   Sample application: Migration wizard warning of changed resources

6. Figure 5-51 shows that the current targeted server runtime is not defined in the current workspace. Make sure that all of the migrated projects are selected in order to change them to the new server runtime. Click **Next**.
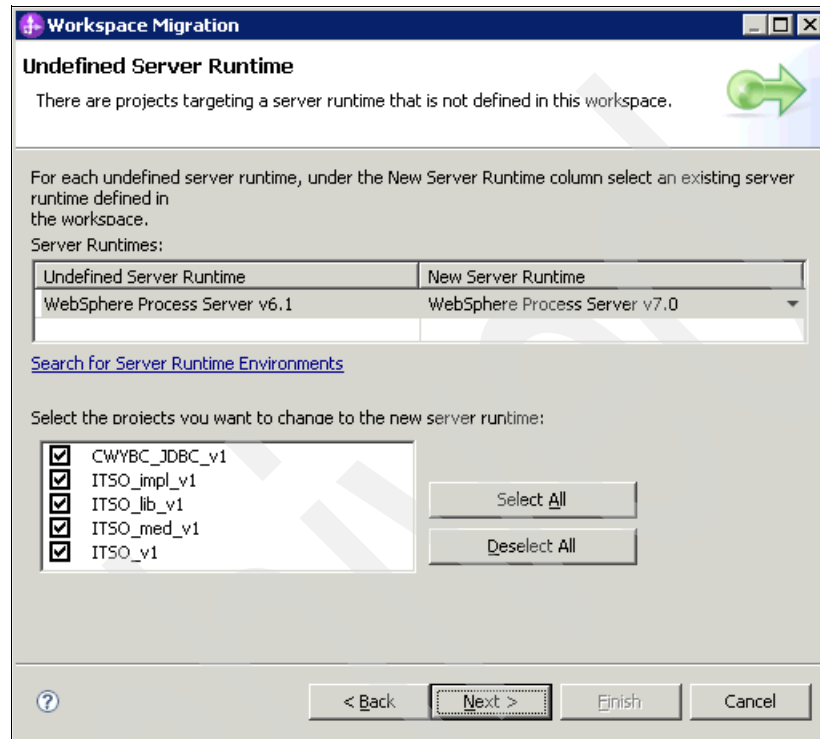
Figure 5-51   Sample application: Migration wizard selecting target server runtime

7. Review the messages. In Figure 5-52, there are two messages to review. The first message indicates that the referenced JDBC adapter project is not in the workspace. We will be installing the new adapter later, so we can ignore this message for now. The second message is about a library associated with WebSphere Business Services Fabric. The application is not using WebSphere Business Services Fabric, so we can safely ignore this message as well. Click **Finish**.
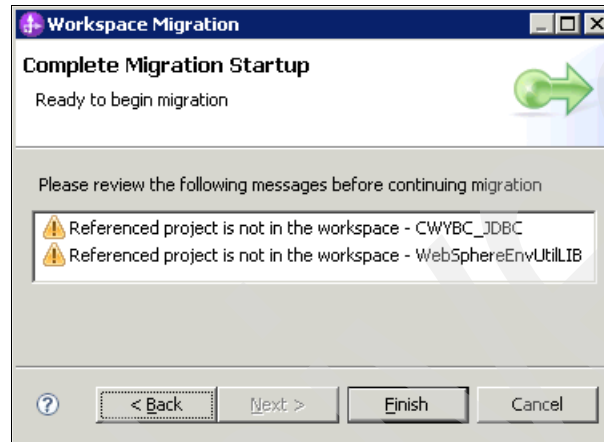
Figure 5-52   Sample application: Migration wizard messages

8. Our migration process ends successfully and the message shown in Figure 5-53 is displayed.
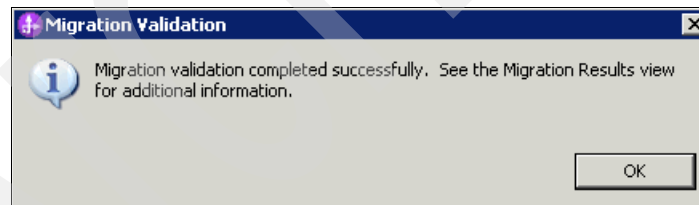
Figure 5-53   Sample application: Migration wizard success

Review the migration results (Figure 5-54 on page 189) by selecting **Window** → **Show View** → **Other** and then selecting **Migration** → **Migration Results**.

Figure 5-54   Sample Application Migration result view

5.6.5 Migrating WebSphere Adapter for JDBC to Version 7.0

After migrating all the modules to Version 7.0, only one error is still showing in the Problems view (Figure 5-55).

Figure 5-55   Sample application: Problems view

To resolve this error, we must migrate the Adapter project.

Perform the following steps:

1. Right-click the **CWYBC_JDBC_v1** adapter project and select **Migrate connector project** (Figure 5-56).
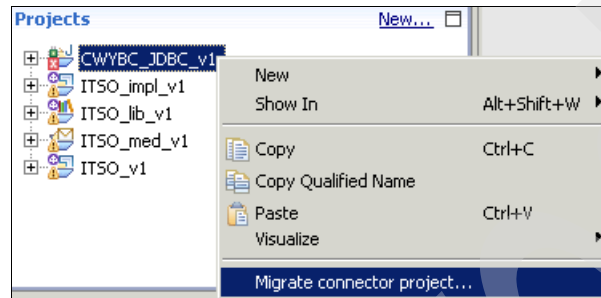
Figure 5-56   Sample application adapter migration: Select Migrate connector project

2. In Figure 5-57, select the JDBC Adapter source module name, the new WebSphere Adapter name, and its Version.
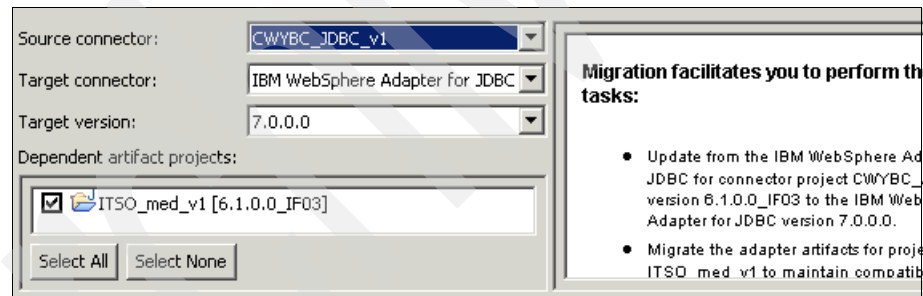
Figure 5-57   Sample application adapter migration: Select source and target adapter

3. Click **Next**. The warning window shown in Figure 5-58 is displayed. Click **OK**.
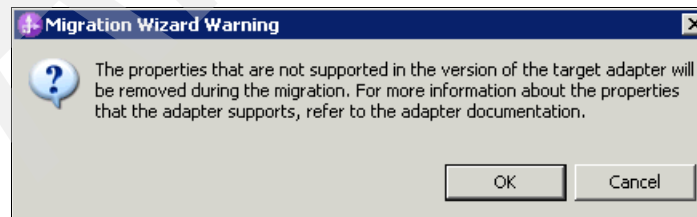
Figure 5-58   Sample application adapter migration: Warning

4. In Figure 5-59, review the migration changes that will occur in each of the artifacts. Expand each node to see the complete migration changes.
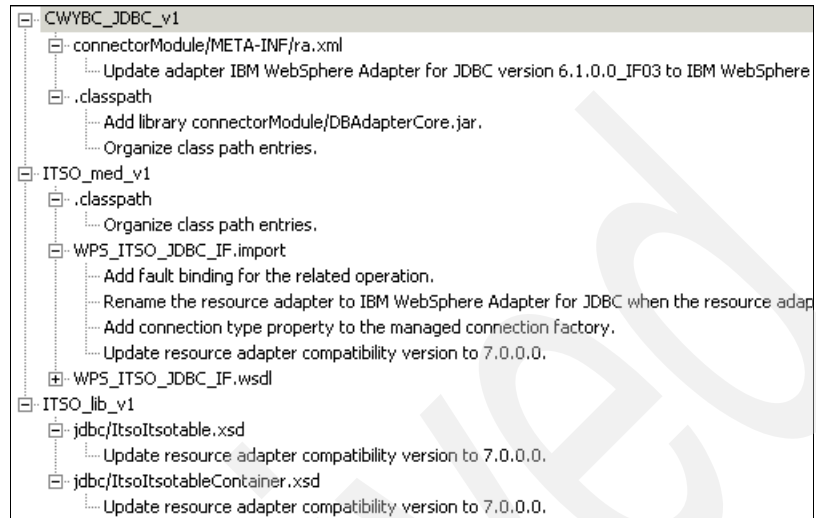
Figure 5-59   Sample application: Review changes within the adapter migration wizard

5. Click **Finish**.

6. Since there are no errors left, the migration is complete (Figure 5-60).
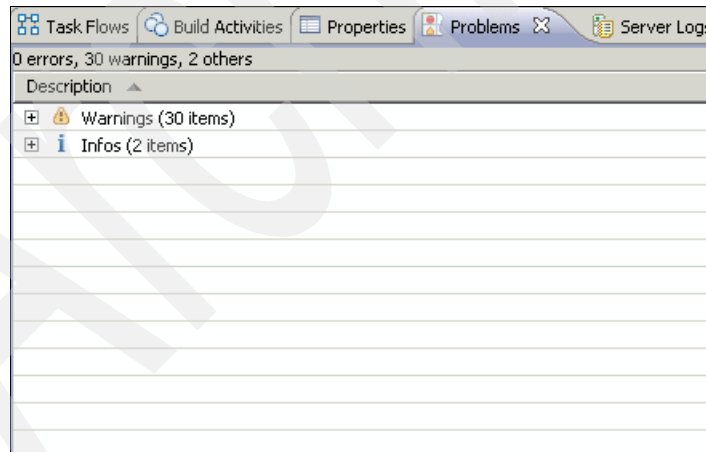
Figure 5-60   Sample application: Problems view

Part 2

Examples

In this part, we provide two migration scenarios that illustrate the migration process. Both scenarios feature the runtime migration pattern.

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Migrating BPM V6.1.2 to WebSphere Dynamic Process Edition V7.0

This chapter provides detailed instructions for migrating a Business Process Management V6.1.2 golden topology to WebSphere Dynamic Process Edition V7.0 with *full downtime*. The topology consists of WebSphere Adapter, WebSphere Business Monitor, WebSphere Process Server, and Business Space on distributed platform systems. The topology is configured over six machines and six clusters.

6.1 Source environment topology

This section describes briefly the source environment topology.

6.1.1 Source environment overview

This scenario uses the topology referred to as the *golden topology*, which is built by using the remote messaging and remote support topology pattern for WebSphere Process Server V6.1.2.3 and WebSphere Business Monitor V6.1.2.5.

The environment to be migrated is a single cell topology with six clusters and a remote DB2 server. The clusters are:

► WPS.Messaging cluster

The messaging cluster hosts the messaging engine infrastructure in the cells. It contains buses for the Common Event Infrastructure (CEI), the Business Process Choreographer (BPC), Service Component Architecture (SCA), and WebSphere Business Monitor.

► WPS.Support cluster

The support cluster hosts the Common Event Infrastructure, the Business Rules Manager, the BPC Explorer, and the BPC Observer applications.

► WPS.AppTarget cluster

The application target cluster hosts the Business Flow Manager and the Human Task Manager applications.

► WBM.Support cluster

The monitor support cluster hosts the monitor action services, the data movement services, and monitor rest services.

► WBM.AppTarget cluster

The monitor application cluster is where monitor models are deployed. The applications in this cluster will reorder the events, process the events, and emit outbound events.

► BPM.WebDashboard cluster

The Web dashboard cluster hosts Business Space and Alphablox.

The topology of the BPM V6.1.2 cell and its elements are shown in Figure 6-1.
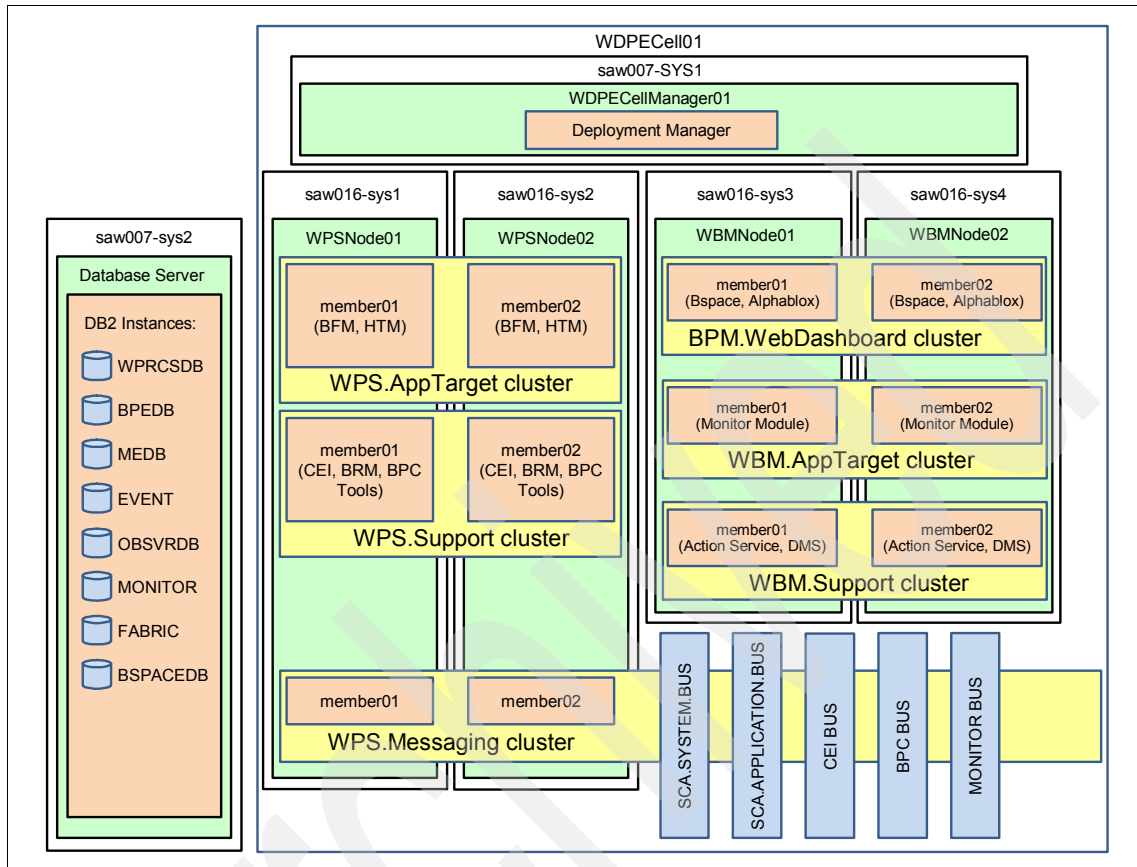
Figure 6-1   BPM V6.1.2 topology

6.1.2 Software versions

We use the software shown in Table 6-1 to create the source environment on six machines. The operating system is Windows 2003 Standard Edition Service Pack 2.

Table 6-1   Installed software versions

Product/Component	Version	Install directory
WebSphere Process Server	Version 6.1.2.3 / 32-bit	`C:\wdpe612`
WebSphere Business Monitor	Version 6.1.2.5 / 32-bit	`C:\wdpe612`
Alphablox	Version 9.5.0.0 Build 262	`C:\wdpe612\Alphablox`
IBM DB2 Universal Database™	Version 9.5 / 32-bit	`C:\IBM\DB295`

6.1.3 Databases

With regard to the product databases in the source environment:

► Separate databases are used for different components.

► The database administrative user ID is db2admin.

► The user ID for the Windows log in is the same as the database administrative user ID.

► We put the tablespaces for BPEDB, OBSVRDB, MONITOR, and BSPACEDB in an separate directory

The database configuration and notes regarding migration are shown in Table 6-2.

Table 6-2   Database details including owner, database name and schema

Database	Schema name	Table space directory	Is migration required	Comments
WPRCSDB	COMMONDB	`C:\DB2\NODE0000\`	Yes	The common database.[a]
BPEDB	BPC	`C:\DBTableSpace`	Yes	The BPC database
OBSVRDB	OBS	`C:\DBTableSpace`	No	The Business Process Observer database.

Database	Schema name	Table space directory	Is migration required	Comments
MEDB	SCASYS	C:\DB2\NODE0000\	No	The SCA system messaging data store.[a]
MEDB	SCAAPP	C:\DB2\NODE0000\	No	The SCA Application messaging data store.[a]
MEDB	CEIME	C:\DB2\NODE0000\	No	The CEI messaging data store.[a]
MEDB	BPCME	C:\DB2\NODE0000\	No	The BPC messaging data store.[a]
EVENT	DB2ADMIN	C:\DB2\NODE0000\	No	The Event database for CEI events.[a] There is no specific schema associated with this database, so it uses the database user ID.
MEDB	MONME	C:\DB2\NODE0000\	No	The WebSphere Business Monitor messaging data store.[a]
MONITOR	MONITOR	C:\DBTableSpace	Yes	The WebSphere Business Monitor database
MONITOR	DB2ADMIN	C:\DBTableSpace	Yes	The Alphablox DB2 repository. There is no specific schema associated with this database, so it uses the database user ID
BSPACEDB	IBMBUSSP	C:\DBTableSpace	Yes	Business Space database.
WDPEDB	ITSO	C:\DB2\NODE0000\	No	Test application database.[a]

a. The table space is in the default directory.

6.1.4 Node and host names

Each machine hosts only one node. Table 6-3 lists all nodes in the cell.

Alphablox is installed and configured only on the WebSphere Business Monitor custom nodes (WBMNode01 and WBMNode02). The Alphablox installations share the same DB2 database repository.

Table 6-3   Node information

Node name/ Instance name	Profile name	Host name	Comments
WDPECellManager	WDPEDmgr	saw007-sys1.itso.ral.ibm.com	Deployment manger node
DB2 Instance	N/A	saw007-sys2.itso.ral.ibm.com	DB2 database system
WPSNode01	WPSCust01	saw016-sys1.itso.ral.ibm.com	The first WebSphere Process Server custom node
WPSNode02	WPSCust02	saw016-sys2.itso.ral.ibm.com	The second WebSphere Process Server custom node
WBMNode01	WBMCust01	saw016-sys3.itso.ral.ibm.com	The first WebSphere Business Monitor custom node
WBMNode02	WBMCust02	saw016-sys4.itso.ral.ibm.com	The second WebSphere Business Monitor custom node

6.1.5 Security settings

The security used in this scenario is outlined in this section:

► Operating system security

We use administrator as the user ID when logging on to the Windows systems unless otherwise noted. This user has administrative privileges to install BPM product binaries and to create the profiles on each machine.

► WebSphere component security

Both administrative security and application security are enabled with the file-based federated repository. The primary administrative user ID is admin and the administrative password is admin.

► Business user role

The business user roles used in this scenario are shown in Table 6-4.

Table 6-4   User ID used by sample applications

User/group name	Password	User/group role	Comment
ITSORequester	password	Common WebSphere Process Server user.	The user will start the sample BPEL process.
ITSOAdmin	password	Escalation user.	The user will receive escalations.
ITSOApprover	N/A	The group that has the authority for approval task.	The users in this group will be the potential owners for approvalTask in the sample BPEL application.
ITSOApprover_member01	password	The user belongs to the ITSOApprover group.	The user can claim and finish approvalTask.
ITSOApprover_member02	password	The user belongs to the ITSOApprover group.	The user can claim and finish approvalTask.
ITSOMonitor	password	Common WebSphere Business Monitor user.	The user can view and configure the monitor dashboard. This role is granted by the Business Manager role. This role has no authority to manage KPI.
admin	admin	Super administrator.	The administrator of the whole system. It is the process administrator and KPI administrator.

6.1.6 Product web applications

This section describes the web applications for the products in our topology:

► BPC Observer is deployed on WPS.Support target. It can be accessed by using these URLs:

```
https://saw016-sys1.itso.ral.ibm.com:9444/bpcobserver
https://saw016-sys2.itso.ral.ibm.com:9444/bpcobserver
http://saw016-sys1.itso.ral.ibm.com:9081/bpcobserver
http://saw016-sys2.itso.ral.ibm.com:9081/bpcobserver
```

The BPC Observer report is shown in Figure 6-2.
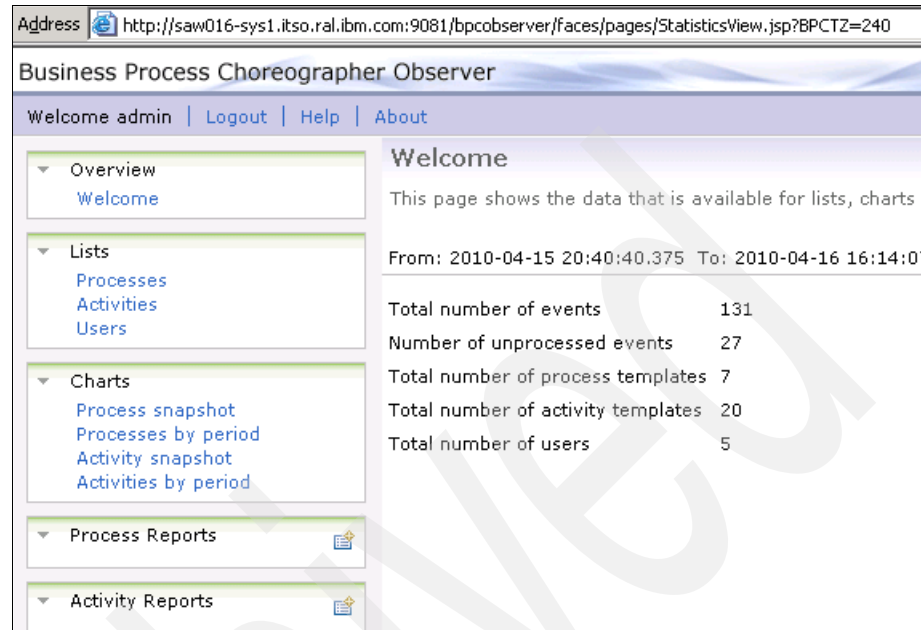
Figure 6-2   BPC observer report

▶ The BPC Explorer application is deployed on the WPS.Support cluster. It can
  be accessed by using these URLs:

```
https://saw016-sys1.itso.ral.ibm.com:9444/bpc
https://saw016-sys2.itso.ral.ibm.com:9444/bpc
http://saw016-sys1.itso.ral.ibm.com:9081/bpc
http://saw016-sys2.itso.ral.ibm.com:9081/bpc
```

▶ The Business Rules Manager application is deployed on the WPS.Support
  cluster. It can be accessed by using these URLs:

```
https://saw016-sys1.itso.ral.ibm.com:9444/br
https://saw016-sys2.itso.ral.ibm.com:9444/br
http://saw016-sys1.itso.ral.ibm.com:9081/br
http://saw016-sys2.itso.ral.ibm.com:9081/br
```

► From the Business Rules Manager, we can check and modify the business rule used in the sample application (Figure 6-3).

Figure 6-3   Business Rules Manager

► The Business Space Manager application is deployed on BPM.WebDashboard cluster. It can be accessed by using these URLs:

```
https://saw016-sys3.itso.ral.ibm.com:9445/BusinessSpace
https://saw016-sys4.itso.ral.ibm.com:9445/BusinessSpace
http://saw016-sys3.itso.ral.ibm.com:9082/BusinessSpace
http://saw016-sys4.itso.ral.ibm.com:9082/BusinessSpace
```

► We can access the Alphablox administrative console to manage the data sources and cubes on Alphablox. The Alphablox administrative consoles can be accessed by using these URLs:

```
https://saw016-sys3.itso.ral.ibm.com:9445/AlphabloxAdmin
https://saw016-sys4.itso.ral.ibm.com:9445/AlphabloxAdmin
http://saw016-sys3.itso.ral.ibm.com:9082/AlphabloxAdmin
http://saw016-sys4.itso.ral.ibm.com:9082/AlphabloxAdmin
```

The data source of Alphablox is shown in Figure 6-4.
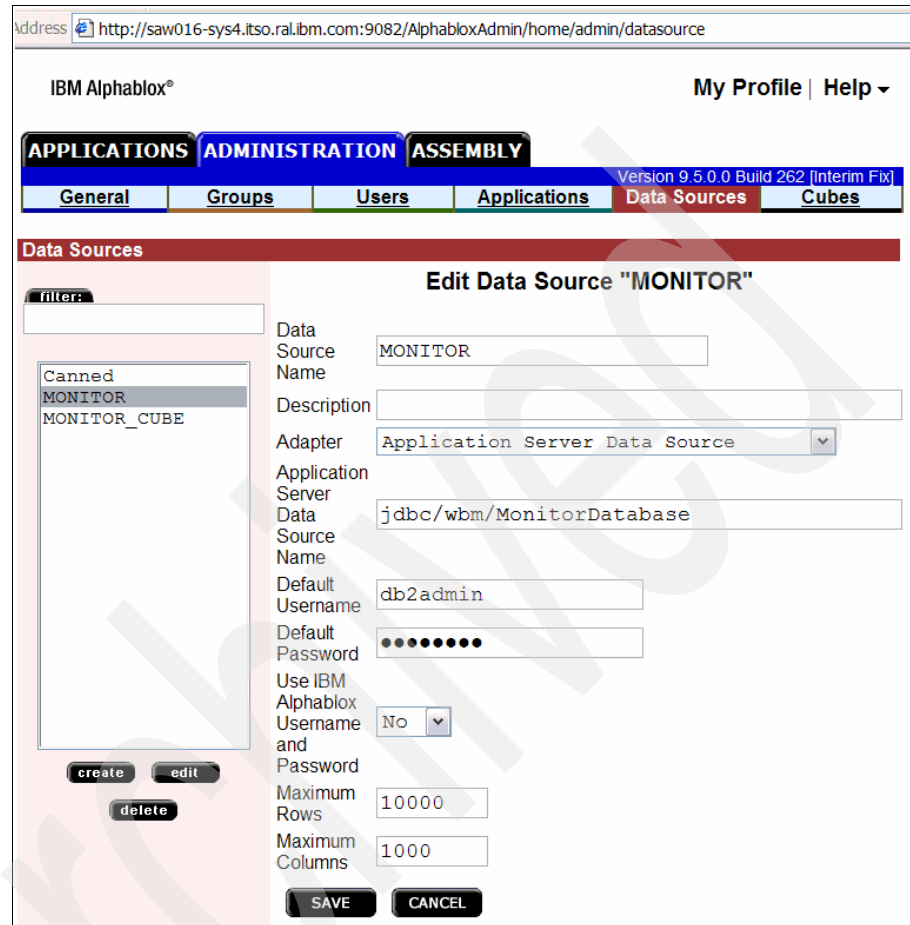
Figure 6-4   Alphablox administrative console

6.1.7 REST service endpoints

For each profile where Business Space is deployed, the endpoint XML files of each product are located in the following directories:

profile_name/BusinessSpace/registryData

For example, the endpoint locations in our environment are:

```
C:\wdpe612\profiles\WBMNode01\BusinessSpace\registryData
C:\wdpe612\profiles\WBMNode02\BusinessSpace\registryData
```

After migration, the REST services should be deployed on the same clusters as the source environment. The port number in the endpoints should be kept unchanged.

The following examples show the locations of the endpoints:

► Endpoints in `bpcEndpoints.xml` are shown in Example 6-1.

Example 6-1   Endpoints in bpcEndpoints.xml

```
<tns:url>https://saw016-sys1.itso.ral.ibm.com:9443/rest/bpm/htm</tns
:url>
<tns:url>https://saw016-sys1.itso.ral.ibm.com:9443/rest/bpm/bfm</tns
:url>
<tns:url>https://saw016-sys2.itso.ral.ibm.com:9443/rest/bpm/htm</tns
:url>
<tns:url>https://saw016-sys2.itso.ral.ibm.com:9443/rest/bpm/bfm</tns
:url>
```

► Endpoints in `wpsEndpoints.xml` are shown in Example 6-2.

Example 6-2   Endpoints in wpsEndpoints.xml

```
<tns:url>https://saw016-sys1.itso.ral.ibm.com:9443/rest/bpm/brules/v
1<tns:url>
<tns:url>https://saw016-sys2.itso.ral.ibm.com:9443/rest/bpm/brules/v
1<tns:url>
```

► Endpoints in `monitorABXEndpoints.xml` are shown in Example 6-3.

Example 6-3   Endpoints in monitorABXEndpoints.xml

```
<tns:url>https://saw016-sys3.itso.ral.ibm.com:9443/rest/</tns:url>
<tns:url>https://saw016-sys4.itso.ral.ibm.com:9443/rest/</tns:url>
```

► Endpoints in `monitorEndpoints.xml` are shown in Example 6-4.

Example 6-4   Endpoints in monitorEndpoints.xml

```
<tns:url>https://saw016-sys3.itso.ral.ibm.com:9443/rest/</tns:url>
<tns:url>https://saw016-sys4.itso.ral.ibm.com:9443/rest/</tns:url>
```

6.2 Data preparation before migration

Before migration, we deploy the sample applications to the source environment. For more details about the sample application, refer to 5.6.1, "Sample application description" on page 178 and 5.6.2, "Features included in the sample application" on page 179.

6.2.1 Application data environment

For verification purposes, we perform the following preparation tasks based on the sample application:

► Multiple BPEL template versions are deployed.

Usually in a production environment, multiple BPEL template versions will be deployed and it is important to test the BPEL versioning functionality after migration. Here we deploy three BPEL versions of the vehicle loan process in the source environment.

The differences between the versions are:

– The rating service implementation is changed from a Java implementation to a business rule.

– The potential owner of ApprovalTask is changed from everyone to ITSOApprover group.

– The user interface for ApprovalTask is added.

– An invocation task and a user interface is added to the process.

► Multiple monitor model versions are deployed.

Monitor models can be modified according to business monitoring requirement changes or model corrections. We deploy multiple versions of the vehicle loan monitor models.

The differences between versions are:

– Inbound events in the monitor model are modified according to the BPEL process version changes.

– Escalation count is added.

– Process failed events and terminated events are added to terminate the process.

– A new measure with a tracking key is added.

► Test BPEL data is generated.

Before migration, several long running BPEL instances and human tasks are generated. These instances will be left in place, as shown in Figure 6-5.

Figure 6-5   BPEL instances in the BPC Explorer

► Test monitor model data is generated.

Just as we have completed and uncompleted instances for each BPEL versions, there are also some completed and uncompleted instances for each monitor model version, as shown in Figure 6-6.

Diagram	Request Time	COMPLETED	Customer Identification Number	VIN	VIN Loc
	April 16, 2010 10:38:34 AM		100	12345678901234567	CLEAN
	April 16, 2010 10:44:34 AM		200	12345678901234	NOT CL
	April 16, 2010 10:45:01 AM		300	412849890	NOT CL
	April 16, 2010 10:45:29 AM		400	324415	NOT CL
	April 16, 2010 10:47:20 AM		100	34215426	NOT CL
	April 16, 2010 10:47:58 AM	★	400	242315134	NOT CL
	April 16, 2010 10:48:53 AM	★			
	April 16, 2010 10:49:27 AM	★			
	April 15, 2010 9:25:34 PM		34	40020	NOT CL
	April 15, 2010 9:28:16 PM		100	100	NOT CL

Page 1 of 5   Go to page: Results 1 to 10 of 46

Figure 6-6   Monitor model instances

► The global human task model is deployed to test the human task widgets.

We deploy the global human task model and configure the human task widgets in Business Space.

► DMS is enabled for each monitor model.

In a production environment, data movement services (DMS) is usually enabled for performance consideration. We enable DMS for each monitor model versions of the sample monitor model.

► The alert template is configured.

The alert template is configured using the administrative console. The Action service sends out dashboard alerts when the timeout outbound alert is emitted by the monitor model.

6.2.2 Server environment

In this section, we list the server configuration settings and the current state of the source environment:

► Common Event Infrastructure event datastore

Some events are emitted and stored in the EVENT database. We disable the Common Event Infrastructure event datastore, because in a production environment, the CEI event datastore is often disabled to achieve higher performance.

► Common Event Infrastructure logging

We configure the CEI logging for both the Business Flow Manager and Human Task Manager. As a result, Common Base Events (CBEs) will be sent out during BPEL execution.

► Human Task Manager group work items

We enable Human Task Manager group work items.

► JDBC adapter

A stand-alone JDBC adapter is deployed on each WebSphere Process Server custom node and the J2C connection factory is created.

6.2.3 Business Space environment

Now we discuss the configuration and preparation for the source Business Space configuration:

► WebSphere Process Server workspace

This space is created using the Managing My Tasks template. In this space, we can start processes, and claim and work on human tasks. The following widgets are included:

– Create Tasks
– Available Task
– My Tasks
– Task Information
– Human Task Diagram

- ► WebSphere Business Monitor Workspace

  This space is created for Business Monitoring purposes. The following widgets are included:

  - – Dimensions
  - – Reports
  - – Diagrams
  - – Instances
  - – KPIs
  - – Export Values
  - – Alerts Subscription
  - – KPI Manager
  - – Human Tasks

- ► Dynamic KPI

  A dynamic KPI named Low Risk Percent and Monthly Escalation Number is created using the KPI manager.

6.3 Source environment preparation

Before migration, you need to check the source environment to make sure that the source environment is in a good state and that there are no in-flight events.

6.3.1 Determine the common database schema

Determine what schema name is used for the common database. We need to modify the database upgrade script during migration if the schema is not the default database user ID by performing the following steps:

1. Navigate to **Resources** → **JDBC** → **Data sources**.

2. Click the **WBI_DataSource** and, under Additional Properties, click **Custom Properties**.

3. Scroll down the list or properties and check the values for currentSchema and cliSchema. If they are blank, this means that the common database schema is the default. For DB2, this is the instance owner name. The schema name is COMMONDB in our environment (Table 6-2 on page 198).

4. We can now ensure that the common database schema you found is correct by listing that tables in the DB2 command-line interface by using the commands shown in Example 6-5.

Example 6-5   List tables command for common database

```
db2 connect to WPRCSDB
db2 list tables for schema COMMONDB
db2 terminate
```

The sample output is shown in Example 6-6. As you can see, the schema is COMMONDB.

Example 6-6   Tables in common database (the output is truncated)

```
Table/View                        Schema
-------------------------------- ---------------
APPTIMESTAMP                      COMMONDB
BYTESTORE                         COMMONDB
BYTESTOREOVERFLOW                 COMMONDB
CUSTPROPERTIES                    COMMONDB
FAILEDEVENTBOTYPES                COMMONDB
FAILEDEVENTDETAIL                 COMMONDB
FAILEDEVENTMESSAGE                COMMONDB
FAILEDEVENTS                      COMMONDB
MEDIATION_TICKETS                 COMMONDB
PERSISTENTLOCK                    COMMONDB
RELN_METADATA_T                   COMMONDB
SCHEMAVERSIONINFO                 COMMONDB
WSCH_LMGR                         COMMONDB
WSCH_LMPR                         COMMONDB
WSCH_TASK                         COMMONDB
WSCH_TREG                         COMMONDB

   16 record(s) selected.
```

6.3.2 Apply the WebSphere Adapter interim fix (if required)
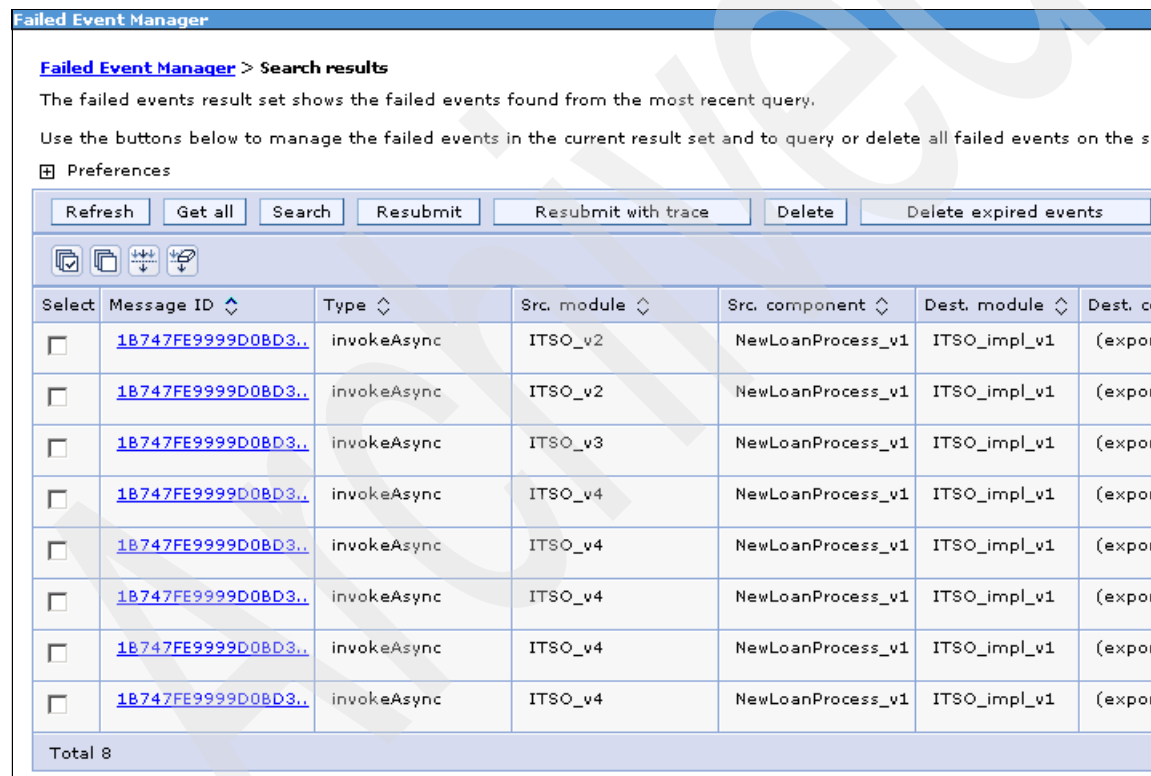
In our migration source environment, we have IBM WebSphere Adapter for JDBC V6.1.0.4, which is at the required fix level. Refer to 5.3.3, "Adapter migration considerations" on page 146 for the mandatory adapter interim fix for the Version 6.1.x and Version 6.2.x adapters.

6.3.3 Failed events

Using the administrative console for WebSphere Process Server in the migration source environment, check the failed events by going to the console and selecting **Integration Applications** → **Failed Event Manager**.

If possible, all existing failed events should be resolved before migration. The number of current remaining failed events should be recorded to ensure that there are no failed events lost during migration. After migration, the number of failed events should be equal to or larger than current number.

One convenient approach to record failed events is to take a screen capture of all the failed events display pages (Figure 6-7).

Figure 6-7   Failed events

> **Note:** It is not mandatory to resolve failed events. You can re-submit them after migration. However, it is best to migrate a system in a clean state, that is, there are no failed events before the migration.

6.3.4 Service Integration Bus (SIB) messages

All SIB queues should be checked for queued messages and dealt with before starting the migration. It is a tedious task to check all the queues one by one manually. The Service Integration Bus Explorer GUI tool can be used to browse queues quickly and easily. The tool can be downloaded from the following address:

http://www.alphaworks.ibm.com/tech/sibexplorer/download

The current depth for queue points in Monitor.WDPECell.Bus is displayed in Figure 6-8. Also, check the queue depth for BPC.WDPECell.Bus, CommonEventInfrastructure_Bus, SCA.APPLICATION.WDPECell.Bus, and SCA.SYSTEM.WDPECell.Bus.

Figure 6-8   Current depth of queue points in MONITOR.WDPECell.Bus

In our source environment, all the queues have no messages.

In general, there should be no messages in the queues when the environment is shut down for migration. Any messages that are still in the queues should be there for a good reason (from an application or business point of view). Any other messages should be handled accordingly before starting the migration.

6.3.5 Transactions

All servers must be checked for open or in-doubt transactions. This check must be performed in the administrative console for each server.

Select **Servers** → **Application servers** → *server_name* → **Container Settings** → **Container Services** → **Transaction Service** → **Runtime**, and then check all the **Review** links for transactions. There should not be any transactions, as shown in Figure 6-9.
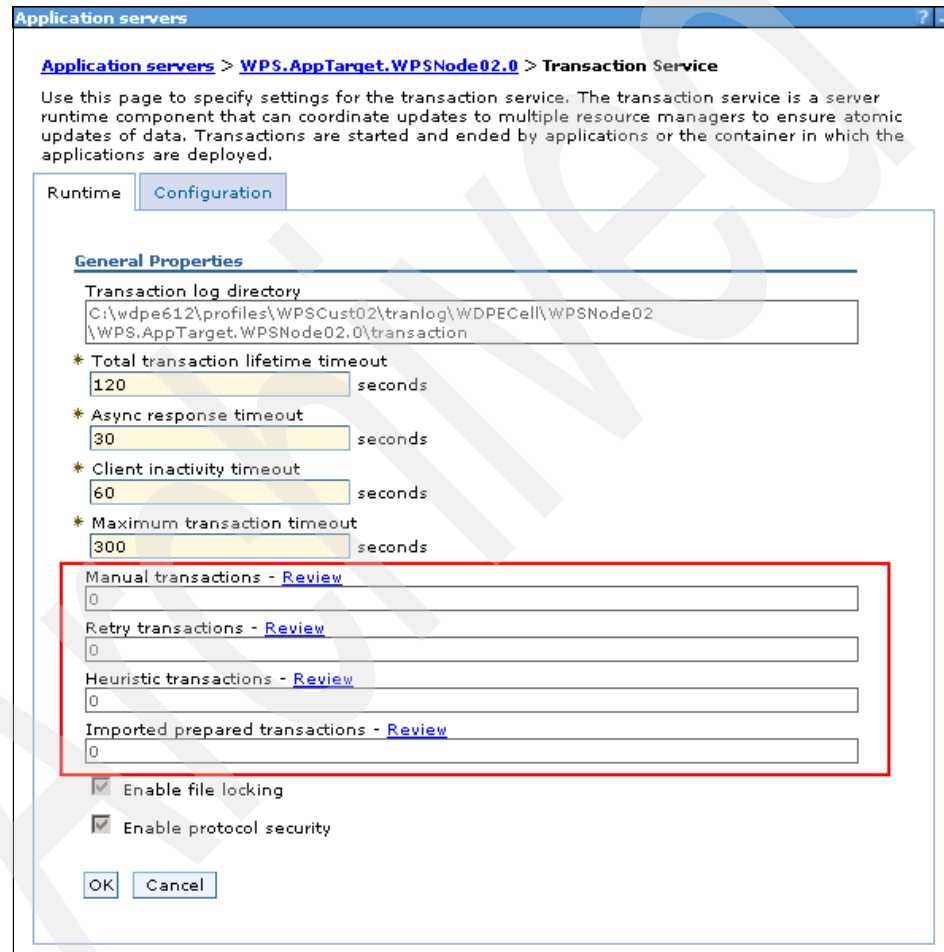
Figure 6-9   Transaction status for WPS.AppTarget.WPSNode02.0

6.3.6 Clean up exceptions

Before migration, the `SystemOut.log` files of all application servers should be checked for any exceptions. You can search for "E" (there is one blank character both before and after char E) in the log file to find exceptions. All runtime and application exceptions should be handled accordingly (non-fatal exceptions can be ignored on a case by case basis).

6.3.7 Manually copy third-party artifacts

We do not use third-party artifacts in our migration source environment, so this step did not apply. But, if you have third-party artifacts, you need to manually copy them to the migrated environment. See 3.4.2, "Runtime migration for network deployment with cluster" on page 99 for more information.

6.3.8 Stop the source environment

For a full downtime migration, we need to stop the migration source environment before starting the migration procedure.

Stop the clusters one at a time

First, stop the clusters in the source environment by performing the following steps:

1. Log into the administrative console on saw007-sys1.itso.ral.ibm.com. Select **Servers → Clusters.** Check **BPM.WebDashboard**, then click **Stop** (Figure 6-10).

Figure 6-10   Stop clusters

2. Check the `SystemOut.log` files for each member to ensure that the cluster is stopped completely. You should see the message shown in Example 6-7.

Example 6-7   Cluster member stop log message

```
[4/16/10 14:23:54:781 EDT] 00000012 ServerCollabo A    WSVR0024I:
Server BPM.WebDashboard.WBMNode01.0 stopped
```

3. Repeat steps 1 on page 215 and 2 to stop these remaining clusters in sequence:

   a. WBM.AppTarget
   b. WBM.Support
   c. WPS.AppTarget
   d. WPS.Support
   e. WPS.Messaging

Stop the node agents

Next, we stop the node agents by performing the following steps:

1. From the administrative console, select **System administration** → **Node agents**, select all the node agents, and click **Stop** (Figure 6-11).
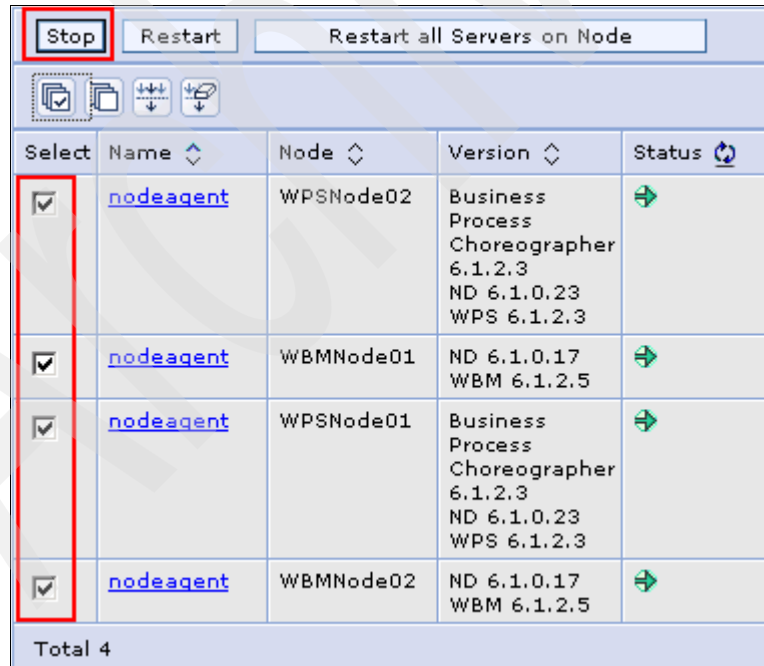
Figure 6-11   Stop node agents

You should see messages similar to the ones shown in Figure 6-12.
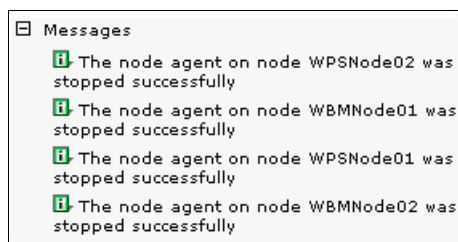
Figure 6-12   Stop node agents message

Stop the deployment manager

Stop the deployment manager by performing the following steps:

1. Open a command line window on the deployment manager system.

2. Navigate to the `bin` directory for the profile:

   `c:\wdpe612\profiles\WDPEDmgr\bin directory`

3. Run **stopManager.bat -username admin -password admin** and press Enter to stop the deployment manager, as shown in Figure 6-13.
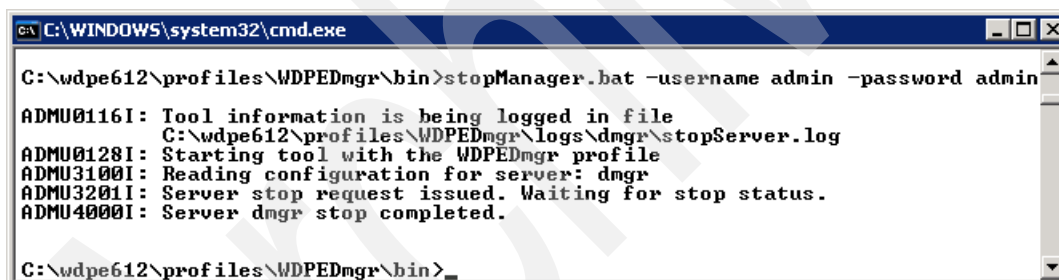
Figure 6-13   Stop deployment manager

4. Check the deployment manager sysout log
   (`c:\wdpe612\profiles\WDPEDmgr\logs\dmgr\SystemOut.log`) to ensure that the stoppage is complete. You should see the message shown in Example 6-8.

Example 6-8   Deployment manager stop log message

```
[4/16/10 14:43:26:515 EDT] 00000010 ServerCollabo A   WSVR0024I:
Server dmgr stopped
```

6.3.9 Back up the source environment

Before performing the actual migration steps, back up the source environment, including the runtime environment and all product databases and user databases. Such a backup is critical for the rollback from an migration failure.

Back up the installation directory of source environment

Perform the following steps to back up the runtime source environment:

1. Log into the deployment manager machine. Use a third-party compression tool to compress the installation directory (`C:\wdpe612` in our environment) of the source environment into a compressed file.

2. Repeat step 1 for all the other machines in the migration source environment. In this case, these are machines saw016-sys1.itso.ral.ibm.com, saw016-sys2.itso.ral.ibm.com, saw016-sys3.itso.ral.ibm.com, and saw016-sys4.itso.ral.ibm.com.

> **Important:** If you created the source profile in a separate directory other than under the product binary directory, you should back up both the profile and binary directories.

Back up the product and user databases

When you back up the runtime installation, you must back up the product databases and user databases as well. You can accomplish these tasks by performing the following steps:

1. Log into the machines hosting the product and user databases (saw007-sys2.itso.ral.ibm.com).

2. Select **Start** → **Run...**, then enter db2cmd to launch the DB2 command-line window.

3. Execute the commands shown in Example 6-9 to back up the product databases. In addition, back up any user databases that you might need in a rollback situation.

Example 6-9   Product databases and user databases backup

```
cd c:\dbbackup
db2 backup database WPRCSDB
db2 backup database BPEDB
db2 backup database OBSVRDB
db2 backup database MEDB
db2 backup database EVENT
db2 backup database MONITOR
db2 backup database BSPACEDB
db2 backup database WDPEDB
```

6.4 Install WebSphere Dynamic Process Edition V7.0
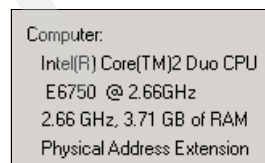
Before installing WebSphere Dynamic Process Edition V7.0, you need to check whether the prerequisites are at the required level.

6.4.1 Prerequisite checking

Runtime migration in a network deployment configuration uses the same machine for the target and source environment. Review all the hardware and software requirements of the machines where the source environment is located before installing any WebSphere Dynamic Process Edition V7.0 component. Information about determining the software and hardware requirements can be found in 3.5, "Runtime migration for specific BPM products" on page 105.

Hardware requirements
Determine your current hardware information first. Our machine has an Intel® 2.66 GHz CPU, as shown in Figure 6-14, which is in the supported scope (Intel Pentium® 500 MHz or faster).


```
Computer:
  Intel(R) Core(TM)2 Duo CPU
  E6750  @ 2.66GHz
  2.66 GHz, 3.71 GB of RAM
  Physical Address Extension
```

Figure 6-14   Hardware information

> **Note:** If the current hardware does not meet the requirements, you need to upgrade to the required levels before migration.

Operating system requirements

Determine the operating system level of the source environment. We are using Windows 2003 Server Standard Edition Service Pack 2, as shown in Figure 6-15.

```
System:
   Microsoft Windows Server 2003
   Standard Edition
   Service Pack 2
```

Figure 6-15   Operation system information

> **Note:** If your operating system level is lower than what is required, ask your system administrator to upgrade it to the required level before migration.

Database version requirement

For DB2, we used the `db2level` command to determine the database version, as shown in Example 6-10.

Example 6-10   Database version

```
C:\>db2level
DB21085I  Instance "DB2" uses "32" bits and DB2 code release "SQL09050"
with level identifier "03010107".
Informational tokens are "DB2 v9.5.0.808", "s071001", "NT3295", and Fix
Pack "0".
Product is installed at "C:\IBM\DB295" with DB2 Copy Name "DB2COPY1".
```

Our database version is in the supported list for WebSphere Dynamic Process Edition V7.0.

> **Note:** If your database version is lower than required by Version 7.0, ask your database administrator to upgrade the database.

Java SDK in the installation package verification

Change directories to the
`/JDK/jre.pak/repository/package.java.jre/java/jre/bin` directory in the
product installation package directory and verify the Java version. The command
completes successfully with no errors when the SDK is intact (Example 6-11).

Example 6-11   Java SDK in the installation package verification

```
C:\software\V7.0\JDK\jre.pak\repository\package.java.jre\java\jre\bin>j
ava -version
java version "1.6.0"
Java(TM) SE Runtime Environment (build
pwi3260sr6ifix-20091015_01(SR6+152211+155930+156106))
IBM J9 VM (build 2.4, JRE 1.6.0 IBM J9 2.4 Windows Server 2003 x86-32
jvmwi3260sr6-20091001_43491 (JIT enabled, AOT enabled)
J9VM - 20091001_043491
JIT  - r9_20090902_1330ifx1
GC   - 20090817_AA)
JCL  - 20091006_01
```

Disk space requirements

Provide adequate disk space for the WebSphere Dynamic Process Edition V7.0
installation, backup, and application objects.

The details for the disk space requirements of our environment are shown in
Table 6-5.

Table 6-5   Required disk space for migration

Directory	Required disk space	Comment
C:\backup	20 GB	Source and target runtime environment backup storage on each runtime machine
C:\backup	5 GB	Database backup storage on database server
C:\software	5 GB	WebSphere Dynamic Process Edition V7.0 installation package
C:\MigrationSnapshot	600 MB	Source profile snapshot directory storage

Directory	Required disk space	Comment
`C:\wdpe7`	3.1 GB	WebSphere Dynamic Process Edition V7.0 installation storage
`C:\Program Files\IBM\Installation Manager`	200 MB	Installation Manager storage

6.4.2 Software version of the target environment

WebSphere Dynamic Process Edition V7.0 has one single installation image. The software shown in Table 6-6 is used for the target environment in our scenario. The IBM Installation Manager is the common tool for installing all products included in WebSphere Dynamic Process Edition V7.0. As a result, the Installation Manager package is also shipped in the WebSphere Dynamic Process Edition V7.0 installation image.

Table 6-6   Software version of target environment

Product/Component	Version	Install directory
WebSphere Dynamic Process Edition	Version 7.0/32-bit	`C:\wdpe7`
Installation Manager	Version 1.3.3/32-bit	`C:\Program Files\IBM\Installation Manager`

6.4.3 Installing WebSphere Dynamic Process Edition V7.0

In this section, we describe the detailed steps that you must perform to install WebSphere Dynamic Process Edition V7.0.

Perform the following steps:

1. Create a software repository containing the new product code.

   A repository is simply a folder that contains the installation software., so we simply uncompress the WebSphere Dynamic Process Edition V7.0 to the appropriate locations; in our case, that location is *base_dir*.

> **Note:** By default, after creating the repositories, the Installation Manager is configured to connect to the Internet. If the environment does not have an Internet connection, the Installation Manager could appear to hang during startup. This topic is discussed in the Technote found at the following address:
>
> http://www-01.ibm.com/support/docview.wss?uid=swg21414213

After creating the base repository for your product, if your machine cannot access the Internet, edit the following files:
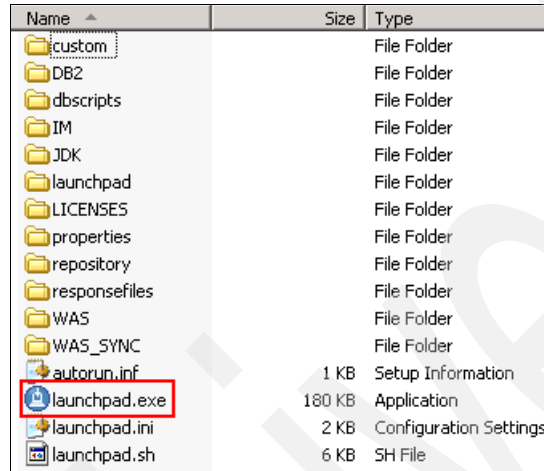
base_dir/IM/install.xml
base_dir/IM/post-install.xml

Remove or comment out the lines, as shown in Example 6-12.

Example 6-12   Sample file of install.xml and post-install.xml(The content is truncated)

```
...
<server>
<repository location='.' temporary='true'/>
<repository location='../repository/' temporary='true'/>
<!-- repository
location='http://public.dhe.ibm.com/software/websphere/repositories/
'
-->
</server>
...
```

2. Install WebSphere Dynamic Process Edition V7.0 on the machine that hosts the deployment manager by performing the following steps:

a. Navigate to your *base_dir* directory and double-click `launchpad.exe` (Figure 6-16) to invoke the IBM WebSphere Dynamic Process Edition Server V7.0 Launchpad.

Figure 6-16   base_dir file list

b. Click **New installation** and enter the installation location. Click **Install WebSphere Application Server**, as shown in Figure 6-17.
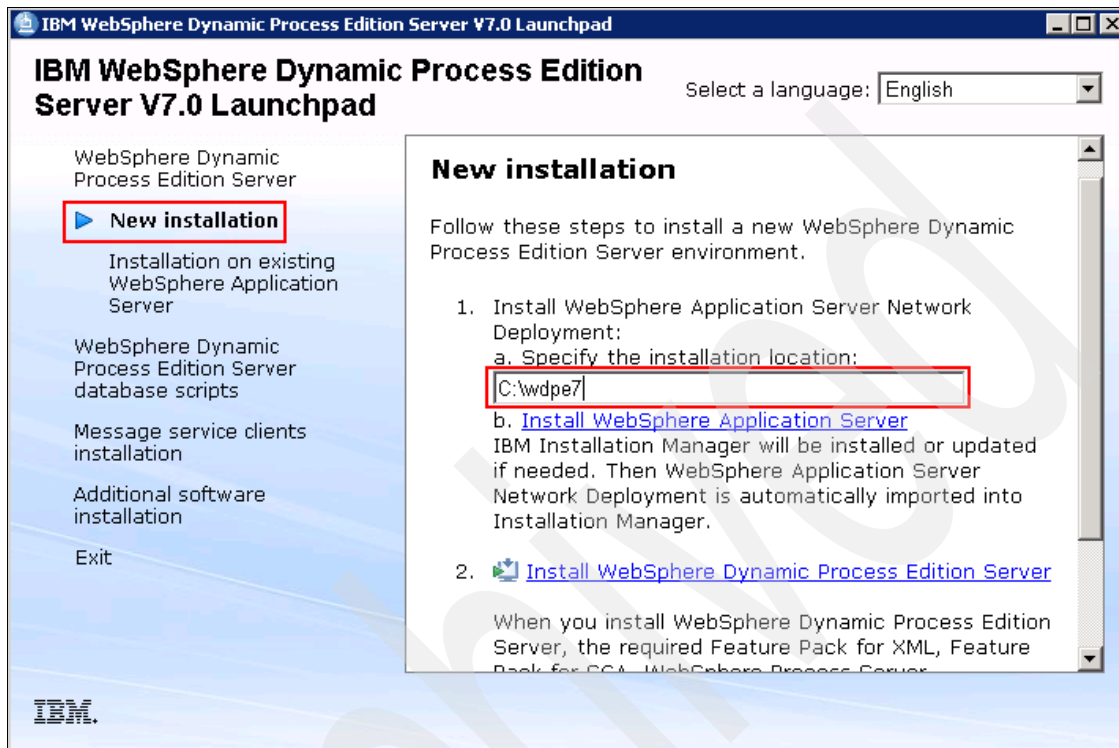
Figure 6-17   Specify the installation location

c. You will see the warning shown in Figure 6-18. If you have an instance of the Installation Manager running, close it. Click **OK** in the Launchpad window to begin the installation of WebSphere Application Server.
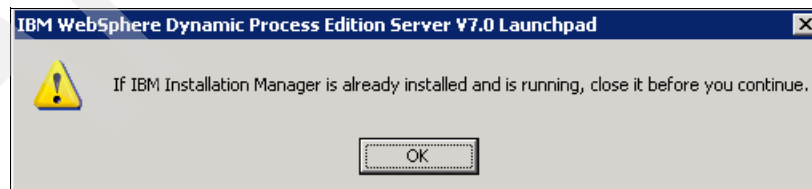
Figure 6-18   Close the running Installation Manager

d. When you see the message shown in Figure 6-19, click **OK**.
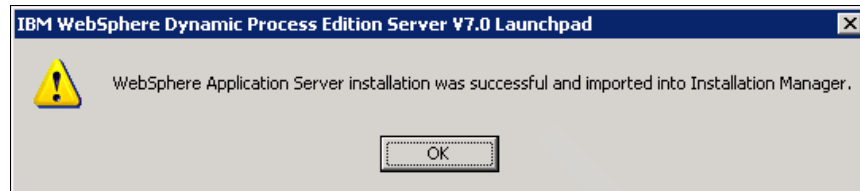
Figure 6-19   Import installed WebSphere Application Server

e. Click **Install WebSphere Dynamic Process Edition Server** to begin the installation of the required components (Figure 6-20).
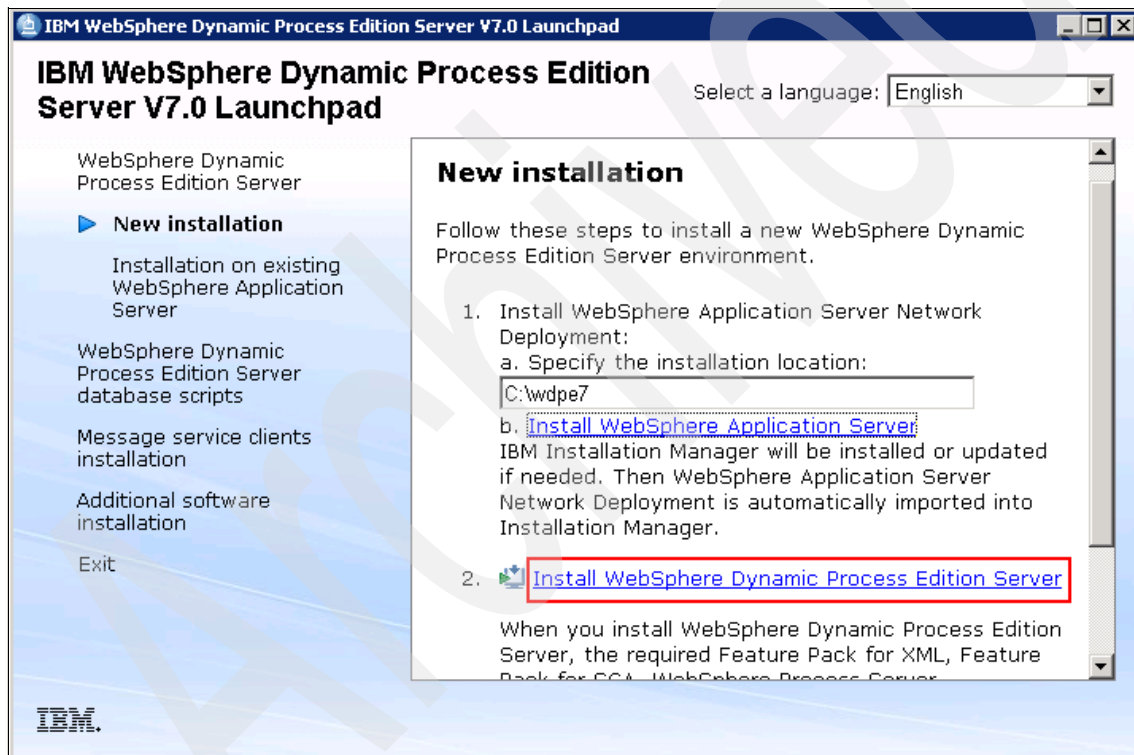
Figure 6-20   Begin the installation of WebSphere Dynamic Process Edition Server

f. Select the components shown in Figure 6-21 and click **Next**.
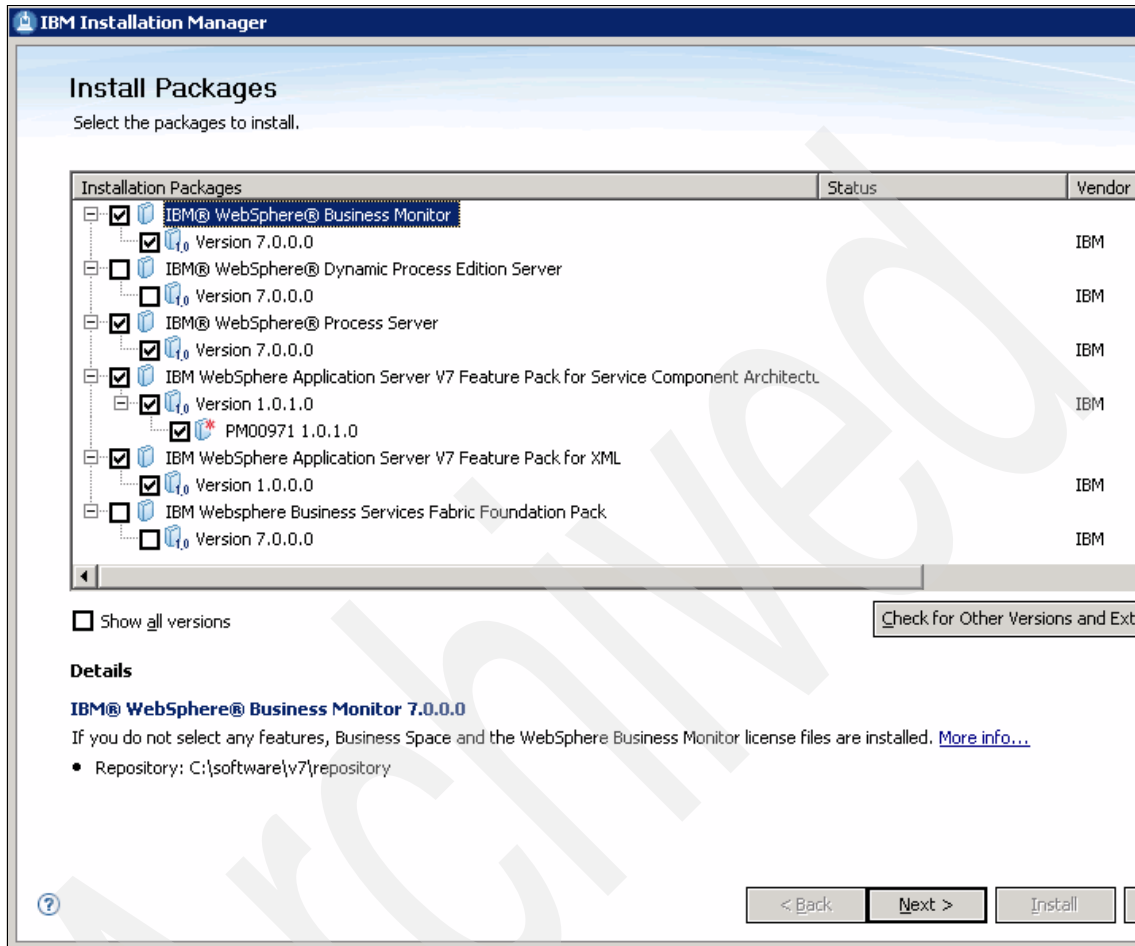
Figure 6-21   Select required components

On the deployment manager machine, we need to install WebSphere
Business Monitor and WebSphere Process Server.

WebSphere Application Server V7.0 Feature Pack for Service Component
Architect and WebSphere Application Server V7.0 Feature Pack for XML
are required by WebSphere Process Server (Figure 6-21).

> **Note:** The IBM WebSphere Dynamic Process Edition Server is the runtime component of the Dynamic Process Edition. It includes the IBM Foundation Pack for WebSphere Business Services Fabric V7.0, IBM WebSphere Process Server V7.0, and IBM WebSphere Business Monitor V7.0. Because we are not including WebSphere Business Services Fabric in this scenario, we select the runtime products individually.

g. Review the license agreements, click **I accept the terms in the license agreements**, and then click **Next** (Figure 6-22).
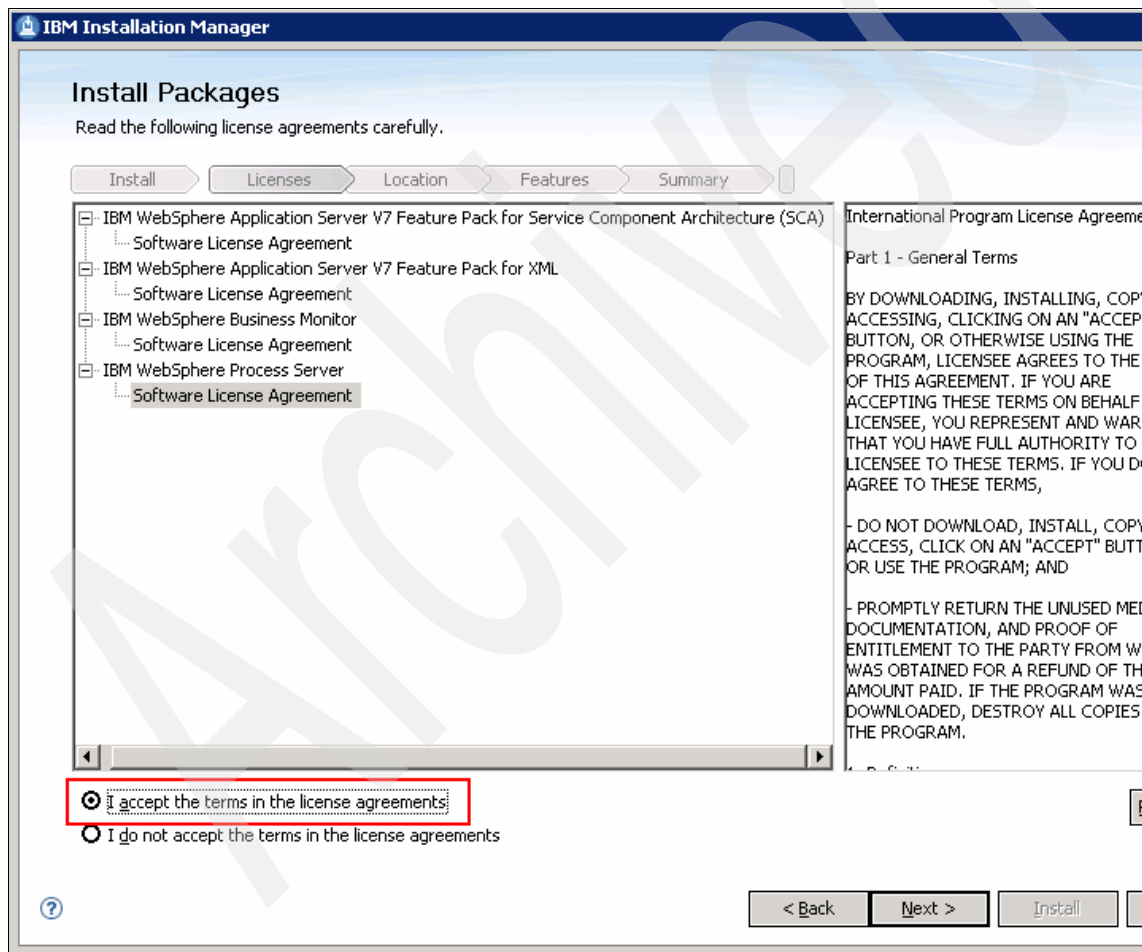
Figure 6-22   Review and accept the license

h. Click **Use the existing package group** to use the installed WebSphere Application Server and click **Next** (Figure 6-23).

WebSphere Dynamic Process Edition V7.0 will be installed into the same directory as the specified WebSphere Application Server.
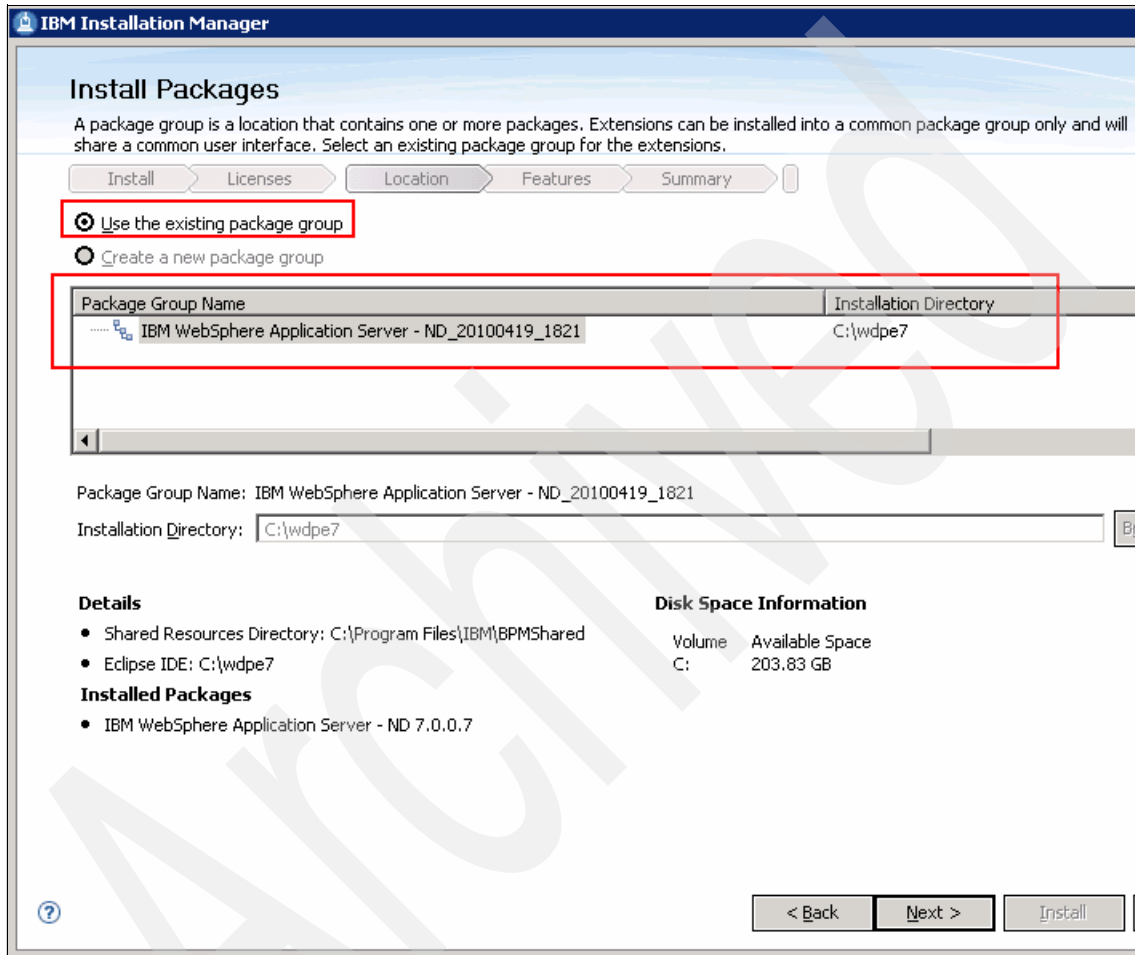
Figure 6-23   Select the used package group

i. Verify the components list and click **Next** (Figure 6-24).
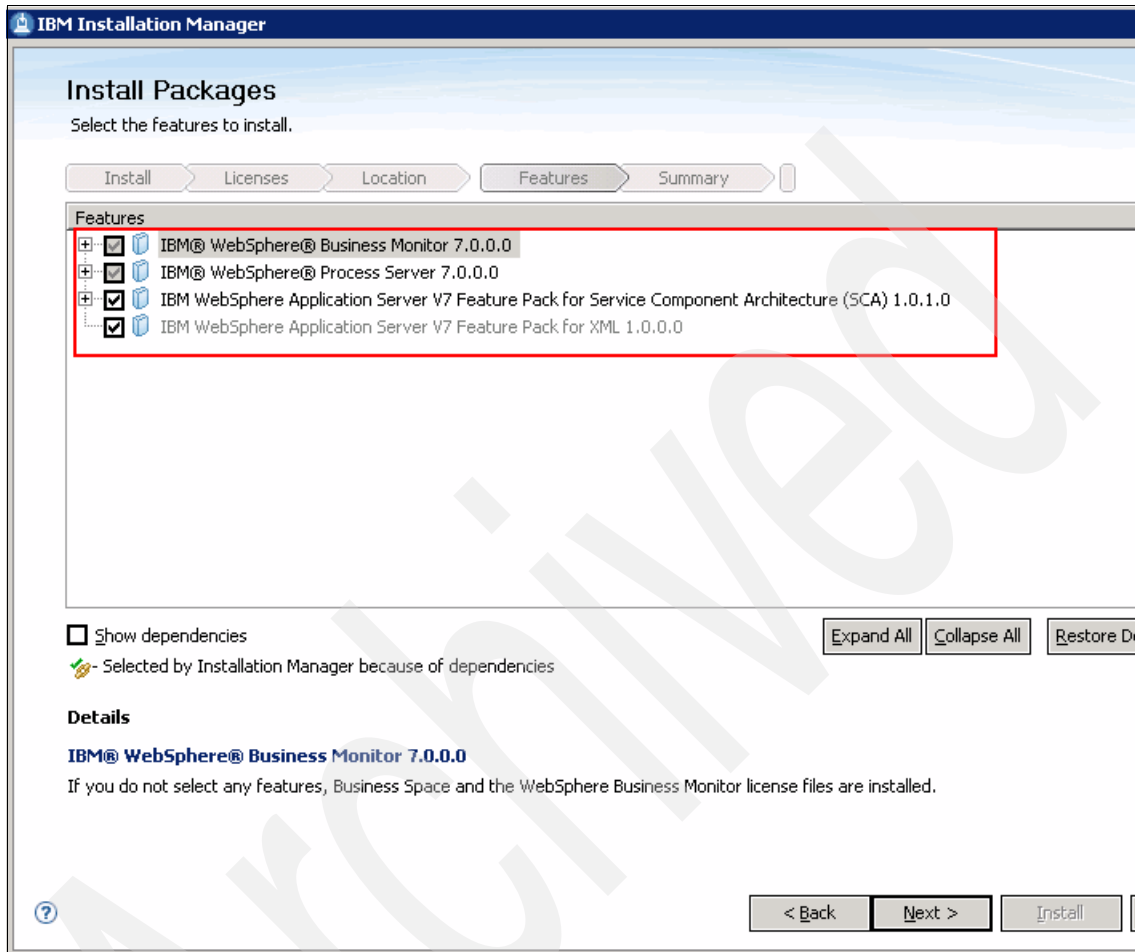
Figure 6-24   Verify the installation components

j. At the summary window, click **Install** (Figure 6-25).
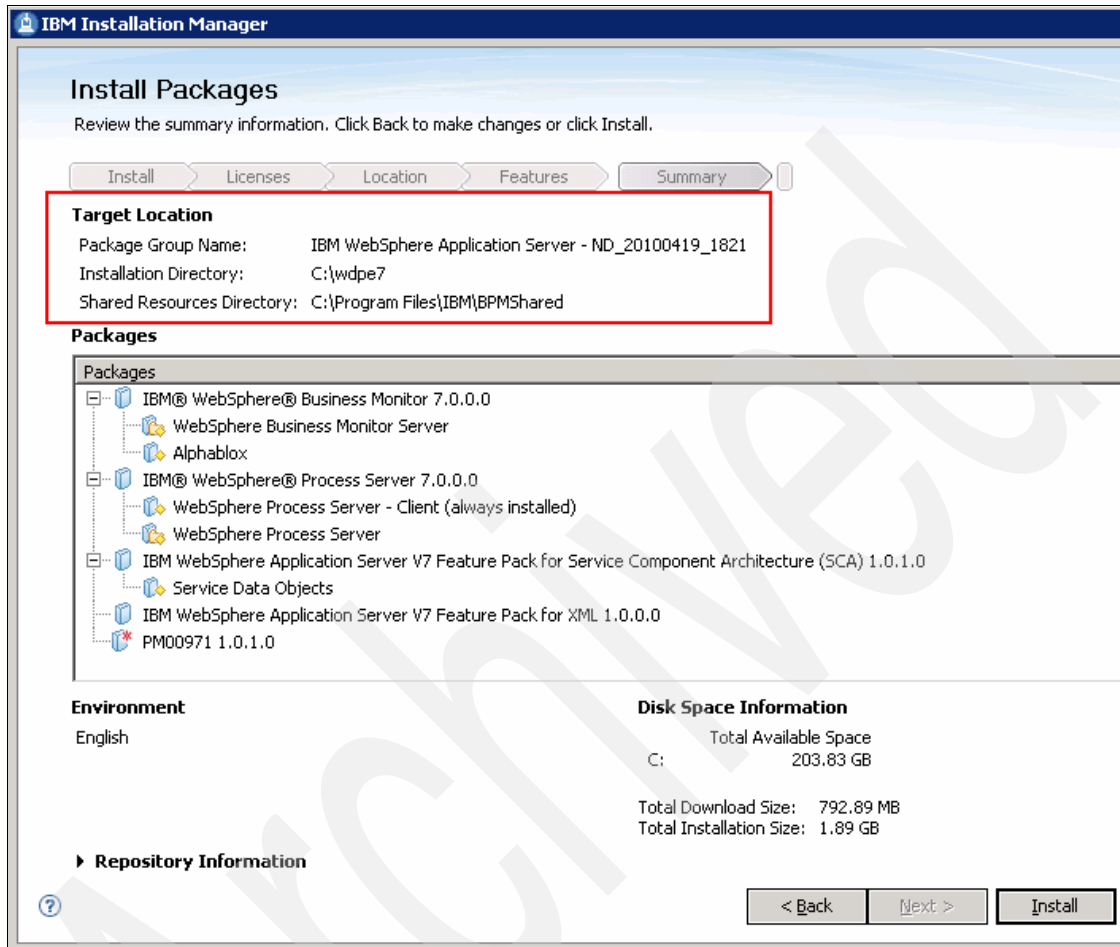
Figure 6-25   Review the summary information

k. Wait for the installation complete, click **None**, and then click **Finish** without launching the profile management tool (Figure 6-26).
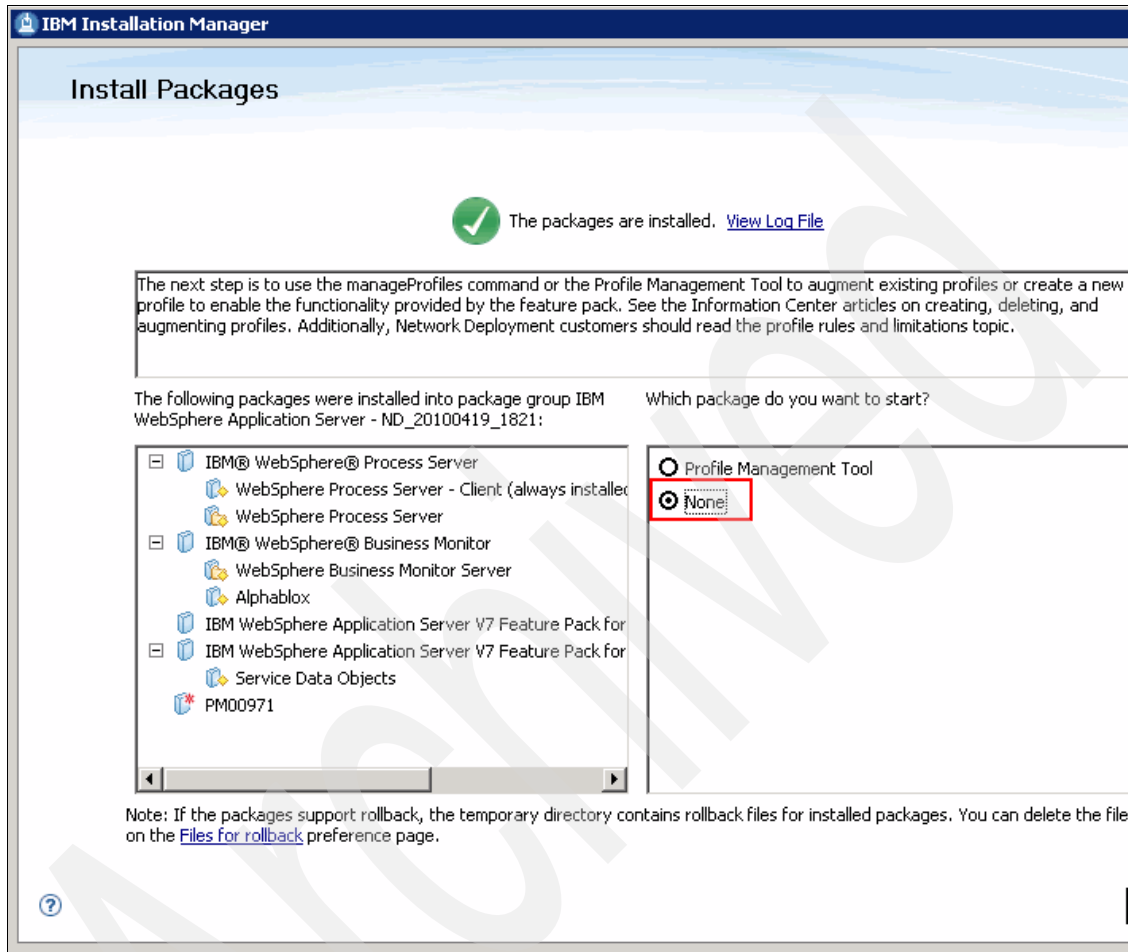
Figure 6-26   Complete the installation

l. Click **Exit** to close the launchpad (Figure 6-27).
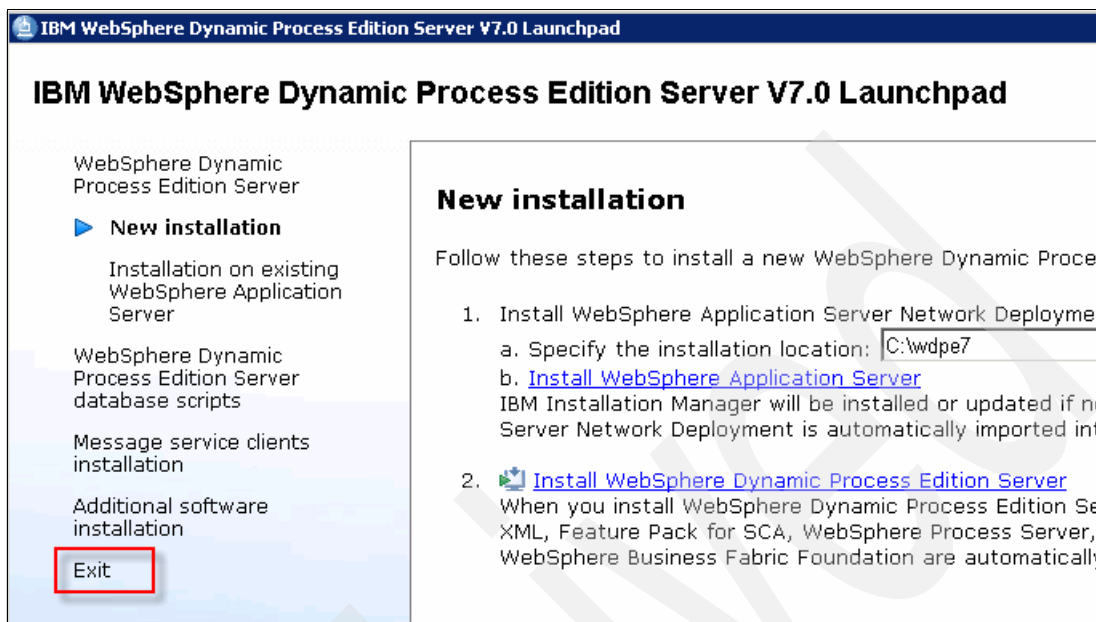
Figure 6-27   Exit IBM WebSphere Dynamic Process Edition Server V7.0 Launchpad

m. Check the installation logs under the `c:\wdpe7\logs` directory for messages indicating the success or failure of the installation.

For example, when checking the `c:\wdpe7\logs\wbi\install\installconfig_server.log` file for the WebSphere Process Server component, you should see the messages shown in Example 6-13. The `INSTCONFSUCCESS` return code indicates success.

Example 6-13   Installation success message

```
<record>
    <date>Apr 14, 2010 5:30:46 PM</date>
    <millis>1271280646937</millis>
    <sequence>1076</sequence>

<logger>com.ibm.ws.install.configmanager.ConfigManager</logger>
    <level>INFO</level>
    <class>com.ibm.ws.install.configmanager.ConfigManager</class>
    <method>launch</method>
    <thread>0</thread>
```

```
        <message>Returning with return code:
INSTCONFSUCCESS</message>
</record>
```

n. Open a command-line window and navigate to the `c:\wdpe7\bin` directory. Execute the **versionInfo.bat** command to verify the version information (Example 6-14).

Example 6-14   versionInfo command output

```
Product List

-----------------------------------------------------------------

SCA                        installed
ND                         installed
WBI                        installed
WBM                        installed
XML                        installed


Installed Product

-----------------------------------------------------------------

Name                       SCA Feature Pack
Version                    1.0.1.0
ID                         SCA
Build Level                z0945.03
Build Date                 11/9/09
Architecture               Intel (32 bit)


Installed Product

-----------------------------------------------------------------

Name                       IBM WebSphere Application Server - ND
Version                    7.0.0.7
ID                         ND
Build Level                wps0946.04
Build Date                 11/18/09
Architecture               Intel (32 bit)


Installed Product

-----------------------------------------------------------------

Name                       IBM WebSphere Process Server
Version                    7.0.0.0
ID                         WBI
Build Level                of0948.05
Build Date                 11/30/09
Architecture               Intel (32 bit)
```

```
Installed Product
------------------------------------------------------------------
Name                      IBM WebSphere Business Monitor
Version                   7.0.0.0
ID                        WBM
Build Level               oap0948.02
Build Date                11/29/09
Architecture              Intel (32 bit)

Installed Product
------------------------------------------------------------------
Name                      XML Feature Pack
Version                   1.0.0.0
ID                        XML
Build Level               g0945.03
Build Date                11/12/09
Architecture              Intel (32 bit)


------------------------------------------------------------------
End Installation Status Report
------------------------------------------------------------------
```

3. Repeat steps 1 and 2 to install WebSphere Dynamic Process Edition V7.0 to `c:\wdpe7` on the systems that host the previous WebSphere Process Server nodes, in this case, saw016-sys1.itso.ral.ibm.com and saw016-sys2.itso.ral.ibm.com.

For these two machines, we install the components shown in Figure 6-28.
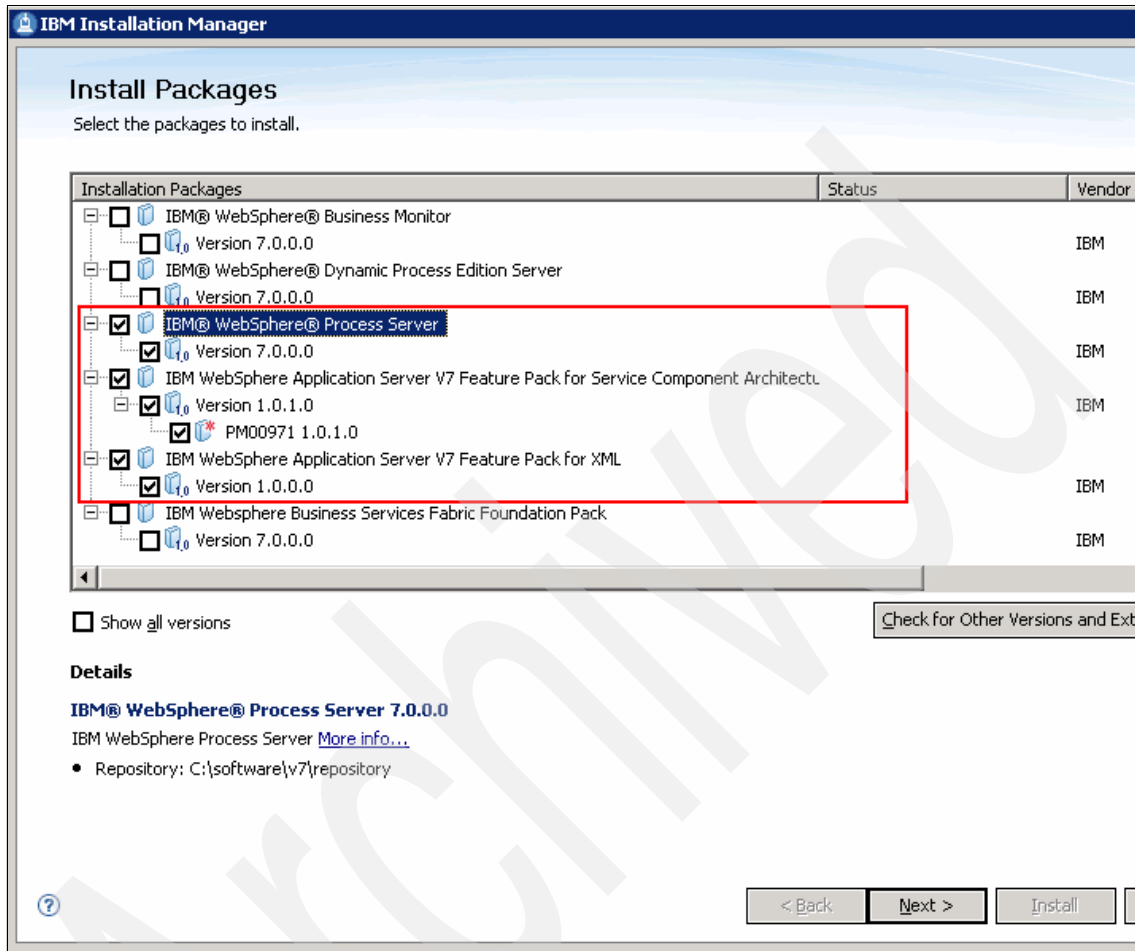
Figure 6-28   WebSphere Process Server components

After installation, execute `c:\wdpe7\versionInfo.bat` and ensure that you see the messages shown in Example 6-15.

Example 6-15   Version information for the WebSphere Process Server node

```
Product List
----------------------------------------------------------------------
SCA                  installed
ND                   installed
WBI                  installed
XML                  installed
```

```
Installed Product
-------------------------------------------------------------------------
Name                      SCA Feature Pack
Version                   1.0.1.0
ID                        SCA
Build Level               z0945.03
Build Date                11/9/09
Architecture              Intel (32 bit)

Installed Product
-------------------------------------------------------------------------
Name                      IBM WebSphere Application Server - ND
Version                   7.0.0.7
ID                        ND
Build Level               wps0946.04
Build Date                11/18/09
Architecture              Intel (32 bit)

Installed Product
-------------------------------------------------------------------------
Name                      IBM WebSphere Process Server
Version                   7.0.0.0
ID                        WBI
Build Level               of0948.05
Build Date                11/30/09
Architecture              Intel (32 bit)

Installed Product
-------------------------------------------------------------------------
Name                      XML Feature Pack
Version                   1.0.0.0
ID                        XML
Build Level               g0945.03
Build Date                11/12/09
Architecture              Intel (32 bit)


-------------------------------------------------------------------------
End Installation Status Report
-------------------------------------------------------------------------
```

4. Repeated steps 1 and 2 to install WebSphere Dynamic Process Edition V7.0 to `c:\wdpe7` on the systems that host the previous WebSphere Business Monitor nodes.machines, in this case, saw016-sys3.itso.ral.ibm.com and saw016-sys4.itso.ral.ibm.com. For these two machines, we install the components shown in Figure 6-29.
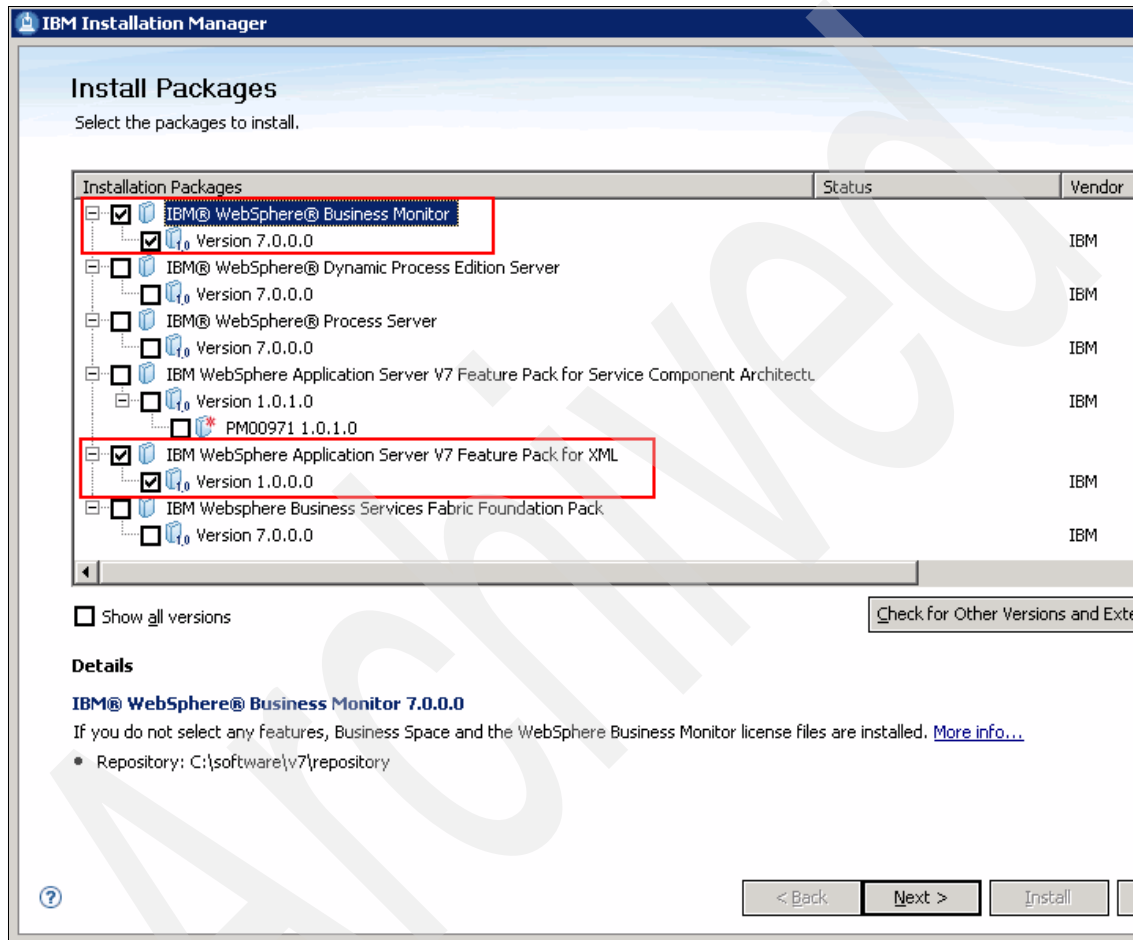
Figure 6-29   WebSphere Business Monitor components

After the installation, execute `c:\wdpe7\versionInfo.bat` and ensure that you see the messages shown in Example 6-16.

Example 6-16   Version information for WebSphere Business Monitor node

```
Product List
----------------------------------------------------------------------
ND                      installed
```

```
WBM                     installed
XML                     installed

Installed Product
-------------------------------------------------------------------------
Name                    IBM WebSphere Application Server - ND
Version                 7.0.0.7
ID                      ND
Build Level             wps0946.04
Build Date              11/18/09
Architecture            Intel (32 bit)

Installed Product
-------------------------------------------------------------------------
Name                    IBM WebSphere Business Monitor
Version                 7.0.0.0
ID                      WBM
Build Level             oap0948.02
Build Date              11/29/09
Architecture            Intel (32 bit)

Installed Product
-------------------------------------------------------------------------
Name                    XML Feature Pack
Version                 1.0.0.0
ID                      XML
Build Level             g0945.03
Build Date              11/12/09
Architecture            Intel (32 bit)


-------------------------------------------------------------------------
End Installation Status Report
-------------------------------------------------------------------------
```

6.4.4 Back up the new installations

As a best practice, before beginning the migration, back up the clean WebSphere Dynamic Process Edition V7.0 installation on each machine. With this backup, you can quickly restore from a migration failure without reinstalling WebSphere Dynamic Process Edition V7.0. You can use a compression tool to back up the `c:\wdpe7` directory.

6.5 Migrate the source environment

This section provides instructions about migrating the Version 6.1.2.x source environment to WebSphere Dynamic Process Edition V7.0. We demonstrate using both the runtime migration command-line tools and the migration GUI wizard tool to migrate a profile.

According to our topology, Figure 6-30 lists the steps we have to do for our runtime migration. The first four steps are already complete.
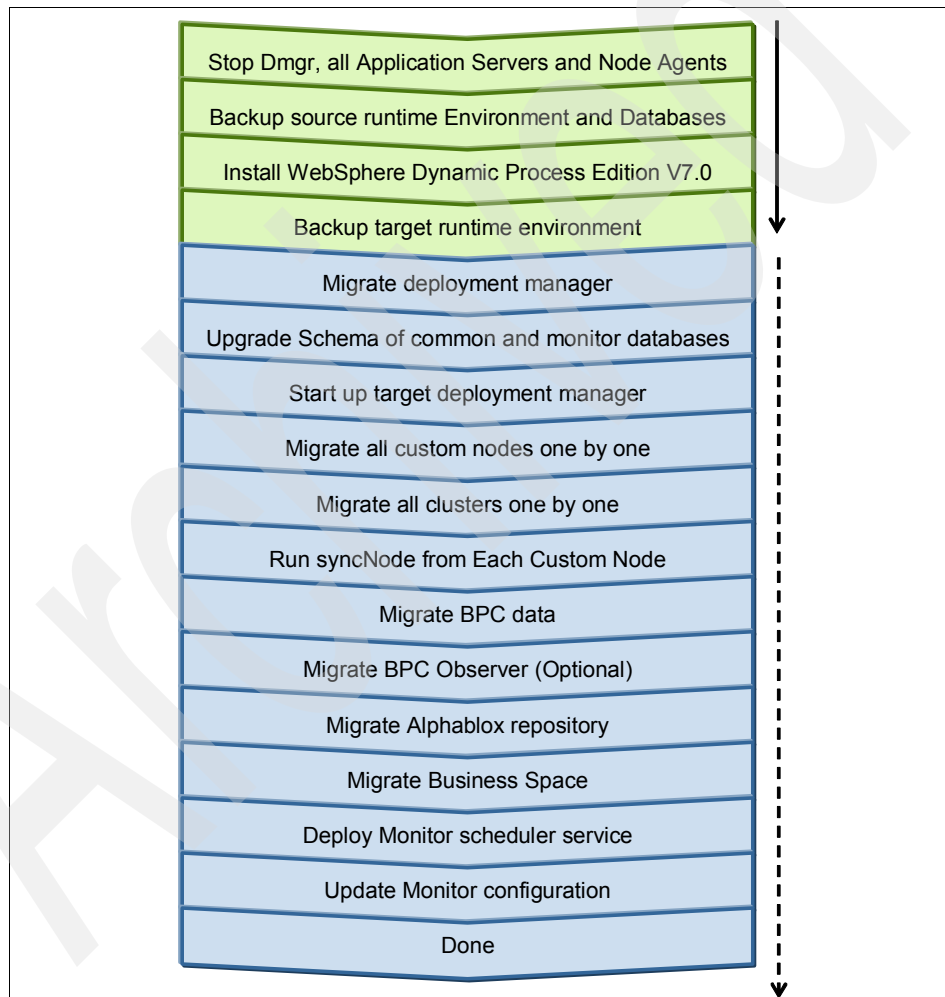
Figure 6-30   Migration steps

6.5.1 Migrate the deployment manager using command-line utilities

You can either use the GUI or command-line utilities for profile migration. We migrate the deployment manager profile by using the command-line utilities.

> **Note:** Remember that after you have performed the migration, you should not start the source deployment manager again.

Create a snapshot of the deployment manager configuration

The first step is to create a snapshot of the deployment manager configuration.

Perform the following steps:

1. Log into the deployment manager machine using the administrator user ID.

2. Launch a command-line window and navigate to the `bin` directory under the target product installation root by running the following command:

   ```
   C:\>cd c:\wdpe7\bin
   ```

3. Execute the following command to get more detailed usage information for the **BPMSnapshotSourceProfile.bat** command:

   ```
   C:\wdpe7\bin>BPMSnapshotSourceProfile.bat -help
   ```

4. Run **BPMSnapshotSourceProfile.bat** (Example 6-17) to copy the deployment manager configuration files to a snapshot directory.

Example 6-17   Example of the BPMSnapshotSourceProfile.bat command

```
C:\wdpe7\bin>BPMSnapshotSourceProfile.bat  -trace fine -traceFile
c:\MigrationSnapshot\WDPEDmgr\MigrationWDPE.trace   c:\wdpe612
WDPEDmgr c:\MigrationSnapshot\WDPEDmgr
```

   – By default, the **BPMSnapshotSourceProfile.bat** command does not print any trace messages. We use the -trace fine option to enable a fine level trace.

   – The -traceFile c:\MigrationSnapshot\WDPEDmgr\MigrationWDPE.trace option specifies the trace file location and name.

   – The c:\wdpe612 parameter specifies the source product installation root.

   – The WDPEDmgr parameter is the source deployment manager profile name. This name must be exactly the same as the source profile name.

- The c:\MigrationSnapshot\WDPEDmgr parameter is the snapshot directory. The command will copy the configuration files into this directory. As a best practice, the snapshot directory should not be located in the source or target product installation directories. Also, if you have multiple profiles on the same machine, specify different snapshot directories for each of them.

The command output is shown in Example 6-18. You should see the successful message at the end.

Example 6-18   The command output of BPMSnapshotSourceProfile.bat

```
C:\wdpe7\bin>BPMSnapshotSourceProfile.bat -trace fine -traceFile
c:\MigrationSnapshot\WDPEDmgr\MigrationWDPE.trace  c:\wdpe612
WDPEDmgr c:\MigrationSnapshot\WDPEDmgr
IBM WebSphere Business Integration, Release 7.0
Product Migration BPMSnapshotSourceProfile tool
Copyright IBM Corp., 2009

sourceWASHome = [C:\wdpe612]
sourceProfileName: [WDPEDmgr]
CWMC00200I: Information is being logged to the
C:\MigrationSnapshot\WDPEDmgr\logs\BPMSnapshotSourceProfile.WDPED
mgr.Mon-Apr-19-19.12.20-EDT-2010.log file.
-traceString
-traceFile
c:\MigrationSnapshot\WDPEDmgr\MigrationWDPE.trace
CWMC00209I: The C:\wdpe7\bin\WASPreUpgrade.bat
c:\MigrationSnapshot\WDPEDmgr c:\wdpe612  -oldProfile WDPEDmgr
-machineChange true -traceString *=fine=enabled -traceFile
c:\MigrationSnapshot\WDPEDmgr\MigrationWDPE.trace WebSphere
Application
 Server utility has been invoked.
CWMC00208I: See the following log file for information:
C:\MigrationSnapshot\WDPEDmgr\logs\WASPreUpgrade.<TIMESTAMP>.log
..........
CWMC00224I: The WebSphere Application Server utility has
completed.
CWMC00208I: See the following log file for information:
C:\MigrationSnapshot\WDP
EDmgr\logs\WASPreUpgrade.<TIMESTAMP>.log
CWMC00823I: The BPMSnapshotSourceProfile command finished
successfully.
```

o. Examine the log files mention in the command output in Example 6-18 on page 242 (highlight in **bold**) under `C:\MigrationSnapshot\logs` to make sure that there are no exceptions in the logs.

In this case, we check `BPMSnapshotSourceProfile.WDPEDmgr.Mon-Apr-19-19.12.20-EDT-2010.log` and find the message shown in Example 6-19, indicating that the command was successful.

Example 6-19   Success message in the BPMSnapshotSourceProifle logs

```
[4/19/10 7:15:34 PM EDT] O BPMSnapshotNode I main(String[] args)
CWMCO0823I: The BPMSnapshotSourceProfile command finished
successfully.
```

In `WASPreUpgrade.Mon-Apr-19-19.12.30-2010.log`, we see the success message at the end of Example 6-20.

Example 6-20   Success message in the WASPreUpgrade logs

```
MIGR0420I: The first step of migration completed successfully.
```

Create the target profile

The second step is to create the target profile.

Perform the following steps:

1. Run the **BPMCreateTargetProfile.bat** command (Example 6-21) to create the target profile.

Example 6-21   Example of the BPMCreateTargetProfile.bat command

```
C:\wdpe7\bin>BPMCreateTargetProfile.bat -targetProfileName WDPEDmgr
-targetProfileDirectory c:\wdpe7\profiles\WDPEDmgr -remoteMigration
false c:\MigrationSnapshot\WDPEDmgr  WDPEDmgr
```

– The -targetProfileName WDPEDmgr option identifies the target deployment manager profile name that will be created under the WebSphere Dynamic Process Edition V7.0 installation. It can be different from the source deployment manager profile name. Here we specified the same profile name for the target profile.

– The -targetProfileDirectory c:\wdpe7\profiles\WDPEDmgr option is the target profile directory.

– The -remoteMigration false option specifies that this is not a remote migration scenario. You should always specify $false$ in network deployment topology, as a remote migration scenario is not applicable.

- The c:\MigrationSnapshot\WDPEDmgr parameter is the migration snapshot directory created by the **BPMSnapshotSourceProfile.bat** command in "Create a snapshot of the deployment manager configuration" on page 241.

- The WDPEDmgr parameter is the source deployment manager profile name that will be migrated.

> **Note:** Target profiles cannot be created with the PMT GUI wizard or the **manageprofiles.bat** command. They can only be created with the BPM migration tool (command-line or GUI migration wizard).

The command output is shown in Example 6-22.

Example 6-22 The command output of BPMCreateTargetProfile.bat

```
C:\wdpe7\bin>BPMCreateTargetProfile.bat -targetProfileName WDPEDmgr
-targetProfileDirectory c:\wdpe7\profiles\WDPEDmgr -remoteMigration
false c:\MigrationSnapshot\WDPEDmgr  WDPEDmgr
args0 value is -targetProfileName
args1 value is WDPEDmgr
args2 value is -targetProfileDirectory
args3 value is c:\wdpe7\profiles\WDPEDmgr
args4 value is -remoteMigration
args5 value is false
args6 value is c:\MigrationSnapshot\WDPEDmgr
args7 value is WDPEDmgr
CWMCO0200I: Information is being logged to the
c:\MigrationSnapshot\WDPEDmgr\logs\BPMCreateTargetProfile.WDPEDmgr.M
on-Apr-19-19.18.36-EDT-2010.log file.
CWMCO0209I: The C:\wdpe7\bin\manageprofiles.bat -winserviceCheck
false -nodeName WDPECellManager -wbmDBPassword UNSET -omitAction
samplesInstallAndConfig -hostName saw007-sys1 -wbmDBUserId UNSET
-cellName WDPECell -profilePath C:\wdpe7\profiles\WDPEDmgr
-wbmDBDelayConfig true -create -profileName WDPEDmgr -templatePath
 C:\wdpe7\profileTemplates\dmgr.wbiserver -wbmDBSchemaName MONITOR
-createDefaultProfileForMigration true -enableAdminSecurity false
WebSphere Application Server utility has been invoked..
INSTCONFSUCCESS: Success: Profile WDPEDmgr now exists. Please
consult C:\wdpe7\profiles\WDPEDmgr\logs\AboutThisProfile.txt for
more information about this profile.

CWMCO0838I: The profile was created or augmented successfully.
CWMCO0209I: The C:\wdpe7\bin\manageprofiles.bat -templatePath
C:/wdpe7/profileTemplates/wbmonitor/dmgr -augment -dbDelayConfig
```

```
true -profileName WDPEDmgr -createDefaultProfileForMigration true
-wbmDBDelayConfig true -wbmDBSchemaName MONITOR -wbmDBUserId UNSET
-wbmDBPassword UNSET WebSphere Application Server utility has been
invoked..
INSTCONFSUCCESS: Profile augmentation succeeded.
```

CWMC00838I: The profile was created or augmented successfully.

2. Examine the log files and the `AboutThisProfile.txt` file in the command output shown in Example 6-22 on page 244 (highlights in **bold**):

   a. Check
      `BPMCreateTargetProfile.WDPEDmgr.Mon-Apr-19-19.18.36-EDT-2010.log`
      to make sure that there are no exceptions in the logs.

   b. Check the profile creation log files under
      `target_install_root`/logs/manageprofiles/ for fatal profile errors. The
      expected messages showing a successful execution are shown in
      Example 6-23.

   Example 6-23   Success message in the profile creation log file

   ```
   <message>INSTCONFSUCCESS: Profile augmentation
   succeeded.</message>
   ...
   <message>Returning with return code: INSTCONFSUCCESS</message>
   ```

   c. Check the profile augment log files under
      `target_install_root`/logs/manageprofiles/ for fatal profile errors. You
      should see the successful execution message in Example 6-24.

   Example 6-24   Success message in the profile augmentation log file

   ```
   <message>INSTCONFSUCCESS: Profile augmentation
   succeeded.</message>
   ...
   <message>Returning with return code: INSTCONFSUCCESS</message>
   ```

   d. Check to see if the `AboutThisProfile.txt` file has been created
      (Example 6-25). This file is created after the profile is successfully created.
      You can also verify the values you entered for node name, cell name, port,
      and so on.

   Example 6-25   Content of AboutThisProfile.txt

   ```
   Application server environment to create: Management
   Location: C:\wdpe7\profiles\WDPEDmgr
   Disk space required: 30 MB
   ```

```
Profile name: WDPEDmgr
Make this profile the default: True
Node name: WDPECellManager
Cell name: WDPECell
Host name: saw007-sys1
Enable administrative security (recommended): False
Administrative console port: 9060
Administrative console secure port: 9043
Management bootstrap port: 9809
Management SOAP connector port: 8879
Run Management as a service: False
```

Migrate the source profile to the target profile

The third step is to migrate the source profile to the target profile.

Perform the following steps:

1. Issue the **BPMMigrateProfile.bat** command (Example 6-26) to migrate the source profile to the target profile.

   Example 6-26   Example of the BPMMigrationProfile.bat command

   ```
   C:\wdpe7\bin>BPMMigrateProfile.bat -username admin -password admin
   -targetProfileName WDPEDmgr -scriptCompatibility false
   -keepSourceDMgrEnabled false -keepAppDirectory false -trace fine
   -traceFile c:\MigrationSnapshot\WDPEDmgr\DmgrMigration.trace
   c:\MigrationSnapshot\WDPEDmgr   WDPEDmgr
   ```

   – The -username admin -password admin option indicates the source
     profile's administrative user ID and password. This is required if global
     security is enabled on the source environment. Also, the user should have
     the operator or administrator role. Here we use the primary administrative
     user ID.

   – The -targetProfileName WDPEDmgr option is the target deployment
     manager profile name created by the **BPMCreateTargetProfile.bat**
     command in "Create the target profile" on page 243. If the name of the
     target profile is different from that of the source profile, this option is
     required.

   – The -scriptCompatibility false option specifies that the migration should
     create WebSphere Application Server V7.0 configuration definitions
     instead of Version 6.x. The default value is true.

> **Note:** You can specify `true` to minimize the impacts to existing administration scripts, if you have existing wsadmin scripts or programs that use third-party configuration APIs to create or modify Version 6.x.
>
> Specifying `true` is only a temporary fix. When all nodes in the environment are at Version 7.0 level, you should perform the following actions:
>
> 1. Modify your administration scripts to use all of the Version 7.0 settings.
> 2. Use the **convertScriptCompatibility.bat** command under the `bin` directory of target profile installation root to convert the configurations to match all of the Version 7.0 settings. For more details, refer to the Information Center topic found at the following address:
>
>   `http://publib.boulder.ibm.com/infocenter/wasinfo/V7.0r0/inde`
>   `x.jsp?topic=/com.ibm.websphere.migration.nd.doc/info/ae/ae/r`
>   `mig_convertscript.html`

– The -keepSourceDMgrEnabled false option specifies that the source deployment manager profile is disabled. This ensures that the source and target deployment managers are not started at the same time. This option is pertinent only for deployment manager profiles.

> **Note:** Specify `true` for this option with care. Specifying `true` means that any configuration changes made in the old configuration during migration might not be migrated.

– The -keepAppDirectory false option specifies that all applications will be installed in a different directories from where they are currently located. The best practice is to specify `false`.

> **Note:** Specifying the option as `true` means that the location is shared by WebSphere Application Server V6.x and V7.0. It will bring mixed-node support limitations and administration risk.

– The -trace fine option enables the fine level trace. Use trace level `all` with care; it can generate a huge size trace file.

– The -traceFile c:\MigrationSnapshot\WDPEDmgr\DmgrMigration.trace option specifies the file where the trace information is written.

- – c:\MigrationSnapshot\WDPEDmgr is the migration snapshot directory created by the **BPMSnapshotSourceProfile.bat** command in "Create a snapshot of the deployment manager configuration" on page 241.
- – WDPEDmgr is the source deployment manager profile name that will be migrated.

For more details, refer to the Information Center topic found at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.websphere.wps.doc/doc/rmig_vtv_bpmmigrateprofile.html

The command output is shown in Example 6-27.

Example 6-27   Output of BPMMigrationProfile.bat (the output is truncated)

```
C:\wdpe7\bin>BPMMigrateProfile.bat -username admin -password admin
-targetProfileName WDPEDmgr -scriptCompatibility false
-keepSourceDMgrEnabled false -keepAppDirectory false -trace fine
-traceFile c:\MigrationSnapshot\WDPEDmgr\DmgrMigratio
n.trace  c:\MigrationSnapshot\WDPEDmgr  WDPEDmgr
IBM WebSphere Business Integration, Release 7.0
Product Migration BPMMigrateProfile tool
Copyright IBM Corp., 2009

backupDirectoryRoot = C:\MigrationSnapshot\WDPEDmgr
Attempting to get the source profile name...
sourceProfileName = [WDPEDmgr]
target profile name = [WDPEDmgr]
Checking username/password...
CWMCO0200I: Information is being logged to the
C:\MigrationSnapshot\WDPEDmgr\logs\BPMMigrateProfile.WDPEDmgr.Mon-Ap
r-19-19.47.14-EDT-2010.log file.
CWMCO0209I: The C:\wdpe7\bin\WASPostUpgrade.bat
c:\MigrationSnapshot\WDPEDmgr  -oldProfile WDPEDmgr -username admin
-password ***** -profileName WDPEDmgr -scrip
tCompatibility false -keepDmgrEnabled false -keepAppDirectory false
-traceString *=fine=enabled -traceFile
c:\MigrationSnapshot\WDPEDmgr\DmgrMigration.trace Web
Sphere Application Server utility has been invoked.
CWMCO0208I: See the following log file for information:
C:\MigrationSnapshot\WDPEDmgr\logs\WASPostUpgrade.WDPEDmgr.<TIMESTAM
P>.log
...............................................................
..
CWMCO0224I: The WebSphere Application Server utility has completed.
```

```
CWMCO0208I: See the following log file for information:
C:\MigrationSnapshot\WDPEDmgr\logs\WASPostUpgrade.WDPEDmgr.<TIMESTAM
P>.log
CWMCO0820I: The ws_ant command is being invoked with the
C:\wdpe7\bin\BPMProfileUpgradeWrapper.bat
C:\wdpe7\profiles\WDPEDmgr\bin\ws_ant.bat -f
C:\wdpe7\util\BPMProfileUpgrade.ant -Duser=admin
-Dwbi.upgrade.previous.profileName=WDPEDmgr -Dpassword=*****
-Duser.install.root=C:\wdpe7\profiles\WDPEDmgr
-Dbpm.upgrade.previous.profileName=WDPEDmgr
-DmigrationDir=C:/MigrationSnapshot/WDPEDmgr command.
CWMCO0208I: See the following log file for information:
C:\MigrationSnapshot\WDPEDmgr\logs\BPMProfileUpgrade.WDPEDmgr.<TIMES
TAMP>.log
....................................
CWMCO0822I: The BPMMigrateProfile command finished successfully.
CWMCO0850I: See the migration documentation for additional migration
tasks that are specific to your configuration such as upgrading
database schemas and/or running BPMMigrateCluster command for
clusters.
```

3. Examine the log files highlighted in **bold** in Example 6-28 and make sure that there are no exceptions:

   - In the BPMMigrateProfile.WDPEDmgr.Mon-Apr-19-19.47.14-EDT-2010.log file, check for the messages in Example 6-28 to ensure that there has been a successful execution.

   Example 6-28   Success message in BPMMigrateProfile log file

   ```
   [4/19/10 8:15:28 PM EDT] 0 BPMMigrateNode  I main(String[] args)
   CWMCO0822I: The BPMMigrateProfile command finished successfully.
   [4/19/10 8:15:28 PM EDT] 0 BPMMigrateNode  I main(String[] args)
   CWMCO0850I: See the migration documentation for additional
   migration tasks that are specific to your configuration such as
   upgrading database schemas and/or running BPMMigrateCluster
   command for clusters.
   ```

   - In the WASPostUpgrade.WDPEDmgr.Mon-Apr-19-19.47.17-2010.log file, we can see the successful message at the end of the example shown in Example 6-29.

   Example 6-29   Success message in WASPostUpgrade log file

   ```
   MIGR0271W: Migration completed successfully, with one or more
   warnings.
   ```

– In the `BPMProfileUpgrade.WDPEDmgr.Mon-Apr-19-20.11.46-2010.log`, file, we can see the successful message at the end of the example shown in Example 6-30.

Example 6-30   Success message in BPMProfileUpgrade log file

```
BUILD SUCCESSFUL
```

6.5.2 Upgrade common database schema

Next, we upgrade the common database schema. Do not start the deployment manager before the database schema is upgraded.

Prepare the scripts

Prepare the scripts by performing the following steps:

1. To upgrade the common database schema, copy the entire *target_install_root*`\dbscripts\CommonDB` folder from the target deployment manager system to a directory on the DB2 system.

   In this case, we copy the folder to `c:\saw016\V7.0` on `saw007-sys2.itso.ral.ibm.com` in our environment.

   As a best practice, copy the whole folder to the DB2 system.

2. Log in to the database system as the db2admin user.

3. Change to the dbscripts folder (`c:\saw016\V7.0\CommonDB\DB2`).

4. We now need to change the current schema in `upgradeSchemaTables.bat`, because the schema name of our common database is different from the DB2 user ID (see Table 6-2 on page 198).

   Open the `upgradeSchemaTables.bat` file with an editor and look for the following line:

   ```
   @db2 set current schema=%DB_USER%
   ```

   Change the schema name to the common database schema. In our example, this line becomes `@db2 set current schema=COMMONDB`.

   > **Important:** If you are not using the database user ID as the schema name for the common database, you need to modify the current schema in `upgradeSchemaTables.bat`.

Execute the scripts

Execute the scripts by performing the following steps:

1. Log in to the database server as the db2admin user.

2. Open a DB2 command prompt and change to the directory where the scripts are located:

```
cd c:\saw016\V7.0\CommonDB\DB2
```

3. Run the **upgradeSchema.bat -help** command if you need usage information:

```
C:\saw016\V7.0\CommonDB\DB2>upgradeSchema.bat -help
```

4. We use the following command to upgrade common database schema (Example 6-31). Make sure each SQL is executed successfully.

Example 6-31   Example of upgradeSchema.bat

```
C:\saw016\V7.0\CommonDB\DB2>upgradeSchema.bat wbiserver 612 WPRCSDB
db2admin
```

- – wbiserver is the migrated profileType for WebSphere Process Server.
- – 612 means that the source product version is WebSphere Process Server V6.1.2.x.
- – WPRCSDB is the common database name.
- – db2admin is the database user who can execute the command scripts.

Upgrade verification

Verify the upgrade by performing the following steps:

1. Check `c:\saw016\V7.0\612.log` and make sure that the five SQL scripts for WebSphere Process Server V6.1.2 are executed (Example 6-32).

Example 6-32   SQL scripts that are executed during upgrade

```
upgradeSchema612_CommonDB.sql
upgradeSchema612_DirectDeploy.sql
upgradeSchema612_governancerepository.sql
upgradeSchema612_relationshipService.sql
wbiserver_upgradeSchema612_Recovery.sql
```

2. Check the table list by using the command-line interface for DB2 (Example 6-33).

Example 6-33   List table command for common database

```
db2 connect to WPRCSDB user db2admin using password
db2 list tables for schema COMMONDB
db2 terminate
```

Make sure the tables shown in Example 6-34 are created.

Example 6-34   Table list for command database after upgrade (the output is truncated)

Table/View	Schema
APPTIMESTAMP	COMMONDB
BYTESTORE	COMMONDB
BYTESTOREOVERFLOW	COMMONDB
CUSTPROPERTIES	COMMONDB
D2D_CONTENT	COMMONDB
D2D_ITEM	COMMONDB
D2D_LOCK	COMMONDB
D2D_MESSAGE	COMMONDB
D2D_METADATA	COMMONDB
D2D_PROGRESS	COMMONDB
FAILEDEVENTBOTYPES	COMMONDB
FAILEDEVENTDETAIL	COMMONDB
FAILEDEVENTMESSAGE	COMMONDB
FAILEDEVENTS	COMMONDB
MEDIATION_TICKETS	COMMONDB
PERSISTENTLOCK	COMMONDB
RELN_METADATA_T	COMMONDB
RELN_VIEW_META_T	COMMONDB
SCHEMAVERSIONINFO	COMMONDB
WSCH_LMGR	COMMONDB
WSCH_LMPR	COMMONDB
WSCH_TASK	COMMONDB
WSCH_TREG	COMMONDB
W_ARTIFACT_BLOB	COMMONDB
W_DBVERSION	COMMONDB
W_LIT_DOUBLE	COMMONDB
W_LIT_FLOAT	COMMONDB
W_LIT_LONG	COMMONDB
W_LOCALE	COMMONDB
W_NAMESPACE	COMMONDB
W_OBJ_LIT_ANY	COMMONDB
W_OBJ_LIT_DATE	COMMONDB
W_OBJ_LIT_DATETIME	COMMONDB
W_OBJ_LIT_STRING	COMMONDB
W_OBJ_PRED_INDEX	COMMONDB
W_OBJ_SUBJ_INDEX	COMMONDB
W_PRED_OBJ_INDEX	COMMONDB
W_PRED_SUBJ_INDEX	COMMONDB
W_STATEMENT	COMMONDB

```
W_SUBJ_OBJ_INDEX                    COMMONDB
W_SUBJ_PRED_INDEX                   COMMONDB
W_URI                               COMMONDB
W_VERSION                           COMMONDB

  43 record(s) selected.
```

6.5.3 Upgrade the monitor database schema using the DDL files

The monitor database schema should be updated before you start the target deployment manager.

Prepare the scripts

Prepare the scripts by performing the following steps:

1. To upgrade monitor database schema, copy the entire
   `target_install_root`\dbscripts\Monitor folder from the target deployment
   manager system to `c:\saw016\V7.0` on the DB2 system. As a best practice,
   you should copy the whole folder to the DB2 system.

2. Log in to the database system as the db2admin user.

3. Change to the dbscripts folder (`c:\saw016\V7.0\Monitor\DB2`).

4. Edit the `upgradeSchema61.sql` file:

   a. Change each occurrence of @SCHEMA@ to your source monitor
      database schema name (for example, MONITOR)

   b. Change each occurrence of @TSDIR@ to your chosen table space
      location and table space prefix. In our example, these occurrences are
      `C:\DBTablespace\RMDEFAULTTS32S,` where `C:\DBTablespace\` is the table
      space location and `RMDEFAULTTS32S` is the table space prefix. The updated
      line (added content is highlighted in **bold**) is shown in Example 6-35.

   Example 6-35   Updated lines for upgradeSchema61.sql (the context is truncated)

   ```
   -- User Temporary Tablespace added for MQT Support
   CREATE USER TEMPORARY TABLESPACE UTMPTS32K PAGESIZE 32 K
   MANAGED BY SYSTEM USING
   ('C:\DBTablespace\RMDEFAULTTS32S_UTMPTS32K' )
   EXTENTSIZE 8 OVERHEAD 10.5 PREFETCHSIZE 32 TRANSFERRATE 0.14
   BUFFERPOOL TMPBP32K;
   ```

Execute the scripts

Execute the scripts by performing the following steps:

1. Open a DB2 command prompt and change to the db2scripts directory:

   ```
   cd c:\saw016\V7.0\Monitor\DB2
   ```

2. Use the following command to upgrade the monitor database schema (Example 6-36). Make sure each SQL is executed successfully.

Example 6-36   Example of an upgraded monitor schema command

```
db2 connect to MONITOR user db2admin using password
db2 -tvf upgradeSchema61.sql
```

Upgrade verification

To verify the upgrade, we list the tables in the MONITOR schema, as shown in Example 6-37.

Example 6-37   List table command for MONITOR database

```
db2 connect to MONITOR user db2admin using password
db2 list tables for schema MONITOR
db2 terminate
```

The expected output is shown in Example 6-38.

Example 6-38   Table list for command database after upgrade (the output is truncated)

```
Table/View                      Schema
------------------------------- ---------------
ABX_LOOKUP                      MONITOR
ABX_LOOKUP_VALUES               MONITOR
ABX_OBJECTS                     MONITOR
ABX_PROPERTY_MAP                MONITOR
ABX_TYPES                       MONITOR
ABX_VERSION                     MONITOR
ACTION                          MONITOR
ACTION_HANDLER_CTRL_T           MONITOR
ACTION_MANAGER_PROP_T           MONITOR
ACTION_T                        MONITOR
ACT_HNDLR_T                     MONITOR
ACT_MGR_ALERTS_T                MONITOR
ACT_MGR_PROP                    MONITOR
ACT_SITUATION_T                 MONITOR
ACT_SIT_TRIG_T                  MONITOR
ACT_TMPLT                       MONITOR
```

```
ACT_TMPLT_T                         MONITOR
ALERTS                              MONITOR
ATAMATCH_T                          MONITOR
CEI_SERVER_SOURCE_T                 MONITOR
D2D_CONTENT                         MONITOR
D2D_ITEM                            MONITOR
D2D_LOCK                            MONITOR
D2D_MESSAGE                         MONITOR
D2D_METADATA                        MONITOR
D2D_PROGRESS                        MONITOR
DASHBOARD_ALERT_T                   MONITOR
DASHBOARD_DATA_T                    MONITOR
DIM_TIME                            MONITOR
DMS_HISTORY_T                       MONITOR
DMS_METADATA_T                      MONITOR
DMS_TRACE_T                         MONITOR
DQ_DEAD_EVENT_T                     MONITOR
DQ_MODEL_VERSION_T                  MONITOR
DSS_MODEL_ARCHIVE_VER_CONFIG_T      MONITOR
DSS_MODEL_CONFIG_T                  MONITOR
DSS_MODEL_CUBE_STATUS_T             MONITOR
DSS_MODEL_SERVICE_CONFIG_T          MONITOR
DSS_MODEL_SERVICE_VER_CONFIG_T      MONITOR
EQ_FAILED_EVENT_T                   MONITOR
EQ_FE_IDS                           MONITOR
EQ_INSTANCE_T                       MONITOR
EQ_MODEL_VERSION_T                  MONITOR
ETAACTRL_T                          MONITOR
ETAMATCH                            MONITOR
ETAMATCH_T                          MONITOR
KPI_HISTORY_T                       MONITOR
KPI_TS_PREDICTION_MODEL_T           MONITOR
KPI_TS_PREDICTION_T                 MONITOR
META_DIMENSION_T                    MONITOR
META_DIM_ATTR_T                     MONITOR
META_KPI_CONTEXT_T                  MONITOR
META_KPI_DEPENDENCY_T               MONITOR
META_KPI_METRIC_FILTER_T            MONITOR
META_KPI_RANGE_T                    MONITOR
META_KPI_T                          MONITOR
META_MEASURE_T                      MONITOR
META_MODEL_STEP_T                   MONITOR
META_MODEL_T                        MONITOR
META_MODEL_UNVERSIONED_T            MONITOR
META_MONITOR_CONTEXT_T              MONITOR
```

```
META_MONITOR_METRIC_T            MONITOR
META_OUTBOUND_EVENT_T            MONITOR
MM_TO_WPS_PT                     MONITOR
MODERATOR_NEXT_ID                MONITOR
MONSCHED_LMGR                    MONITOR
MONSCHED_LMPR                    MONITOR
MONSCHED_TASK                    MONITOR
MONSCHED_TREG                    MONITOR
PLUG_SVC                         MONITOR
PLUG_SVC_T                       MONITOR
RAT_AUTH_DOMAIN                  MONITOR
RAT_PARTY_ROLES                  MONITOR
RAT_RESOURCE_GROUPS              MONITOR
RAT_SUPERUSERS                   MONITOR
RAT_UPDATE_MONITOR               MONITOR
RECORDED_EVENTS                  MONITOR
RECORDED_EVENTS_MODELVERSIONS    MONITOR
SCHEMA_VERSION                   MONITOR
SUBSCRIBED_USER_T                MONITOR
USER_DATA_T                      MONITOR

  81 record(s) selected.
```

6.5.4 Update the JDBC driver

Update the JDBC driver on the WebSphere Dynamic Process Edition V7.0
runtime by performing the following steps:

1. From the DB2 system, copy the following JDBC driver jar files under
   `C:\IBM\DB295\java\` to the JDBC driver directory on each WebSphere
   Dynamic Process Edition V7.0 runtime machine:

   ```
   db2jcc.jar
   db2jcc_license_cu.jar
   ```

Table 6-7 shows the information about the JDBC driver location on each of the machines in our environment.

Table 6-7   JDBC driver locations

Host name	Target JDBC driver directory

saw007-sys1.itso.ral.ibm.com	`C:\wdpe7\universalDriver_wbi\lib`
	`C:\wdpe7\universalDriver.wbm\lib`
	`C:\wdpe7\universalDriver\lib`

saw016-sys1.itso.ral.ibm.com	`C:\wdpe7\universalDriver_wbi\lib`
saw016-sys2.itso.ral.ibm.com	`C:\wdpe7\universalDriver_wbi\lib`
saw016-sys3.itso.ral.ibm.com	`C:\wdpe7\universalDriver.wbm\lib`
saw016-sys4.itso.ral.ibm.com	`C:\wdpe7\universalDriver.wbm\lib`

6.5.5 Start the target deployment manager

Start the new Version 7.0 deployment manager by performing the following steps:

1. Log in to the deployment manager machine with the administrator user ID.

2. Navigate to *target_dmgr_profile_root*/bin directory, for example,
   `C:\wdpe7\profiles\WDPEDmgr\bin`.

3. Execute the **startManager.bat** command.

4. Check `C:\wdpe7\profiles\WDPEDmgr\logs\dmgr\SystemOut.log` to make sure that there are no exceptions.

6.5.6 Migrate the first WebSphere Process Server custom node

After the target deployment manager is started, we can migrate the WebSphere Process Server custom nodes.

Note:

► During custom node migration, WebSphere Dynamic Process Edition V7.0 deployment manager must be running.

► Custom nodes must be migrated one at a time.

Here we migrate the first WebSphere Process Server custom node profile (WPSCust01 in our environment) by using command-line utilities.

Create a snapshot of the source custom profile configuration

Just like the deployment manager migration, the first step is to create the snapshot for the source WebSphere Process Server custom profile.

Perform the following steps:

1. Log in to the first WebSphere Process Server custom node machine (saw016-sys1.itso.ral.ibm.com in our environment) using the administrator user ID.

2. Navigate to the `bin` directory under target product installation root (`C:\wdpe7\bin`).

3. Run **BPMSnapshotSourceProfile.ba**t (Example 6-39) to copy the source WPSCust01 configuration files to a snapshot directory.

Example 6-39   Example of the BPMSnapshotSourceProfile.bat command

```
C:\wdpe7\bin>BPMSnapshotSourceProfile.bat -trace fine -traceFile
c:\MigrationSnapshot\WPSCust01\WPSCust01Migration.trace  c:\wdpe612
WPSCust01  c:\MigrationSnapshot\WPSCust01
```

4. Examine the logs under `C:\MigrationSnapshot\WPSCust01\logs` and make sure that there are no exceptions in the logs.

   – In
     `BPMSnapshotSourceProfile.WPSCust01.Mon-Apr-19-20.34.45-EDT-2010.l`
     `og`, we can see a success message (see Example 6-40) at the end of the example.

   Example 6-40   Success message in the BPMSnapshotSourceProifle logs

   ```
   [4/19/10 8:36:17 PM EDT] 0 BPMSnapshotNode I main(String[] args)
   CWMC00823I: The BPMSnapshotSourceProfile command finished
   successfully.
   ```

   – In `WASPreUpgrade.Mon-Apr-19-20.34.54-2010.log`, we can see a success message (see Example 6-41) at the end of the message.

   Example 6-41   Successful message in the WASPreUpgrade logs

   ```
   MIGR0303I: The existing Application Server environment is save
   MIGR0420I: The first step of migration completed successfully.
   ```

Create the target profile

The next step is to create the target profile by performing the following steps:

1. Run **BPMCreateTargetProfile.bat** (Example 6-42) to create the target profile.

Example 6-42   Example of the BPMCreateTargetProfile command

```
C:\wdpe7\bin>BPMCreateTargetProfile.bat  -targetProfileName
WPSCust01 -targetProfileDirectory c:\wdpe7\profiles\WPSCust01
-remoteMigration  false  c:\MigrationSnapshot\WPSCust01   WPSCust01
```

2. Examine the log and AboutThisProfile.txt files listed in the command output:

   – At the end of the command output, there should be a message indicating that the profile was created successfully (Example 6-43).

   Example 6-43   Success message in the command output

   ```
   CWMCO0838I: The profile was created or augmented successfully.
   ```

   – Check the BPMCreateTargetProfile log and make sure that there are no exceptions in the logs. The log file in this scenario is stored at:

   C:\MigrationSnapshot\WPSCust01\logs\BPMCreateTargetProfile.WPSCust01.Mon-Apr-19-20.39.00-EDT-2010.log

   – Check the profile creation log files for any fatal profile errors (C:\wdpe7\logs\manageprofiles\WPSCust01_create.log).

   The message in Example 6-44 indicates that the profile was created successfully.

   Example 6-44   Profile creation or augmentation successful message

   ```
   <message>Returning with return code: INSTCONFSUCCESS</message>
   ```

   – Check C:\wdpe7\profiles\WPSCust01\logs\AboutThisProfile.txt (Example 6-45). This file is created after the profile is successfully created. You can also verify the values you entered for node name, cell name, port, and so on.

   Example 6-45   Content of AboutThisProfile.txt

   ```
   Application server environment to create: Custom
   Location: C:\wdpe7\profiles\WPSCust01
   Disk space required: 10 MB
   Profile name: WPSCust01
   Make this profile the default: True
   ```

```
Node name: WPSNode01
Host name: saw016-sys1
Federate to deployment manager: False
```

Migrate the source profile to the target profile

Perform the migration of the profile by performing the following steps:

1. Run **BPMMigrateProfile.bat** (Example 6-46) to migrate the source profile to the target profile.

Example 6-46   Example of the the BPMMigrationProfile.bat command

```
C:\wdpe7\bin>BPMMigrateProfile.bat -username admin -password admin
-targetProfileName WPSCust01 -scriptCompatibility false
-keepAppDirectory false  -trace fine -traceFile
c:\MigrationSnapshot\WPSCust01\MigrationWPSCust01.trace
c:\MigrationSnapshot\WPSCust01   WPSCust01
```

2. Examine the log files to make sure that there are no exceptions;

   – In the command output, you should find the success message shown in Example 6-47.

   Example 6-47   Success message for the BPMMigrationProfile command

   ```
   CWMC00822I: The BPMMigrateProfile command finished successfully.
   CWMC00850I: See the migration documentation for additional
   migration tasks that are specific to your configuration such as
   upgrading database schemas and/or running BPMMigrateCluster
   command for clusters.
   ```

   – In the BPMProfileUpgrade log, you should see a "build successful" message at the end of the log. In our scenario, the file is located at:

   ```
   C:\MigrationSnapshot\WPSCust01\logs\BPMProfileUpgrade.WPSCust01.M
   on-Apr-19-20.58.54-2010.log
   ```

   – In the WASPostUpgrade log, we can see a success message at the end of the log, as shown in Example 6-48. The log is located at:

   ```
   C:\MigrationSnapshot\WPSCust01\logs\WASPostUpgrade.WPSCust01.Mon-
   Apr-19-20.47.12-2010.log
   ```

   Example 6-48   Success message in the WASPostUpgrade log file

   ```
   MIGR0271W: Migration completed successfully, with one or more
   warnings.
   ```

– In the `BPMMigrateProfile` log, we see the messages shown in Example 6-49 that indicate a successful migration. The log is located at:

```
C:\MigrationSnapshot\WPSCust01\logs\BPMMigrateProfile.WPSCust01.M
on-Apr-19-20.47.09-EDT-2010.log
```

Example 6-49   Success message in the BPMMigrateProfile log file

```
MIGR0271W: Migration completed successfully, with one or more
warnings.
```

6.5.7 Migrate the second WebSphere Process Server custom node

For demonstration purpose, we migrate the second WebSphere Process Server custom node profile (WPSCust02) using the BPM profile migration wizard.

Migrate the profile

Migrate the profile using the BPM profile migration wizard and perform the following steps:

1. Log in to the second WebSphere Process Server custom node machine (saw016-sys2.itso.ral.ibm.com) using the administrator user ID.

2. Navigate to the `bin` directory under the target product installation root (`C:\wdpe7\bin` in our environment).

3. Run **BPMMigrate.bat**. The welcome window opens (Figure 6-31). Click **Next**.
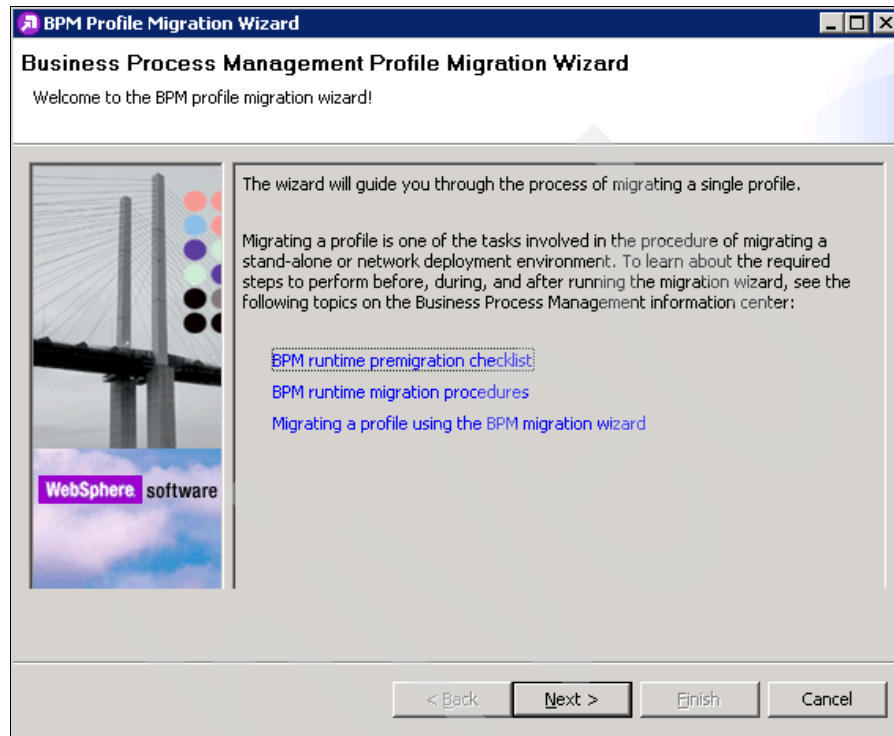
Figure 6-31   Welcome window of BPM profile migration wizard

4. Select **Custom Migration** as the migration type and click **Next** (Figure 6-32).
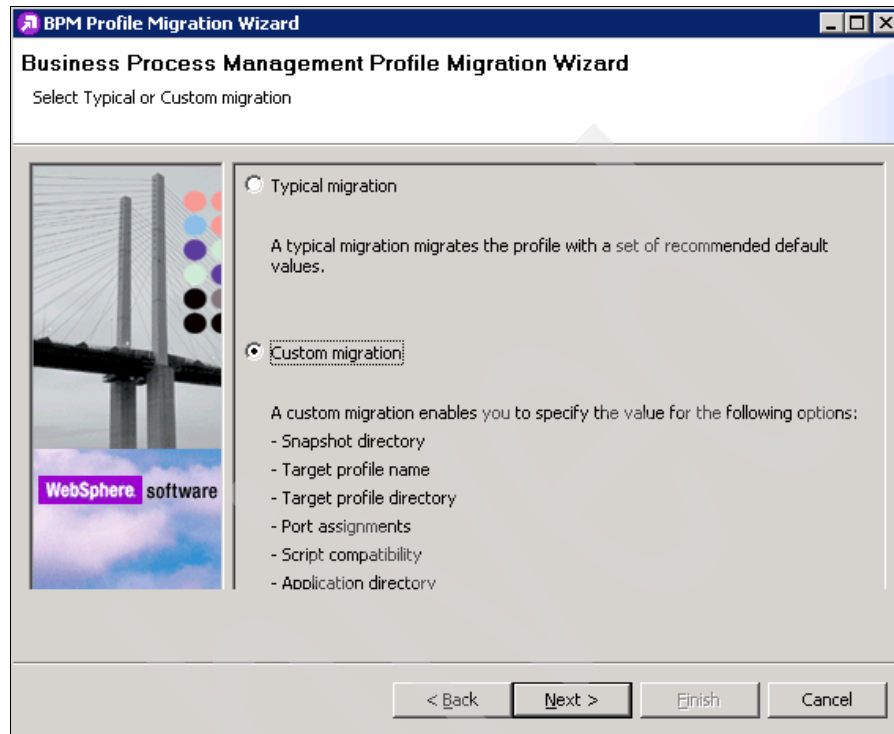
Figure 6-32   Migration type selection window

5. The migration wizard detects our Version 6.1.2 installation automatically (Figure 6-33), so we simply select it.

   If your migration wizard does not detect the source installation automatically, click **Browse for a compatible migration source that was not detected** and specify the source product installation root. Click **Next** when you finish.
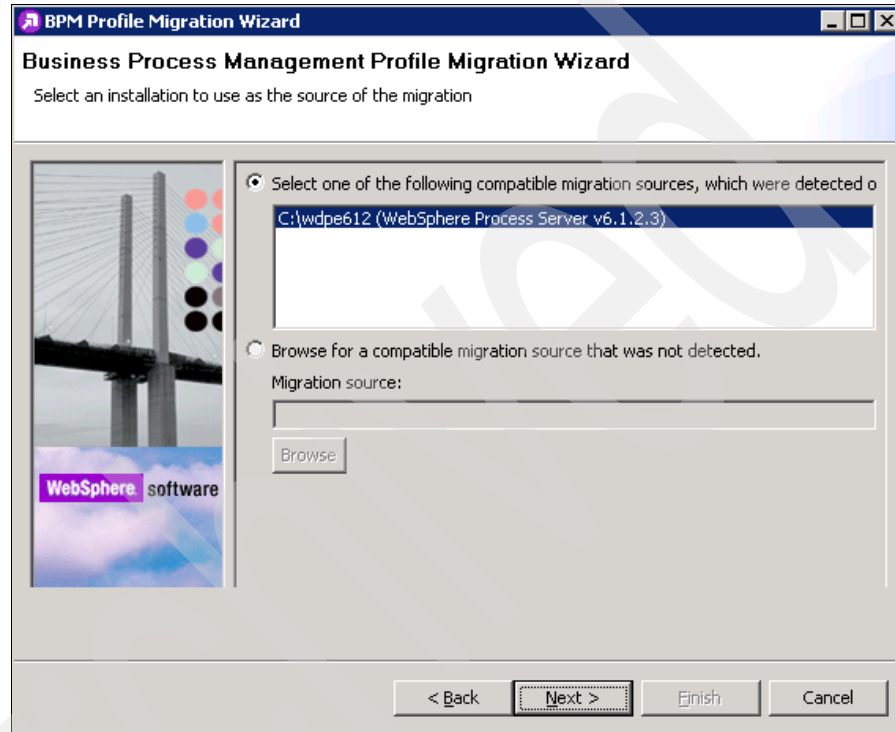
Figure 6-33   Migration source selection window

6. The migration wizard detects the source profiles in the source installation. Select the one you want to migrate. Here we only have one profile to be migrated:

   ```
   WPSCust02, Managed[managed.wbiserver],C:\wdpe612\profiles\WPSCust02
   ```

Enter the administrative user ID and password for the selected profile and click **Next** (Figure 6-34).
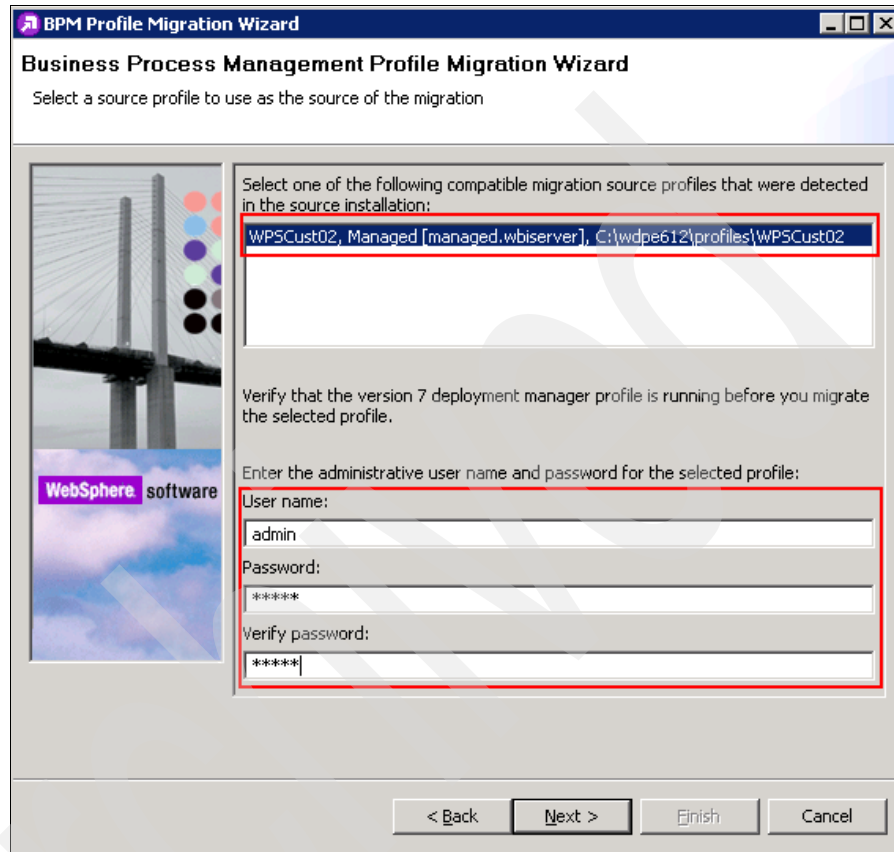
Figure 6-34   Migration source profile and profile type window

7. Specify the Snapshot™ directory and click **Next**. In our example, this is
    `C:\MigrationSnapshots\WPSCust02` (Figure 6-35). This could be any directory
    on the machine, but as a best practice, choose a different directory than the
    source and target installation directories.
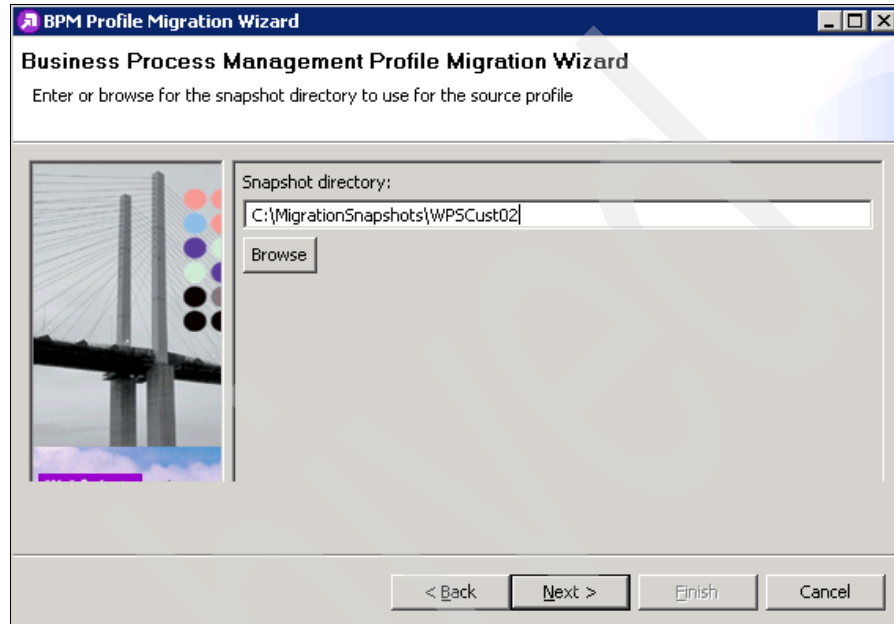
Figure 6-35   Snapshot directory window

8. We enter WPSCust02 and C:\wdpe7\profiles\WPSCust02 as Target profile name and Target profile directory (Figure 6-36). The target profile name can be different from the source profile name. Click **Next**.
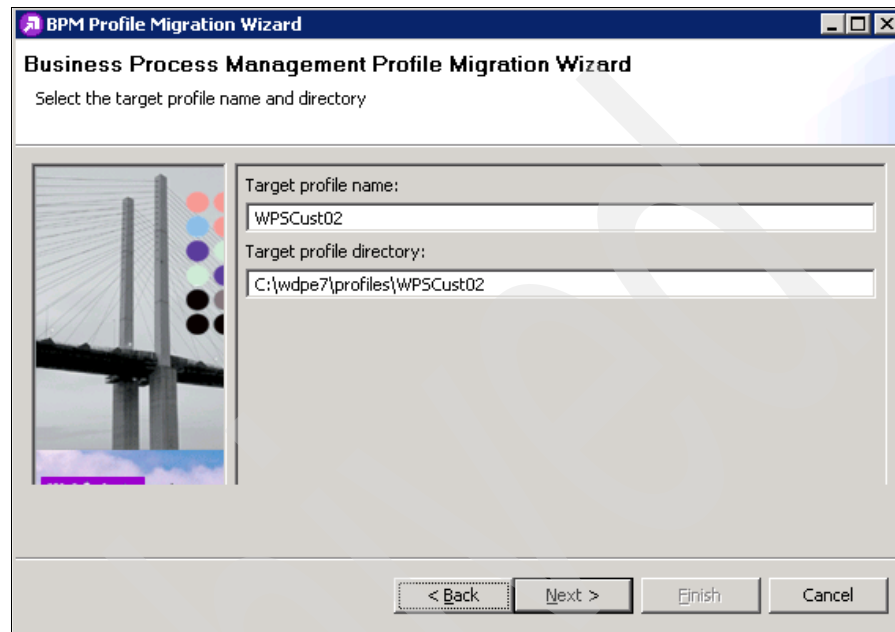
Figure 6-36   Target profile name and directory window

9. In the profile migration summary window, verify the migration selections. Click **Next** to begin the migration (Figure 6-37).
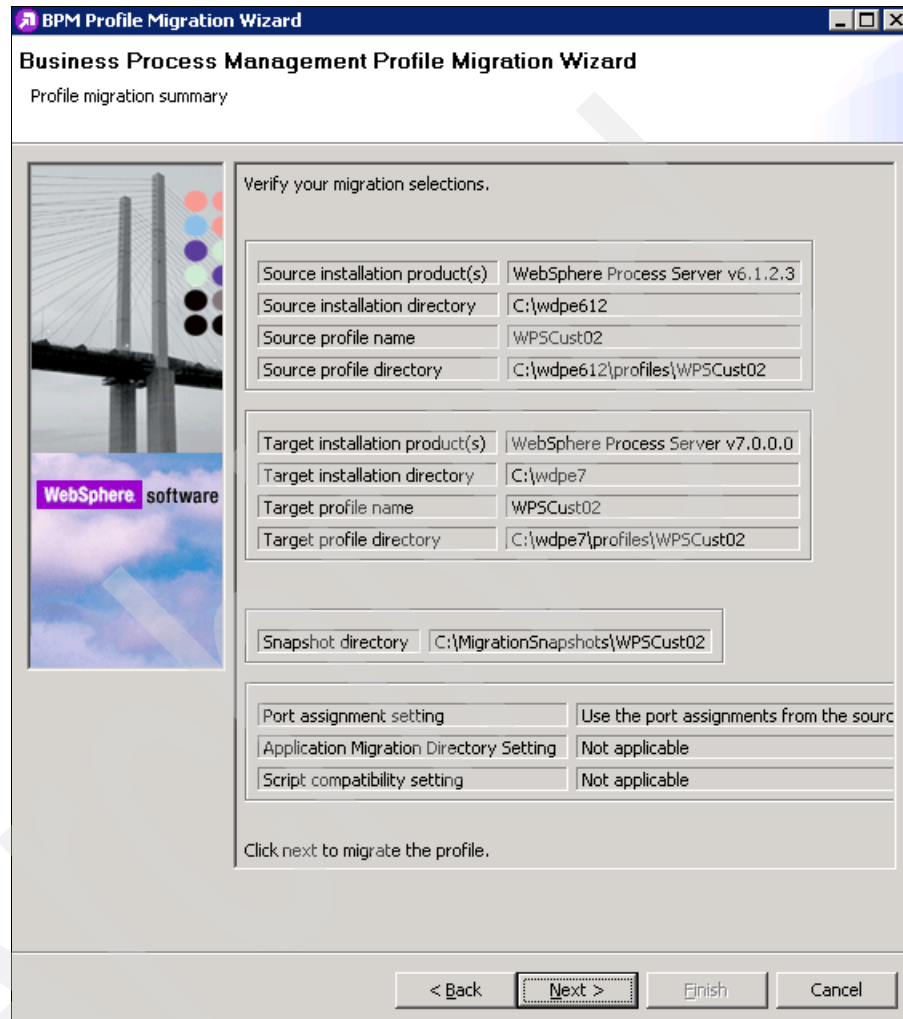
Figure 6-37   Profile migration summary window

10. The status of the profile migration is shown in the migration execution window (Figure 6-38).
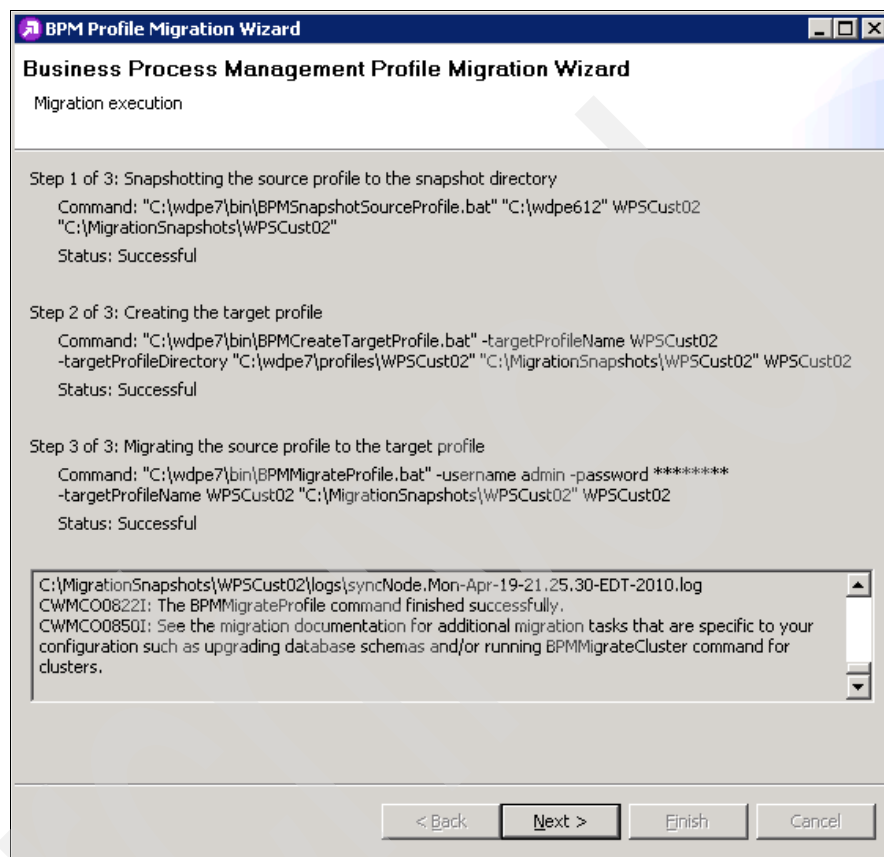
Figure 6-38   Migration execution window

Monitor the migration to validate that it is running successfully.

11. When the migration is finished you should see the window shown in Figure 6-39. Click **Finish** to exit.
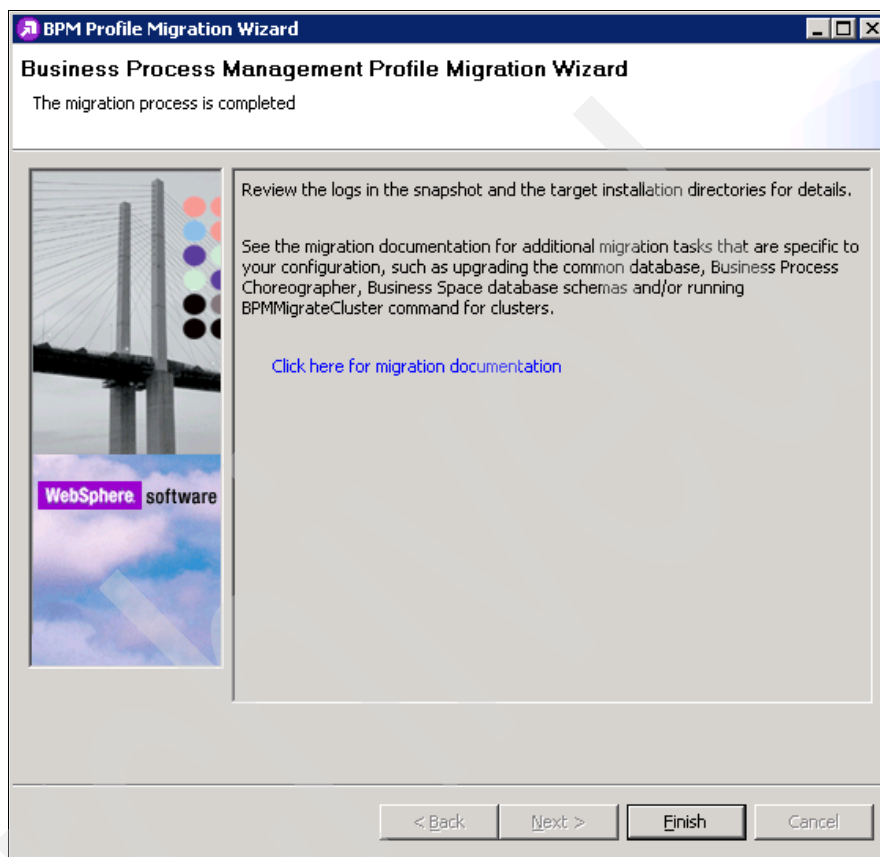
Figure 6-39   Migration completed window

Migration verification

To verify that the migration is successful, check the following logs:

- ▶ The migration logs are located in `c:\MigrationSnapshots\WPSCust02\logs`. Examine the following logs to make sure that there are no exceptions:
  - `BPMSnapshotSourceProfile.WPSCust02.Mon-Apr-19-21.08.24-EDT-2010.log`
  - `WASPreUpgrade.Mon-Apr-19-21.08.31-2010.log`
  - `BPMCreateTargetProfile.WPSCust02.Mon-Apr-19-21.09.45-EDT-2010.log`
  - `WASPostUpgrade.WPSCust02.Mon-Apr-19-21.12.20-2010.log`
  - `BPMProfileUpgrade.WPSCust02.Mon-Apr-19-21.23.45-2010.log`
  - `BPMMigrateProfile.WPSCust02.Mon-Apr-19-21.12.18-EDT-2010.log`

For information about what messages to look for in the logs, refer to 6.5.6, "Migrate the first WebSphere Process Server custom node" on page 257

► Check the profile creation log and the `AboutThisProfile.txt` file to make sure the profile is created successfully:

  – `C:\wdpe7\logs\manageprofiles\WPSCust02_create.log`
  – `C:\wdpe7\profiles\WPSCust02\logs\AboutThisProfile.txt`

6.5.8 Migrate the first WebSphere Business Monitor custom node

Now we migrate the first WebSphere Business Monitor custom node profile (WBMCust01). All the WebSphere Dynamic Process Edition products use the common profile migration command-line utilities. We migrate the WBMCust01 profile using the command-line utilities. You can either use a GUI or the command-line utilities for migration.

Create a snapshot of the source custom profile configuration

The first step is to create the snapshot of the source WebSphere Business Monitor custom profile by performing the following steps:

1. Log in to the WebSphere Business Monitor custom node machine (saw016-sys3.itso.ral.ibm.com in our environment) with the administrator user ID.

2. Navigate to the `bin` directory under target product installation root (`C:\wdpe7\bin` in our environment).

3. Run **`BPMSnapshotSourceProfile.bat`** (Example 6-50) to copy the source WBMCust01 configuration files to a snapshot directory.

Example 6-50   Example of the BPMSnapshotSourceProfile.bat command

```
C:\wdpe7\bin>BPMSnapshotSourceProfile.bat -trace  fine  -traceFile
c:\MigrationSnapshot\WBMCust01\WBMCust01Migration.trace c:\wdpe612
WBMCust01   c:\MigrationSnapshot\WBMCust01
```

4. Examine the logs under `C:\MigrationSnapshot\WPSCust01\logs` and make sure that there are no exceptions:

   – In `BPMSnapshotSourceProfile.WBMCust01.Mon-Apr-19-21.40.22-EDT-2010.log`, we can see the message shown in Example 6-51 at the end of the message that indicates a successful snapshot.

   Example 6-51   Success message in the BPMSnapshotSourceProifle logs

   ```
   [[4/19/10 9:40:41 PM EDT] 0 BPMSnapshotNode I main(String[] args)
   CWMC00823I: The BPMSnapshotSourceProfile command finished
   successfully.
   ```

   – In `WASPreUpgrade.Mon-Apr-19-21.40.26-2010.log`, we can see the message shown in Example 6-52 at the end of the message that indicates a upgrade.

   Example 6-52   Success message in the WASPreupgrade logs

   ```
   MIGR0303I: The existing Application Server environment is save
   MIGR0420I: The first step of migration completed successfully.
   ```

Create the target profile

Next, create the target profile by performing the following steps:

1. Run **BPMCreateTargetProfile.bat** (Example 6-53) to create the target profile.

   Example 6-53   Example of the BPMCreate Target Profile command

   ```
   C:\wdpe7\bin>BPMCreateTargetProfile.bat  -targetProfileName
   WBMCust01 -targetProfileDirectory  c:\wdpe7\profiles\WBMCust01
   -remoteMigration  false  c:\MigrationSnapshot\WBMCust01
   WBMCust01
   ```

2. Examine the command output, logs, and the `AboutThisProfile.txt` file listed in the command output.

   – At the end of the command output, we see the message indicating that the profile was created successfully (Example 6-54).

   Example 6-54   Success message in the command output

   ```
   CWMC00838I: The profile was created or augmented successfully.
   ```

- Check the BPMCreateTargetProfile log
  (`C:\MigrationSnapshot\WBMCust01\logs\BPMCreateTargetProfile.WBMCu st01.Mon-Apr-19-21.46.34-EDT-2010.log`) and make sure that there are no exceptions.

- Check the profile creation log file,
  `C:\wdpe7\logs\manageprofiles\WBMCust01_create.log`, for any fatal profile errors. You should see the message shown in Example 6-55 if the profile is created successfully.

Example 6-55   Profile creation or augmentation success message

```
<message>Returning with return code: INSTCONFSUCCESS</message>
```

- Check the `C:\wdpe7\profiles\WBMCust01\logs\AboutThisProfile.txt` file to make sure the profile is created (Example 6-56).

Example 6-56   Content of AboutThisProfile.txt

```
Application server environment to create: Custom
Location: C:\wdpe7\profiles\WBMCust01
Disk space required: 10 MB
Profile name: WBMCust01
Make this profile the default: True
Node name: WBMNode01
Host name: saw016-sys3
Federate to deployment manager: False
```

Migrate the source profile to the target profile

Next, migrate the source profile by performing the following steps:

1. Run **BPMMigrateProfile.bat** (Example 6-57) to migrate the source profile to the target profile.

Example 6-57   Example of the BPMMigrationProfile.bat command

```
C:\wdpe7\bin>BPMMigrateProfile.bat  -username admin -password admin
-targetProfileName  WBMCust01  -scriptCompatibility  false
-keepAppDirectory  false -trace fine  -traceFile
C:\MigrationSnapshot\WBMCust01\MigrationWBMCust01.trace
c:\MigrationSnapshot\WBMCust01  WBMCust01
```

2. Examine the log files to make sure that there are no exceptions:

   – In the command output, you should find the "command finished successfully" message, as shown in Example 6-58.

   Example 6-58   Success message for the BPMMigrationProfile command

   ```
   CWMC00822I: The BPMMigrateProfile command finished successfully.
   CWMC00850I: See the migration documentation for additional
   migration tasks that are specific to your configuration such as
   upgrading database schemas and/or running BPMMigrateCluster
   command for clusters.
   ```

   – In
     `C:\MigrationSnapshot\WBMCust01\logs\BPMProfileUpgrade.WBMCust01.M`
     `on-Apr-19-21.55.53-2010.log`, we see the "build successful" message at
     the end of the log.

   – In
     `C:\MigrationSnapshot\WBMCust01\logs\WASPostUpgrade.WBMCust01.Mon-`
     `Apr-19-21.52.37-2010.log`, we see the message shown in Example 6-59.

   Example 6-59   Success message in the WASPostUpgrade log file

   ```
   MIGR0271W: Migration completed successfully, with one or more
   warnings.
   ```

   – In
     `C:\MigrationSnapshot\WBMCust01\logs\BPMMigrateProfile.WBMCust01.M`
     `on-Apr-19-21.52.35-EDT-2010.log`, we see the message shown in
     Example 6-60.

   Example 6-60   Success message in the BPMMigrateProfile log file

   ```
   MIGR0271W: Migration completed successfully, with one or more
   warnings.
   ```

6.5.9 Migrate the second WebSphere Business Monitor custom node

Now we can migrate the second WebSphere Business Monitor custom node
(WBMCust02). For demonstration purpose, we use the BPM profile migration
wizard to for this profile. You can either use a GUI or command-line utilities for
the migration.

Perform the following steps:

1. Log in to the second WebSphere Business Monitor custom node machine
   (saw016-sys4.itso.ral.ibm.com) using the administrator user ID.

2. Navigate to the `bin` directory under target product installation root
   (`C:\wdpe7\bin`).

3. Run **BPMMigrate.bat**. The welcome window opens (Figure 6-40). Click **Next**.
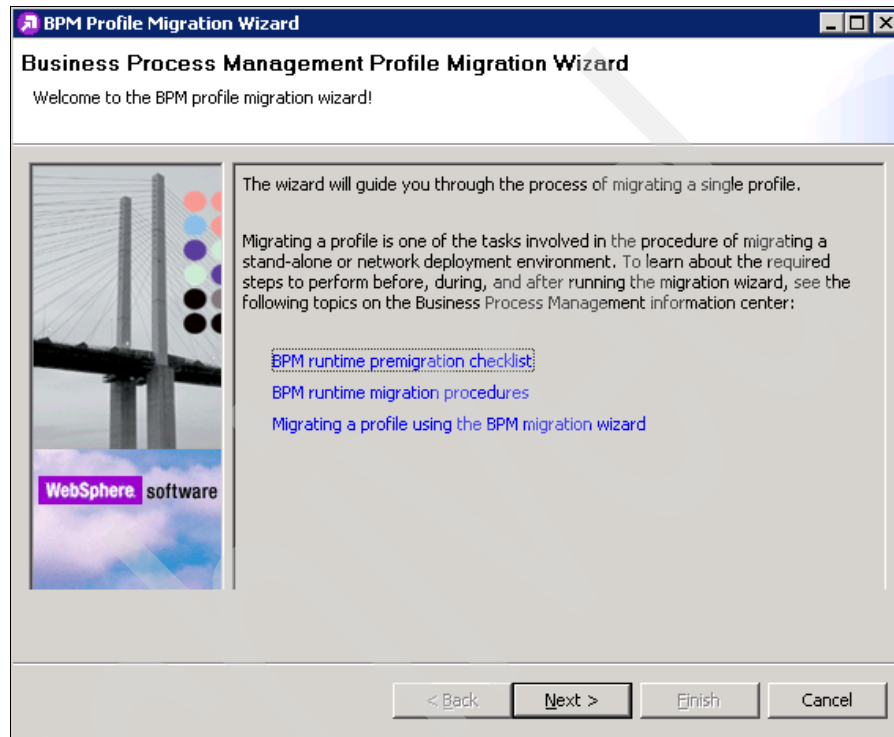
Figure 6-40 Welcome window of the BPM profile migration wizard

4. Select **Custom Migration** as the migration type and click **Next** (Figure 6-41).
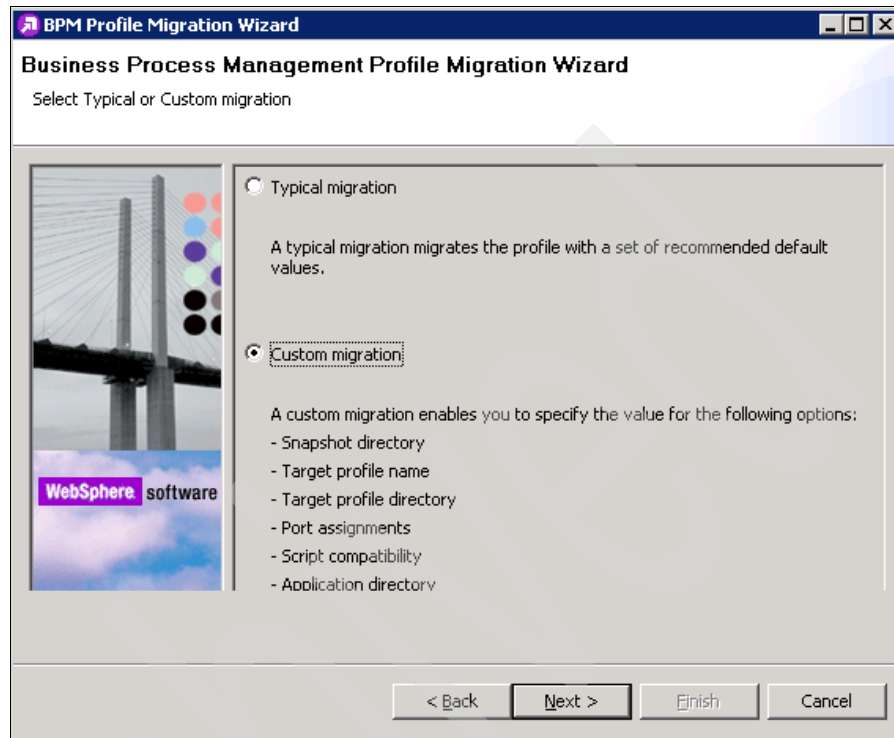
Figure 6-41   Migration type selection window

5. The migration wizard detected the `C:\wdpe612`(`WebSphere Business Monitor v6.1.2.5` installation automatically (Figure 6-42), so we simply select it. If your migration wizard does not detect the source installation automatically, click **Browse for a compatible migration source that was not detected** and specify the source product installation root. Click **Next** when you finish.
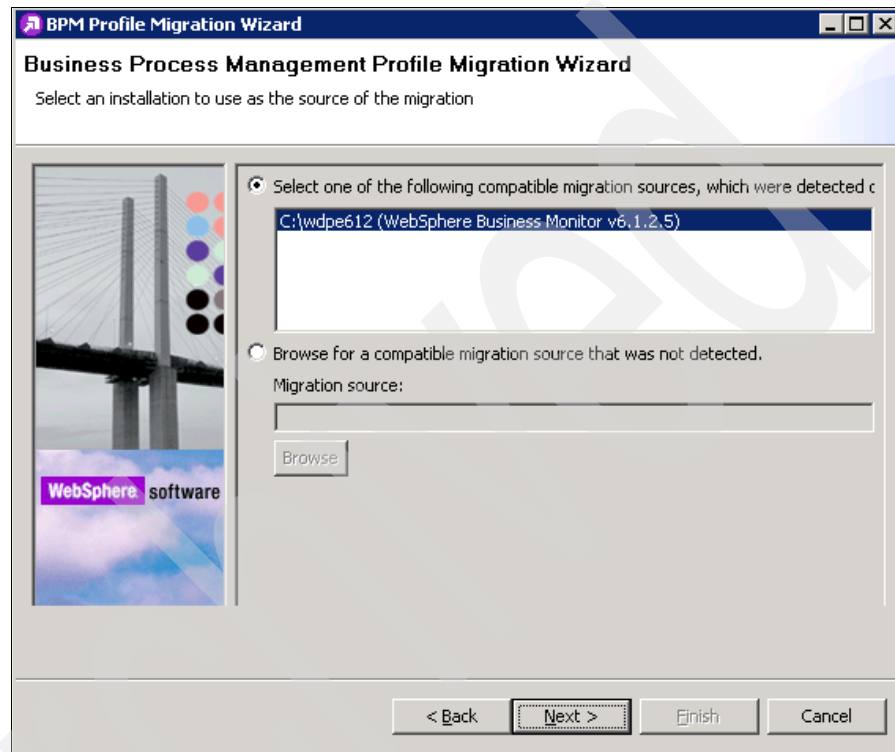
Figure 6-42   Migration source selection window

6. The migration wizard detects the source profiles in the source installation. Select the one you want to migrate. Here we only have one profile to be migrated (Figure 6-43):

```
WBMCust02, Managed[wbmonitor/managed], C:\wdpe612\profiles\WBMCust02
```

Enter the administrative user ID and password for the selected profile and click **Next**.
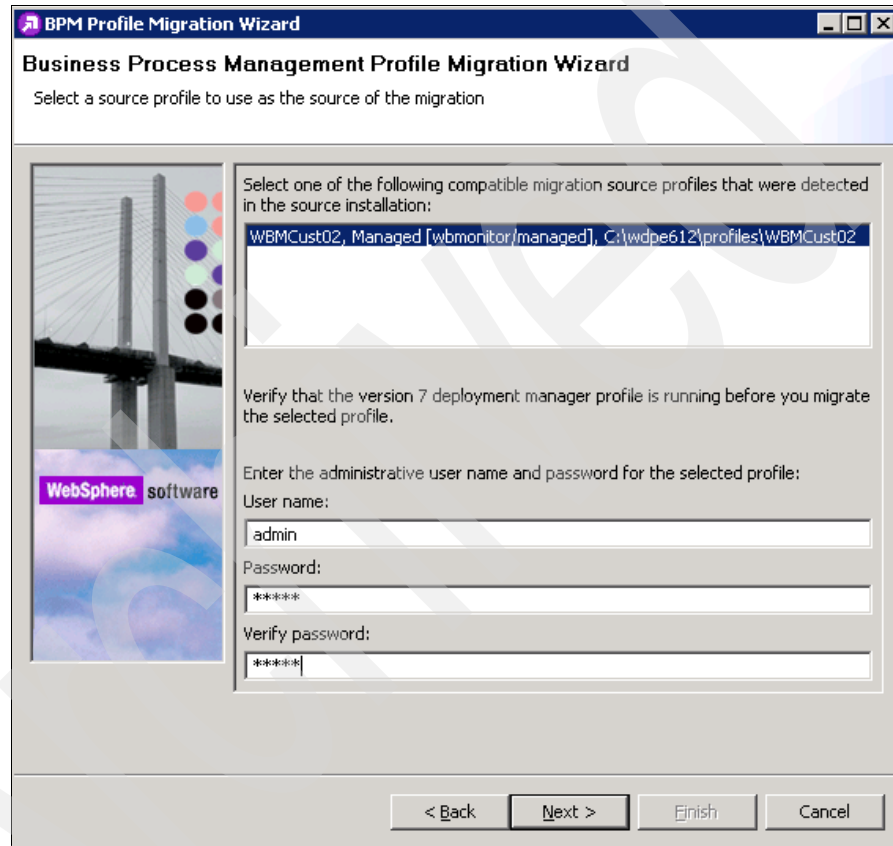
Figure 6-43   Migration source profile and profile type window

7. Specify the Snapshot directory (`C:\MigrationSnapshots\WBMCust02`) and click **Next**, as shown in Figure 6-44. This could be any directory on the machine, but, as a best practice, choose a different directory than the source and target installation directory. Specify different snapshot directories for different profiles on the same machine.
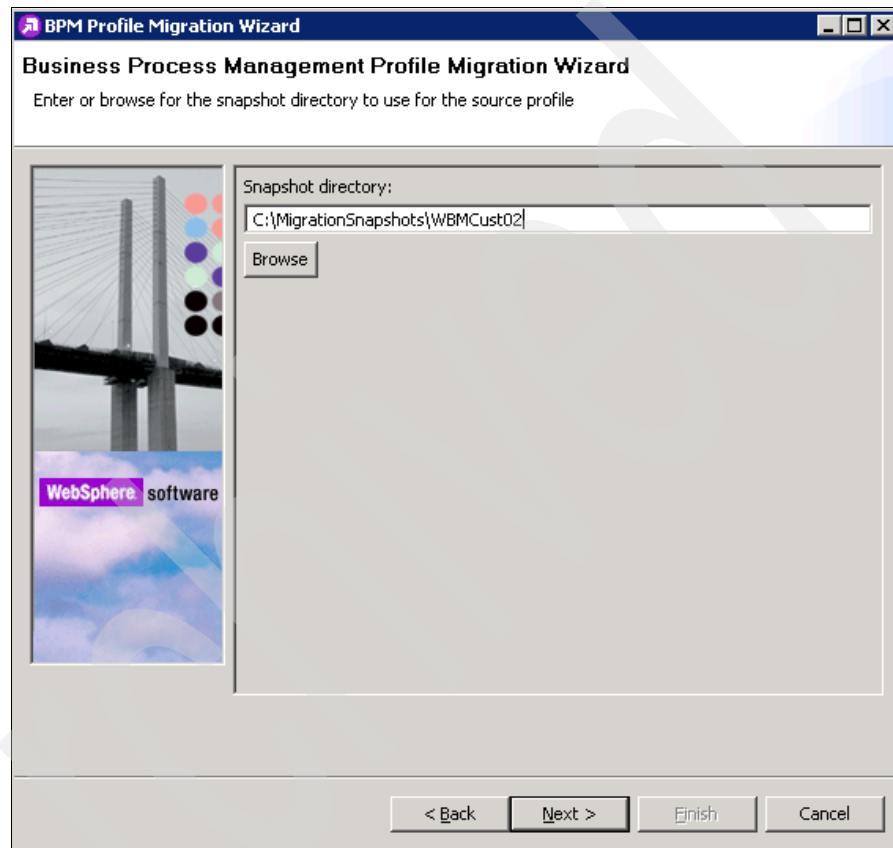
Figure 6-44   Snapshot directory window

8. We enter WBMCust02 and C:\wdpe7\profiles\WBMCust02 as the Target profile name and Target profile directory (Figure 6-45). The target profile name can be different from the source profile name. Click **Next** to go to the next window.
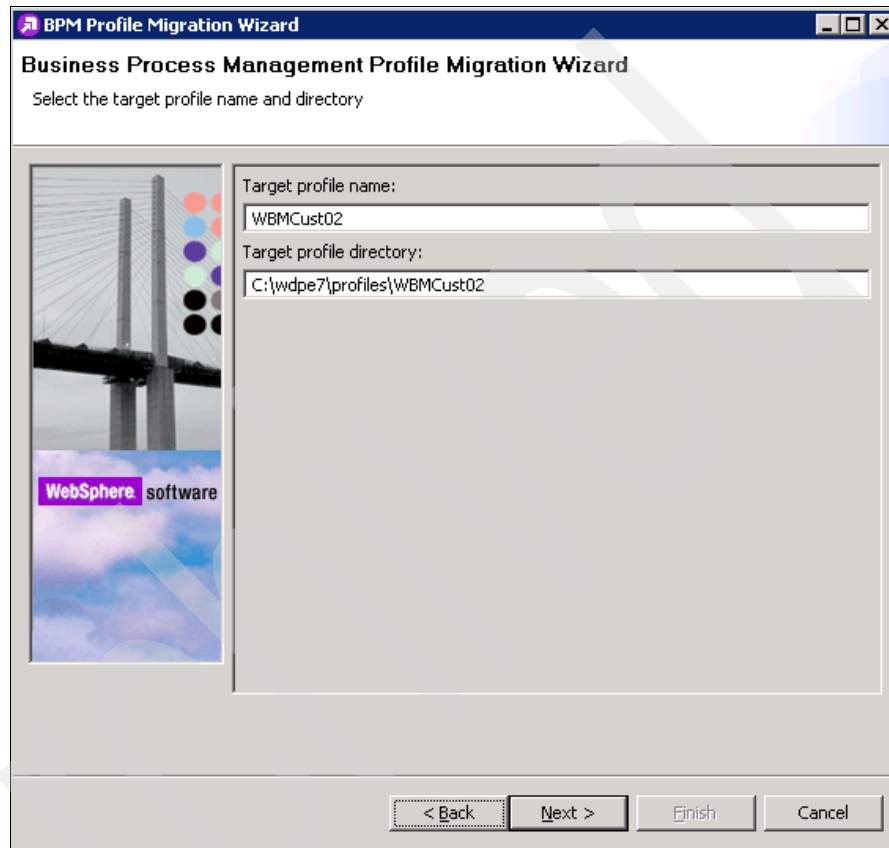
Figure 6-45   Target profile name and directory window

9. On the profile migration summary window, verify the migration selections. Click **Next** to begin the migration (Figure 6-46).
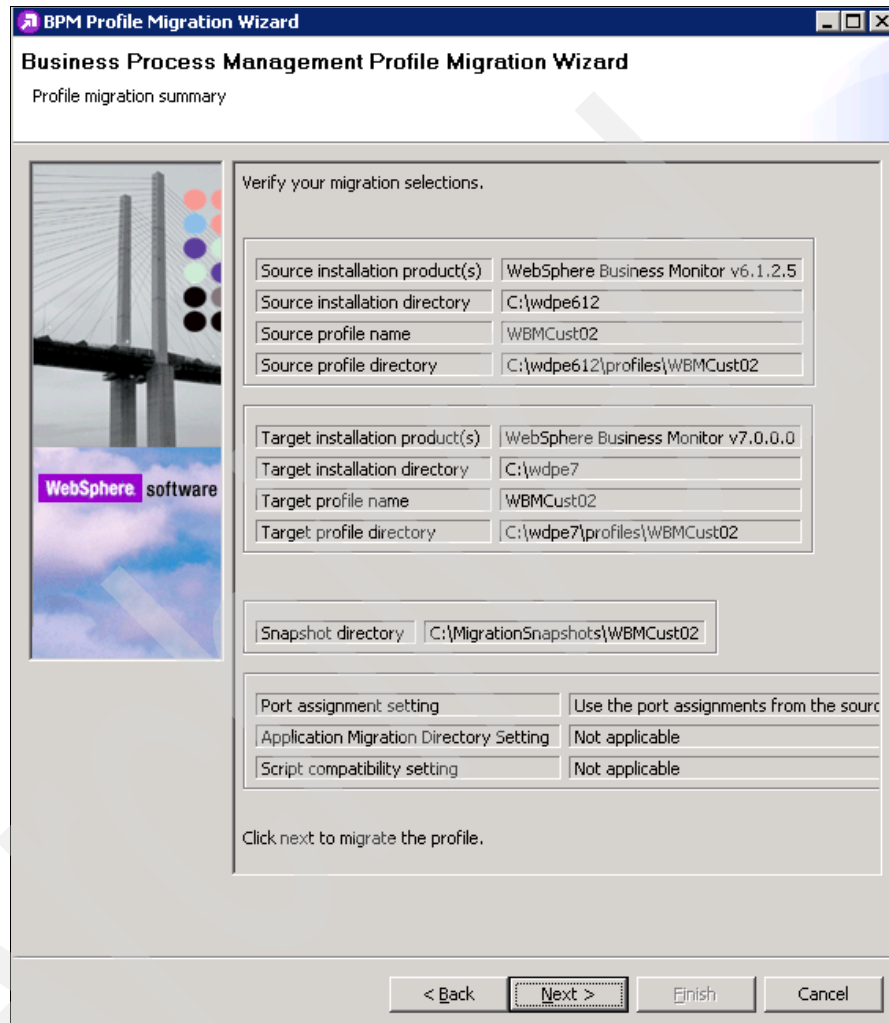
Figure 6-46   Profile migration summary window

10.The status of the profile migration will display on the migration execution window during migration (Figure 6-47).
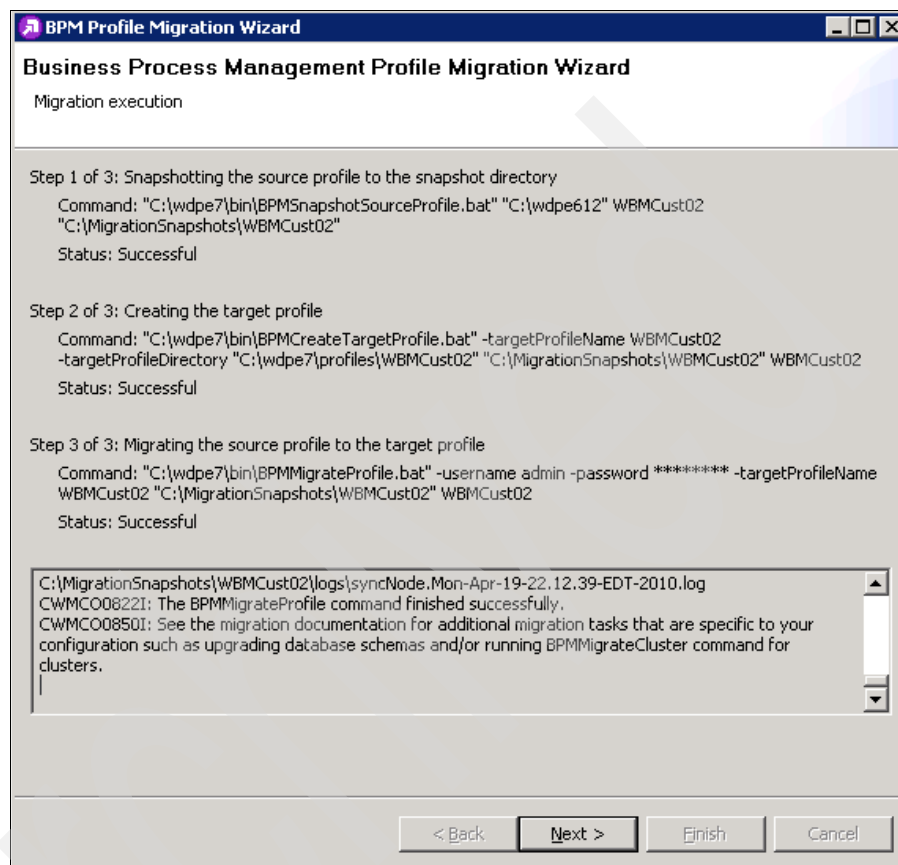
Figure 6-47   Migration execution window

Monitor the migration to validate that it is running successfully.

11. When the migration is finished, you should see the window shown in Figure 6-48.
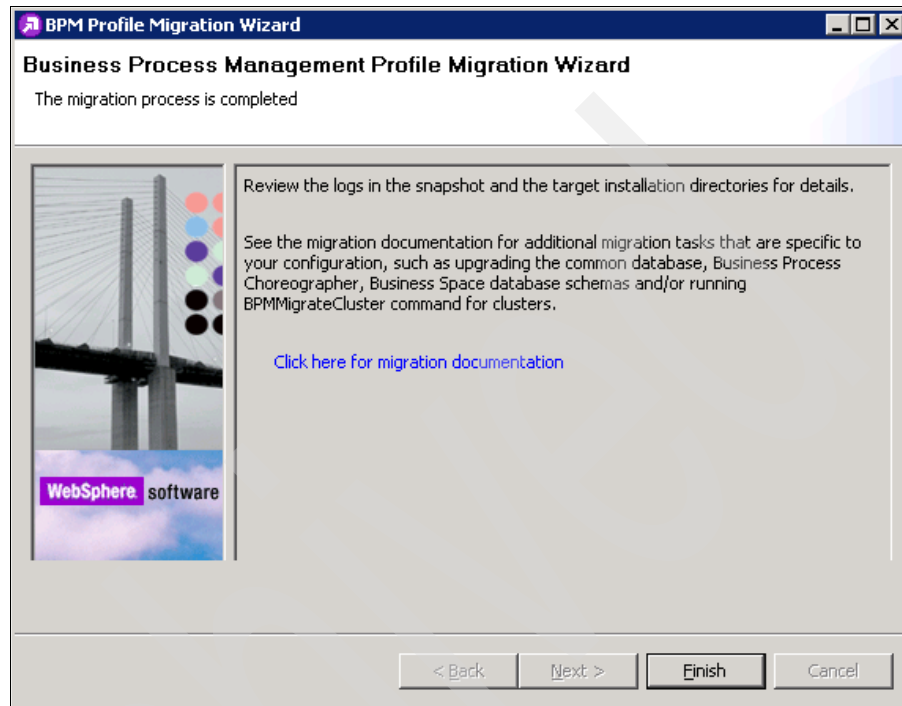
Figure 6-48   Migration completed window

6.5.10 Migrate clusters

After all the managed nodes are migrated, we can go on to migrate the clusters. The `BPMMigrateCluster` command migrates cluster-scoped applications and configuration information.

> **Note:**
>
> ► All the clusters must be migrated to Version 7.0 if their custom nodes have been migrated to Version 7.0.
>
> ► The **BPMMigrateCluster** command is run under *target_dmgr_profile_root*/bin on the Version 7.0 deployment manager machine.
>
> ► The deployment manager must be running during the **BPMMigrateCluster** command execution.
>
> ► All clusters must be migrated one at a time. No simultaneous migration is allowed.
>
> ► No administrative user ID and password is needed even if global security is enabled.
>
> ► The **BPMMigrateCluster** command can be run again if a failure occurs.

Perform the following steps:

1. Log in to the deployment manager machine with the administrator user ID.

2. Navigate to the bin directory under the target deployment manager profile installation root (C:\wdpe7\profiles\WDPEDmgr\bin).

3. Issue the command as shown in Example 6-61 in order to obtain usage information.

Example 6-61   Example of the bin>BPMMigrateCluster.bat -help command

```
C:\wdpe7\profiles\WDPEDmgr\bin>BPMMigrateCluster.bat -help
Usage: BPMMigrateCluster <backupDir>  <cluster> <target deployment
manager profile name>
```

– <backupDir> is the migration snapshot directory. It contains the configuration of the source deployment manager (c:\MigrationSnapshot\WDPEDmgr).

– <cluster> is the cluster name that you want to migrate (WPS.Messaging in our environment).

– <target deployment manager profile name> is the profile name of your target deployment manager (WDPEDmgr in our environment).

4. The **BPMMigrateCluster** command creates a log when it runs that is written to the following directory:

snapshot_directory/logs/BPMMigrateCluster-*DmgrProfileName.time_stamp*
.log

snapshot_directory is the value specified for the <backupDir> parameter in the **BPMMigrateCluster** command. You can view the log file with a text editor after migration.

Migrate the WPS.Messaging cluster

We migrate the WPS.Messaging cluster by performing the following steps:

1. Issue the command shown in Example 6-62 to migrate the WPS.Messaging cluster.

Example 6-62   Command to migrate the WPS.Messaging cluster

```
C:\wdpe7\profiles\WDPEDmgr\bin>BPMMigrateCluster.bat
c:\MigrationSnapshot\WDPEDmgr  WPS.Messaging WDPEDmgr
```

2. Check the logs file in `c:\MigrationSnapshot\WDPEDmgr\logs` (BPMMigrateCluster.WDPEDmgr.Mon-Apr-19-22.18.24-2010.log in our environment) for the message `BUILD SUCCESSFUL` and make sure that there are no exceptions. If an error occurred and you can determine the cause from the message, attempt to correct the problem and rerun the command. Even if you cannot determine the cause or the corrective action to take, try rerunning the **BPMMigrateCluster** command. It is safe to rerun the command multiple times.

Migrate other clusters

Follow the steps in "Migrate the WPS.Messaging cluster" on page 285 to migrate the other clusters, one at a time.

Perform the following steps:

1. Run the commands shown in Example 6-63 to migrate the clusters.

Example 6-63   Commands to migrate the other clusters

```
C:\wdpe7\profiles\WDPEDmgr\bin>BPMMigrateCluster.bat
c:\MigrationSnapshot\WDPEDmgr  WPS.Support WDPEDmgr

C:\wdpe7\profiles\WDPEDmgr\bin>BPMMigrateCluster.bat
c:\MigrationSnapshot\WDPEDmgr  WPS.AppTarget   WDPEDmgr

C:\wdpe7\profiles\WDPEDmgr\bin>BPMMigrateCluster.bat
c:\MigrationSnapshot\WDPEDmgr  WBM.Support     WDPEDmgr

C:\wdpe7\profiles\WDPEDmgr\bin>BPMMigrateCluster.bat
c:\MigrationSnapshot\WDPEDmgr  WBM.AppTarget WDPEDmgr
```

```
C:\wdpe7\profiles\WDPEDmgr\bin>BPMMigrateCluster.bat
c:\MigrationSnapshot\WDPEDmgr  BPM.WebDashboard WDPEDmgr
```

2. Check the log files in the `c:\MigrationSnapshot\WDPEDmgr\logs` directory for the message `BUILD SUCCESSFUL` and make sure that there are no exceptions after migrating each cluster. If an error occurred and you can determine the cause from the message, attempt to correct the problem and rerun the command. Even if you cannot determine the cause or the corrective action to take, try rerunning the **BPMMigrateCluster** command. It is safe to rerun the command multiple times.

6.5.11 Back up the target environment

After migrating all the clusters, it is a good idea to back up the migrated environment before you synchronize with the nodes.

Stop the deployment manager

Stop the deployment manager by performing the following steps:

1. Log in to the deployment manager machine with the administrator user ID.

2. Open a command window and navigate to the `c:\wdpe7\profiles\WDPEDmgr\bin` directory.

3. Enter **stopManager.bat -username admin -password admin** and press Enter to stop the deployment manager

4. Check the `c:\wdpe7\profiles\WDPEDmgr\logs\dmgr\SystemOut.log` file to ensure that the deployment manager has stopped.

Back up the target environment

Back up the target environment by performing the following steps:

1. On the deployment machine, back up the target deployment manager installation folder (`c:\wdpe7`) by compressing it.

2. Repeat step 1 on page 218 for all the other target environment installations. In our scenario, this was performed on machines saw016-sys1.itso.ral.ibm.com, saw016-sys2.itso.ral.ibm.com, saw016-sys3.itso.ral.ibm.com, saw016-sys4.itso.ral.ibm.com.

Note: If you created the target profile in a separate directory other than under the product binary directory, you should back up both the profile and product directories.

Back up the databases

Back up the product databases and the user databases (WDPEDB in our scenario).

Perform the following steps:

1. Log in to the machine `that` hosts the product databases and user databases (saw007-sys2.itso.ral.ibm.com).

2. Select **Start** → **Run...**, and then enter `db2cmd` to launch the DB2 command window.

3. Execute the commands shown in Example 6-64 to back up the product databases and user databases.

Example 6-64   Product databases and user databases backup

```
cd c:\dbbackup
db2 backup database WPRCSDB
db2 backup database BPEDB
db2 backup database OBSVRDB
db2 backup database MEDB
db2 backup database EVENT
db2 backup database MONITOR
db2 backup database BSPACEDB
db2 backup database WDPEDB
```

6.5.12 Synchronize the managed nodes

We need to synchronize the node with the target deployment manager by running the `syncNode` command for each managed node.

> **Note:**
>
> ► When executing `syncNode`, make sure that the target deployment manager is running.
>
> ► Before running the synchronization procedure, you should back up the target migration environment. If the synchronization procedure fails, you should restore the backup and redo the synchronization. For more information, refer to the IBM Technote found at the following address:
>
> http://www.ibm.com/support/docview.wss?uid=swg21410474

If you check the installed applications under the
target_custom_profile_root/installedApps/*cell_name* directory on the
custom node machines
(c:\wdpe7\profiles\WPSCust01\installedApps\WDPECell in our environment)
before running the synchronization, you will find that some applications, for
example, the Failed Event Manager, are still at Version 6.1.2.

Now we begin the synchronization by performing the following steps:

1. Start the target deployment manager by performing the steps in 6.5.5, "Start
   the target deployment manager" on page 257.

2. Log in to the machine hosting the first WebSphere Process Custom node with
   the administrator user ID.

3. Execute the **syncNode** command shown in Example 6-65 under
   custom_profile_root/bin.

Example 6-65   The syncNode command

```
C:\wdpe7\profiles\WPSCust01\bin>syncNode.bat
saw007-sys1.itso.ral.ibm.com 8879 -username admin -password admin
```

 – saw007-sys1.itso.ral.ibm.com is the host name of the target deployment
   manager.

 – 8879 is the SOAP_CONNECTOR_ADDRESS port of target deployment
   manager.

 – The -username admin -password admin option is the administrative user
   ID and password, which are required if global security is enabled.

The command output is show in Example 6-66.

Example 6-66   Command output of syncNode

```
C:\wdpe7\profiles\WPSCust01\bin>syncNode.bat
saw007-sys1.itso.ral.ibm.com 8879 -username admin -password admin
ADMU0116I: Tool information is being logged in file
            C:\wdpe7\profiles\WPSCust01\logs\syncNode.log
ADMU0128I: Starting tool with the WPSCust01 profile
ADMU0401I: Begin syncNode operation for node WPSNode01 with
Deployment Manager saw007-sys1.itso.ral.ibm.com: 8879
ADMU0016I: Synchronizing configuration between node and cell.
ADMU0402I: The configuration for node WPSNode01 has been
synchronized with Deployment Manager saw007-sys1.itso.ral.ibm.com:
8879
```

4. Check the application level after synchronization. All applications should be
   Version 7.0.

5. Repeat steps 2 on page 288 through 4 to synchronize the other three custom profiles, that is, WPSCust02, WBMCust01, and WBMCust02.

6.5.13 Update the BPC database

The next step is to update the BPC database.

Generate the BPC upgrade script

During migration, a database properties file is generated. This properties file is required to generate the schema upgrade scripts for the BPC database.

Perform the following steps:

1. Log in to the deployment manager machine with the administrator user ID.

2. Navigate to *target_dmgr_install_root*\util\dbUtils
   (C:\wdpe7\util\dbUtils in our environment).

3. Execute the following command to edit the BPC database schema properties interactively:

   C:\wdpe7\util\dbUtils>DbDesignGenerator.bat -e
   c:\wdpe7\profiles\WDPEDmgr\dbscripts\ProcessChoreographer\DB2\BPEDB\
   BPC\createSchema.properties

   – c:\wdpe7\profiles\WDPEDmgr\dbscripts\ProcessChoreographer\DB2\BPEDB
     \BPC\createSchema.properties specifies the BPC database schema
     properties file name. It is under
     target_dmgr_profile_root\dbscripts\ProcessChoreographer\DB2\BPEDB
     \BPC\.

   The command output is shown in Example 6-67. The input is highlighted in
   bold.

> **Note:** Enter true for Use tablespaces if you have a separate directory for
> the BPC database. A table space directory is required when using
> tablespaces or migrate from pre-6.2 version.

Example 6-67   Command output for editing the BPC database schema properties file

```
C:\wdpe7\util\dbUtils>DbDesignGenerator.bat -e
c:\wdpe7\profiles\WDPEDmgr\dbscripts\ProcessChoreographer\DB2\BPEDB\
BPC\createSchema.properties

[info] running DbDesignGenerator in editing mode...

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

```
[status] BPC is not complete with 1 remaining item(s):
[ 1 ] BPC :  : dbProviderKey is not set.

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

(1)DB2-distributed
(2)DB2-iSeries
(3)DB2-zOS-8
(4)DB2-zOS-9
(5)Derby
(6)Informix
(7)Oracle
(8)SQL Server

Please enter the number for the database type
[default=DB2-distributed] :1

[info] Please enter the values for the properties in the database
objects section.

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

(1)Configuration
(2)Migration
(3)Removal

Please enter the number for the scenario [default=Configuration] :2
Database name[default=BPEDB] :
Territory (only needed when creating the database)[default=en-us] :
Database schema name (leave empty to use default schema / implicit
schema)[default=BPC] :
Use tablespaces (true/false)?[default=false] :true
Tablespace directory / container path (only needed when using
tablespaces or when migrating from a pre-6.2 release; use file
separator appropriate for the database server)[default=]
:c:\DBTablespace
Tablespace for audit log items (leave default when not using
tablespaces)[default=AUDITLOG] :
Tablespace for instance items (leave default when not using
tablespaces)[default=INSTANCE] :
Tablespace for scheduler items (leave default when not using
tablespaces)[default=SCHEDTS] :
Tablespace for staff query items (leave default when not using
tablespaces)[default=STAFFQRY] :
```

```
Tabplespace for template items (leave default when not using
tablespaces)[default=TEMPLATE] :
Tablespace for work item tables and indexes (leave default when not
using tablespaces)[default=WORKITEM] :

[info] You have completed database objects section properties needed
for database scripts generation.

To skip data source properties, enter 's'; or enter anything else to
continue :s

[info] data source properties section is skipped.
Do you want to save changes back to the same file
'c:\wdpe7\profiles\WDPEDmgr\dbscripts\ProcessChoreographer\DB2\BPEDB
\BPC\createSchema.properties'? (y/n) :y

[info] The database design has been generated in
c:\wdpe7\profiles\WDPEDmgr\dbscripts\ProcessChoreographer\DB2\BPEDB\
BPC\createSchema.properties
[info] thanks, quitting now ...
```

4. Execute the command in Example 6-68 to generate the BPC database
   upgrade scripts.

Example 6-68   Generate the BPEDB update script command

```
C:\wdpe7\util\dbUtils>DbDesignGenerator.bat -g
c:\wdpe7\profiles\WDPEDmgr\dbscripts\ProcessChoreographer\DB2\BPEDB\
BPC\createSchema.properties
```

The command output is shown in Example 6-69. The scripts generated in the
directory are highlighted in **bold**.

Example 6-69   The command output to generate the BPEDB update script

```
C:\wdpe7\util\dbUtils>DbDesignGenerator.bat -g
c:\wdpe7\profiles\WDPEDmgr\dbscripts\ProcessChoreographer\DB2\BPEDB\
BPC\createSchema.properties

[info] running DbDesignGenerator in generating mode...

[info] generating database scripts from
c:\wdpe7\profiles\WDPEDmgr\dbscripts\ProcessChoreographer\DB2\BPEDB\
BPC\createSchema.properties
```

```
[info] The script(s) have been generated in
C:\wdpe7\util\dbUtils\DB2-distributed-BPC
[info] thanks, quitting now ...
```

Update the BPC database schema

Perform the following steps to update BPC database schema:

1. To upgrade BPC database schema, copy the entire
   `C:\wdpe7\util\dbUtils\DB2-distributed-BPC` folder from the target
   deployment manager system to `c:\saw016\V7.0` on the DB2 system.

2. Log in to the database system with the db2admin user ID.

3. Open a DB2 command prompt and change to the db2scripts directory:

   `cd c:\saw016\V7.0\DB2-distributed-BPC`

4. We use the command in Example 6-70 to upgrade the BPC database
   schema. Make sure each SQL statement is executed successfully.

Example 6-70   Example of the upgrade monitor schema command

```
C:\saw016\V7.0\DB2-distributed-BPC>db2 connect to BPEDB user
db2admin using password
C:\saw016\V7.0\DB2-distributed-BPC>db2 -tvf upgradeTablespace612.sql
C:\saw016\V7.0\DB2-distributed-BPC>db2 -tvf upgradeSchema612.sql
C:\saw016\V7.0\DB2-distributed-BPC>db2 connect reset
```

Migrate the BPC data

When migrating from a pre-Version 6.2 product, a data migration must be done
before you start the server or any cluster member that has BPC configured. The
data migration is done by running the migrateDB.py script.

> **Note:**
>
> ► The migrateDB.py script must be run from the node that hosts the BPC
>   cluster member or server.
>
> ► If there are multiple BPC clusters configured, this script must be run
>   against each BPC database.

1. Log in to the machine that hosts one member of the WPS.AppTarget cluster
   with the administrator user ID. The BPC container is deployed to the
   WPS.AppTarget cluster.

2. Navigate to `target_WPS_custom_profile_root`\bin
   (`C:\wdpe7\profiles\WPSCust01\bin` in our example).

3. Execute the command in Example 6-71 to migrate the BPC data.

> **Note:** The conntype should be `NONE`.

Example 6-71   Migrate BPC data

```
C:\wdpe7\profiles\WPSCust01\bin>wsadmin.bat -conntype NONE
-profileName WPSCust01  -tracefile
c:\MigrationSnapshot\WPSCust01\logs\migrateDB.trace  -f
c:\wdpe\ProcessChoreographer\admin\migrateDB.py -cluster
WPS.AppTarget  -dbUser db2admin    -dbPassword  password
```

- Specify NONE as the connect type using -conntype NONE.

- -profileName WPSCust01 specifies the custom profile of this WebSphere Process Server node.

- -tracefile c:\MigrationSnapshot\WPSCust01\logs\migrateDB.trace specifies the trace file.

- -f c:\wdpe\ProcessChoreographer\admin\migrateDB.py specifies the migrateDB.py location. The script is located in `WPS_install_root`\ProcessChoreographer\admin\.

- -cluster WPS.AppTarget specifies the cluster name where the BPC container is deployed.

- -dbUser db2admin -dbPassword password is the DB2 administrative user ID and password.

The command output is shown in Example 6-72.

Example 6-72   Command output of migrating BPC data

```
C:\wdpe7\profiles\WPSCust01\bin>wsadmin.bat -conntype NONE -profileName
WPSCust01  -tracefile
c:\MigrationSnapshot\WPSCust01\logs\migrateDB.trace  -f
c:\wdpe7\ProcessChoreographer\admin\migrateDB.py -cluster WPS.AppTarget
-dbUser db2admin    -dbPassword  password
WASX7357I: By request, this scripting client is not connected to any
server process. Certain configuration and application operations will
be available in local mode.
WASX7303I: The following options are passed to the scripting
environment and are available as arguments that are stored in the argv
variable: "[-cluster, WPS.AppTarget, -dbUser, db2admin, -dbPassword,
password]"
Using configured schema qualifier 'BPC'.
```

```
File C:\wdpe7\universalDriver_wbi\lib\db2jcc.jar exists, adding it to
the classpath.
File C:\wdpe7\universalDriver\lib\db2jcc_license_cu.jar exists, adding
it to the classpath.
File C:\wdpe7\universalDriver_wbi\lib\db2jcc_license_cisuz.jar exists,
adding it to the classpath.
migrateDB.py finished.
```

6.5.14 Migrate the BPC Observer (optional)

The source BPC Observer can still work even after the environment is migrated
to Version 7.0. You can still log in to the BPC Observer using
`https://hostname:default_secure_port/bpcobserver`, but if you want to view
the report in BPC Explorer, you need to migrate it to Version 7.0.

> **Note:**
> - ► Migrate BPC Observer if you want to use the new feature.
> - ► Do not migrate BPC Observer if any profile that hosts BPC Explorer is not
>   migrated.

To migrate the BPC Observer, perform the following steps:

1. Log in to the machine that hosts deployment manager with the administrator
   user ID.

2. Navigate to *target_dmgr_profile_root*/bin
   (`C:\wdpe7\profiles\WDPEDmgr\bin` in our example).

3. Execute the following command to migrate the BPC Observer:

   ```
   C:\wdpe7\profiles\WDPEDmgr\bin>wsadmin.bat -conntype NONE  -f
   ..\ProcessChoreographer\migrate_BPCObserver_WPS.Support.jacl
   ```

   The command output is shown in Example 6-73.

Example 6-73   Command output for migrating the BPC Observer

```
C:\wdpe7\profiles\WDPEDmgr\bin>wsadmin.bat -conntype NONE  -f
..\ProcessChoreographer\migrate_BPCObserver_WPS.Support.jacl
WASX7357I: By request, this scripting client is not connected to any
server process. Certain configuration and application operations
will be available in local mode.
Updated BPCExplorer_WPS.Support.
Now uninstall BPCObserver_WPS.Support using the administrative
console.
```

4. You can either uninstall the old BPC Observer from the administrative console or leave it there.

6.5.15 Migrate the Alphablox repository

The Alphablox repository of our source environment is in the same database as the WebSphere Business Monitor database, but it uses DB2ADMIN as the schema instead of MONITOR. As a result, Alphablox repository migration is needed.

> **Note:**
> ► You should stop all servers that are running Alphablox applications before migration.
> ► The deployment manager should be running during migration.
> ► If your existing database repository is in the same database as the WebSphere Business Monitor database and is using the same schema as the MONITOR metadata tables, then migration to Version 7.0 is not necessary.

Perform the following steps:

1. Stop the target deployment manager and back up the whole target runtime environment as well as the database by following the steps in 6.5.11, "Back up the target environment" on page 286.

> **Note:** Before migrating the Alphablox repository, back up the whole target environment. You might need to recover the environment if you get any errors during the Alphablox repository migration.

2. Start the target deployment manager by following the steps in 6.5.5, "Start the target deployment manager" on page 257.

> **Note:** The target deployment manager must be started before migrating the Alphablox repository, or it will fail.

3. Log in to one of the machines where Alphablox is installed (saw016-sys3.itso.ral.ibm.com in our environment) with the administrator user ID.

4. Open a command line and navigate to `target_Alphablox_install_root`/bin (`C:\wdpe7\Alphablox\bin` in our environment).

5. Run the **convertRepository.bat** command to migrate the Alphablox repository interactively. The command output is shown in Example 6-74 (The input is highlighted in **bold**). For more details, refer to the Information Center topic at the following address:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com .ibm.btools.help.monitor.mig.doc/mig/62_to_n_abx_db_db_cpy61.html

> **Note:** Remember to set the IBM Alphablox file manager root and instance name before converting one repository to another. In Example 6-74, we first choose 1 and 2 to set the manager root and instance name. Finally, we choose 3 to convert one repository to another.

Example 6-74   Execute convertRepostiory.bat interactively

```
C:\wdpe7\Alphablox\bin>ConvertRepository.bat
------------------------------------------------------
-                                                    -
- note:                                              -
- To have this utility use JDBC drivers for a non    -
- DB2 database, update the ConvertRepository.lax     -
- file. Add the needed drivers jars to the           -
- "lax.class.path" property.                         -
-                                                    -
------------------------------------------------------
Press any key to continue . . .

IBM Alphablox Repository Conversion Utility 9.5.0.0 Build 262
[Interim Fix]
Copyright International Business Machines Corporation 2007. All
rights reserved.

US Government Users Restricted Rights - Use, duplication or
disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

A MSSQL 2005 Driver was not found in the classpath; MSSQL 2005
connectivity disabled
An Oracle Driver was not found in the classpath; Oracle connectivity
disabled
An Informix JDBC Driver was not found in the classpath; Informix
connectivity disabled

Please choose an option:

1) Set IBM Alphablox File Manager root
2) Set IBM Alphablox instance name
```

```
3) Convert one repository to another
4) Create an empty database repository
5) Verify and repair a repository
6) Change IBM Alphablox to use a different repository
7) Conversion Utility options
8) Configure Web Application Server Connection pooling
9) Exit


Select (1-9): 1
Enter new File Manager root []: c:\wdpe7\Alphablox\repository


Please choose an option:

1) Set IBM Alphablox File Manager root
[c:\wdpe7\Alphablox\repository\]
2) Set IBM Alphablox instance name
3) Convert one repository to another
4) Create an empty database repository
5) Verify and repair a repository
6) Change IBM Alphablox to use a different repository
7) Conversion Utility options
8) Configure Web Application Server Connection pooling
9) Exit


Select (1-9): 2
Enter new instance name []: AlphabloxAnalytics


Please choose an option:

1) Set IBM Alphablox File Manager root
[c:\wdpe7\Alphablox\repository\]
2) Set IBM Alphablox instance name [AlphabloxAnalytics]
3) Convert one repository to another
4) Create an empty database repository
5) Verify and repair a repository
6) Change IBM Alphablox to use a different repository
7) Conversion Utility options
8) Configure Web Application Server Connection pooling
9) Exit


Select (1-9): 3
Please choose an option:

1) Convert from file to database
2) Convert from database to file
```

```
3) Convert from file to file
4) Convert from database to database
5) Go back to main menu

Select (1-5): 4


Convert Database To Database
    Source Database

Please select the database type:

1) IBM DB2
2) Apache Derby Server
3) Go back to main menu

Select (1-3): 1

Server: saw007-sys2.itso.ral.ibm.com
Port []: 50000
Alias []: MONITOR
Schema (if different from user): DB2ADMIN
User: db2admin
Password: password

1) Continue, 2) Re-enter, 3) Go back to main menu  Select (1-3): 1

Convert Database To Database
    Destination Database

Please select the database type:

1) IBM DB2
2) Apache Derby Server
3) Go back to main menu

Select (1-3): 1

Server: saw007-sys2.itso.ral.ibm.com
Port []: 50000
Alias []: MONITOR
Schema (if different from user): MONITOR
User: db2admin
Password: password
```

```
1) Continue, 2) Re-enter, 3) Go back to main menu  Select (1-3): 1


The following questions can be answered by using the first character
   in the selected option or press <ENTER> for the default.

Enter conversion operation (COPY, MOVE) [COPY]: COPY
Enter repository creation operation (NEW, UPDATE, OVERWRITE) [NEW]:
OVERWRITE
Update IBM Alphablox to use the destination repository [Y]: Y
Update IBM Alphablox properties in the destination
   repository (ALL, SPECIFIC, GLOBAL, NONE) [ALL]: ALL

Below is a description of the options selected:
* Copy source repository to destination repository. Remove existing
destination repository before copying (if it exists).
* Set Alphablox to point to the destination repository.
* Copy all Alphablox server properties to the destination
repository.

1) Continue, 2) Re-enter, 3) Go back to main menu  Select (1-3): 1
Deleting existing repository...
Creating the destination repository...
Copying the source repository (this may take a few minutes)...
Updating the server to point to the destination repository...
Could not test for running server: Could not find TelnetConsolePort
number

Do you want to move source Cluster Manager settings to the
destination (Y/N) [Y]: Y
Found previous connection pooling data source in server.properties;
Using it.


Repository operation completed successfully

Please choose an option:

1) Set IBM Alphablox File Manager root
[c:\wdpe7\Alphablox\repository\]
2) Set IBM Alphablox instance name [AlphabloxAnalytics]
3) Convert one repository to another
4) Create an empty database repository
5) Verify and repair a repository
6) Change IBM Alphablox to use a different repository
7) Conversion Utility options
```

```
8) Configure Web Application Server Connection pooling
9) Exit

Select (1-9): 9

C:\wdpe7\Alphablox\bin>
```

6.5.16 Migrate Business Space

Next, we migrate Business Space. The tasks described in this section must be done in the listed sequence. You must start and stop the deployment manager, node agents and servers exactly as the instructions in this section indicate.

Update the Business Space schema

Before updating the Business Space schema, stop the deployment manager by performing the following steps:

1. Stop the target deployment manager by following the steps in "Stop the deployment manager" on page 286.

2. To upgrade the Business Space database schema, copy the entire *target_dmgr_profile_root*\dbscripts\BusinessSpace folder from the target deployment manager system to c:\saw016\V7.0 on the DB2 system.

3. Log in to the database system as the db2admin user.

4. Open a DB2 command prompt and change to the dbscripts directory:

   cd C:\saw016\V7.0\BusinessSpace\BPM.WebDashboard\DB2\BSPACEDB

5. We use the following command to upgrade the Business Space database schema. Enter the database administrative user ID (db2admin) and password when prompted for them. Make sure each SQL statement is executed successfully:

   C:\saw016\V7.0\BusinessSpace\BPM.WebDashboard\DB2\BSPACEDB>migrateSc
   hema.bat

6. Tun the **bind** command for BSPACEDB, as shown in Example 6-75.

Example 6-75   Run the rebind command for BSPACEDB

```
C:\saw016\V7.0\BusinessSpace\BPM.WebDashboard\DB2\BSPACEDB>db2
connect to BSPACEDB user db2admin using password
C:\saw016\V7.0\BusinessSpace\BPM.WebDashboard\DB2\BSPACEDB>db2 bind
c:\IBM\DB295\bnd\@db2cli.lst blocking all grant public
C:\saw016\V7.0\BusinessSpace\BPM.WebDashboard\DB2\BSPACEDB>db2 bind
c:\IBM\DB295\bnd\@db2ubind.lst blocking all grant public
```

```
C:\saw016\V7.0\BusinessSpace\BPM.WebDashboard\DB2\BSPACEDB>db2
connect reset
C:\saw016\V7.0\BusinessSpace\BPM.WebDashboard\DB2\BSPACEDB>db2stop
04/21/2010 13:22:19     0   0   SQL1064N  DB2STOP processing was
successful.
SQL1064N  DB2STOP processing was successful.
C:\saw016\V7.0\BusinessSpace\BPM.WebDashboard\DB2\BSPACEDB>db2start
04/21/2010 13:22:24     0   0   SQL1063N  DB2START processing was
successful.
SQL1063N  DB2START processing was successful.
```

Install the WebSphere Process Server product widget

Because the machine hosting Business Space does not have WebSphere
Process Server installed on it, we need to manually install the WebSphere
Process Server widget on the cluster where Business Space is running (the
BPM.WebDashboard cluster in our environment).

> **Note:** In Version 7.0, product widgets are shipped with the separate Business
> Process Management products instead of a Business Space product. In our
> topology, we did not install WebSphere Process Server on the machines that
> host Business Space (saw016-sys3.itso.ral.ibm.com and
> saw016-sys4.itso.ral.ibm.com), so we need to install the WebSphere Process
> Server widgets manually.

Perform the following steps:

1. Log in to the target deployment manager machine with the administrator user
   ID.

2. Start the target deployment manager.

3. Open a command line and navigate to *target_dmgr_profile_root*\bin.

4. Run the commands shown in Example 6-76 (highlighted in **bold**).

Example 6-76   Install widget command

```
C:\wdpe7\profiles\WDPEDmgr\bin>wsadmin.bat -username admin -password
admin
WASX7209I: Connected to process "dmgr" on node WDPECellManager using
SOAP connector;  The type of process is: DeploymentManager
WASX7029I: For help, enter: "$Help help"
wsadmin>$AdminTask installBusinessSpaceWidgets  {-clusterName
BPM.WebDashboard -widgets  c:\wdpe7\BusinessSpace\widgets\WPS}

wsadmin>quit
```

– -clusterName BPM.WebDashboard specifies the cluster name where
  Business Space is deployed.

– -widgets c:\wdpe7\BusinessSpace\widgets\WPS is the WebSphere
  Process Server widgets location, as shown in Figure 6-49. All the products
  widgets are located in *product_install_root*\BusinessSpace\widgets.
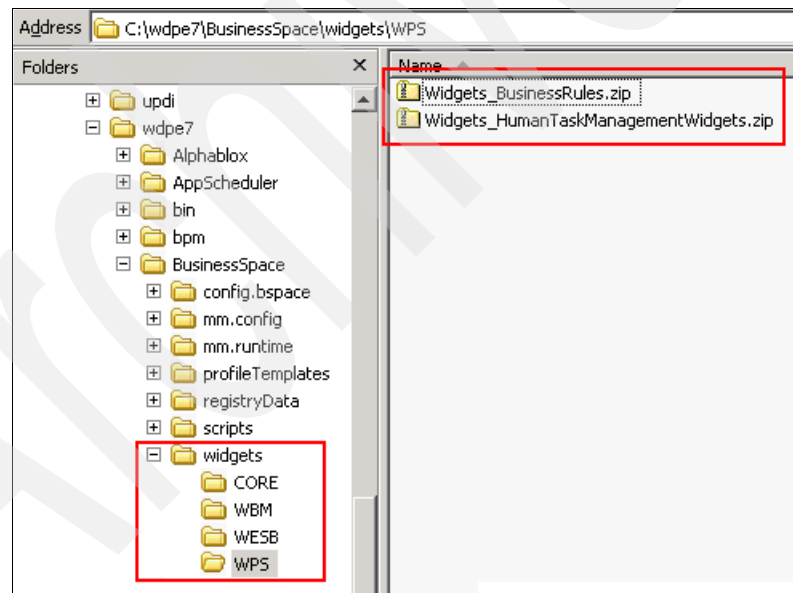
Figure 6-49   WebSphere Process Server widgets

5. After installing the WebSphere Process Server widgets, you can check the following location to ensure that the WebSphere Process Server widgets are there:

   ```
   target_dmgr_profile_root\BusinessSpace\cluster_name\widgets
   ```

   In our example, shown in Figure 6-50, the widgets are in the following location:

   ```
   C:\wdpe7\profiles\WDPEDmgr\BusinessSpace\BPM.WebDashbaord\widgets
   ```
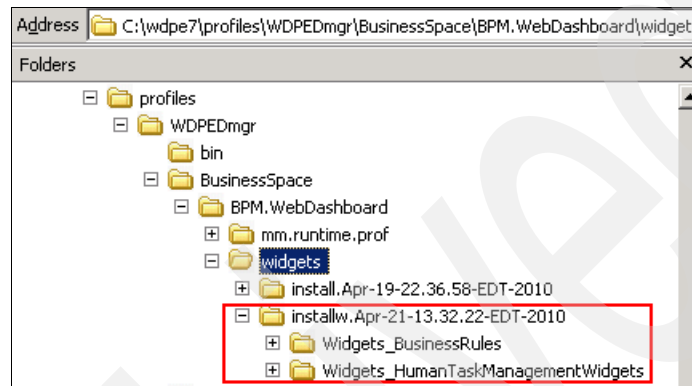

Figure 6-50   Installed WebSphere Process Server widgets

6. Start *all* the node agents.

7. From the deployment manager machine, open the properties file at:

   ```
   target_dmgr_profile_root\BusinessSpace\Business_Space_Cluster_Name\mm.runtime.prof\config\ConfigService.properties
   ```

   For example:

   ```
   C:\wdpe7\profiles\WDPEDmgr\BusinessSpace\BPM.WebDashboard.WBMNode01.0\m.runtime.prof\config\ConfigService.properties
   ```

8. Search the file for the `com.ibm.mashups.directory.templates` entry. The value is shown in Example 6-77.

Example 6-77   The value of com.ibm.mashups.directory.templates

```
com.ibm.mashups.directory.templates =
config/cells/WDPECell/nodes/WBMNode01/servers/BPM.WebDashboard.WBMNode01.0/mm/templates
```

From the this value, we can identify the following information:

– Node name: WBMNode01

– Server name: BPM.WebDashboard.WBMNode01.0

9. We need to start the BPM.WebDashboard.WBMNode01.0 server. On the administrative console, navigate to **Servers** → **Server Types** → **WebSphere application servers**, select **BPM.WebDashboard.WBMNode01.0**, and click **Start**.

This will populate the configuration from the deployment manager to the BPM.WebDashboard.WBMNode01.0 server. You should now be able to find the BPM.WebDashboard folder in C:\wdpe7\profiles\WBMCust01\BusinessSpace, as shown in Figure 6-51.
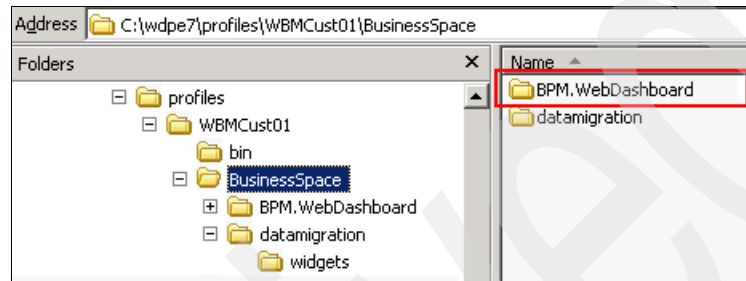
Figure 6-51   BPM.WebDashboard folder

10. Stop the BPM.WebDashboard.WBMNode01.0 server from the administrative console.

11. Log in to the machine that hosts the identified node (WBMNode01).

12. Open *identified_custom_profile*\BusinessSpace\BPM.WebDashboard\mm.runtime. prof\public\ oobLoadedStatus.properties with a text editor, for example C:\wdpe7\profiles\WBMCust01\BusinessSpace\BPM.WebDashboard\mm.runtim e.prof\public\oobLoadedStatus.properties in our environment.

13. Update the importTemplates.txt and importSpaces.txt properties to true, as shown in Example 6-78.

Example 6-78   Updated properties in oobLoadedStatus.properties

```
importTemplates.txt=true
importSpaces.txt=true
```

14. On the administrative console, navigate to **System administration** → **Nodes.** Select *all* the nodes, then click **Full Resynchronize** to synchronize the custom profile.

Copy the iwidget files

During profile migration, the Version 6.2.0 and Version 6.1.2 widget definition files are automatically copied to the following directory on the Version 7.0 target server that hosts Business Space:

profile_root/BusinessSpace/datamigration/widgets

However, the Version 7.0 widget definition files and any Version 6.2.0 or Version 6.1.2 *custom* widget definition files must be copied to this directory manually.

For a clustered Business Space environment, copy the widget files on all the profiles participating in the cluster by performing the following steps:

1. Log in to one of the machines where Business Space is installed with the administrator user ID.

2. Search all the iwidget.xml files under the *profile_root*\installedApps*Cell_Name* directory (C:\wdpe7\profiles\WBMCust01\installedApps\WDPECell in our example).

3. Copy all of the iwidget.xml files you find to the *profile_root*\BusinessSpace\datamigration\widgets directory (C:\wdpe7\profiles\WBMCust01\BusinessSpace\datamigration\widgets in our example) on the machines where the Business Space is installed. *Overwrite* the existing files if there are any.

4. Follow steps 1 - 3 to copy the iwidget.xml files to the *profile_root*\BusinessSpace\datamigration\widgets directory on all the other machines that host Business Space.

Migrate the Business Space data

When migrating the Business Space data, the personalized information that is migrated for every Business Space user is limited to 10 of the most recently viewed pages and 60 of the most recently adjusted widgets.

Before migrating the Business Space data, the target deployment manager and at least one of the node agents and servers that host Business Space should be started.

To migrate the Business Space data, perform the following steps:

1. Start the application server that hosts the Business Space Manager applications (BPM.WebDashboard.WBMNode01.0). On the administrative console, click **Servers** → **Application Servers**, select BPM.WebDashboard.Node01.0, and click **Start**.

2. Log in to the machine where the started application server in step 1 is running.

3. Open a command line window and navigate to *target_custom_node_install_root*\BusinessSpace\scripts (C:\wdpe7\BusinessSpace\scripts in our environment).

4. Execute the following command:

```
C:\wdpe7\BusinessSpace\scripts>migrateBSpaceData.bat  -host
saw016-sys3.itso.ral.ibm.com -port 8881 -user admin -password admin
-cluster BPM.WebDashboard
```

   - -host saw016-sys3.itso.ral.ibm.com is the host name of the machine where the BPM.WebDashboard.Node01.0 server is.

   - -port 8881 is the SOAP_CONNECTOR_ADDRESS port of the BPM.WebDashboard.Node01.0 server.

   - -user admin -password admin is the administrative user ID and password.

   - -cluster BPM.WebDashboard is the cluster name where Business Space is running.

The command output is shown in Example 6-79.

Example 6-79   Command output for migrateBSpaceData.bat

```
C:\wdpe7\BusinessSpace\scripts>migrateBSpaceData.bat  -host
saw016-sys3.itso.ral.ibm.com -port 8881 -user admin -password admin
-cluster BPM.WebDashboard

Starting migration, please check log file
C:\wdpe7\logs\bspace\BusinessSpaceData
Migration.log to make sure migration was successful without any
exception after it's completed.
WASX7209I: Connected to process "BPM.WebDashboard.WBMNode01.0" on
node WBMNode01 using SOAP connector;  The type of process is:
ManagedProcess
WASX7303I: The following options are passed to the scripting
environment and are available as arguments that are stored in the
argv variable: "[BPM.WebDashboard]"
Business Space Data Migration was completed!
```

5. Check *profile_root*\logs*cluster_member*\SystemOut.log (C:\wdpe7\profiles\WBMCust01\logs\BPM.WebDashboard.WBMNode01.0\SystemOut.log in our environment) to verify the migration result. You should see the information shown in Example 6-80 in the logs.

Example 6-80   DataMigrationCommand message

```
DataMigration I
com.ibm.bspace.datamigration.admintask.DataMigrationCommand
```

```
executeDBDataMigrate() Migration of Business Space v6 to  V7.0 was
successful!
```

Migrate the widget endpoints for product and custom widgets

If you are migrating a network deployment environment, run the
updateBusinessSpaceWidgets command on the deployment manager profile to
populate the migrated widget endpoints for both product and custom widgets that
were generated in XML format under the
profile_root/BusinessSpace/datamigration/endpoints folder.

Perform the following steps:

1. Log in to the target deployment manager machine with the administrator user
   ID.

2. Open a command line window and navigate to
   target_dmgr_profile_root\bin (C:\wdpe7\profiles\WDPEDmgr\bin in our
   environment).

3. Execute the command shown in Example 6-81 (highlighted in **bold**) to update
   the Business Space widgets.

Example 6-81   Update the Business Space widget command

```
C:\wdpe7\profiles\WDPEDmgr\bin>wsadmin.bat -username admin -password
admin
WASX7209I: Connected to process "dmgr" on node WDPECellManager using
SOAP connector;  The type of process is: DeploymentManager
WASX7029I: For help, enter: "$Help help"
wsadmin>$AdminTask  updateBusinessSpaceWidgets {-clusterName
BPM.WebDashboard  -endpoints
c:\wdpe7\profiles\WBMCust01\BusinessSpace\datamigration\endpoints}

wsadmin>quit
```

- -clusterName BPM.WebDashboard is the name of the cluster that hosts
  Business Space.

- -endpoints
  c:\wdpe7\profiles\WBMCust01\BusinessSpace\datamigration\endpointsis
  the endpoint location. It is located under
  custom_profile_root\BusinessSpace\datamigration\endpoints.

Next, you need to modify the properties in oobLoadedStatus.properties again
after you update the Business Space widgets.

4. From the deployment manager machine, open the
   target_dmgr_profile_root\BusinessSpace*Business_Space_Cluster_Name*\m
   m.runtime.prof\config\ConfigService.properties file:

   ```
   C:\wdpe7\profiles\WDPEDmgr\BusinessSpace\BPM.WebDashboard.WBMNode01.
   0\m.runtime.prof\config\ConfigService.properties
   ```

5. Search for com.ibm.mashups.directory.templates; its value is shown in
   Example 6-82.

   Example 6-82   The value of com.ibm.mashups.directory.templates

   ```
   com.ibm.mashups.directory.templates =
   config/cells/WDPECell/nodes/WBMNode01/servers/BPM.WebDashboard.WBMNo
   de01.0/mm/templates
   ```

   From this value, we can identify the following information:

   – Node name: WBMNode01

   – Server name: BPM.WebDashboard.WBMNode01.0

6. Start the BPM.WebDashboard.WBMNode01.0 server from the administrative
   console to populate the configuration from deployment manager to the
   BPM.WebDashboard.WBMNode01.0 server.

7. Stop the BPM.WebDashboard.WBMNode01.0 server from the administrative
   console.

8. Log in to the machine that hosts the identified node WBMNode01. Open
   identified_custom_profile\BusinessSpace\BPM.WebDashboard\mm.runtime.
   prof\public\ oobLoadedStatus.properties by using a text editor:

   ```
   C:\wdpe7\profiles\WBMCust01\BusinessSpace\BPM.WebDashboard\mm.runtim
   e.prof\public\oobLoadedStatus.properties
   ```

9. Update the importTemplates.txt and importSpaces.txt properties, as shown in
   Example 6-83.

   Example 6-83   Updated properties in oobLoadedStatus.properties

   ```
   importTemplates.txt=true
   importSpaces.txt=true
   ```

10. On the administrative console, navigate to **System administration** →
    Nodes. Select *all* the nodes. Click **Full Resynchronize** to synchronize the
    custom profile.

6.5.17 Deploy WebSphere Business Monitor scheduled service

In a stand-alone installation, the WebSphere Business Monitor scheduled services will be deployed during migration. In a network deployment environment, migration requires that you deploy the WebSphere Business Monitor scheduled services manually. Deploying the WebSphere Business Monitor scheduled services creates the WebSphere Application Server scheduler resource that calls the Data Memory System (DMS) and KPI history and prediction for each model.

To deploy the WebSphere Business Monitor scheduled services in an network deployment environment, perform the following steps.

1. Stop the BPM.WebDashboard.WBMNode01.0 server.

2. Make sure all the custom node agents are started (the WPSCust01, WPSCust02, WBMCust01 and WBMCust02 nodes).

3. Log in to the administrative console using an administrative user ID.

4. Select **Servers → WebSphere Business Monitor configuration** (see Figure 6-52).
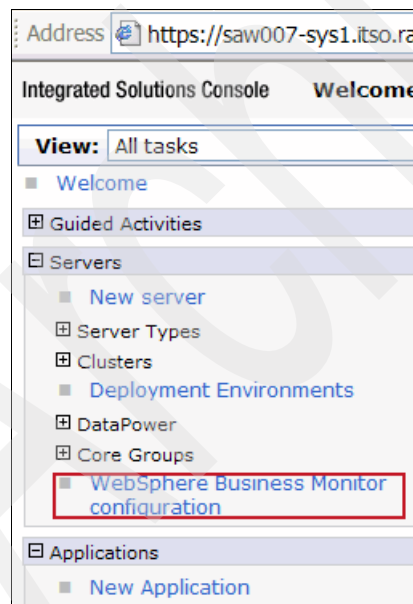
Figure 6-52   Navigate to WebSphere Business Monitor configuration

5. You can see that the WebSphere Business Monitor scheduled services are not configured, as shown in Figure 6-53.

Figure 6-53   WebSphere Business Monitor scheduled services configuration status

6. Click **Monitor scheduled services** and select WBM.Support for the cluster to deploy the WebSphere Business Monitor scheduled service, as shown in Figure 6-54.
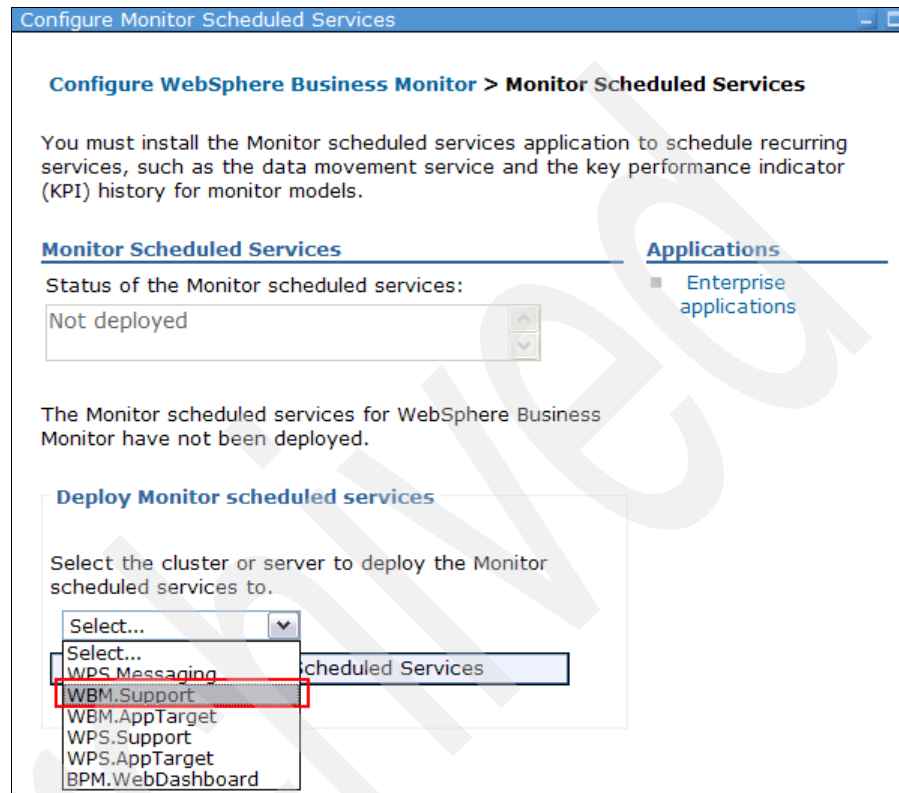
Figure 6-54   Select the cluster to deploy

7. Click **Deploy Monitor Scheduled Services**, as shown in Figure 6-55.
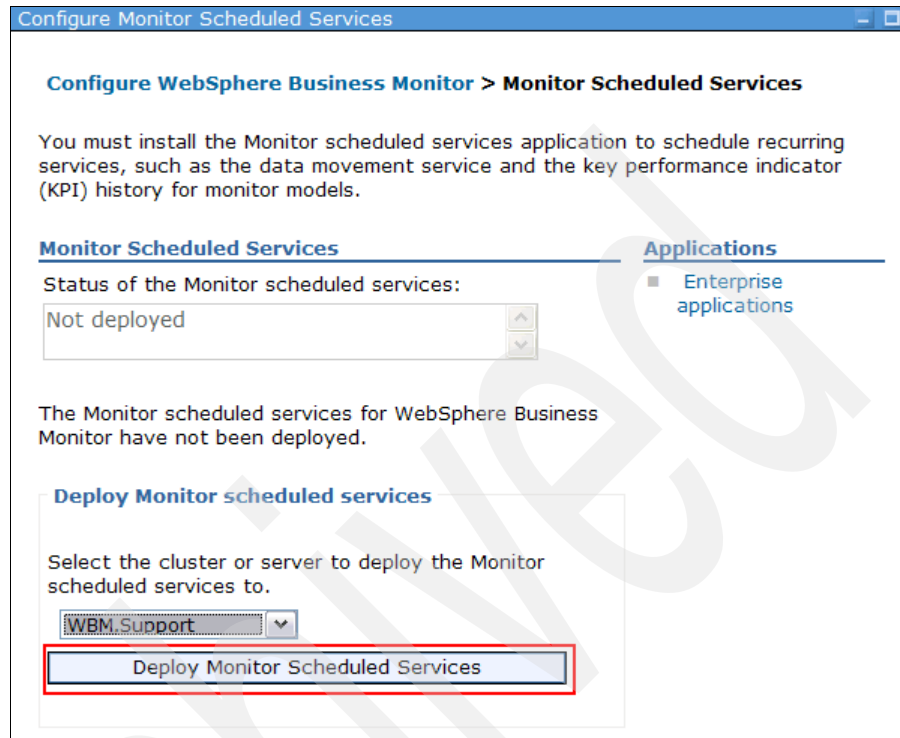
Figure 6-55   Deploy Monitor Scheduled Services

8. The CWMTW0651I message will be displayed if the deployment is successful, as shown in Figure 6-56.
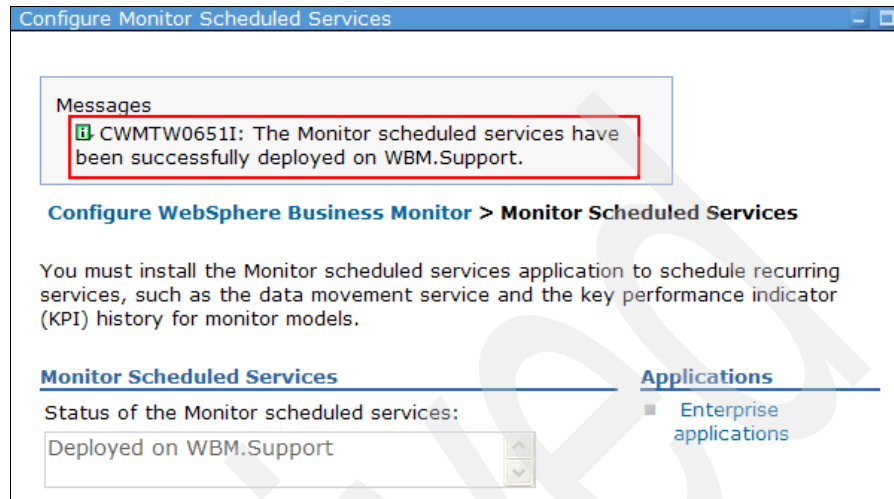
Figure 6-56   CWMTW0651I message

9. Save your workspace changes to the master configuration. Remember to check **Synchronize changes with Nodes** before clicking **Save**, as shown in Figure 6-57.
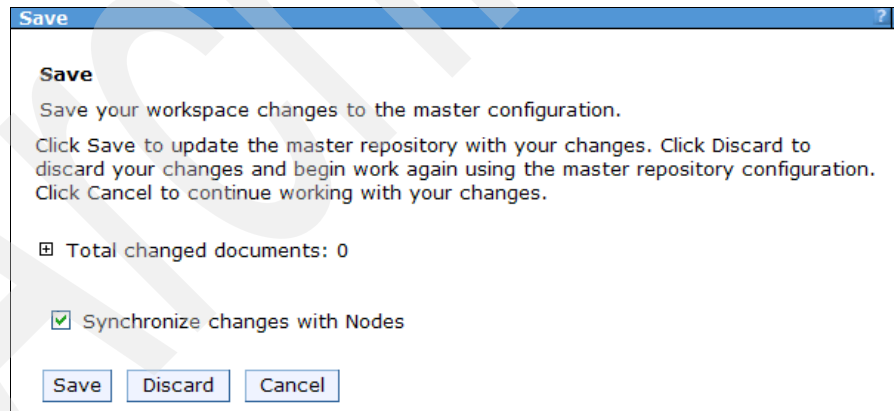
Figure 6-57   Save to the master configuration

Now the list of WebSphere Business Monitor components shows that the "Monitor scheduled services" component is deployed on the WBM.Support cluster (Figure 6-58).

Figure 6-58   Monitor scheduled services are deployed on WBM.Support

> **Errors?:** If, after migration, you find that the outbound CEI event service has the state shown in Figure 6-58 (a red circle with an x), refer to 6.7.1, "Update the outbound CEI event service" on page 329. The correct status should be "Configured using the event service on WPS.Support".

6.5.18 Update the WebSphere Business Monitor configuration

Updating the WebSphere Business Monitor configuration is a required task, regardless of whether Alphablox is installed. It registers models with the Data Services Scheduler and updates the cube configuration on the WebSphere Business Monitor V7.0 profile. You can complete this task by running the monConfigurationUpgrade script.

> **Note:** During the update of the WebSphere Business Monitor configuration, all the WebSphere Business Monitor related servers should be started (deployment manager, all the custom nodes, five clusters: WPS.Messaging, WPS.Support, WBM.Support, WBM.AppTarget, and BPM.Dashboard in our environment).
>
> Start the deployment manager first.

To update the WebSphere Business Monitor configuration, perform the following steps:

1. Stop all the node agents and target deployment manager. Restart the target deployment manager.

2. Start each target custom node by running the `startNode.bat` command under the *target_custom_profile_root*/bin directory on each machine.

3. Log in to the administrative console as an administrative user ID.

4. Start the six clusters in sequence:

   a. WPS.Messaging
   b. WPS.Support
   c. WPS.AppTarget
   d. WBM.Support
   e. WBM.AppTarget
   f. BPM.WebDashboard

   > **Note:**
   >
   > ► The clusters should be started one at a time in the sequence shown above.
   >
   > ► Check the log files for possible errors after the servers are started.

5. Log in to one of the machines where the WebSphere Business Monitor custom node is installed with the administrator user ID.

6. Open the *target_custom_profile_root*\scripts.wbm\migration\configuration\monConfigurationUpgrade.bat file by using a text editor:

   `C:\wdpe7\scripts.wbm\migration\configuration\monConfigurationUpgrade.bat`

Update the values shown in Example 6-84. The updated values are highlighted in **bold**.

> **Note:** If you are using a network deployment environment, you must configure the WSADMIN_HOST, WSADMIN_PORT and WSADMIN_USER settings to refer to the deployment manager of the cell, not an individual node. The underlying code for this operation is configured to the scope of the deployment manager. Therefore, if you configure the script to refer to a node other than the deployment manager, you will receive an error.

Example 6-84   monConfigurationUpdade.bat file

```
set WSADMIN_HOST=saw007-sys1.itso.ral.ibm.com
set WSADMIN_PORT=8879
set WSADMIN_CONN_TYPE=SOAP
set WSADMIN_USER=admin
set WSADMIN_PASSWORD=admin
set
WSADMIN_CLASSPATH=%WAS_HOME%\plugins\com.ibm.wbimonitor.lifecycle.sp
i.jar

set ABX_HOST=saw016-sys3.itso.ral.ibm.com
set ABX_PORT=9811
set ABX_USER=admin
set ABX_PASSWORD=admin
```

– WSADMIN_HOST refers to the host name of target deployment manager machine.

– WSADMIN_PORT refers to the SOAP_CONNECTOR_ADDRESS port of the deployment manager.

– WSADMIN_CONN_TYPE specifies the connection type. Here we use SOAP.

– WSADMIN_USER and WSADMIN_PASSWORD are the profile administrative user ID and password.

– ABX_HOST is the host name of the machine where Alphablox is installed.

– ABX_PORT is the SOAP_CONNECTOR_ADDRESS of the BPM.WebDashboard.WBMNode01.0 server.

– ABX_USER and ABX_PASSWORD are the profile administrative user ID and password.

7. Execute **monConfigurationUpgrade.bat** to update the monitor configuration. The command output is shown in Example 6-85. The input is highlighted in **bold**.

Example 6-85   Command output of monConfigurationUpgrade.bat

```
C:\wdpe7\scripts.wbm\migration\configuration>monConfigurationUpgrade
.bat
********************************************************************
Upgrade the Monitor configurations from 6.x to 7.0
********************************************************************
Please check the required wsadmin parameters defined in
monConfigurationUpgrade.bat, and they are used to connect to the
Monitor server.
   <WSADMIN_HOST>       = saw007-sys1.itso.ral.ibm.com
   <WSADMIN_PORT>       = 8879
   <WSADMIN_CONN_TYPE>  = SOAP
   <WSADMIN_USER>       = admin
   <WSADMIN_PASSWORD>   = admin

Please also check the optional Alphablox server configuration,
and the cubes on the default or specified Alphablox server will be
upgraded.
   <ABX_HOST>           = saw016-sys3.itso.ral.ibm.com
   <ABX_PORT>           = 9811
   <ABX_USER>           = admin
   <ABX_PASSWORD>       = admin

   Usage 1: upgrade the cubes in the default Alphablox server which
was specified in the Monitor database
      <ABX_HOST>        = .
      <ABX_PORT>        = .
      <ABX_USER>        = .
      <ABX_PASSWORD>    = .
   Usage 2: upgrade the cubes in the specified Alphablox server with
security disabled
      <ABX_HOST>        = hostname or IP (e.g. localhost)
      <ABX_PORT>        = BOOTSTRAP_ADDRESS (e.g. 2809)
      <ABX_USER>        = .
      <ABX_PASSWORD>    = .
   Usage 3: upgrade the cubes in the specified Alphablox server with
security enabled
      <ABX_HOST>        = hostname or IP (e.g. localhost)
      <ABX_PORT>        = BOOTSTRAP_ADDRESS (e.g. 2809)
      <ABX_USER>        = user
```

```
          <ABX_PASSWORD>  = password

Continue? [Input Y to continue or input N if you want to modify the
listed parameters]:Y

Please input the version of the old Monitor[61 or 62]:61

Start to upgrade the Monitor configurations, and after it's
completed, you could check the log file:
C:\wdpe7\logs\wbm\migration\monitor_configuration_upgrade_log.txt.
```

8. Check the `monitor_configuration_upgrade_log.txt` log file (the location is shown in the command output in **bold** in Example 6-85 on page 317) for the message shown in Example 6-86 to ensure that the updating is successful.

Example 6-86   Success message in the log

```
Info  - finish to update all Alphablox cubes successfully.
```

Errors?: If you find error WASX7017E in the log, refer to 6.7.3, "Alphablox cubes cannot be created" on page 335.

6.6 Verify the migration target environment

After migration, restart the entire target environment.

Stop the servers, one at a time, in the following sequence:

1. BPM.WebDashboard cluster
2. WBM.AppTarget cluster
3. WBM.Support cluster
4. WPS.AppTarget cluster
5. WPS.Support cluster
6. WPS.Messaging cluster
7. All the node agents
8. Deployment manager

Start the servers, one at a time, in the following sequence:

1. Deployment manager
2. All the node agents
3. WPS.Messaging cluster
4. WPS.Support cluster
5. WPS.Target cluster
6. WBM.Support cluster
7. WBM.AppTarget cluster
8. BPM.WebDashboard cluster

6.6.1 Verify the log files

After starting the target environment, check the `SystemOut.log` files for each server first. On each machine, navigate to the `target_profile_root`/logs/`Server_Name` directory and check the `SystemOut.log` file. There should be no fatal errors and you should see the "open for e-business" message (Example 6-87).

Example 6-87   Server successful start message

```
Server RMSgold.AppTarget.aix224Node02.0 open for e-business
```

Errors?: If you see the UTLS0002E message for the ABX_LIBS shared library, refer to 6.7.4, "Shared libraries for Alphablox" on page 339.

6.6.2 Check the messaging engine status

Check the messaging engine status to ensure all the messaging engines are running by performing the following steps:

1. Log in to the administrative console and navigate to **Service integration** → **Buses**. Click one of the bus names (for example, BPC.WDPECell.Bus).
2. Select **Topology** → **Messaging engines**.
3. The messaging engine should be in the started status.
4. Follow steps 1- 3 to check the messaging engine status for all the other buses. If any of the messaging engines are not in the started status, check the `SystemOut.log` file of the corresponding application server for the root cause of the problem.

6.6.3 Verify the applications

Log in to the administrative console and make sure that all the applications are started by performing the following steps:

1. Log in to the administrative console and navigate to **Applications** → **Application Types** → **WebSphere enterprise applications**.

2. All the applications should be in the started status, as shown in Figure 6-59.

Figure 6-59   Application status

> **Note:** If any application is not in the started status, check the
> `SystemOut.log` file of the application server and the previous migration log
> file.

3. Navigate to **Applications** → **Monitor Models**.
4. Make sure the Deployment status is the same as in the pre-migration
   environment, as shown in Figure 6-60 (OK in our environment).

Figure 6-60 Monitor model deployment status

6.6.4 Verify the WebSphere Process Server failed events

If there are WebSphere Process Server failed events left before migration, check
those failed events from the administrative console to make sure that no failed
event is lost during migration.

Perform the following steps:

1. Log in to the administrative console and navigate to **Integration
   Applications** → **Failed Event Manager**.

2. Check the recovery sub-system status and application server version information at the right-top corner of your window, as shown in Figure 6-61.
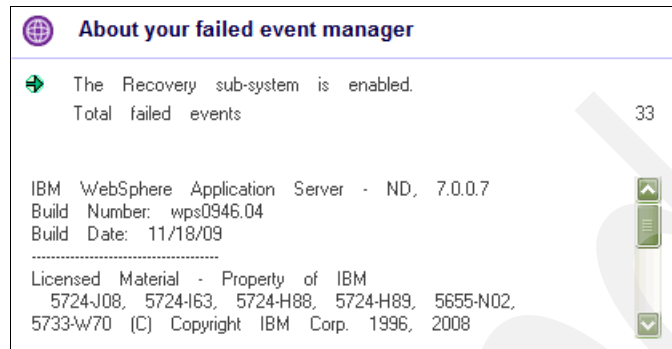
Figure 6-61   Recovery sub-system status

3. Click **Get all failed events**, and you should see all the legacy failed events, as shown in Figure 6-62. In the failed event list, we can see that the additional failed events from the BPC modules are shown. Displaying the failed events from business process choreographer applications is a new feature in WebSphere Process Server V7.0.

Figure 6-62   Failed event manager

4. We can successfully resubmit one of the legacy failed events, as shown in Figure 6-63.


```
☐ Messages
    ⓘ Failed event [_PI:90030128.4192517.5154d5f6.e8c400d0] was resubmitted successfully.
```
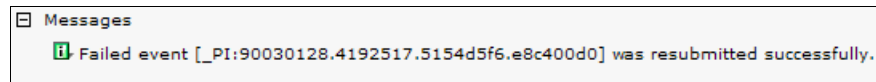
Figure 6-63   Resubmit failed event successfully

6.6.5 Verify WebSphere Business Monitor failed events

If you have any WebSphere Business Monitor failed events before migration, you can check the failed events on the administrative console to make sure they are migrated by performing the following steps:

1. Log in to the administrative console and navigate to **Troubleshooting** → **Monitor Models** → **Failed Event Sequences**.

2. Check the failed instances for each monitor model. The list should be the same as in the pre-migration environment.

3. Click the failed instances number and you can see the failed event number for each of the instances.

6.6.6 Verify the BPC Client

If you have long running BPEL instances in place before migration, you can log in to BPC Explorer to check the legacy instances by performing the following steps:

1. Log in to the BPC Explorer with the admin user ID at `http://saw016-sys1.itso.ral.ibm.com:9081/bpc`.

2. Navigate to **Process Instances** → **Administrated By Me**.

3. We can see all the legacy BPEL instances, as shown in Figure 6-64.

Process Instances for Process Templates

Use this page to work with process instances that belong to spe

| Terminate | Delete | Suspend | Resume | Restart | Compensa

☐   Process Instance Name ⬍

☐   _PI:90030128.823ab49.5154d5f6.ecde0005
☐   _PI:90030128.7ca44df.5154d5f6.7c20084
☐   _PI:90030128.7d72968.5154d5f6.7c200c0
☐   _PI:90030128.7da4acd.5154d5f6.7c200fc
☐   _PI:90030128.808ff48.5154d5f6.7290000
☐   _PI:90030128.813abd3.5154d5f6.7290045
☐   _PI:90030128.835ad83.5154d5f6.ecde0033
☐   _PI:90030128.8391b23.5154d5f6.ecde006d
☐   _PI:90030128.8397bc2.5154d5f6.ecde009b
☐   _PI:90030128.839ec5e.5154d5f6.ecde00d5
☐   _PI:90030128.83a523c.5154d5f6.ecde0104
☐   _PI:90030128.83b010a.5154d5f6.ecde013e
☐   _PI:90030128.83b6f93.5154d5f6.ecde016c
☐   _PI:90030128.84ccf06.5154d5f6.ecde01c8
☐   _PI:90030128.84d25b1.5154d5f6.ecde01eb
☐   _PI:90030128.84d4a8f.5154d5f6.ecde0215
☐   _PI:90030128.84dbec5.5154d5f6.ecde0238
☐   _PI:90030128.84de642.5154d5f6.ecde0261
☐   _PI:90030128.84e2dab.5154d5f6.ecde028a
☐   _PI:90030128.84eacce.5154d5f6.ecde02b4
☐   _PI:90030128.84f61b7.5154d5f6.ecde02d7
☐   _PI:90030128.84f86a4.5154d5f6.ecde0300
☐   _PI:90030128.8500fe8.5154d5f6.ecde0329

Items found: 23   Items selected: 0 | << |

Figure 6-64 Legacy BPEL instances

4. If you migrated the BPC Observer, click **Reports** to see the reports in the BPC explorer (Figure 6-65).

Figure 6-65   Report in BPC Explorer

6.6.7 Verify the Business Rules Manager

Log in to the Business Rules Manager to check the business rules by performing the following steps:

1. Log in to the Business Rules Manager with the user ID admin at `http://saw016-sys1.itso.ral.ibm.com:9081/br`.

2. Navigate to **Business Rule Groups**.

3. Expand one of the business rules, for example, **RatingService** → **performRiskRating** → **performRiskRating**, and check the details (Figure 6-66).

Figure 6-66   Business Rules Manager

6.6.8 Verify the Alphablox administrative console

Log in to the Alphablox administrative console at `http://saw016-sys3.itso.ral.ibm.com:9082/AlphabloxAdmin` to see if the cubes for each model version are running, as shown in Figure 6-67.

Figure 6-67   Checking the cube status in the Alphablox administrative console

6.6.9 Verify Business Space

You can log in to Business Space with different user IDs to check that all the legacy spaces, pages, and widgets are displayed by performing the following steps:

1. We log in as the ITSORequester user to see the legacy space shown in Figure 6-68.
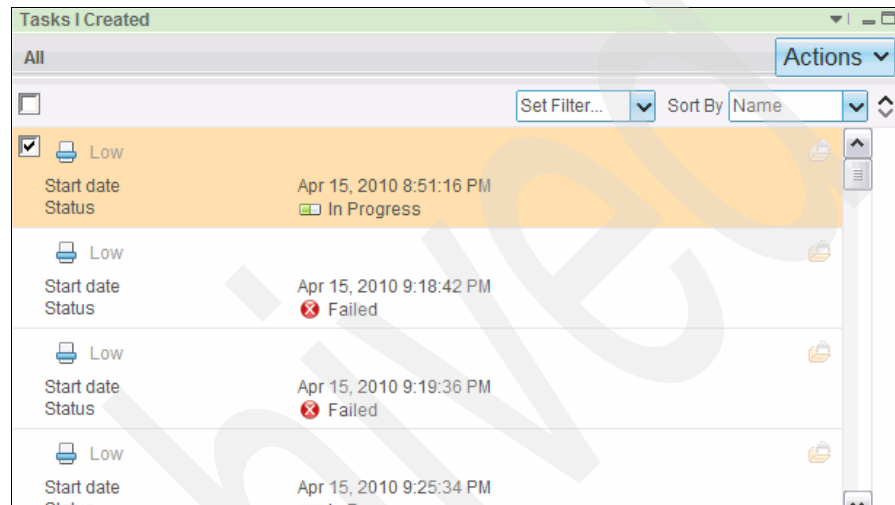
Figure 6-68   Legacy space for ITSORequester

2. We log in as the ITSOMonitor user to see the space shown in Figure 6-69.
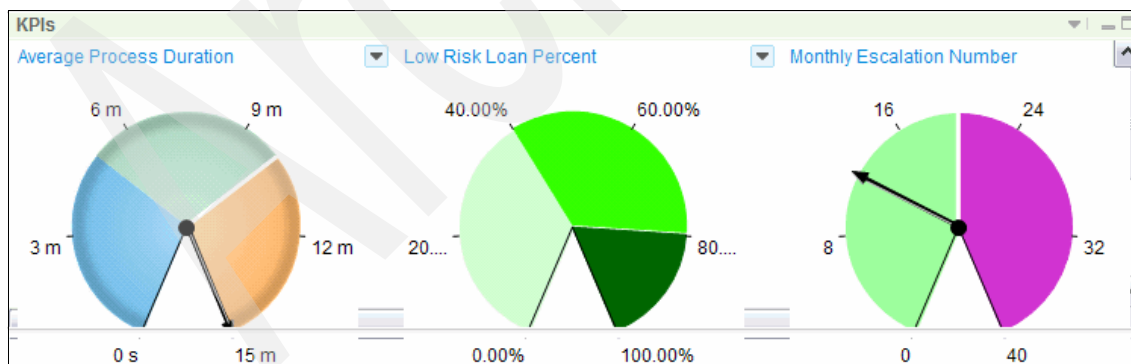
Figure 6-69   Legacy space for ITSOMonitor user

3. You can also create a new Business Space using a template.

> **Errors?:** If you find that some or all of the WebSphere Business Monitor widgets do not work properly, refer to 6.7.2, "REST Services port error" on page 332 for a possible solution.

6.6.10 Verify long running BPEL instances

Next, verify that the migrated long running BPEL instances are intact by performing the following steps:

1. Log in to Business Space as the ITSOApprover_member01 user.

2. You can successfully claim and complete one of the available tasks to finish one legacy BPEL instance for the sample application. This indicates that the long running BPEL instances are migrated successfully and WebSphere Process Server is working properly after migration.

3. Log in to Business Space as the ITSOMonitor user. You will see that the newly executed instance is complete.

4. Launch a new instance as ITSORequester using Business Process Choreographer Explorer. In the instance widget, you can see that there is one more instance.

This shows that WebSphere Dynamic Process Edition is working properly for long running instances after migration. You can also check the other widgets on the Business Space for a thorough testing.

6.7 Troubleshooting

In this section, we describe the issues we encountered during our migration procedure.

6.7.1 Update the outbound CEI event service

After migration, we found that the outbound CEI event service was not in the correct state.

Symptom

After deploying the WebSphere Business Monitor scheduled services, we used the administrative console to navigate to **Servers → WebSphere Business Monitor configuration**. We saw a red cross for **Outbound CEI event service**, as shown in Figure 6-70.

	Component	Status
❌	Outbound CEI event service	
✅	Messaging engine	Deployed on WPS.Messaging
✅	Action services	Deployed on WBM.Support
✅	Monitor scheduled services	Deployed on WBM.Support

Figure 6-70   Outbound CEI event service configuration has a red X

Solution

If you encounter this problem, perform the following steps to solve the problem:

1. Log in to the administrative console and navigate to **Service integration → Common Event Infrastructure → Event emitter factories**.

2. Click **Monitor Emitter Factory**, as shown in Figure 6-71 (Monitor Emitter Factory in our environment).

Figure 6-71   Event emitter factories

3. In the Additional Properties section, click the **Event service transmission** link.

4. Replace the JNDI name with:

`cell/clusters/`*cluster_name*`/com/ibm/events/configuration/bus-transmission/Default`

The *cluster_name* is the cluster name where the common event infrastructure service is deployed. In our example (Figure 6-72), we use the following value:

`cell/clusters/WPS.Support/com/ibm/events/configuration/bus-transmission/Default`

The default is `com/ibm/events/configuration/bus-transmission/Default`.

Figure 6-72   Default CEI event bus transmission

5. Navigate to **Service integration** → **Common Event Infrastructure** → **Event emitter factories**.

6. Under **Component**, select **Outbound CEI event service**.

7. Click **Monitor Emitter Factory**.

8. Select the JNDI name you just entered as the **JNDI name for event service transmission**. In our example, we select:

```
cell/clusters/WPS.Support/com/ibm/events/configuration/bus-transmiss
ion/Default
```

9. Click **OK**.

6.7.2 REST Services port error

After migration, we found that not all of the WebSphere Business Monitor widgets work properly.

Symptom

After we log in to the Business Space, we cannot view any data in the Monitor instance widget. Other widgets display Widget Needs Configuration on the legacy space we configured before migration (Figure 6-73).
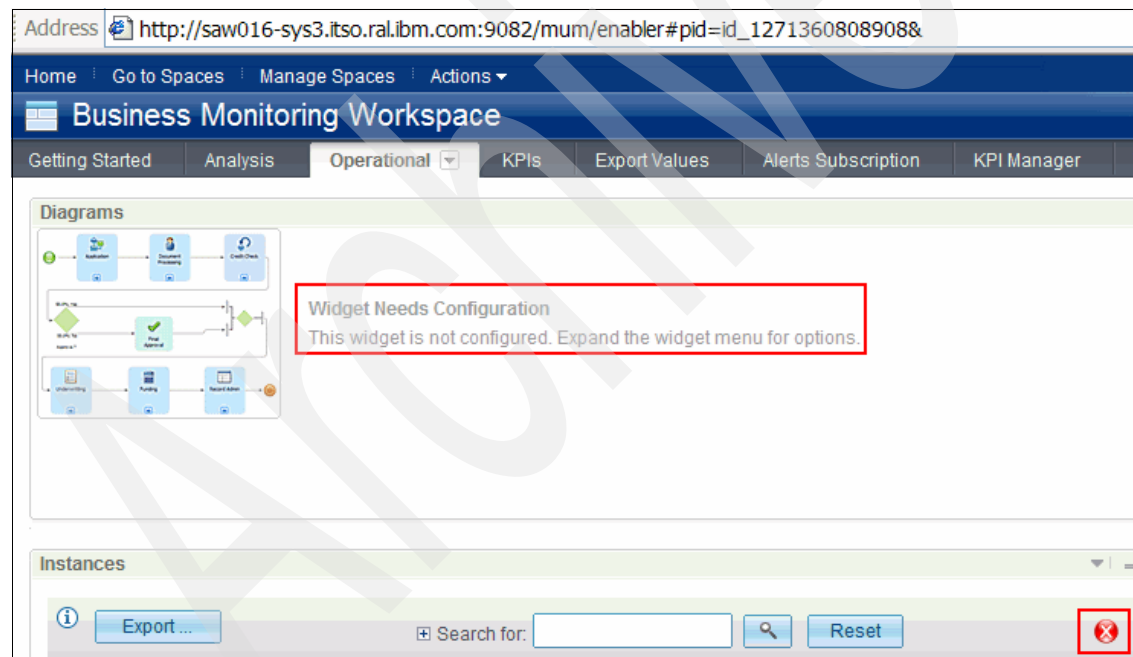
Figure 6-73   No data is shown in Monitor widgets

When we add a new widget in the page and try to configure it, the warning shown in Figure 6-74 opens.
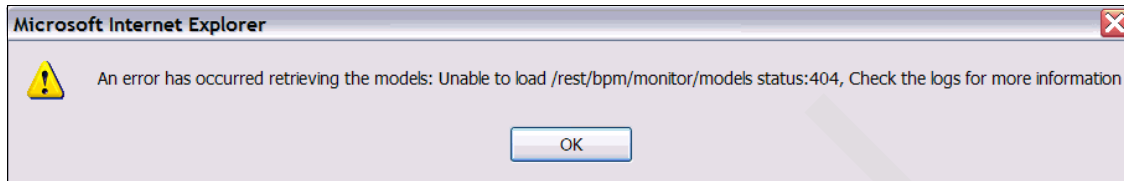
Figure 6-74   Warning window when configuring a new widget

When we check the logs for the BPM.WebDashboard cluster (`C:\wdpe7\profiles\WBMCust01\logs\BPM.WebDashboard.WBMNode01.0\SystemOut.log`), we find the errors shown in Example 6-88.

Example 6-88   Rest Service API error message

```
[4/21/10 16:28:11:078 EDT] 00000056 webcontainer  E
com.ibm.ws.webcontainer.WebContainer handleRequest SRVE0255E: A
WebGroup/Virtual Host to handle
/rest/bpm/monitor/alerts/dashboardalerts has not been defined.
[4/21/10 16:30:50:265 EDT] 00000057 webcontainer  E
com.ibm.ws.webcontainer.WebContainer handleRequest SRVE0255E: A
WebGroup/Virtual Host to handle
/rest/bpm/monitor/models/NewLoanProcessMM/cubes/NEWLOANPROCESSMM_NEW_LO
AN_PROCESS_CUBE/saw016-sys3_9445 has not been defined.
```

Root cause

This error occurs because the REST services port is set incorrectly after migration (Figure 6-75).

Figure 6-75   REST Services port

REST_Services_Gateway is deployed on the WBM.Support cluster and the WC_defaulthost_secure port for WBM.Support.WBMNode01.0 is 9443. We need to modify the REST services port to 9443.

Solution

Perform the following steps to correct the REST services port:

1. Log in to the administrative console and navigate to **Servers** → **Clusters** → **WebSphere application server clusters**.

2. Click **BPM.WebDashboard**.

3. Select **Business Integration** → **REST services**.

4. Modify the port to 9443 (Figure 6-76).

Figure 6-76   Correct port for REST services

5. Click **OK**.

6. Restart the BPM.WebDashboard cluster.

6.7.3 Alphablox cubes cannot be created

Updating the monitor configuration fails because the Alphablox cubes cannot be created.

Symptom

After updating the monitor configuration, we found the error shown in Example 6-89 in the `monitor_configuration_upgrade_log.txt` log file.

Example 6-89   Error message in monitor_configuration_upgrade_log.txt

```
Info  - [EomsMM/20080616210719] recreate the Alphablox cubes.
WASX7017E: Exception received while running file
"monConfigurationUpgrade.jy"; exception information:
javax.management.MBeanException
java.lang.NullPointerException: java.lang.NullPointerException
```

When we check the log for the BPM.WebDashboard cluster member (`C:\wdpe7\profiles\WBMCust01\logs\BPM.WebDashboard.WBMNode01.0\SystemOut.log`), we found the errors shown in Example 6-90.

Example 6-90   AlphabloxConf exception when creating cubes

```
[4/21/10 17:05:51:156 EDT] 0000005f AlphabloxConf E
com.ibm.wbimonitor.alphablox.mbeans.AlphabloxConfigMBeanImpl
createCube( String, Map ) CWMLC6211E: AlphabloxConfig MBean failed.
Cause: [DB2 SQL Error: SQLCODE=-805, SQLSTATE=51002,
SQLERRMC=NULLID.SYSLN203 0X5359534C564C3031, DRIVER=3.51.90 ( DB2 SQL
Error: SQLCODE=-805, SQLSTATE=51002, SQLERRMC=NULLID.SYSLN203
0X5359534C564C3031, DRIVER=3.51.90 )].
```

On the administrative console, the "Alphablox cubes created" option shows a red cross, as shown in Figure 6-77.

Figure 6-77   Alphablox cubes created status

Root cause

This error occurs because Alphablox tries to access the SYSLN203 package, which was not created in the database. As a result, the cubes cannot be created.

Solution

To fix the problem, perform the following steps:

1. On the DB2 server machine, open a DB2 command-line window.

2. Execute the command shown in Example 6-91 to rebind db2cli.lst to CLIPKG 20.

Example 6-91   Rebind db2cli.lst command

```
C:\backup\afterBSpace>db2 connect to MONITOR user db2admin using
password

   Database Connection Information

 Database server        = DB2/NT 9.5.0
 SQL authorization ID   = DB2ADMIN
 Local database alias   = MONITOR

C:\backup\afterBSpace>db2 "bind c:\IBM\DB295\bnd\@db2cli.lst
blocking all sqlerror  continue grant public CLIPKG 20"

LINE    MESSAGES FOR db2cli.lst
----------------------------------------------------------------------
        SQL0061W  The binder is in progress.
        SQL0091N  Binding was ended with "0" errors and "0"
warnings.

C:\backup\afterBSpace>db2 "select pkgname from syscat.packages where
pkgname='SYSLN203'"

PKGNAME
----------------------------------------------------------------------
SYSLN203

  1 record(s) selected.

C:\backup\afterBSpace>db2 connect reset
DB20000I  The SQL command completed successfully.
```

3. Rerun the `monConfigurationUpgrade.bat` command to update the Alphablox cubes for other models.

4. We need to create the Alphablox cubes manually for the EomsMM model. The `monConfigurationUpgrade.bat` command will not create the cubes for this model during re-execution.

5. On the administrative console, navigate to **Applications** → **Monitor Models.**

6. Click **Version of EomsMM** (2008-06-16T21:07:19 in our environment).

7. Click **Manage Alphablox Cubes** under Version Properties.

8. The window shown in Figure 6-78 opens. Click **Create**.
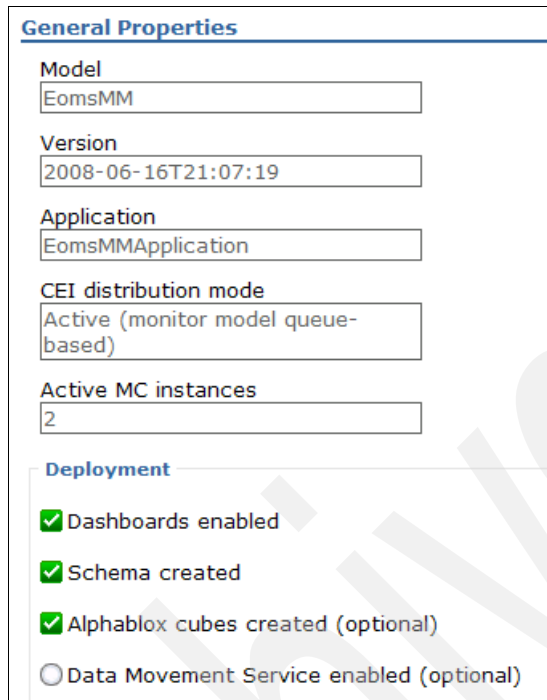
Figure 6-78   Create Alphablox cubes manually

The Alphablox cubes are successfully created (Figure 6-79).

Figure 6-79   The Alphablox cubes have been successfully created

6.7.4 Shared libraries for Alphablox

After migration, there can be error messages indicating that shared libraries are not found for Alphablox in the WebSphere Process Server logs.

Symptom

After starting the target environment after migration, there are several exceptions for the ABX_LIBS libraries in `SystemOut.log` for the WPS.Messaging, WPS.Support, and WPS.AppTarget members (Example 6-92).

Example 6-92   Shared library not found logs

```
[4/20/10 14:32:19:718 EDT] 00000000 ModuleManifes E   UTLS0002E: The
shared library ABX_LIBS contains a classpath entry which does not
resolve to a valid jar file, the library jar file is expected to be
found at C:\wdpe7\Alphablox\lib\aasreputil.jar.
```

Root cause
This error occurs because the ABX_LIBS shared library is configured at the cell scope, but Alphablox is not installed on the WebSphere Process Server systems. Because our WebSphere Process Server does not use Alphablox, the exception can be safely ignored.

Solution
Simply ignore the exceptions about ABX_LIBS in WebSphere Process Server logs if the node is a WebSphere Process Server custom node.

Migrating WebSphere Process Server V6.1.2 to V7.0 on a z/OS system

This chapter provides a detailed example of a walkthrough with instructions for migrating a WebSphere Process Server V6.1.2 runtime environment on a z/OS system to Version 7.0 with *full downtime*. This topology is configured with a single cluster topology, which includes two servers on two separate nodes on the same z/OS system.

This chapter contains the following sections:

► "Source environment overview" on page 342. This section describes the source environment that is to be migrated on z/OS. The source environment topology, databases, nodes, cluster and servers, sample applications deployed are introduced.

► "Installing WebSphere Process Server V7.0 on z/OS" on page 351. This section provides full instructions to install WebSphere Process Server V7.0 on a z/OS system.

► "Migrating the runtime environment" on page 352. This section provides full instructions to migrate the existing topology from Version 6.1.2 to Version 7.0 with full downtime on z/OS.

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► "Post-migration verification" on page 438. This section describes the instructions to perform the post-migration verifications. You will examine the target environment and verify if the migration process has successfully created the corresponding objects in the target environment.

► "Troubleshooting" on page 445. This section describes issues that were discovered and fixed during the migration on z/OS.

7.1 Source environment overview

This section briefly describes the Version 6.1.2 source environment that will be migrated to Version 7.0.

7.1.1 Source environment topology

The source topology is a single cluster topology that includes two servers on two separate nodes on the same z/OS system, as shown in Figure 7-1.
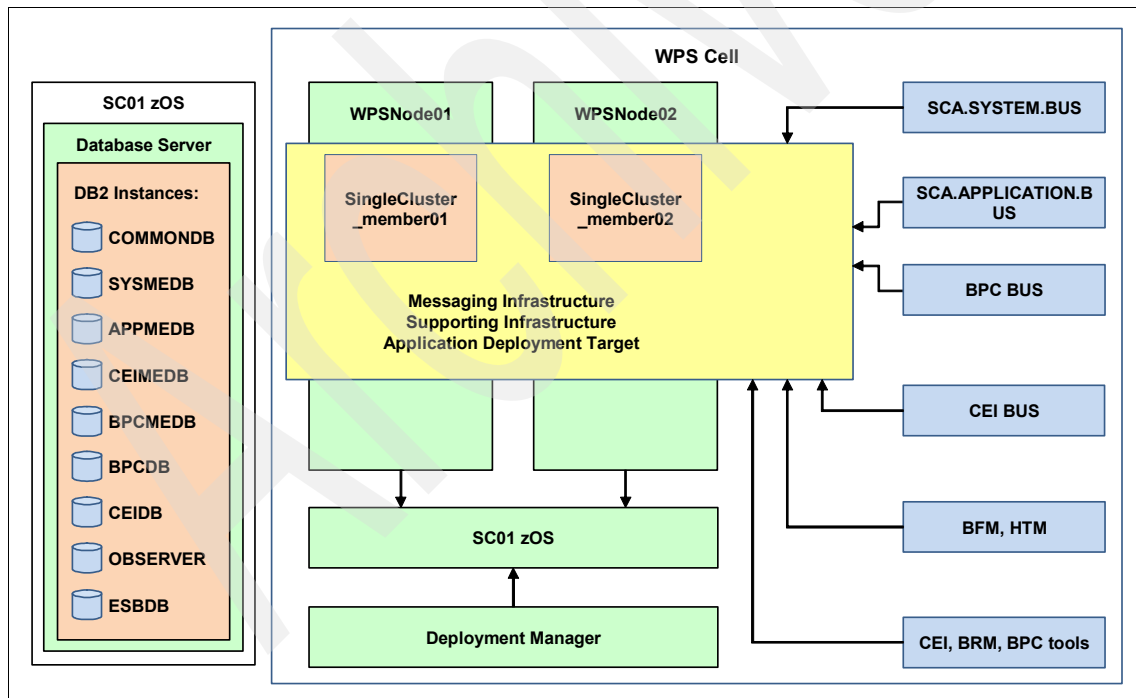
Figure 7-1   Source environment topology

The single cluster pattern is the default topology of WebSphere Process Server for z/OS. All components are run on a single cluster:

► Service Component Architecture (SCA) application bus members
► SCA system bus members
► Business Process Choreographer (BPC) bus members
► Common Event Interface (CEI) bus members
► Business Process Choreographer components, such as the explorer
► Business Process Choreographer container
► Business Rules Manager
► CEI server
► Application deployment target

7.1.2 Sample application

We used the sample application to generate long-running BPEL instances, human tasks, and failed events. We later verify, in the target environment, whether they are intact during post-migration.

The sample application was deployed and started. For migration, the following situation exists:

► Several process instances were started.

► Several process instances and human tasks are found in BPC explorer.

► Several fail events were generated.

For more information about the sample application, refer to 5.6.1, "Sample application description" on page 178 and 5.6.2, "Features included in the sample application" on page 179.

7.1.3 Source environment checking

In this section, we check the source environment to see if it is set correctly.

Installed software versions

Log into the administrative console and check the software versions of the source environment (Figure 7-2).

Integrated Solutions Console provides a common administration console for multiple products. lists the product suites that can be administered through this installation. Select a product suite information.

Suite Name	Version
WebSphere Application Server	6.1.0.28
WebSphere Process Server	6.1.2.3

Figure 7-2   Administrative console of the source environment

Cell topology

Log into the administrative console and observe the source environment (Figure 7-3).

Local Topology

Cell
- l1cl01
  - Nodes
    - l1nodea (Business Process Choreographer 6.1.2.3, ND 6.1.0.28, WPS 6.1.2.3)
      - Cluster members
        - l1cl011
    - l1nodeb (Business Process Choreographer 6.1.2.3, ND 6.1.0.28, WPS 6.1.2.3)
      - Cluster members
        - l1cl012
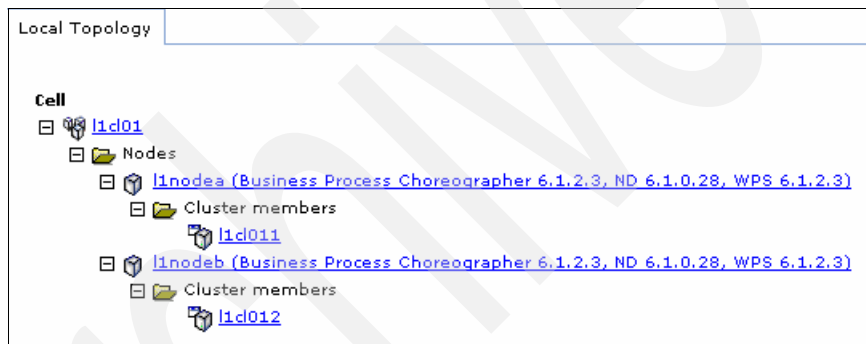
Figure 7-3   Cell topology

Enterprise applications

Before migration, we deploy the sample applications to the source environment. You can check the status of the enterprise applications including the system and sample applications in the administrative console (Figure 7-4).

☐	AppScheduler	⇨
☐	BPCExplorer_l1cl01	⇨
☐	BPEContainer_l1cl01	⇨
☐	BusinessRulesManager	⇨
☐	DefaultApplication.ear	⇨
☐	HTM_PredefinedTaskMsg_V612_l1cl01	⇨
☐	HTM_PredefinedTasks_V612_l1cl01	⇨
☐	ITSO_impl_v1App	⇨
☐	ITSO_med_v1App	⇨
☐	ITSO_v1App	⇨
☐	RemoteAL61	⇨
☐	TaskContainer_l1cl01	⇨
☐	persistentLkMgr	⇨
☐	sca.sib.mediation	⇨
☐	wpsFEMgr_6.1.2	⇨

Figure 7-4   Applications deployed in the source environment

Process instances

For verification purposes, we also do some data preparation based on the sample application. Before migration, some long running BPEL instances and human tasks are generated (Figure 7-5). These instances will be left there until post-migration.

Figure 7-5   Process instances

Business Rule Manager
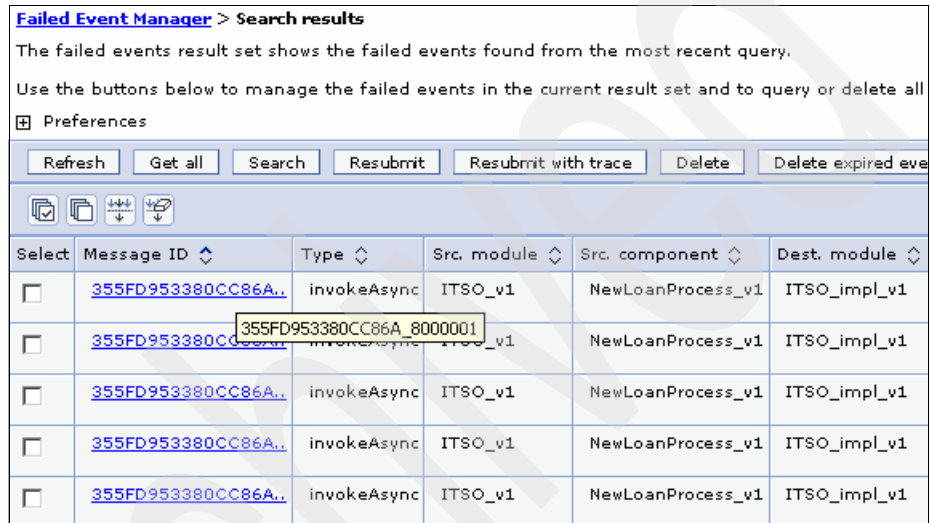
Check that the business rules can be viewed and edited in the business rule manager of the source environment (Figure 7-6).

Figure 7-6   Business rules

Failed events

Check the failed events from administrative console of the source environment by selecting **Integration Applications** → **Failed Event Manager** (you can see the results in the window that is shown in Figure 7-7). If possible, all existing failed events should be resolved before migration. The number of current remaining failed events should be recorded to ensure that there are no failed events lost during migration. After migration, the number of failed events should be equal to or larger than the current number. One convenient approach to recording the failed events is to take a screen capture of all the failed events display pages.

Figure 7-7   Failed events

Check the first one of these failed events (Figure 7-8).

Figure 7-8   The first failed event

Check the business data of the first failed event (Figure 7-9).

```
Failed Event Manager > Search results > 355FD953380CC86A_8000001 > Business data editor
Use this page to view and edit business data parameters.

[ Resubmit ]  [ Undo local business data changes ]

Parameter name ◇            Parameter value ◇          Parameter type ◇
input1                      Error                       java.lang.String

   Total 1    Filtered total: 1
```

Figure 7-9   The business data of the first failed event

> **Note:** It is not mandatory to resolve failed events. You can re-submit them
> after migration as well. However, it is best practice to migrate a system in a
> clean state, that is, when there are no failed events before the migration.

Clean up the exceptions

Before migration, the `SystemOut.log` files of all the application servers should be
checked for any exceptions. You can search for " E " (there is one blank character
both before and after the E) through the log file to find any exception. All runtime
and application exceptions should be handled accordingly (non-fatal exceptions
can be ignored on a case by case basis).

Manually copy third-party artifacts

We did not use third-party artifacts in our migration source environment. If you
have used third-party artifacts, you need to manually copy them to the migrated
environment again. See 3.4.2, "Runtime migration for network deployment with
cluster" on page 99 for more information.

Stop the source environment

For a full downtime migration, we need to stop the whole source environment
before starting the migration procedure. You should first stop the application
servers, then stop the node agents, and then stop the deployment manager.

Back up the source environment

Before the actual migration steps, back up the source environment, including the
runtime environment and all of the product databases and user databases on
z/OS. This backup is critical for performing a rollback in case there is a migration
failure.

7.2 Installing WebSphere Process Server V7.0 on z/OS

Before you start migrating the source deployment environment, you need to create the WebSphere Process Server V7.0 target profiles that have the same type as the ones on z/OS. In this sample, we need to create the Version 7.0 deployment manager and two empty nodes on z/OS.

For instructions about how to create the profiles on z/OS, refer to Chapter 3, "Creating the WebSphere Process Server deployment manager and two empty nodes", in *z/OS: WebSphere Business Process Management V7 Production Topologies*, SG24-7831.

Before the actual migration steps, back up the target Version 7.0 profiles on z/OS. This backup is critical for performing a rollback in case there is a migration failure.

> **Note:**
> ► There is a fundamental difference between the distributed process and the z/OS migration process, because the target cell comprised of profiles of the same type must be created before migration.
>
> ► Use the same cell name and node name of the source when creating the target profiles. If you use different cell and node names, federated nodes cannot successfully migrate to the Version 7.0 cell.
>
> ► You can use the Version 6.1.2 databases for the target profiles, or you can create new databases. Although re-using the Version 6.1.2 databases in the target environment is generally preferred, it might be a good time to re-organize your DB2 databases for performance reasons. In this document, we re-used the Version 6.1.2 databases.
>
> ► Use the same procedure names for the daemon and controller regions when creating the target deployment manager.
>
> ► Use the same procedure names for the daemon, adjunct, controller, and servant regions when creating the target empty managed nodes.
>
> ► Simply create the target profiles of the deployment manager and empty managed nodes. Do *not* start and federate them.

7.3 Migrating the runtime environment

This section provides the instructions needed to migrate the existing topology from Version 6.1.2 to Version 7.0 on z/OS.

7.3.1 Migration steps overview

Figure 7-10 lists the typical steps to migrate the WebSphere Process Server V6.1.2 cell to Version 7.0.
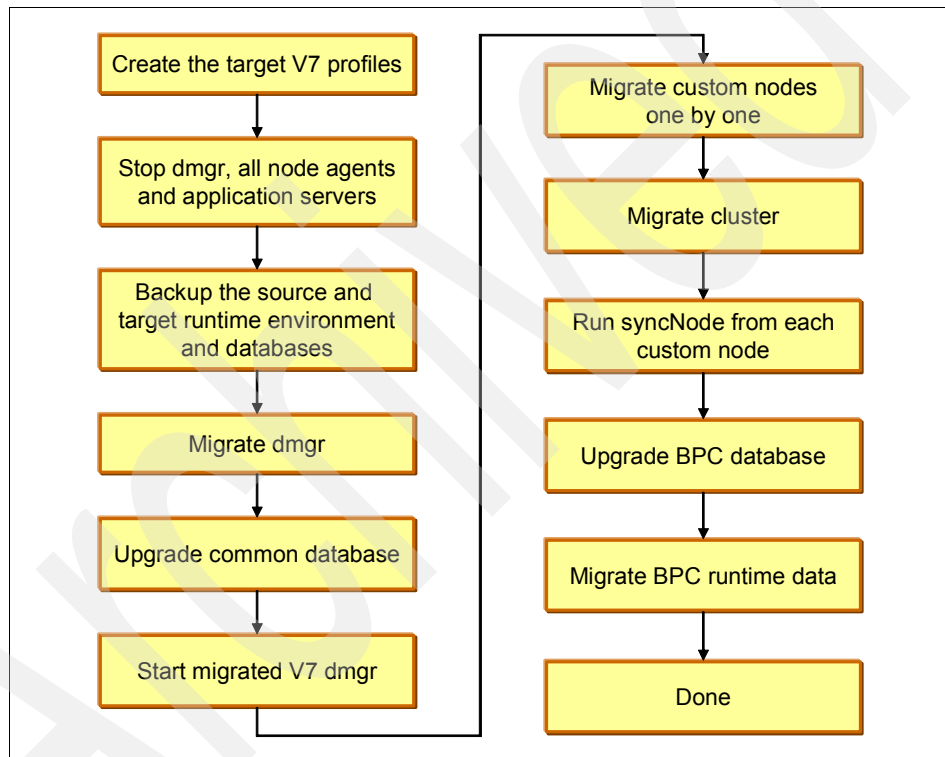

Figure 7-10   Migration overview steps

7.3.2 Migrating the deployment manager

The deployment manager profile must be the first profile to be migrated. It must be migrated before the migration is attempted on the managed nodes. During the migration of the deployment manager profile, the applications (user applications, system applications, support applications, and the sample applications) and the deployment environment configuration data (clusters, JMS resources, database resources, and so on) are transformed and copied to the target profile. The target profile is the new Version 7.0 deployment manager profile.

The source and target deployment manager profiles for this example are shown in Table 7-1.

Table 7-1   Deployment manager migration

Source server	Target server
/was61config/l1cell/l1dmnode	/was70config/l1cell/l1dmnode

In this section, you use the migration jobs to perform the migration on the deployment manager. The deployment manager profile in Version 6.1.2 is migrated to the deployment manager profile in Version 7.0. After the migration, the Version 6.1.2 deployment manager should not be started.

The steps to migrate the deployment manager profile are:

► Generate the WebSphere Application Server migration jobs
► Edit and submit the migration job BPZWMG3D

Generate the WebSphere Application Server migration jobs

The first step to migrate a profile on z/OS is to generate the WebSphere Application Server migration jobs and variables from the z/OS Migration Management Tool (MMT) component of the WebSphere Customization tools (WCT).

At this point, we assume that you have installed WCT V7.0 or later and you have verified that it starts.

> **Note:** You can download WebSphere Customization Tools V7.0 from the IBM Support website at the following address:
>
> http://www-01.ibm.com/support/docview.wss?rs=180&uid=swg24020368

Now we can begin the discussion of how to use the MMT to customize the WebSphere Application Server migration utility jobs.

Create migration location

A migration location is where the MMT will store the results of the migration job customization work you do. The location can be on a local hard drive or a network drive. You can create a new location or tell the tool to use an existing one. In this example, we show how to create a new location.

Perform the following steps:

1. Launch WCT V7.0. To open the z/OS MMT component, if you see the z/OS Migration Management Tool tab, click it; otherwise, select **Window** → **Open Perspective** → **Other**. The window shown in Figure 7-11 opens.
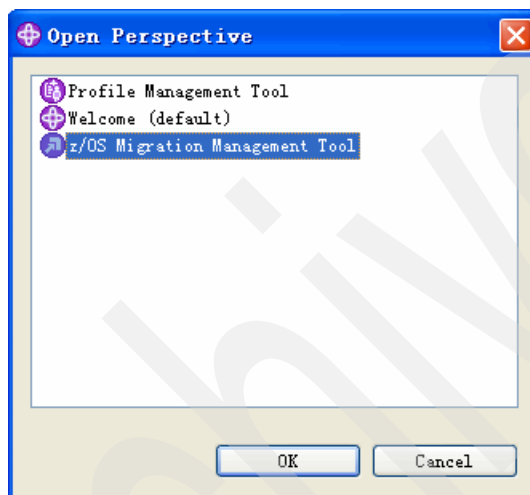
Figure 7-11   Open Perspective window

2. Select **z/OS Migration Management Tool** and click **OK**. The z/OS MMT window opens, as shown in Figure 7-12.
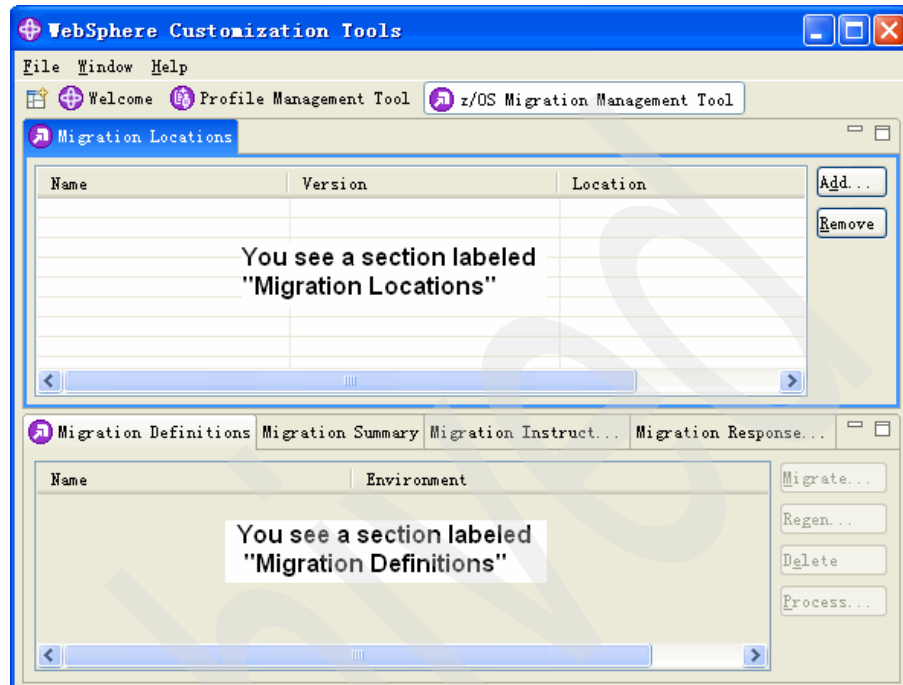
Figure 7-12   z/OS Migration Management Tool

3. In the Migration Locations section, click **Add**... (Figure 7-13).
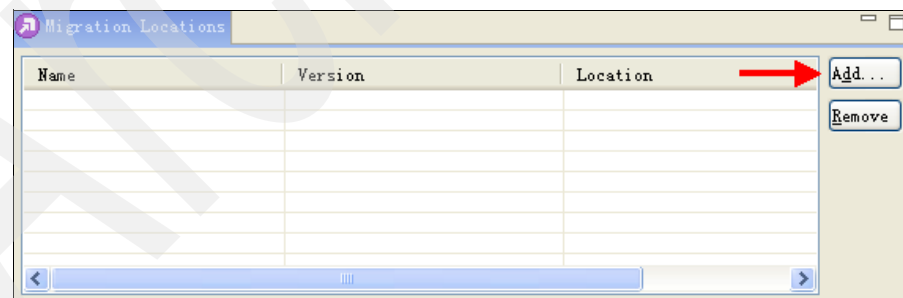
Figure 7-13   Launch the Add Migration Location window

4. In the Add Migration Location window, enter the information shown in Figure 7-14.
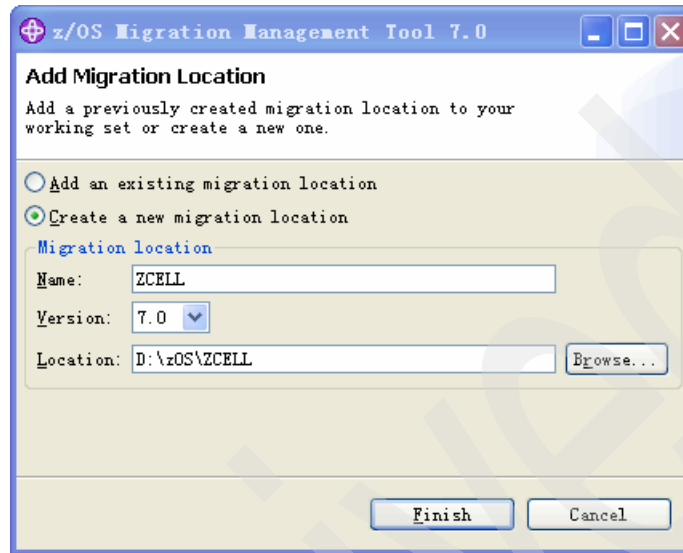
Figure 7-14 Add Migration Location window

– You have two choices for a location: Add an existing location or create a new one. Selecting **Add an existing migration location** assumes that the directory exists and is already populated with WCT information. Selecting **Create a new migration location** initializes a new location, either an empty directory you point to or a new directory that the WCT creates for you. In this example, we select **Create a new migration location**.

– The name of the location is what will be displayed in the tool. It should be something meaningful to you. For example, ZCELL refers to the cell being migrated on z/OS. Inside the ZCELL location are the definitions for the nodes in ZCELL being migrated.

– For the version number, select **7.0**.

– The location is the actual path on the storage device (local drive or network drive) where WCT will save the migration definitions. The directory might already exist, but it must be empty. You may name a new folder and the WCT will create it for you. Here we define a new directory named `D:\zOS\ZCELL`.

Click **Finish**.

Note:

► The Version 7.0 WCT now has a locking mechanism that allows a location to be used by multiple people.

► Locations should be in a place other than the installation path for the WCT itself. This configuration prevents the accidental loss of definitions if the WCT is uninstalled and someone deletes the whole folder structure.

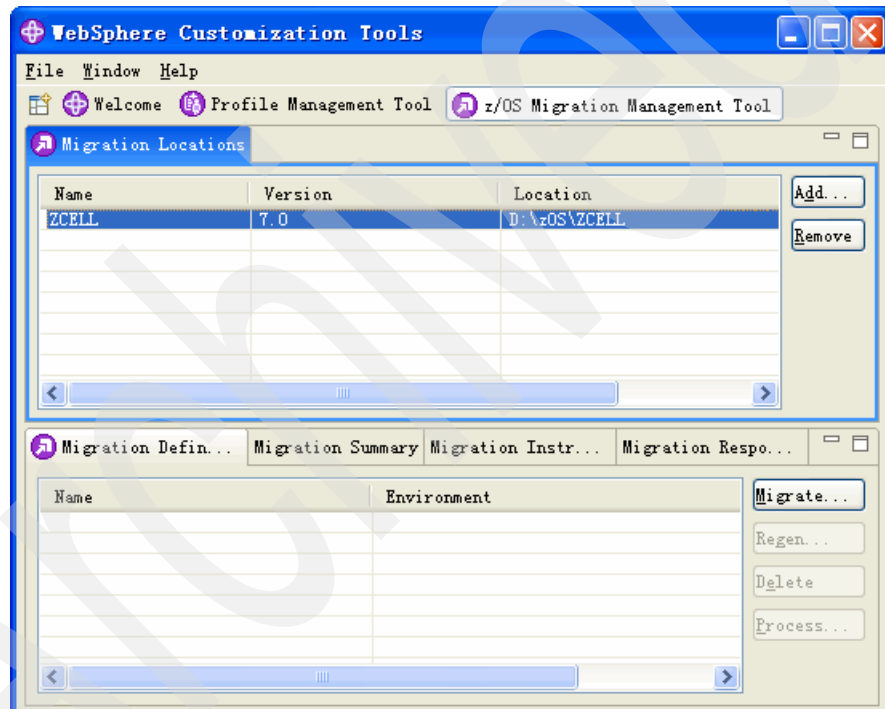5. Now you should see the new location you just created (Figure 7-15). There should be no definitions in the list because the location is new.

Figure 7-15   Migration location is created

Note: If you had a different cell, for example, ACELL, you might consider creating a separate location for it. You *could* keep both cells in one location, but it might cause confusion. Different locations allow you to organize your definitions into logical groups.

Create the migration definition for the deployment manager

After the location is created, you can begin the process of creating the migration definition for the deployment manager. A migration definition is what holds all the information about one node being migrated, as well as all the generated components (such as the actual batch jobs) for the migration utilities.

Migration is a node-by-node process. Each node requires its own migration definition. A cell with three nodes will require three migration definitions. In this section, we create the migration definition for the deployment manager. The migration definitions for the two managed nodes will be created later in 7.3.5, "Migrating the primary node" on page 387 and 7.3.6, "Migrating the secondary node" on page 415.

Perform the following steps to create the migration definition for the deployment manager:

1. Make sure that your new location is highlighted in the Migration Locations section.

2. Click the **Migrate** button in the Migration Definitions section. A window that looks like Figure 7-16 opens.
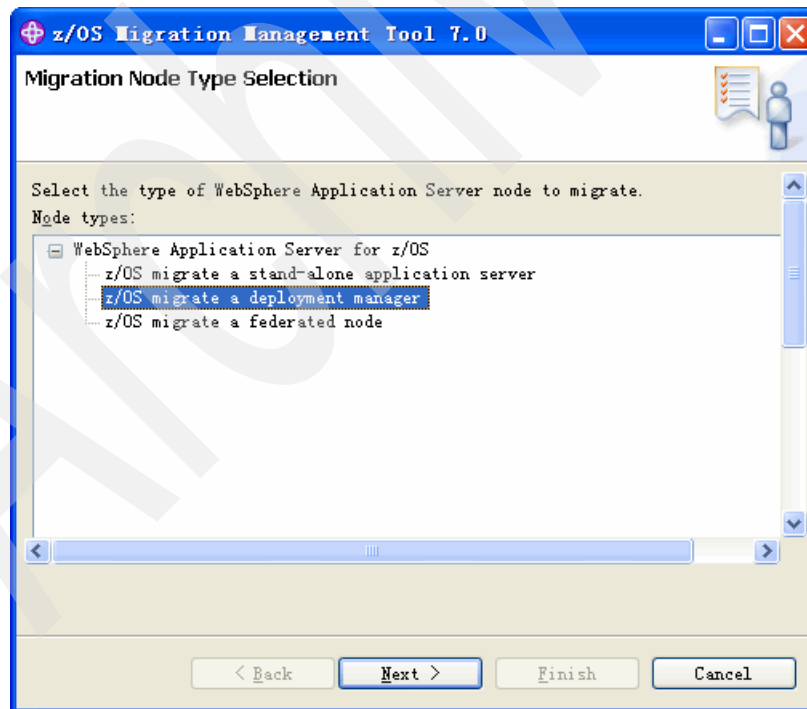
Figure 7-16   Select the type of node to be migrated

This window shows the three types of nodes that can be migrated:

– Standalone: The node within a cell that consists of a single application server only; there is no deployment manager or node agent that part of the cell. This is not a Network Deployment cell.

– Deployment manager: The deployment manager node that is part of a Network Deployment cell.

– Federated node: A managed node in a Network Deployment cell that has been federated into the DMGR cell.

Select **z/OS migrate a deployment manager** and then click **Next**.

3. Provide a definition name and, optionally, a response file (Figure 7-17).
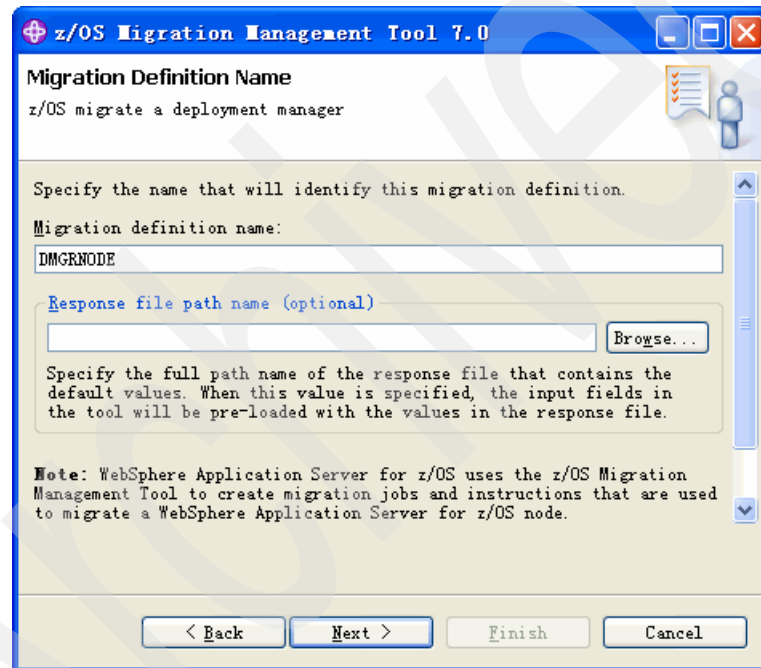
Figure 7-17 Migration definition name window

– The definition name displays in the list of Migration Definitions within the selected location. It can be whatever is meaningful to you. Blank spaces are not allowed. We use the definition name of DMGRNODE.

– A response file is a flat file of variable name/value pairs that are used to populate the input fields for a definition. Response files are optional; if you do not have one, it simply means that you supply the information manually. Here we left it blank and completed all the fields manually. After we supplied all the inputs and saved the deployment manager definition, the MMT produces a response file in the migration location `D:\zOS\ZCELL\profiles\DMGRNODE.X\DMGRNODE.responseFile`, where *X* is the number of the modification).

Click **Next**.

4. Provide the high-level qualifier for that z/OS data sets that will hold the generated jobs and instructions from the MMT (Figure 7-18).
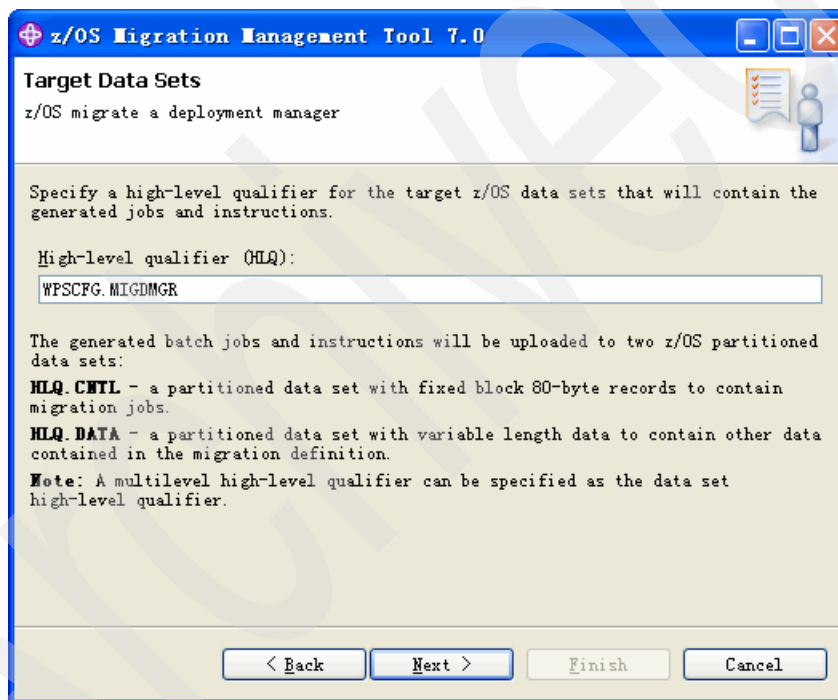
Figure 7-18   Specify target data sets to store generated jobs

We enter the high-level qualifier WPSCFG.MIGDMGR, which results in the following data sets being used:

– WPSCFG.MIGDMGR.CNTL
– WPSCFG.MIGDMGR.DATA

The generated jobs and instructions from the MMT are uploaded to the above two partitioned data sets on z/OS.

5. Next, we specify the system proc library and the location of the WebSphere
    Application Server V7.0 SMP/E file system (Figure 7-19).
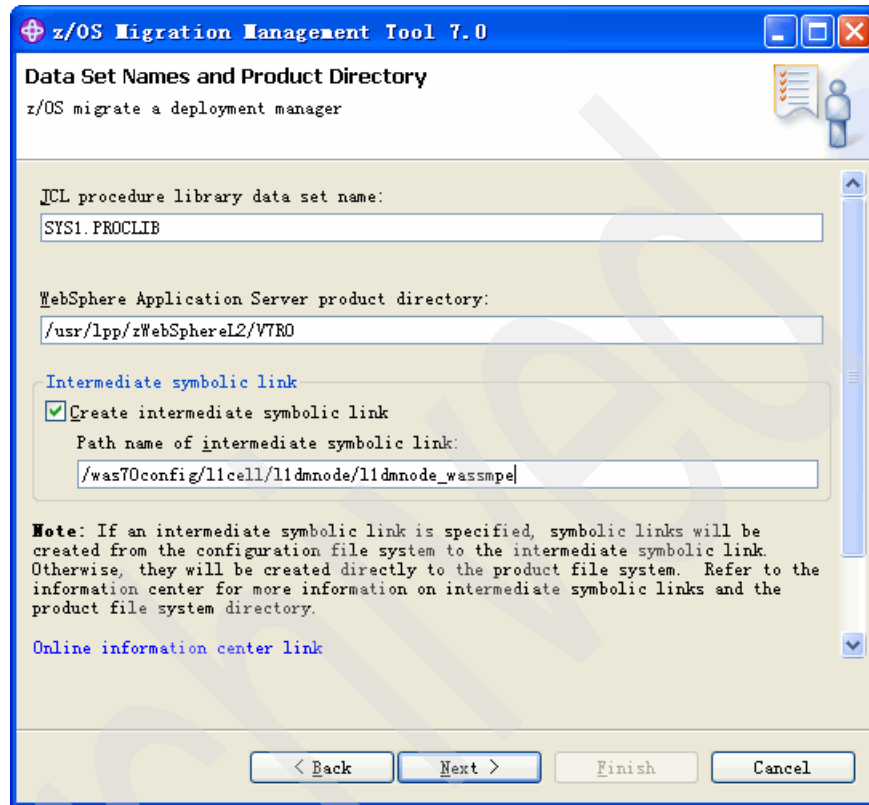
Figure 7-19   Data Set Names and Product Directory window

–   Specify the procedure library you want the copy job to use when copying
    the new JCL. We specify the JCL procedure library of SYS1.PROCLIB.

–   We use the WebSphere Application Server product directory
    `/usr/lpp/zWebSphereL2/V7.0R0` in our z/OS installation. This provides the
    migration utility with knowledge of where the WebSphere Application
    Server V7.0 SMP/E product file system is located.

    We select **Create intermediate symbolic link** and give it the path name
    of `/was70config/l1cell/l1dmnode/l1dmnode_wassmpe`.

    We give it an intermediate symbolic link to provide each node the ability to
    be moved to a new level of maintenance.
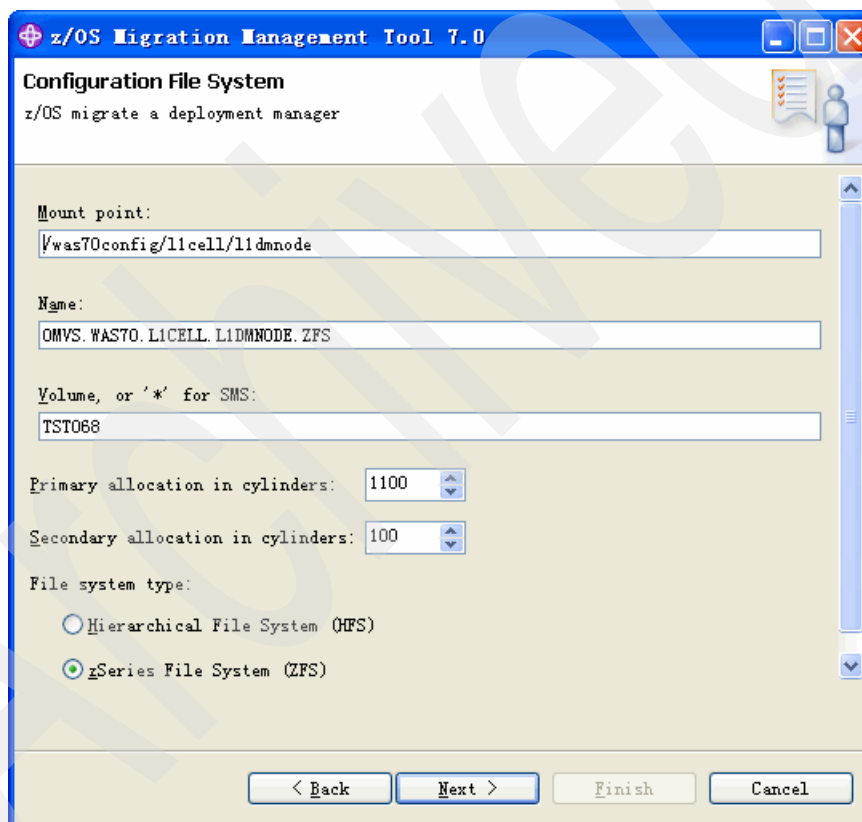
For more information about this topic, search for WP100396 at the following address:

In short, an intermediate symbolic link is a symlink you create that points to the actual WebSphere Application Server V7.0 SMP/E product file system. That provides an "alias" for the actual location.

Click **Next**.

6. Figure 7-20 shows the job that allocates and mounts the file system that will hold the Version 7.0 deployment manager's migrated configuration.

Figure 7-20   File system configuration for Version 7.0 deployment manager

– The mount point should be the new Version 7.0 deployment manager's configuration file system, not the "from" Version 6.1.2 mount point (that mount point is used later). We use the value /was70config/l1cell/l1dmnode.

- We use the actual data set name of OMVS.WAS70.L1CELL.L1DMNODE.ZFS for the Version 7.0 deployment manager's configuration.
- We use the actual volume name of *TSTO68* for the Version 7.0 deployment manager's configuration.
- The primary and second allocation values should be set to correspond roughly to your current configuration file system's size and allow for future growth. In our example, we use 1100 and 100 cylinders, respectively.

  Note: The primary allocation of 420 cylinders should be the minimum value. Check the actual size of your current node file system and adjust this value accordingly, taking into account any anticipated growth in applications in the future.

- Select the file system type you use. We use ZFS in our example.

Click **Next**.

7. Figure 7-21, along with Figure 7-22, shows the bulk of the migration information.

Figure 7-21   Server customization for deployment manager migration: Part 1

– For the deployment manager's "from" mount point, we use the value of was61config/l1cell/l1dmnode, where the WebSphere Process Server V6.1.2 deployment manager is located. This is where the migration utility will go to read in the existing Version 6.1.2 configuration that will be migrated.

– The "to" mount point is where the migration utility will write the migrated configuration for Version 7.0. The mount point field is greyed-out, and is based on the value you supplied in Figure 7-20.

- The default home directory, DeploymentManager, is used for both the "from" and "to" configuration location. We left this value unchanged.

- We need provide the JCL V7.0 start procedure names, including the ones for the daemon, controller, and servant procedures for the deployment manager. In Version 6.1.2, the names for the daemon, controller, and servant procedures of the deployment manager are L1DEMN, L1DCR and L1DSR, respectively.

  In this example, we re-use the same JCL start procedure names for the Version 7.0 deployment manager. Clearing the check box means that the migration utility will not replace the START strings held in the configuration XML.

  Because we re-use the same JCL start procedure names, we cleared **Replace started procedure command names**. The Version 7.0 start procedures have a different format than Version 6.x, so the old Version 6.1.2 procedures need be overwritten. Before starting the migrated servers, the *CPY1 job need to be executed to overlay the existing JCL start procedures in your JCL procedure library. This step will be performed in 7.3.4, "Start the deployment manager" on page 386.

- When migrating a deployment manager node, the migration utility attempts to make contact with the dmgr process. The utility needs to know the user ID and password that will allow it access:

  - If global security is off for the cell, then this value is not required to do the migration, but the MMT requires the ID field and the password fields to be populated. You may take the defaults just to satisfy the requirement to fill the fields.

  - If security is enabled, then provide a valid ID and password for accessing the dmgr process.

    Note: The password value is encrypted in the files that are created, both in the MMT tool and in the uploaded job files.

g. Click **Next**. The window shown in Figure 7-22 opens.

Figure 7-22   Server customization for deployment manager migration: Part 2

Where:

- The Migrate to support script compatibility check box determines whether the migrated configuration will be backwards compatible with the earlier versions of the WSADMIN scripting interface. We cleared it because we did not have scripts with compatibility issues.

- It is a good idea to disable the old dmgr process after migration is successfully completed. We did not have the migration utility disable this process.

- For Application migration preference, we took the default here. If you believe your applications are installed somewhere other than default, then you should review the options and make the selection best suited for your environment.

- For Migration trace options, we left all boxes clear. Check these boxes only when directed to do so by IBM Support.The trace options produce significant amounts of output.

- For migrating the My tasks settings, we used the default. We had no previous "My Tasks".

- The temporary directory location is where the migration utility will create the temporary files it needs during the migration run. We create a separate directory named `/was70config/l1migrate/temp` that is distinct from the system `/tmp` directory, and allocated and mounted a file system at that location that was 1.5 times the current size of the node's configuration file system. We made sure that the permissions on this directory were 777.

> **Important:**
>
> ► Depending on the size of the configuration, the migration utility might need up to 500 cylinders of temporary space. Allocate and mount a temporary file system of that size and point to that location in this field.
>
>   Lack of space is one of the most common causes of migration job failure.
>
> ► If you are performing multiple migrations, or rerunning a migration, remember to clean out the temporary directory so you have the maximum space available to you.

8. In Figure 7-23, you can create the JOB card that will be used in the generated jobs. You should change this card to conform with your normal procedures. Figure 7-23 is the JOB card used in our z/OS system.

Figure 7-23   JOB card for the generated jobs

9. Figure 7-24 shows the migration summary. Click the **Create** button to create the migration definition.
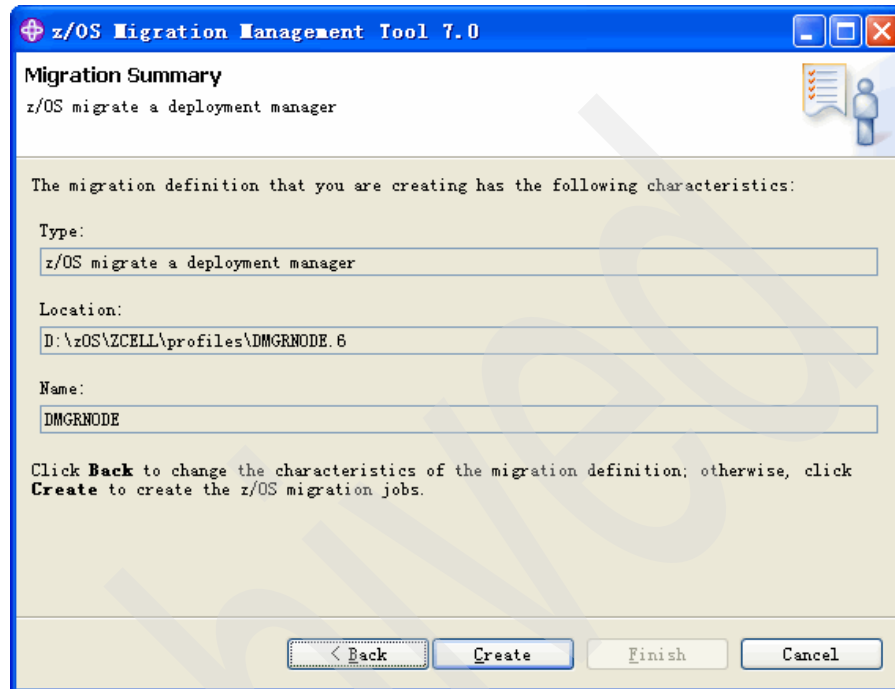
Figure 7-24   Migration summary for the deployment manager

10. The migration definition for the deployment manager is created successfully, as shown in Figure 7-25. Click **Finish**.
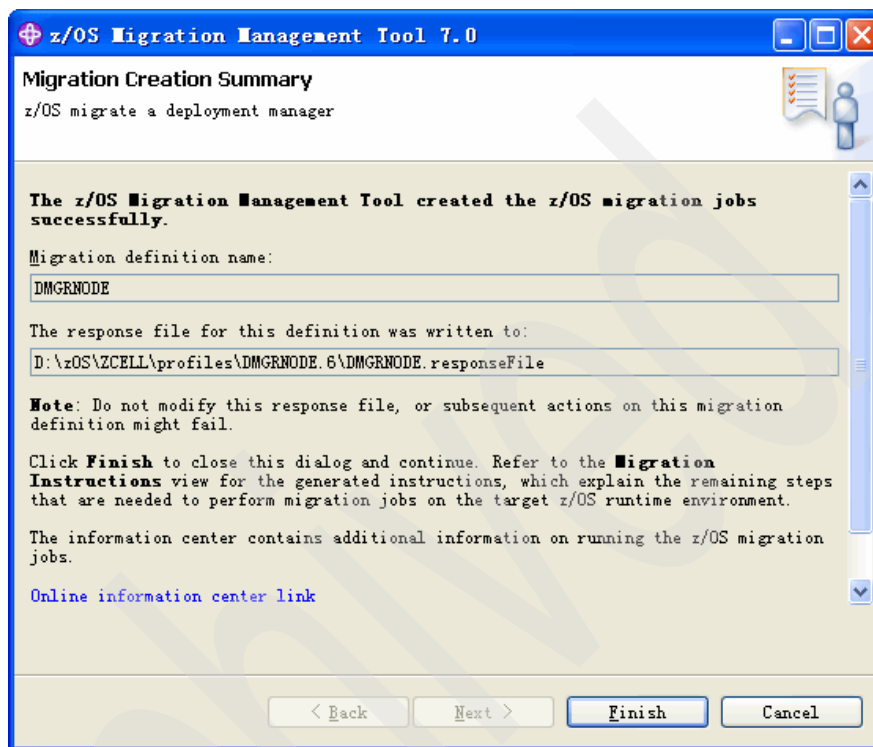
Figure 7-25   Migration definition is created successfully

Process (upload) the definition to z/OS

This step transfers the generated customized jobs for migrating the deployment manager from the MMT tool on your workstation up to the z/OS system where they will be run. To accomplish this task, perform the following steps:

1. Select the DMGRNODE definition we just created and click the **Process** button.

2. Select the option to upload to z/OS (Figure 7-26).
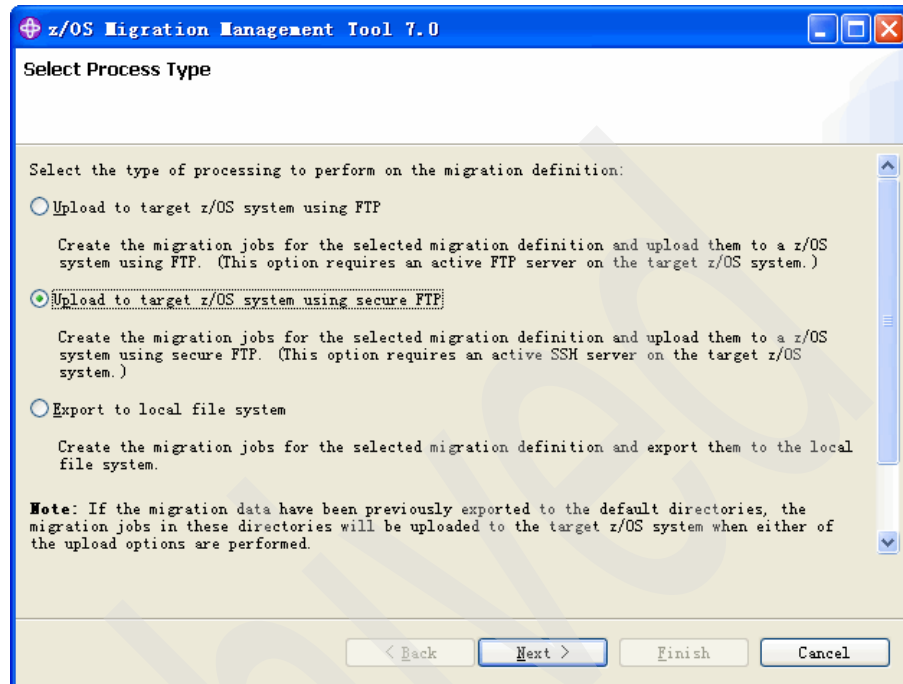
Figure 7-26   Select upload option

3. Provide the parameters that will allow the upload to z/OS to succeed (Figure 7-27).

Figure 7-27   Provide parameters for upload jobs

– Provide the host IP name of the system on which the jobs will be run.

– Provide a user ID and password for the FTP upload.

– Modify the port if you know your system uses something other than 21 for FTP.

– Check **Allocate target z/OS data sets** (leave it clear if you are pre-allocating manually)

– Specify the volume and unit if you desire; otherwise, leave it blank.

Click **Finish**.

4. Watch the progress bar (Figure 7-28).
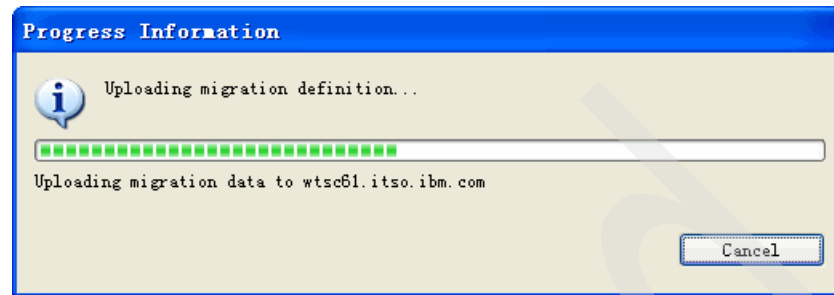
Figure 7-28   The progress bar

5. Look for the "Upload successful" message (Figure 7-29).
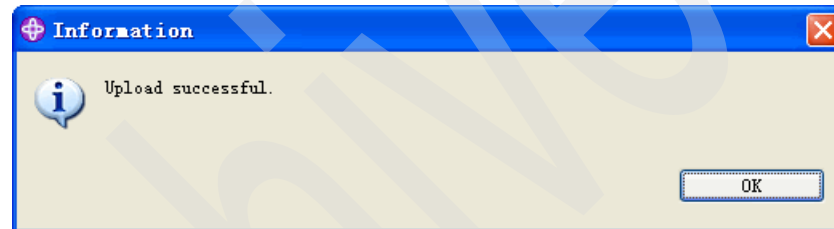
Figure 7-29   Upload successful

6. You should see the MMT main window again. The customized migration jobs for the deployment manager should now be on the z/OS system and be ready to be submitted. We validate that the data sets have been created and that they contain the expected member. Figure 7-30 shows the CNTL data set.

```
VIEW                    WPSCFG.MIGDMGR.CNTL
Command ===> _____
               Name     Prompt        Size
_____  BBOMDCP
_____  BBOMDCR
_____  BBOMDDN
_____  BBOMDHFS
_____  BBOMDINS
_____  BBOMDSR
_____  BBOMDZFS
_____  BBOSCHED
_____  BBOWDPOS
_____  BBOWDPRE
_____  BBOWDPRO
_____  BBOWMG3D
            **End**
```

Figure 7-30   The data sets contained the generated migration jobs

Edit and submit the migration job BPZWMG3D

After the migration jobs and variables are generated and uploaded by the z/OS MMT tool, we can edit the sample WebSphere Process Server migration job BPZWMG3D to make use of these WebSphere Application Server migration jobs.

After the BPZWMG3D job is submitted, it executes the wbimgrt2.sh script, which invokes the migration utilities BPMSnapshotSourceProfile.sh and BPMMigrateProfile.sh to migrate the WebSphere Process Server V6.1.2 deployment manager to Version 7.0.

Perform the following steps:

1. Find the sample migration job BPZWMG3D in the installed WebSphere Process Server JCL PDS (.**.SBPZJCL). In our z/OS system, it is located in BBL27061.SBPZJCL PDS. Copy it to your working PDS. In this sample, we used WPSCFG.WPS.JCL as the working PDS.

2. Edit the copy of the sample job BPZWMG3D to make use of the WebSphere Application Server migration jobs generated by MMT:

   a. Add a JOB card for the BPZWMG3D job, making sure that you use the administrator user ID and password.

Example 7-1 shows the JOB card we used in our z/OS.

Example 7-1   JOB card for the BPZWMG3D job

```
//BPZWMG3D  JOB NOTIFY=&SYSUID,CLASS=A,MSGCLASS=H,
//  REGION=0M,TIME=1440,
// USER=L1ADMIN,PASSWORD=L1ADMIN
/*JOBPARM S=SC61
//*
```

    b. Replace the parameters shown in Example 7-2 to reflect the deployment
       manager configuration and the parameters entered in MMT.

Example 7-2   Parameters to be replaced in BPZWMG3D job

```
//*      #tempdir#   temporary working directory                      *
//*                  eg.  V7.00dm1                                      *
//*                  V7.00DMGR                                          *
//*                                                                    *
//*      #wpsndir#   directory of the V7.0.0 WPS product               *
//*                  eg. /usr/lpp/zWPS/V7.0R0                           *
//*                  /usr/lpp/zWPSL2/V7.0R0                             *
//*                                                                    *
//*      #wpsosvr#   home directory of the old wps server              *
//*                  eg. /WebSphere/V62DM1                             *
//*                  /was61config/l1cell/l1dmnode                      *
//*                                                                    *
//*      #wpsnsvr#   home directory of the new wps server              *
//*                  eg. /WebSphere/V7.00DM1                            *
//*                  /was70config/l1cell/l1dmnode                      *
//*                                                                    *
//*      #wassmpe#   dir of the WAS smpe install                       *
//*                  eg. /usr/lpp/zWebSphere/V7.00P4098                 *
//*                  /usr/lpp/zWebSphereL2/V7.0R0                       *
//*                                                                    *
//*      #procdmn#   name of the started task procedure (daemon)       *
//*                  eg WDDM1Z1                                         *
//*                  L1DEMN                                             *
//*                                                                    *
//*      #procctr#   name of the started task procedure (control)      *
//*                  eg WCDM1Z1                                         *
//*                  L1DCR                                              *
//*                                                                    *
//*      #procsvr#   name of the started task procedure (servant)      *
//*                  eg WSDM1Z1                                         *
//*                  L1DSR                                              *
```

```
//*                                                              *
//*     #migrpds#  hlq of pds of migration jobs created by WebSphere *
//*                Customisation panels.                          *
//*                eg. ZWPS.WAS.V7.00.V7.00DM1.MIG                    *
//*                WPSCFG.MIGDMGR                                 *
//*                                                              *
//*     #touserid# if security is switched on in the old wps server *
//*                then supply the userid.                        *
//*                eg. wsadmin                                    *
//*                l1admin                                        *
//*                                                              *
//*     #topswd#   if security is switched on in the old wps server *
//*                then supply the password.                      *
//*                l1admin                                        *
```

3. Submit the edited BPZWMG3D job (Figure 7-31).

```
VIEW       WPSCFG.WPS.JCL(BPZWMG3D) - 01.12              Columns 00001 00072
Command ===> submit_____ Scroll ===> PAGE
****** *************************** Top of Data ********************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001 //BPZWMG3D  JOB NOTIFY=&SYSUID,CLASS=A,MSGCLASS=H,
000002 //  REGION=0M,TIME=1440,
000003 // USER=L1ADMIN,PASSWORD=L1ADMIN
000004 /*JOBPARM S=SC61
000005 //*
000006 //*****************************************************************************
000007 //* Licensed Materials - Property of IBM
000008 //* 5655-W05
000009 //* (C) COPYRIGHT International Business Machines Corp. 2007, 2009
000010 //* US Government Users Restricted Rights - Use, duplication or disclose
000011 //* restricted by GSA ADP Schedule Contract with IBM Corp.
000012 //* The source code for this program is not published or otherwise dive
000013 //* of its trade secrets, irrespective of what has been deposited with
000014 //* U.S. Copyright Office.
000015 //*****************************************************************************
```

Figure 7-31   The BPZWMG3D job

After the job is submitted, it executes the wbimgrt2.sh script, which invokes the migration utilities BPMSnapshotSourceProfile.sh and BPMMigrateProfile.sh. These utilities migrate the WebSphere Process Server V6.1.2 deployment manager to Version 7.0.

The migration of a source profile consists of two steps in the following sequence:

a. Take a backup of the source profile to the snapshot directory (Figure 7-32). The `BPMSnapshotSourceProfile.sh` command will be executed to take the snapshot of the deployment manager profile in the source environment.

The snapshot directory on z/OS is /tmp/migrate/*#tempdir#*, where #tempdir# is the parameter you defined as V7.00DMGR in step 2b on page 375 (see Example 7-2 on page 375).

Figure 7-32   The snapshot directory

b. Migrate the source profile to the target profile. The `BPMMigrateProfile.sh` command will be created to migrate the source profile to the target profile.

4. Examine the output in /tmp/migrate/*#tempdir#*/BPZWMG3D.out and /tmp/migrate/*#tempdir#*/dmgr_backup/logs (Figure 7-33) to make sure the migration completed successfully.

Figure 7-33   Logs created for deployment manager migration activity

a. Step 3a on page 377 creates the following log files in the logs subdirectory of the `snapshot/dmgr_backup` directory:

- `BPMSnapshotSourceProfile.default.`*Time_Stamp*`.log.lck`

- `BPMSnapshotSourceProfile.default.`*Time_Stamp*`.log`

- `WASPreUpgrade.default.`*Time_Stamp*`.trace`

- `WASPreUpgrade.`*Time_Stamp*`.log`

You can examine these logs to monitor the progress of the snapshot activity. The `log.lck` file is a lock file to indicate an instance of an activity taking a snapshot of the deployment manager profile that is already running. This mechanism prevents starting multiple snapshot activities inadvertently by different users.

When step 3a on page 377 is finished, you should see the output shown in Example 7-3 in `BPMSnapshotSourceProfile.default.`*Time_Stamp*`.log`.

Example 7-3   Output for snapshot activity

```
[4/16/10 2:10:27 PM EDT] 0 FileUtilities   > serializeObject
ENTRY
{/SC61/tmp/migrate/V7.00DMGR/dmgr_backup/profiles/default/default
.profinfo}
[4/16/10 2:10:27 PM EDT] 0 FileUtilities   < serializeObject
RETURN
[4/16/10 2:10:27 PM EDT] 0 BPMSnapshotNode < invokeAdditionalMigr
RETURN
[4/16/10 2:10:27 PM EDT] 0 WBIUpgradeBase  < migrate
RETURN
[4/16/10 2:10:27 PM EDT] 0 BPMSnapshotNode I main(String[] args)
CWMCO0823I: The BPMSnapshotSourceProfile command finished
successfully.
```

b. The logs for step 3b on page 377 are also created in the logs subdirectory of the `snapshot/dmgr_backup` directory. You can watch these logs to see the progress and results.

- `BPMMigrateProfile.default.`*Time_Stamp*`.log`

- `BPMProfileUpgrade.default.`*Time_Stamp*`.log`

- `BPMProfileUpgrade.default.`*Time_Stamp*`.trace`

- `WASPostUpgrade.default.`*Time_Stamp*`.trace`

- `WASPostUpgrade.default.`*Time_Stamp*`.log`

c. After both steps complete successfully, check the output in
    /tmp/migrate/#tempdir#/BPZWMG3D.out. You should see the output in
    BPZWMG3D.out (Example 7-4).

Example 7-4   Output in BPZWMG3D.out

```
=================================================================
 STEP: MKCONFIG
=================================================================
...
Validation of Environment Completed...
=================================================================
 STEP: PREUPGRD (BPMSnapshotSourceProfile)
=================================================================
...
CWMC00224I: The WebSphere Application Server utility has
completed.
CWMC00208I: See the following log file for information:
/SC61/tmp/migrate/V7.0ODMGR/dmgr_backup/logs/WASPreUpgrade.<TIMES
TAMP>.log
CWMC00823I: The BPMSnapshotSourceProfile command finished
successfully.
...
=================================================================
STEP: UPGRADE (BPMMigrateProfile)
=================================================================
CWMC00224I: The WebSphere Application Server utility has
completed.
CWMC00208I: See the following log file for information:
/SC61/tmp/migrate/V7.0ODMGR/dmgr_backup/logs/WASPostUpgrade.defau
lt.<TIMESTAMP>.log
...
CWMC00822I: The BPMMigrateProfile command finished successfully.
...
Migration Completed Successfully...
*****************************************************************
```

5. Check the BPZWMG3D job status via SDSF in a TSO session (Figure 7-34).

```
GC   - 20090817_AA, Java Compiler = j9jit24, Java VM name = IBM J9 VM
was.install.root = /was70config/l1cell/l1dmnode/DeploymentManager
user.install.root = null
Java Home = /SC61/zWebSphereL2/java/J6.0
ws.ext.dirs = /was70config/l1cell/l1dmnode/DeploymentManager/java/lib:/was7
Classpath = /was70config/l1cell/l1dmnode/DeploymentManager/properties:/was7
Java Library path = /SC61/zWebSphereL2/java/J6.0/lib/s390:/SC61/zWebSphereL
Current trace specification = *=info
************** End Display Current Environment **************
?/16/10 14:34:58:514 EDT?00000000 ManagerAdmin  I   BBOO0222I: TRAS0017I: T

*******************************************************************************

 Migration Completed Successfully...


*******************************************************************************
```

Figure 7-34   The BPZWMG3D job status

6. Check if the applications (user applications, system applications, support applications, and sample applications) have been copied to the target profile (Figure 7-35).
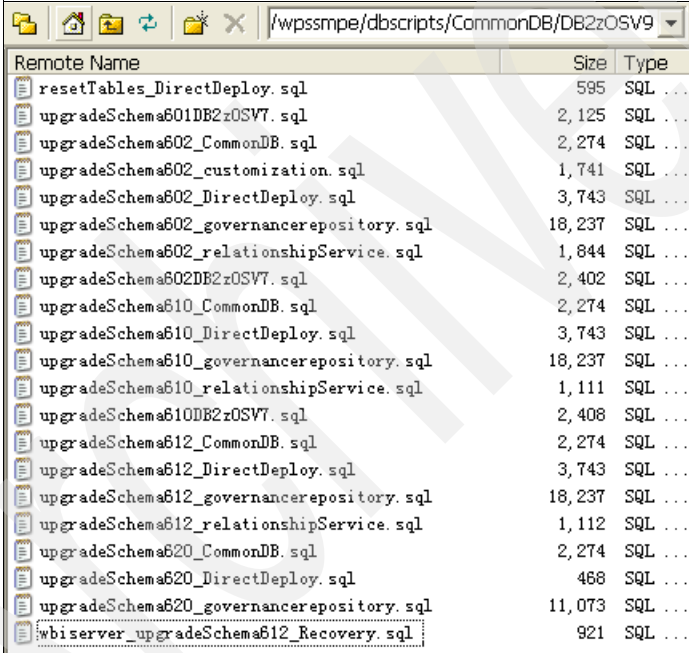

Figure 7-35   Applications copied into the target profile

7.3.3 Upgrading the common database

This procedure can be done manually or by using the Dbdesign generator and upgradeDB.sh scripts. In our example, we update it manually by performing the following steps:

1. Locate the directory that contains the migration upgrade scripts for the common database. These scripts are generated in database-specific directories within the `dbscripts` directory of the target deployment manager. In this example, the common database version we used was DB2 z/OS V9, and the directory where these migration upgrade scripts are located is `/was70config/l1cell/l1dmnode/wpssmpe/dbscripts/CommonDB/DB2zOSV9/` (Figure 7-36).

Figure 7-36   The SQL scripts for a common database

2. In the directory, look for any SQL files that contain the name `upgrade`, the version number of the source server `612`, and `wbi`. We found five SQL files in total in this directory, which will be used to upgrade the common database (Example 7-5).

Example 7-5   SQL files for the common database migration

```
upgradeSchema612_CommonDB.sql
upgradeSchema612_DirectDeploy.sql
upgradeSchema612_governancerepository.sql
upgradeSchema612_relationshipService.sql
wbiserver_upgradeSchema612_Recovery.sql
```

3. Edit the values in the SQL files to suit your needs. Replace the following parameters of the common database according to the actual database configuration. Example 7-6 shows the parameters we used in our z/OS. All the parameters in @*@ have been replaced with the actual values of the common database configuration.

Example 7-6   Parameters replaced in the SQL files to upgrade the common database

```
-- ******************************************
-- @DB_NAME@      = DB2 Database name            = L1CELLDB
-- @SCHEMA@       = DB2 SQLID (Schema Qualifier) = L1CELL
-- @STOGRP@       = DB2 Storage group name       = L1DBSTO
-- @BPTABLE4K@    = Buffer Pool of 4k Size       = BP1
-- @BPINDEX@      = Buffer Pool Index            = BP2
-- @BPLOB4K@      = Buffer Pool Lobs             = BP3
-- ******************************************
```

4. Save the SQL files you have edited. Because the **DBUtility.sh** command will be used to execute these SQL files and it uses ASCII input, you do *not* need to convert these SQL files from ASCII to EBCDIC.

5. Copy the SQL files to your working directory, for example, `/u/<username>/Migration/DB/`, and assign the appropriate permissions.

6. Create five scripts to execute the above five SQL files. In these scripts, the SQL file is executed using the `DBUtility.sh` command. The command parameters for `DBUtility.sh createTable` are shown in Figure 7-37.

```
"createTable" is the action, following args are needed:
    -DprofilePath=<profilePath>   The path of profile
    -DprofileName=<profileName>   The name of the profile
    -DdbDelayConfig=<boolean>     The Flag is to be false to create Tables
    -DdbType=<dbtype>             The database type
    -DdbName=<dbName>             The database name or alias name
    -DsqlScriptPath.default=<defautlSqlPath>
                                  The default sql script for creating table
                                  DBUtility will attempt to find sql script for each database type
                                  in this naming convention <defautlSqlPath>_<dbType>.sql.
                                  DBUtility will run <defautlSqlPath>,
                                  if <defautlSqlPath>_<dbType>.sql does not exist.
    -DsqlScriptName.default=<defautlSqlScriptName>
                                  The default sql script for creating table
                                  DBUtility will attempt to form a sql script path for each database
                                  in this naming convention <defautlSqlScriptName>_<dbType>.sql.
                                  DBUtility will run <defautlSqlScriptName>,
                                  if <defautlSqlScriptName>_<dbType>.sql does not exist.
    -DdbHostName=<dbHostName>     The host name or IP address for database server
    -DdbServerPort=<dbServerPort> The JDBC port number for database server
    -DdbJDBCClasspath=<dbJDBCClasspath>
                                  The directory path which contains JDBC driver files
    -DdbUserId=<dbUserId>         The user id to access database
    -DdbPassword=<dbPassword>     The password to access the database
    -DdbInstance=<dbInstance>     The database instance name --only required for Informix
    -DdbSchemaName=<dbSchemaName> The schema name
    -DdbConnectionLocation=<dbConnectionLocation>
                                  The database connection location --only required for zOS
    -DdbStorageGroup=<dbStorageGroup>
                                  The database storage group --only required for zOS
    -DdbJDBCProperties=<dbJDBCProperties>
                                  The directory containing DB2JccConfiguration.properties --only re
```

Figure 7-37   The parameters for DBUtility.sh createTable

The script shown in Example 7-7 was created to execute upgradeSchema612_CommonDB.sql against the common database in our z/OS system.

Example 7-7   Script to execute upgradeSchema612_CommonDB.sql

```
./DBUtility.sh createTable
-DprofilePath=/was70config/l1cell/l1dmnode/DeploymentManager/profile
s/default -DprofileName=default -DdbDelayConfig=false
-DdbType=DB2UDBOS390_V9_1 -DdbName=DB9K
-DsqlScriptPath.default=/u/<username>/Migration/DB/upgradeSchema612_
CommonDB.sql -DsqlScriptName.default=upgradeSchema612_CommonDB.sql
-DdbHostName=wtsc61.itso.ibm.com -DdbServerPort=38340
-DdbJDBCClasspath=/usr/lpp/db2/db9k/db2910_jdbc/classes
-DdbUserId=peise1 -DdbPassword=IBM1q2w -DdbSchemaName=L1CELL
```

```
-DdbConnectionLocation=DB9K -DdbStorageGroup=L1DBSTO
-DdbJDBCProperties=/etc/db9k
>/u/<username>/Migration/DB/log/output.out
2>>/u/<username>/Migration/DB/log/error.out
```

For the other four scripts, you can just modify the SQL file name in the -DsqlScriptPath.default and -DsqlScriptName.default parameters.

7. Convert the five scripts from ASCII to EBCDIC. You can accomplish this task by using code editing software (such as UltraEdit, Notepad++, and so on) or by the using the **iconv** command to convert the file to EBCDIC, as shown in Example 7-8.

Example 7-8   Using the iconv command

```
iconv —t IBM-1047 —f ISO8859-1 Script_upgradeSchema612_CommonDB.sh >
Script_upgradeSchema612_CommonDB_EBCDIC.sh
```

8. Put the scripts into the `bin` directory of the target deployment manager profile. This directory is `/was70config/l1cell/l1dmnode/DeploymentManager/bin` in our environment. Assign the appropriate permissions for them.

9. Change the working directory in UNIX® System Services to `/was70config/l1cell/l1dmnode/DeploymentManager/bin`, and then execute the scripts, one at a time.

10. Check the output of the executing SQL files in `/u/<username>/Migration/DB/log/output.out` and `/u/<username>/Migration/DB/log/error.out`.

The output of upgradeSchema612_CommonDB.sql is shown in Example 7-9.

Example 7-9   Output for executing common database upgrade scripts

```
BEGIN COPYRIGHT
...
[sql] Executing file:
/u/<username>/Migration/DB/upgradeSchema612_CommonDB.sql
[sql] 10 of 10 SQL statements executed successfully
...
BUILD SUCCESSFUL
Total time: 18 seconds
```

7.3.4 Start the deployment manager

After migrating the deployment manager profile and upgrading the common database, you can start the deployment manager in the target environment by performing the following steps:

1. Before starting the migrated target deployment manager, the start JCL procedures in your JCL procedure library need to be updated for the deployment manager. Because the Version 7.0 start procedures have a different format from Version 6.x, the old Version 6.1.2 procedures need be replaced.

   a. Locate the BBODCPY1 job in the PDS, where the jobs for creating the target deployment manager in 7.2, "Installing WebSphere Process Server V7.0 on z/OS" on page 351 were stored (Figure 7-38). In our z/OS, we found it in the WPSCFG.DMGRV7.0.CNTL PDS.

```
VIEW         WPSCFG.DMGRV7.CNTL(BBODCPY1) - 01.00           Columns 00001 00072
Command ===> submit_                                          Scroll ===> PAGE
****** *********************************** Top of Data ******************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001 //BBODCPY1  JOB (999,POK),'WPS SETUP',CLASS=A,REGION=0M,
000002 //               MSGCLASS=H,NOTIFY=&SYSUID
000003 /*JOBPARM S=SC61
000004 //*
000005 //COPY1 EXEC  PGM=IEBCOPY
000006 //* Copy customized members to the installation proclib
000007 //SYSPRINT  DD SYSOUT=*
000008 //INPUT     DD DISP=SHR,
000009 //            DSN=WPSCFG.DMGRV7.CNTL
000010 //OUTPUT    DD DISP=SHR,DSN=SYS1.PROCLIB
000011 //SYSIN     DD *
000012  C INDD=INPUT,OUTDD=OUTPUT
000013  S M=((BBOPDMN2,L1DEMN,R))
000014  S M=((BBOPDCR,L1DCR,R))
000015  S M=((BBOPDSR,L1DSR,R))
```

Figure 7-38   The BBODCPY1 job

   b. Submit the BBODCPY1 job (Figure 7-39). Because we use the same JCL start procedure names in Version 6.1.2 and Version 7.0, the BBODCPY1 job will overwrite the existing JCL start procedures in your JCL procedure library.

```
JOB BBODCPY1(JOB23581) SUBMITTED
*** _
```

Figure 7-39   Submit the BBODCPY1 job

c. Wait until the console shows that the BBODCPY1 job has finished (Figure 7-40).

```
22.43.41 JOB23581 $HASP165 BBODCPY1 ENDED AT WTSCPLX1   MAXCC=0 CN(INTERNAL)
*** _
```

Figure 7-40   The BBODCPY1 job finished

d. Check the BBODCPY1 job status via SDSF in a TSO session (Figure 7-41).

```
IEB1013I COPYING FROM PDS   INDD=INPUT    VOL=TSTO49 DSN=WPSCFG.DMGRV7.CNTL
IEB1014I             TO PDS  OUTDD=OUTPUT   VOL=TOTSY1 DSN=SYS1.PROCLIB
IEB167I FOLLOWING MEMBER(S) COPIED FROM INPUT DATA SET REFERENCED BY INPUT
IEB155I L1DCR    HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB155I L1DEMN   HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB155I L1DSR    HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB1098I 3 OF 3 MEMBERS COPIED FROM INPUT DATA SET REFERENCED BY INPUT
IEB144I THERE ARE 823 UNUSED TRACKS IN OUTPUT DATA SET REFERENCED BY OUTPUT
IEB149I THERE ARE 429 UNUSED DIRECTORY BLOCKS IN OUTPUT DIRECTORY
IEB147I END OF JOB - 0 WAS HIGHEST SEVERITY CODE
```

Figure 7-41   Check the BBODCPY1 job status via SDSF

2. Start the deployment manager in the target environment.

3. Check for any errors in the server logs.

7.3.5 Migrating the primary node

During the migration of the managed node profiles, server specific configurations in the source profiles are transformed and copied to the profiles in the target environment. Table 7-2 shows the source and target profiles for our migration.

Table 7-2   Managed node migration

Source server	Target server
/was61config/l1cell/l1nodea	/was70config/l1cell/l1nodea
/was61config/l1cell/l1nodeb	/was70config/l1cell/l1nodeb

In this section, we migrate the primary managed node first. Use the WebSphere Process Server migration jobs to perform the migration against the primary managed node.

Notes:

► During the migration of a managed node, ensure that the target deployment manager is running.

► Managed nodes can only be migrated one at a time.

The steps to migrate the primary managed node are:

► Generate the WebSphere Application Server migration jobs
► Edit and submit the WebSphere Process Server migration jobs

Generate the WebSphere Application Server migration jobs

The first step for migrating a managed profile on z/OS is to generate the WebSphere Application Server migration jobs and variables from the z/OS MMT tool component of WCT.

Create a migration definition for the primary node

Perform the following steps to create migration definition for the primary node:

1. Launch WCT V7.0 and click the **z/OS Migration Management Tool** tab.

2. Make sure your location is highlighted in the Migration Locations section.

3. Click the **Migrate** button in the Migration Definitions section. The window shown in Figure 7-42 opens.
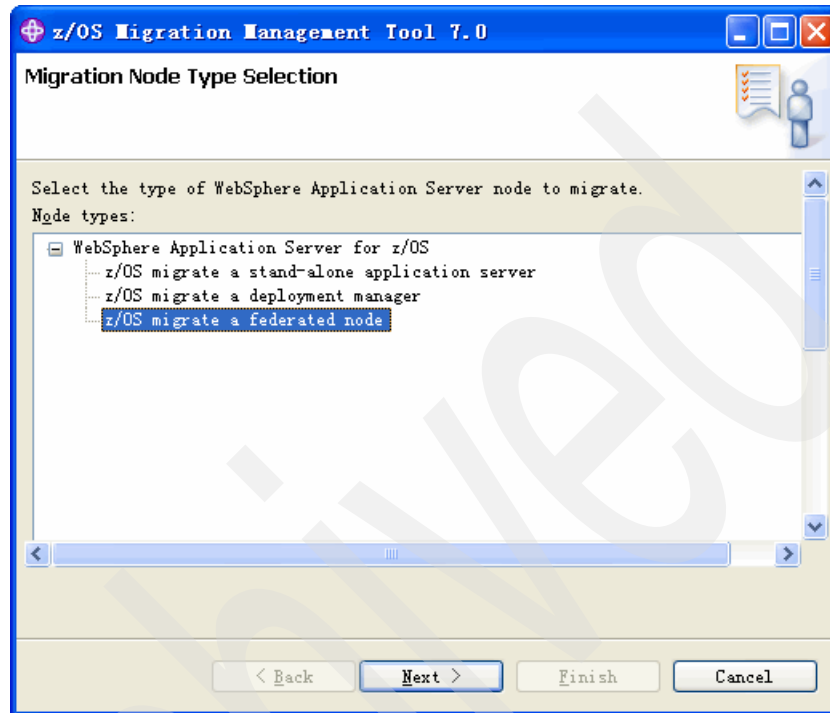

Figure 7-42 Select the type of node to be migrated

4. Select **z/OS migrate a federated node** and then click **Next**.

5. Provide a definition name and, optionally, a response file (Figure 7-43).
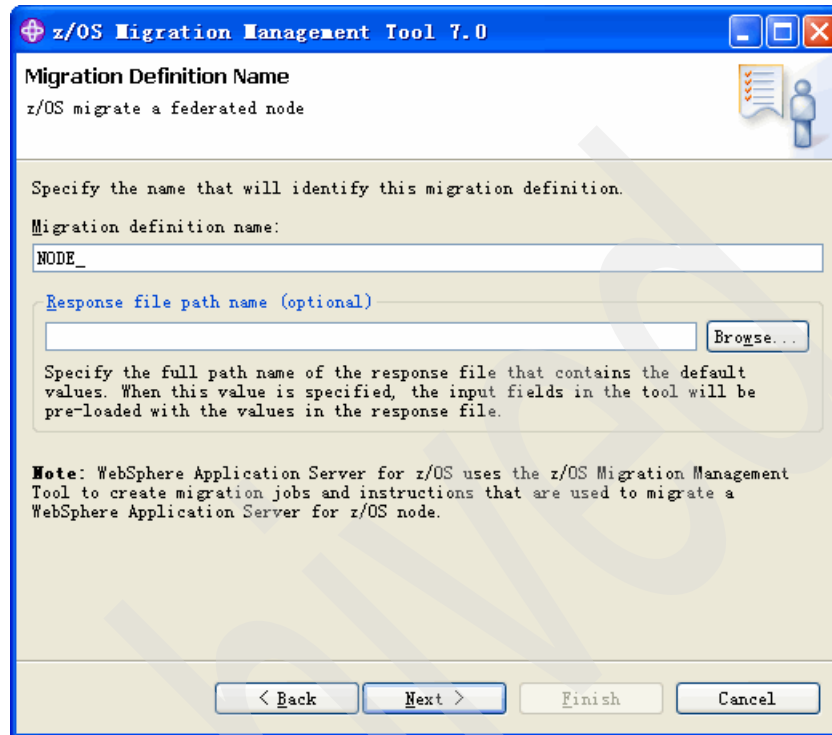
Figure 7-43   Migration definition name window

- The definition name is what will display in the list of Migration Definitions within the selected location. It can be whatever is meaningful to you. Blank spaces are not allowed. We use the definition name of NODEA in our environment.

- The response file is a flat file of variable name/value pairs that is used to populate the input fields of a definition. Response files are optional; if you do not have one, it simply means you supply the information manually. Here we left it blank and input all the fields manually.

  After we have supplied all the inputs and saved the node definition, the MMT produces a response file in the migration location D:\zOS\ZCELL\profiles\NODEA.*X*\NODEA.responseFile (X is the modification number).

  Click **Next**.

6. Provide the high-level qualifier for z/OS data sets that will hold the generated jobs and instructions from the MMT (Figure 7-44).

Figure 7-44   Specify the target data sets to store generated jobs

We used the high-level qualifier WPSCFG.MIGNODEA, which results in the following data sets being used:
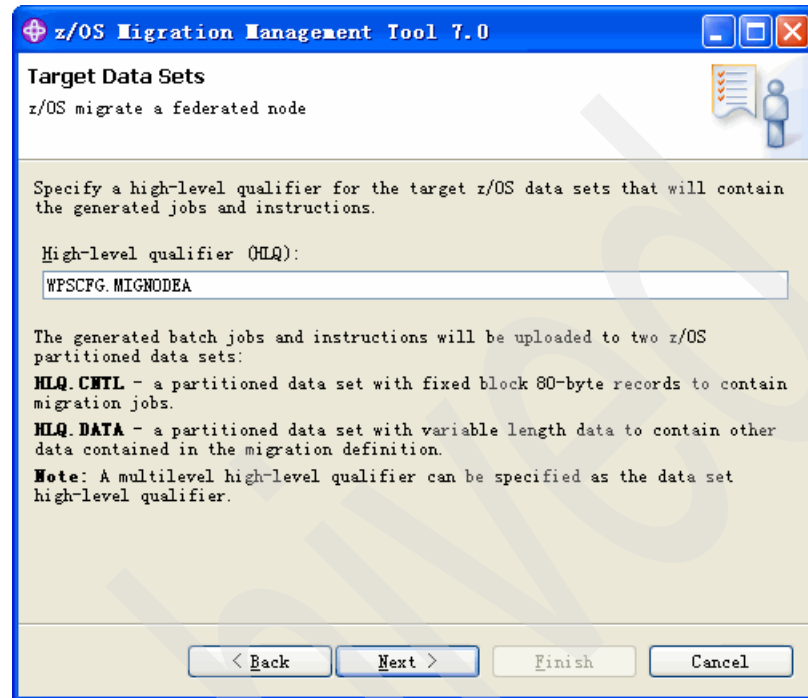
– WPSCFG.MIGDNODEA.CNTL

– WPSCFG.MIGNODEA.DATA

The generated jobs and instructions from the MMT will be uploaded to the above two partitioned data sets on z/OS.

7. Next, we specify the system proc library and the location of the WebSphere
    Application Server V7.0 SMP/E file system (Figure 7-45).
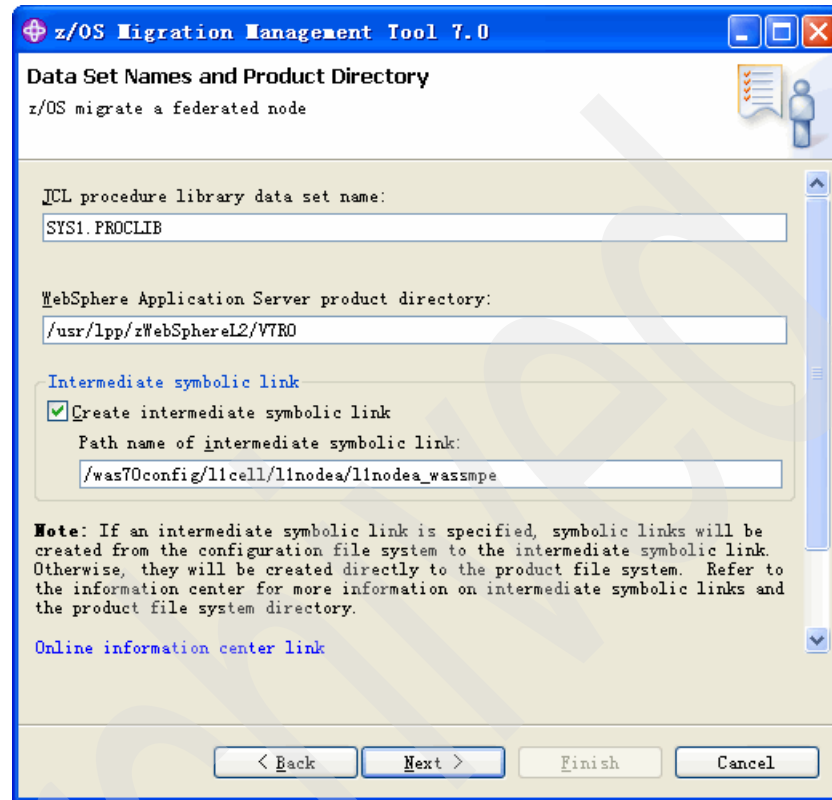
Figure 7-45   Data Set Names and Product Directory window

–   Specify the procedure library into which the copy job puts the new JCL.
    We specify SYS1.PROCLIB.

–   For the WebSphere Application Server product library, we specify
    `/usr/lpp/zWebSphereL2/V7.0R0`, which provides the migration utility with
    knowledge of where the WebSphere Application Server V7.0 SMP/E
    product file system is located.

–   We select **Create intermediate symbolic link** and give it the path name
    of `/was70config/l1cell/l1dmnode/l1dmnode_wassmpe`.

    Creating an intermediate symbolic link provides each node with the ability
    to be moved to a new level of maintenance, which provides a kind of "alias"
    for the actual location.

8. The window shown in Figure 7-46 is used by the job that allocates and mounts the file system that holds the Version 7.0 primary node's migrated configuration.

Figure 7-46   File system configuration for Version 7.0 primary node

– The mount point should be filled with the new Version 7.0 primary node's configuration file system, not the "from" Version 6.1.2 mount point. We use the value /was70config/l1cell/l1nodea in our environment.

– We use the data set name of OMVS.WAS70.L1CELL.L1NODEA.ZFS for the Version 7.0 primary node's configuration in our environment.

– We use the volume name of TSTO71 for the V7.0 primary node's configuration in our environment.

– The primary and second allocation values should be set to correspond roughly to your current configuration file system's size and allow for future growth. In our environment, we use 1100 and 100 cylinders, respectively.

> **Note:** The primary allocation of 420 cylinders should be considered a minimum. Check the actual size of your current node file system and adjust this value accordingly, taking into account any anticipated growth in applications in the future.

   – Select the file system type you use. We use ZFS in our environment.

   Click **Next**.

9. Figure 7-47 shows the first of two windows where most of the migration information is entered.

Figure 7-47 Server customization for primary node migration: Part 1

- For the primary node's "from" mount point, we use the value of was61config/l1cell/l1nodea, where the Version 6.1.2 primary node is located. This is where the migration utility will "read in" the existing Version 6.1.2 configuration that is to be migrated.

- The "to" mount point is where the migration utility will write the migrated configuration for Version 7.0. The mount point field is greyed-out, and is based on the value you supplied in Figure 7-46.

- The default home directory AppServer is used for both the "from" and "to" configuration location. We did not change it in our environment.

- We need to provide the JCL V7.0 start procedure names, including the daemon, controller, servant, and adjunct procedures for the primary node. In Version 6.1.2, the names for the daemon, controller, servant, and adjunct procedures of the primary node are L1DEMNA, L1ACRA, L1ASRA, and L1AARA, respectively.

  In our example, we are re-using the same JCL start procedure names for the Version 7.0 primary node. Clearing the box means the migration utility will not replace the START strings held in the configuration XML.

  Because we are re-using the same JCL start procedure names, we cleared **Replace started procedure command names**.

  The Version 7.0 start procedures have a different format that the Version 6.x start procedures, so the old Version 6.1.2 procedures need be overwritten. Before starting the migrated servers, the *CPY1 job needs to be executed to overlay the existing JCL start procedures in your JCL procedure library. This step is discussed in 7.3.11, "Start the migrated environment" on page 433.

- When migrating a managed node, the migration utility attempts to make contact with the running DMGR, so it will need a user ID and password that will allow it access.

  • If global security is off for the cell, then this value is not required for the migration, but the MMT requires that the ID field and the password fields be populated. You may use the defaults.

  • If security is enabled, provide a valid ID and password to access the DMGR.

  Note: The password value is encrypted in the files that are created, both in the MMT tool and in the uploaded job files.

Click **Next**.

10. For the next window, we provided the input shown in Figure 7-48.
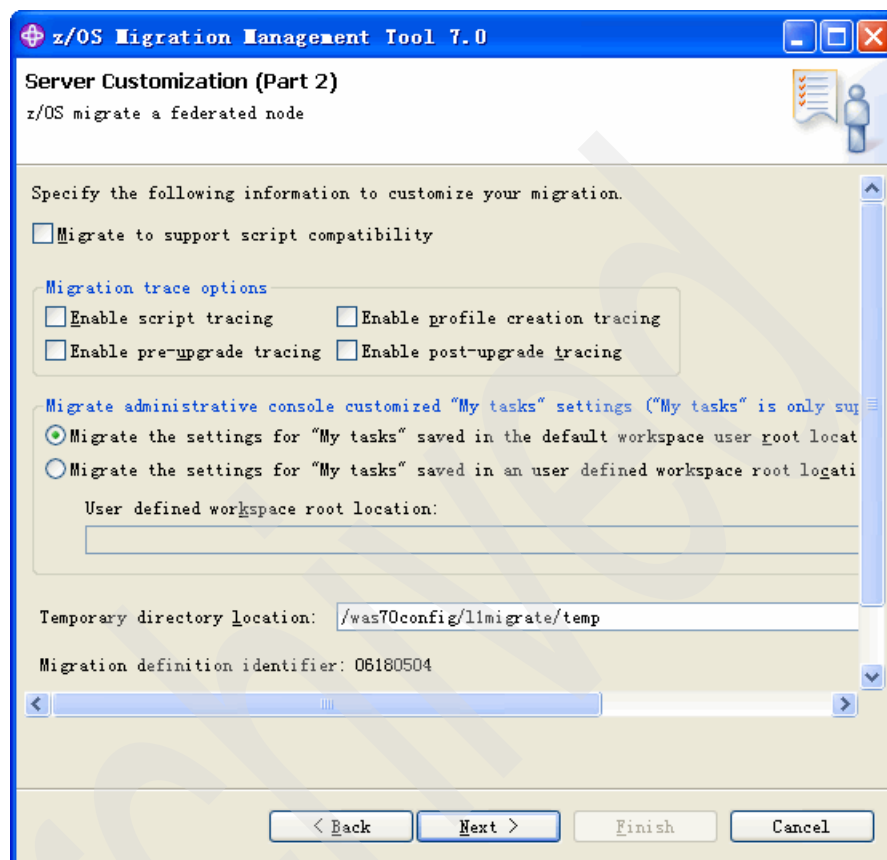
Figure 7-48   Server customization for primary node migration: Part 2

– The Migrate to support script compatibility check box determines whether the migrated configuration will be compatible with the earlier versions of the WSADMIN scripting interface. We cleared it because we did not have scripts with script compatibility issues.

– We left all the Migration trace options boxes cleared. Check these boxes only when directed to do so by IBM Support. The trace options produce significant amounts of output.

– We use the default Migrating My tasks settings.

– The temporary directory location is where the migration utility creates the temporary files it needs during the migration run. We create a separate directory, `/was70config/llmigrate/temp`, which is distinct from the system `/tmp` directory, and we allocated and mounted a file system at that location that was 1.5 times the current size of the node's configuration file system. We made sure the permissions on this directory were 777.

> **Important:**
>
> ► Depending on the size of the configuration, the migration utility might need up to 500 cylinders of temporary space. Allocate and mount a temporary file system of that size and point to that location in this field.
>
> Lack of space is one of the most common causes of migration job failure.
>
> ► If you are performing multiple migrations, or you are rerunning a migration, remember to clean out the temporary directory so you have the maximum space available to you.

11. In the window shown in Figure 7-49, you can create the JOB card that will be used in the generated jobs. You should update this card to conform with your normal procedures. Figure 7-49 shows the JOB card used in our z/OS system.

Figure 7-49   JOB card for the generated jobs

12.Figure 7-50 shows the migration summary. Click the **Create** button to create the migration definition.
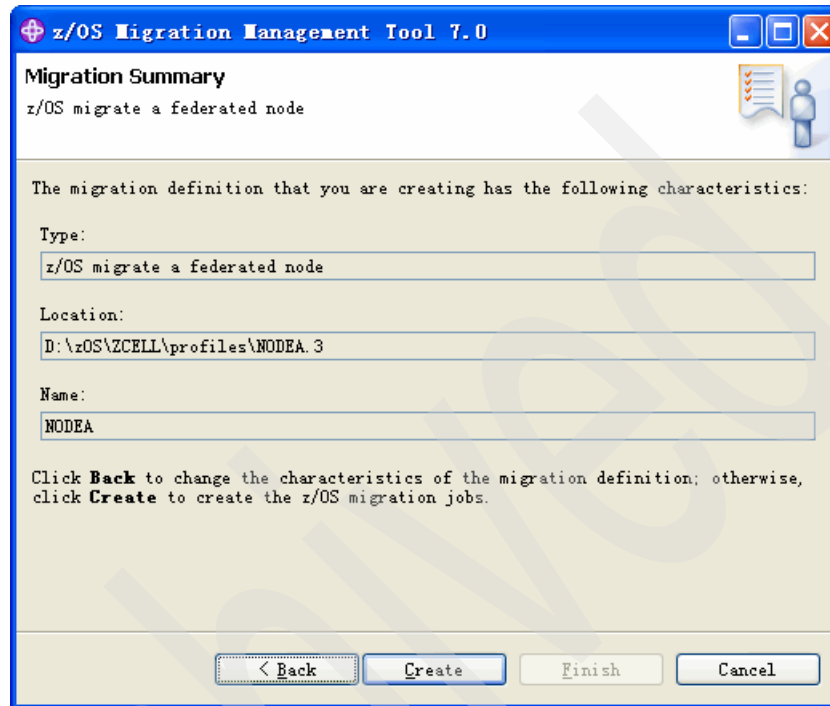
Figure 7-50   Migration summary for the primary node

13. Finally, the migration definition for the primary node is created successfully (Figure 7-51).
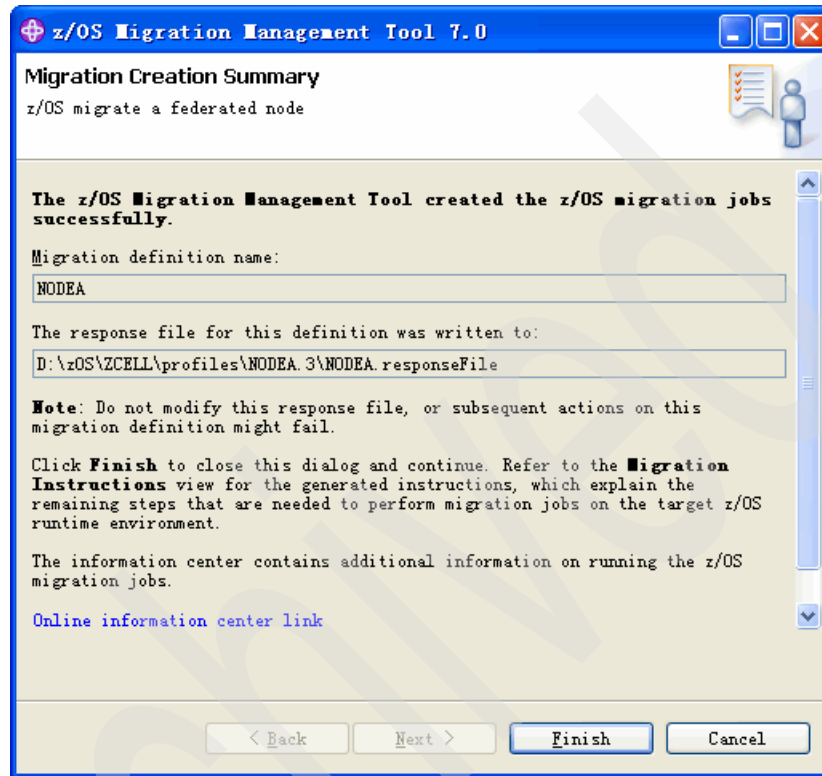
Figure 7-51   Migration definition is created successfully

Process (upload) the definition to z/OS

The next step transfers the generated customized jobs that are used to migrate the primary node from the MMT tool on your workstation on to the z/OS system where they will be run.

Perform the following steps:

1. Select the NODEA definition we just created and click the **Process** button.

2. Select the option to upload to z/OS (Figure 7-52).
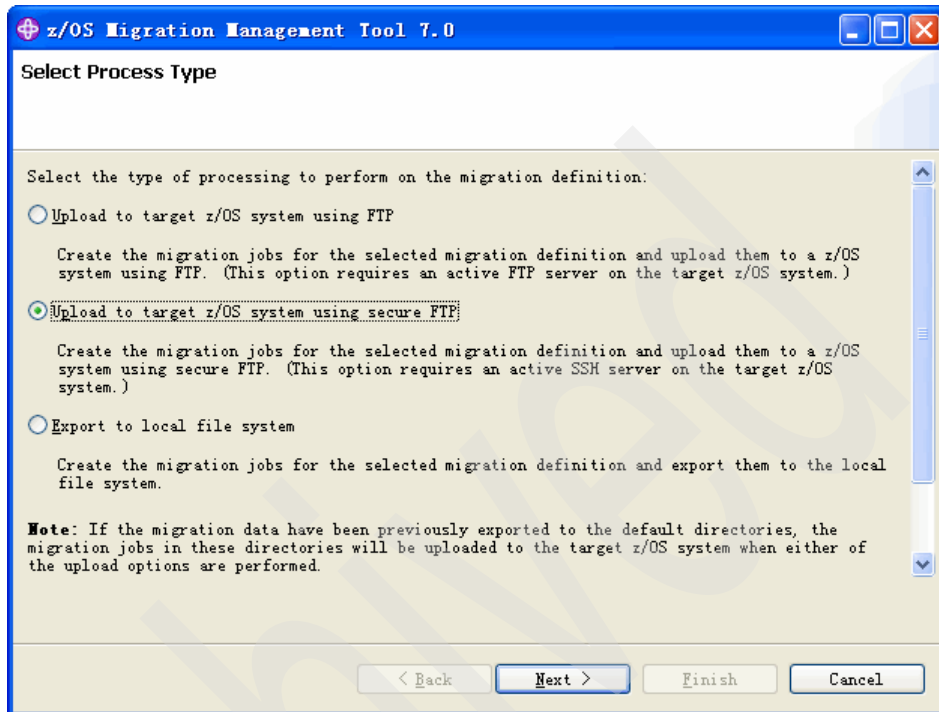
Figure 7-52   Select upload option

3. Provide the parameters that will allow the upload to z/OS to succeed (Figure 7-53).

Figure 7-53   Provide parameters for upload jobs

– Provide the host IP name of the system on which the jobs will be run.

– Provide a user ID and password for the FTP upload.

– Modify the port if you know your system uses something other than 21 for FTP.

– Check **Allocate target z/OS data sets** (leave it clear if you are pre-allocating manually).

– Specify the volume and unit or leave it blank.

Click **Finish**.

4. Watch the progress bar (Figure 7-54).
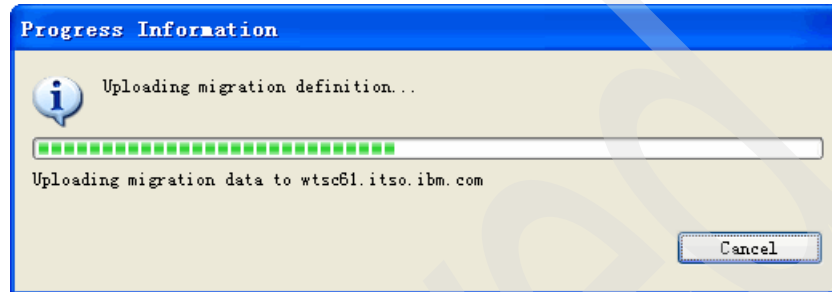
Figure 7-54   The progress bar

5. The "Upload successful" message will be displayed (Figure 7-55).

Figure 7-55   Upload successful

6. You should see the MMT main window again. The customized migration jobs for the primary node on the z/OS system are ready to be submitted. We validate that the data sets have been created and that they contain the expected member. The CNTL data set looks like the panel shown in Figure 7-56.

```
VIEW                    WPSCFG.MIGNODEA.CNTL
Command ===> _
             Name       Prompt        Size
_____   BBOMMAJ
_____   BBOMMCP
_____   BBOMMCR
_____   BBOMMDN
_____   BBOMMHFS
_____   BBOMMINS
_____   BBOMMSR
_____   BBOMMZFS
_____   BBOSCHED
_____   BBOWMG1F
_____   BBOWMG2F
_____   BBOWMG3F
_____   BBOWMPOS
_____   BBOWMPRE
_____   BBOWMPRO
             **End**
```

Figure 7-56   The data sets contained the generated migration jobs

Edit and submit the WebSphere Process Server migration jobs

After the WebSphere Application Server migration jobs and variables are generated and uploaded by the z/OS MMT tool, we can edit the sample WebSphere Process Server migration jobs BPZWMG1F, BPZWMG2F, and BPZWMG3F to make use of these WebSphere Application Server migration jobs.

After these jobs are submitted, they invoke the WebSphere Process Server script wbimigrt2.sh, which is very similar to the WebSphere Application Server script bbomigrt2.sh. The wbimgrt2.sh script invokes the migration utilities BPMSnapshotSourceProfile.sh and BPMMigrateProfile.sh to migrate the WebSphere Process Server V6.1.2 primary node to Version 7.0.

Perform the following steps:

1. Find the sample WebSphere Process Server migration jobs BPZWMG1F, BPZWMG2F, and BPZWMG3F in the installed WebSphere Process Server JCL PDS (.**.SBPZJCL). In our z/OS system, the JCL PDS is located in BBL27061.SBPZJCL PDS. Copy these three jobs to your working PDS and change their names to BPZWMG1A, BPZWMG2A, and BPZWMG3A, respectively. In this sample, we use WPSCFG.WPS.JCL as the working PDS.

```
VIEW                    WPSCFG.WPS.JCL
Command ===> _
                Name      Prompt
_____  BPZWMG1A
_____  BPZWMG1B
_____  BPZWMG2A
_____  BPZWMG2B
_____  BPZWMG3A
_____  BPZWMG3B
_____  BPZWMG3D
_____  L1ADMINS
_____  L1DMSYM
_____  L1EJB
_____  L1GEJB
_____  L1HOMEG
_____  L1NASYM
_____  L1NBSYM
```

Figure 7-57   Migration jobs to migrate the primary node

2. Edit BPZWMG1A, BPZWMG2A, and BPZWMG3A so that you can use the WebSphere Application Server migration jobs generated by MMT:

   a. Add a JOB card for BPZWMG1A, BPZWMG2A, and BPZWMG3A to make sure that you use the administrator user name and password. Example 7-10 shows the JOB card for the BPZWMG1A job used in our environment. For the BPZWMG2A and BPZWMG3A jobs, add JOB card in the same way.

   Example 7-10   JOB card for the BPZWMG1A job

```
//BPZWMG1F JOB NOTIFY=&SYSUID,CLASS=A,MSGCLASS=H,
//  REGION=0M,TIME=1440,
// USER=L1ADMIN,PASSWORD=L1ADMIN
/*JOBPARM S=SC61
//*
```

b. Replace the following parameters in BPZWMG1A, BPZWMG2A, and BPZWMG3A according to the primary node configuration and the parameters entered in MMT. Example 7-11 shows the parameters for the primary node in our z/OS system.

Example 7-11 Replace parameters in BPZWMG1A, BPZWMG2A, and BPZWMG3A jobs

```
//*      #tempdir#  temporary working directory                        *
//*                 eg.  V7.00fn1                                       *
//*                 V7.00NODEA                                          *
//*                                                                     *
//*      #wpsndir#  directory of the V7.0.0 WPS product                 *
//*                 eg. /usr/lpp/zWPS/V7.0R0                            *
//*                 /usr/lpp/zWPSL2/V7.0R0                              *
//*                                                                     *
//*      #wpsosvr#  home directory of the old wps server                *
//*                 eg. /WebSphere/V62FN1                               *
//*                 /was61config/l1cell/l1nodea                         *
//*                                                                     *
//*      #wpsnsvr#  home directory of the new wps server                *
//*                 eg. /WebSphere/V7.00FN1                             *
//*                 /was70config/l1cell/l1nodea                         *
//*                                                                     *
//*      #wassmpe#  dir of the WAS smpe install                         *
//*                 eg. /usr/lpp/zWebSphere/V7.00P4098                  *
//*                 /usr/lpp/zWebSphereL2/V7.0R0                        *
//*                                                                     *
//*      #procdmn#  name of the started task procedure (daemon)         *
//*                 eg WDFN1Z1                                          *
//*                 L1DEMNA                                             *
//*                                                                     *
//*      #procctr#  name of the started task procedure (control)        *
//*                 eg WCFN1Z1                                          *
//*                 L1ACRA                                              *
//*                                                                     *
//*      #procadj#  name of the started task procedure (adjunct)        *
//*                 eg WAFN1Z1                                          *
//*                 L1AARA                                              *
//*                                                                     *
//*      #procsvr#  name of the started task procedure (servant)        *
//*                 eg WSFN1Z1                                          *
//*                 L1ASRA                                              *
//*                                                                     *
//*      #migrpds#  hlq of pds of migration jobs created by WebSphere   *
//*                 Customisation panels.                               *
```

```
//*           eg. ZWPS.WAS.V7.00.V7.00FN1.MIG                    *
//*           WPSCFG.MIGNODEA                                    *
//*                                                              *
//*    #touserid# if security is switched on in the old wps server *
//*           then supply the userid.                           *
//*           eg. wsadmin                                       *
//*           l1admin                                           *
//*                                                              *
//*    #topswd#  if security is switched on in the old wps server *
//*           then supply the password.                         *
//*           l1admin                                           *
```

3. Next, you need to submit BPZWMG1A, BPZWMG2A, and BPZWMG3A. If there were XA connectors installed in the Version 6.1.2 server, the BPZWMG1A and BPZWMG2A jobs need to be run. Otherwise, only submit the BPZWMG3A job to do the actual migration. In our example, we need to execute all three jobs, because XA connectors are used in the Version 6.1.2 source environment.

4. Execute the BPZWMG1A job:

    a. Locate the BPZWMG1A job that you edited in the WPSCFG.WPS.JCL PDS (Figure 7-58).

```
VIEW       WPSCFG.WPS.JCL(BPZWMG1A) - 01.00            Columns 00001 00072
Command ===> submit_                                    Scroll ===> PAGE
****** ***************************** Top of Data *****************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001 //BPZWMG1F JOB NOTIFY=&SYSUID,CLASS=A,MSGCLASS=H,
000002 //  REGION=0M,TIME=1440,
000003 // USER=L1ADMIN,PASSWORD=L1ADMIN
000004 /*JOBPARM S=SC61
000005 //*
000006 //********************************************************************
000007 //* Licensed Materials - Property of IBM
000008 //* 5655-W05
000009 //* (C) COPYRIGHT International Business Machines Corp. 2007, 2009
000010 //* US Government Users Restricted Rights - Use, duplication or disclos
000011 //* restricted by GSA ADP Schedule Contract with IBM Corp.
000012 //* The source code for this program is not published or otherwise dive
000013 //* of its trade secrets, irrespective of what has been deposited with
000014 //* U.S. Copyright Office.
000015 //********************************************************************
```

Figure 7-58   The BPZWMG1A job

b. Submit the modified BPZWMG1A job (Figure 7-59).

```
VIEW        WPSCFG.WPS.JCL(BPZWMG1A) - 01.00              Columns 00001 00072
Command ===> submit_____ Scroll ===> PAGE
****** ***************************** Top of Data *******************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001 //BPZWMG1F JOB NOTIFY=&SYSUID,CLASS=A,MSGCLASS=H,
000002 //  REGION=0M,TIME=1440,
000003 // USER=L1ADMIN,PASSWORD=L1ADMIN
000004 /*JOBPARM S=SC61
000005 //*
000006 //****************************************************************
000007 //* Licensed Materials - Property of IBM
000008 //* 5655-W05
000009 //* (C) COPYRIGHT International Business Machines Corp. 2007, 2009
000010 //* US Government Users Restricted Rights - Use, duplication or disclos
000011 //* restricted by GSA ADP Schedule Contract with IBM Corp.
000012 //* The source code for this program is not published or otherwise dive
000013 //* of its trade secrets, irrespective of what has been deposited with
JOB BPZWMG1F(JOB24453) SUBMITTED
*** _
```

Figure 7-59   Submit the BPZWMG1A job

   c. Examine the output in /tmp/migrate/#tempdir#/BPZWMG1F.out to make
      sure that the BPZWMG1A job completed successfully. The #tempdir# is
      the parameter you defined as V7.00NODEA (see Example 7-11 on
      page 406). The output is shown in Example 7-12 as BPZWMG1F.out.

   Example 7-12   Output in BPZWMG1F.out

```
STEP: MKCONFIG


=====================================================================
...
BBOJ0054I Transformer symlink - Already Linked:
/was61config/l1cell/l1nodea/L1CELL.L1NODEA.L1CL011  ->
/was61config/l1cell/l1nodea/AppServer/profiles/default/config/cel
ls/l1cell/nodes/l1nodea/servers/l1cl011
BBOJ0054I Transformer symlink - Already Linked:
/was61config/l1cell/l1nodea/L1CELL.L1NODEA.L1CL011.HOME  ->
/was61config/l1cell/l1nodea/AppServer
BBOJ0056I Transformer Processing Complete, RC=0.
preMigrate completed...
```

5. Execute the BPZWMG2A job:

   a. Locate the BPZWMG2A job that you edited in the working WPSCFG.WPS.JCL PDS (Figure 7-60).

```
VIEW       WPSCFG.WPS.JCL(BPZWMG2A) - 01.00            Columns 00001 00072
Command ===> submit_                                       Scroll ===> PAGE
****** ***************************** Top of Data ****************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>          your edit profile using the command RECOVERY ON.
000001 //BPZWMG2F JOB NOTIFY=&SYSUID,CLASS=A,MSGCLASS=H,
000002 //  REGION=0M,TIME=1440,
000003 // USER=L1ADMIN,PASSWORD=L1ADMIN
000004 /*JOBPARM S=SC61
000005 //*
000006 //*******************************************************************
000007 //* Licensed Materials - Property of IBM
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000009 //* (C) COPYRIGHT International Business Machines Corp. 2007, 2009
000010 //* US Government Users Restricted Rights - Use, duplication or disclos
000011 //* restricted by GSA ADP Schedule Contract with IBM Corp.
000012 //* The source code for this program is not published or otherwise dive
000013 //* of its trade secrets, irrespective of what has been deposited with
000014 //* U.S. Copyright Office.
000015 //*******************************************************************
```

Figure 7-60   The BPZWMG2A job

   b. Submit the modified BPZWMG2A job (Figure 7-61).

```
VIEW       WPSCFG.WPS.JCL(BPZWMG2A) - 01.00            Columns 00001 00072
Command ===> submit                                        Scroll ===> PAGE
****** ***************************** Top of Data ****************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>          your edit profile using the command RECOVERY ON.
000001 //BPZWMG2F JOB NOTIFY=&SYSUID,CLASS=A,MSGCLASS=H,
000002 //  REGION=0M,TIME=1440,
000003 // USER=L1ADMIN,PASSWORD=L1ADMIN
000004 /*JOBPARM S=SC61
000005 //*
000006 //*******************************************************************
000007 //* Licensed Materials - Property of IBM
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000010 //* US Government Users Restricted Rights - Use, duplication or disclos
000011 //* restricted by GSA ADP Schedule Contract with IBM Corp.
000012 //* The source code for this program is not published or otherwise dive
000013 //* of its trade secrets, irrespective of what has been deposited with
JOB BPZWMG2F(JOB24465) SUBMITTED
*** _
```

Figure 7-61   Submit the BPZWMG2A job

c. Examine the output in `/tmp/migrate/#tempdir#/BPZWMG2F.out` to make sure the BPZWMG2A job completed successfully. The #tempdir# is the parameter you have defined in step 2b on page 406 as V7.00NODEA. You can find the output (Example 7-13) in `BPZWMG2F.out`.

Example 7-13   Output in BPZWMG1F.out

```
STEP: MKCONFIG


================================================================
...
BBOJ0054I Transformer symlink - Already Linked:
/was61config/l1cell/l1nodea/L1CELL.L1NODEA.L1CL011  ->
/was61config/l1cell/l1nodea/AppServer/profiles/default/config/cel
ls/l1cell/nodes/l1nodea/servers/l1cl011
BBOJ0054I Transformer symlink - Already Linked:
/was61config/l1cell/l1nodea/L1CELL.L1NODEA.L1CL011.HOME  ->
/was61config/l1cell/l1nodea/AppServer
BBOJ0056I Transformer Processing Complete, RC=0.
postMigrate completed...
```

6. Execute the BPZWMG3A job:

   – Locate the BPZWMG3A job that you edited in the WPSCFG.WPS.JCL PDS (Figure 7-62).

```
VIEW        WPSCFG.WPS.JCL(BPZWMG3A) - 01.00        Columns 00001 00072
Command ===> submit_                                    Scroll ===> PAGE
****** ****************************** Top of Data ******************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001 //BPZWMG3F JOB NOTIFY=&SYSUID,CLASS=A,MSGCLASS=H,
000002 //  REGION=0M,TIME=1440,
000003 // USER=L1ADMIN,PASSWORD=L1ADMIN
000004 /*JOBPARM S=SC61
000005 //*
000006 //****************************************************************
000007 //* Licensed Materials - Property of IBM
000008 //* 5655-W05
000009 //* (C) COPYRIGHT International Business Machines Corp. 2007, 2009
000010 //* US Government Users Restricted Rights - Use, duplication or disclos
000011 //* restricted by GSA ADP Schedule Contract with IBM Corp.
000012 //* The source code for this program is not published or otherwise dives
000013 //* of its trade secrets, irrespective of what has been deposited with
000014 //* U.S. Copyright Office.
```

Figure 7-62   The BPZWMG3A job

– Submit the BPZWMG3A job (Figure 7-63).

```
VIEW        WPSCFG.WPS.JCL(BPZWMG3A) - 01.00            Columns 00001 00072
Command ===> submit                                    Scroll ===> PAGE
****** ***************************** Top of Data ********************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001 //BPZWMG3F JOB NOTIFY=&SYSUID,CLASS=A,MSGCLASS=H,
000002 //  REGION=0M,TIME=1440,
000003 // USER=L1ADMIN,PASSWORD=L1ADMIN
000004 /*JOBPARM S=SC61
000005 //*
000006 //*****************************************************************
000007 //* Licensed Materials - Property of IBM
000008 //* 5655-W05
000009 //* (C) COPYRIGHT International Business Machines Corp. 2007, 2009
000010 //* US Government Users Restricted Rights - Use, duplication or disclosu
000011 //* restricted by GSA ADP Schedule Contract with IBM Corp.
000012 //* The source code for this program is not published or otherwise dives
000013 //* of its trade secrets, irrespective of what has been deposited with
JOB BPZWMG3F(JOB24470) SUBMITTED
*** _
```

Figure 7-63   Submit the BPZWMG3A job

After the BPZWMG3A job is submitted, it executes the WebSphere Process Server script wbimigrt2.sh, which is very similar to the WebSphere Application Server script bbomigrt2.sh. The wbimgrt2.sh script invokes the migration utilities BPMSnapshotSourceProfile.sh and BPMMigrateProfile.sh to do the actual migration. The migration of a source profile consists of two steps in the following sequence:

a. Take a backup of the source profile to the snapshot directory. The **BPMSnapshotSourceProfile.sh** command is executed to take the snapshot of the source profile. The snapshot directory is /tmp/migrate/V7.00NODEA (Figure 7-64).
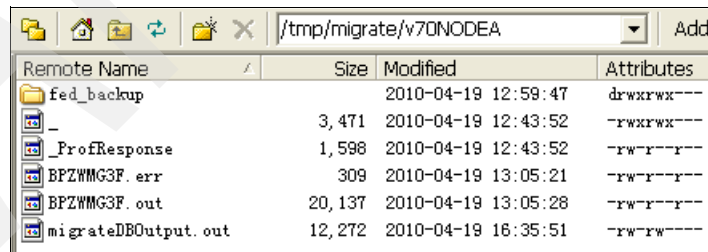

Figure 7-64   The snapshot directory

b. Migrate the source profile to the target profile. The `BPMMigrateProfile.sh` command is executed to migrate the source profile.

7. Examine the output in `/tmp/migrate/#tempdir#/BPZWMG3F.out` and `/tmp/migrate/#tempdir#/fed_backup/logs` to make sure the migration completed successfully. The #tempdir# parameter in this case is V7.00NODEA (Example 7-11 on page 406).
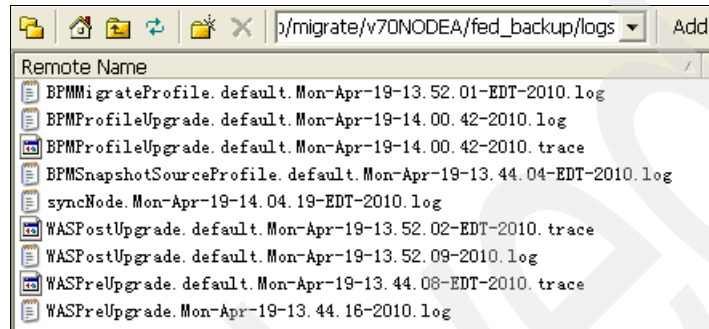
Figure 7-65   Logs created for the primary node migration

a. Step 6a on page 411 creates the following log files in the `logs` subdirectory of the `snapshot/fed_backup` directory. You can examine these logs to monitor the progress of the snapshot activity. The `log.lck` file is a lock file, which indicates an instance of an activity is taking a snapshot of the primary node profile that is already running. This is a mechanism that is used to prevent multiple snapshot activities by different users.
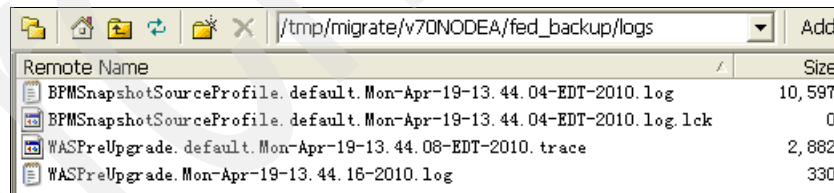
Figure 7-66   Logs created for snapshot activity

After Step 6a on page 411 completes, you should see an output similar to Example 7-14 in `BPMSnapshotSourceProfile.default.Time_Stamp.log`.

Example 7-14   Output for snapshot activity

```
[4/19/10 1:51:44 PM EDT] O BPMSnapshotNode F invokeAdditionalMigr
Serializing file =
[/SC61/tmp/migrate/V7.00NODEA/fed_backup/profiles/default/default
.profinfo]
```

```
[4/19/10 1:51:44 PM EDT] 0 FileUtilities   > serializeObject
ENTRY
{/SC61/tmp/migrate/V7.00NODEA/fed_backup/profiles/default/default
.profinfo}
[4/19/10 1:51:44 PM EDT] 0 FileUtilities   < serializeObject
RETURN
[4/19/10 1:51:44 PM EDT] 0 BPMSnapshotNode < invokeAdditionalMigr
RETURN
[4/19/10 1:51:44 PM EDT] 0 WBIUpgradeBase  < migrate
RETURN
[4/19/10 1:51:45 PM EDT] 0 BPMSnapshotNode I main(String[] args)
CWMC00823I: The BPMSnapshotSourceProfile command finished
successfully.
```

b. In step 6b on page 412, the actual migration of the data from the snapshot directory to the target profile is performed. During this step, the migration process performs the following actions:

- Changes the local properties.

- Connects to the deployment manager and changes the node information on the master repository.

- Installs new system applications if required.

The logs for this step are also created in the `logs` subdirectory of the `snapshot/fed_backup` directory. Check for any errors in these log files:

- `BPMMigrateProfile.default.`*Time_Stamp*`.log`

- `BPMProfileUpgrade.default.`*Time_Stamp*`.log`

- `BPMProfileUpgrade.default.`*Time_Stamp*`.trace`

- `WASPostUpgrade.default.`*Time_Stamp*`.trace`

- `WASPostUpgrade.default.`*Time_Stamp*`.log`

c. The BPZWMG3A job synchronizes the target primary managed profile with the running deployment manager. The changes made at the deployment manager (master repository) will be synchronized to the local repository. The synchronization step also creates a log file in the `logs` subdirectory, as shown in Figure 7-67.
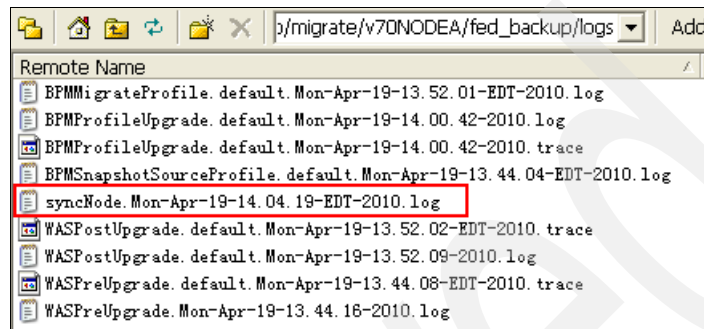
Figure 7-67   The syncNode log file

d. After both steps have completed successfully, check the output in `/tmp/migrate/#tempdir#/BPZWMG3F.out`. You can find the output in Example 7-15 as `BPZWMG3F.out`.

Example 7-15   Output in BPZWMG3F.out

```
=================================================================
 STEP: MKCONFIG
=================================================================
...
CWMCO0224I: The WebSphere Application Server utility has
completed.
CWMCO0208I: See the following log file for information:
/SC61/tmp/migrate/V7.00NODEA/fed_backup/logs/WASPreUpgrade.<TIMES
TAMP>.log
CWMCO0823I: The BPMSnapshotSourceProfile command finished
successfully.
...
CWMCO0224I: The WebSphere Application Server utility has
completed.
CWMCO0208I: See the following log file for information:
/SC61/tmp/migrate/V7.00NODEA/fed_backup/logs/syncNode.Mon-Apr-19-
14.04.19-EDT-2010.log
CWMCO0822I: The BPMMigrateProfile command finished successfully.
CWMCO0850I: See the migration documentation for additional
migration tasks that are specific to your configuration such as
```

```
                    upgrading database schemas and/or running BPMMigrateCluster
                    command for clusters.
                    ...
                    Migration Completed Successfully...
                    *****************************************************************
```

7.3.6 Migrating the secondary node

Here we give the steps to perform the migration on the secondary node. These
steps are similar to the ones performed during the migration of the primary node
in 7.3.5, "Migrating the primary node" on page 387. We will only mention the
steps where there are differences.

Perform the following steps:

1. Make sure that the deployment manager in the target environment is running
   and the node agent is stopped.

2. Create a migration definition, NODEB, for the secondary node in MMT:

   a. Provide the high-level qualifier for z/OS data sets of
      WPSCFG.MIGNODEB that will hold the generated jobs for the secondary
      node from MMT (Figure 7-68).
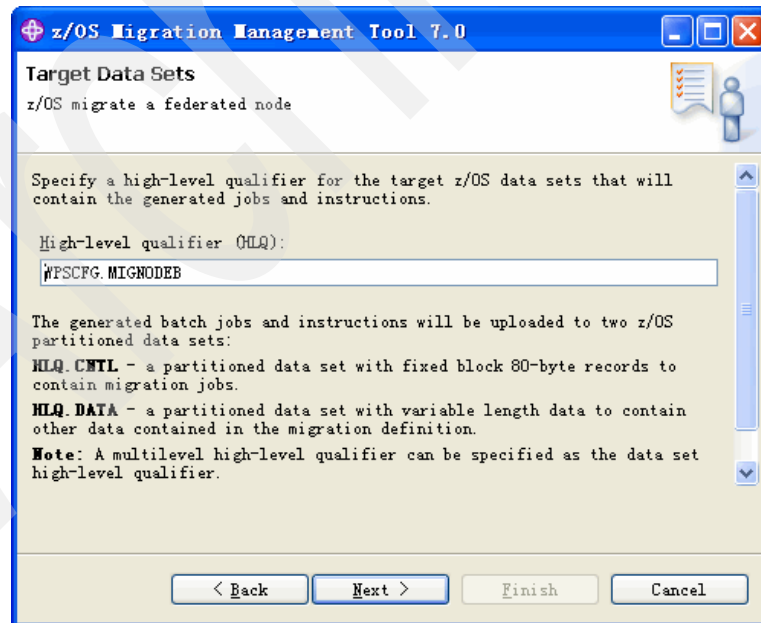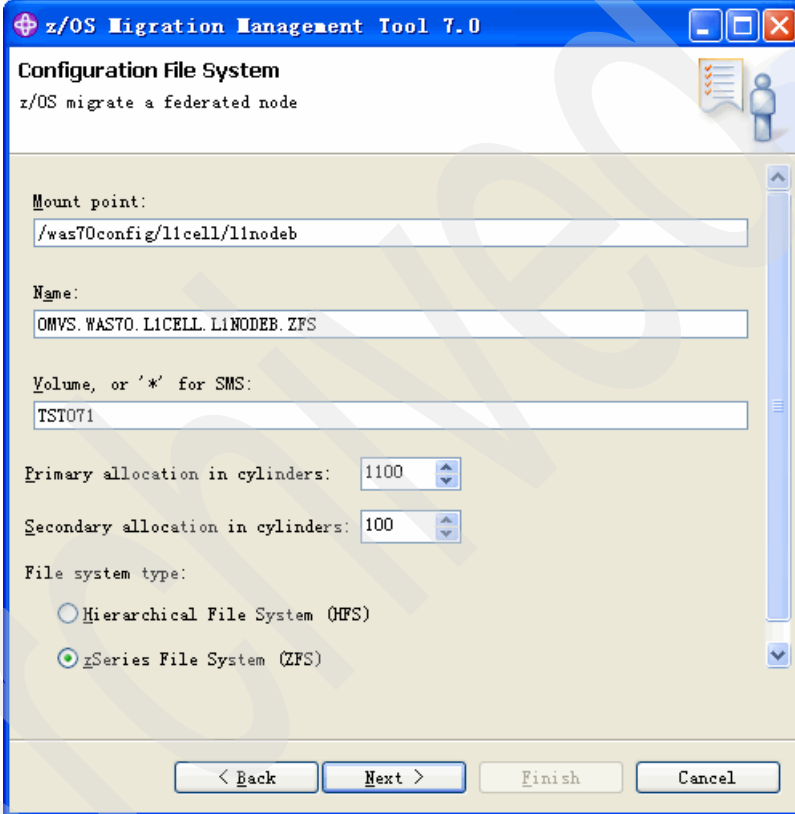
Figure 7-68   Specify target data sets to store generated jobs

We used the high-level qualifier WPSCFG.MIGNODEB, which results in the following data sets being used:

- WPSCFG.MIGDNODEB.CNTL
- WPSCFG.MIGNODEB.DATA

b. Provide the mount point, the data set name, and the volume name for the Version 7.0 secondary node's configuration file system (Figure 7-69).

Figure 7-69   File system configuration for the Version 7.0 secondary node

c. Provide the migration information for the secondary node, including the secondary node's "from" and "to" mount point, and the JCL start procedure names for the secondary node, including the daemon, controller, servant, and adjunct procedures (Figure 7-70).

Figure 7-70   Server customization for secondary node migration

3. Upload the migration jobs for the secondary node to z/OS (Figure 7-71).

Figure 7-71   Upload the migration jobs for the secondary node to z/OS

4. After the customized migration jobs for the secondary node are on the z/OS system, we validate that the data sets have been created and that they contain the expected member.

Figure 7-72 shows the CNTL data set.

```
VIEW                 WPSCFG.MIGNODEB.CNTL
Command ===>  _
              Name      Prompt        Size
_____   BBOMMAJ
_____   BBOMMCP
_____   BBOMMCR
_____   BBOMMDN
_____   BBOMMHFS
_____   BBOMMINS
_____   BBOMMSR
_____   BBOMMZFS
_____   BBOSCHED
_____   BBOWMG1F
_____   BBOWMG2F
_____   BBOWMG3F
_____   BBOWMPOS
_____   BBOWMPRE
_____   BBOWMPRO
             **End**
```

Figure 7-72   The data sets containing the generated migration jobs

5. Edit the WebSphere Process Server migration jobs:

   a. Copy the sample migration jobs BPZWMG1F, BPZWMG2F, and
      BPZWMG3F to the working PDS and change their names to BPZWMG1B,
      BPZWMG2B, and BPZWMG3B, respectively. In our example, we used the
      WPSCFG.WPS.JCL PDS.

```
VIEW                 WPSCFG.WPS.JCL
Command ===>  _
              Name      Prompt
_____   BPZWMG1A
_____   BPZWMG1B
_____   BPZWMG2A
_____   BPZWMG2B
_____   BPZWMG3A
_____   BPZWMG3B
_____   BPZWMG3D
_____   L1ADMINS
_____   L1DMSYM
_____   L1EJB
_____   L1GEJB
```

Figure 7-73   Migration jobs to migrate the secondary node

   b. Edit the BPZWMG1B, BPZWMG2B, and BPZWMG3B jobs.

      Add a JOB card for BPZWMG1A, BPZWMG2A, and BPZWMG3A.

Replace the following parameters in BPZWMG1B, BPZWMG2B, and BPZWMG3B according to the secondary node configuration, and the parameters entered in MMT. Example 7-16 shows the parameters for the secondary node in our z/OS system.

Example 7-16   Parameters replaced in BPZWMG1B, BPZWMG2B, and BPZWMG3B

```
//*      #tempdir#  temporary working directory                       *
//*                 eg.  V7.00fn1
*
//*                 V7.00NODEB
*
//*                                                                    *
//*      #wpsndir#  directory of the V7.0.0 WPS product
*
//*                 eg. /usr/lpp/zWPS/V7.0R0
*
//*                 /usr/lpp/zWPSL2/V7.0R0
*
//*                                                                    *
//*      #wpsosvr#  home directory of the old wps server               *
//*                 eg. /WebSphere/V62FN1                              *
//*                 /was61config/l1cell/l1nodeb                        *
//*                                                                    *
//*      #wpsnsvr#  home directory of the new wps server               *
//*                 eg. /WebSphere/V7.00FN1
*
//*                 /was70config//l1cell/l1nodeb                       *
//*                                                                    *
//*      #wassmpe#  dir of the WAS smpe install                        *
//*                 eg. /usr/lpp/zWebSphere/V7.00P4098
*
//*                 /usr/lpp/zWebSphereL2/V7.0R0
*
//*                                                                    *
//*      #procdmn#  name of the started task procedure (daemon)        *
//*                 eg WDFN1Z1                                         *
//*                 L1DEMNB                                           *
//*                                                                    *
//*      #procctr#  name of the started task procedure (control)       *
//*                 eg WCFN1Z1                                         *
//*                 L1ACRB                                            *
//*                                                                    *
//*      #procadj#  name of the started task procedure (adjunct)       *
//*                 eg WAFN1Z1                                         *
```

```
//*                      L1AARB                                        *
//*                                                                    *
//*       #procsvr#  name of the started task procedure (servant)      *
//*                  eg WSFN1Z1                                        *
//*                      L1ASRB                                        *
//*                                                                    *
//*       #migrpds#  hlq of pds of migration jobs created by WebSphere *
//*                  Customisation panels.                             *
//*                  eg. ZWPS.WAS.V7.00.V7.00FN1.MIG
*
//*                      WPSCFG.MIGNODEB                               *
//*                                                                    *
//*       #touserid# if security is switched on in the old wps server  *
//*                  then supply the userid.                           *
//*                  eg. wsadmin                                       *
//*                      l1admin                                       *
//*                                                                    *
//*       #topswd#   if security is switched on in the old wps server  *
//*                  then supply the password.                         *
//*                      l1admin                                       *
```

6. Submit the edited jobs BPZWMG1B, BPZWMG2B, and BPZWMG3B.

   As was the case when migrating the primary managed profile, these jobs perform the migration on the secondary node.

   The jobs create corresponding logs in each step of the migration. Examine the output in /tmp/migrate/#*tempdir*#/BPZWMGxF.out and /tmp/migrate/#*tempdir*#/fed_backup/logs to make sure the migration completed successfully. The #tempdir# is V7.00NODEB.

7.3.7 Migrating the cluster

After the managed nodes are migrated, all clusters in the source environment must be migrated. The cluster migration is done by using the BPMMigrateCluster script.

Example 7-17 shows the usage information of the BPMMigrateCluster script.

Example 7-17   Usage information of the BPMMigrateCluster script

```
Usage: BPMMigrateCluster <backupDir> <cluster> <target deployment
manager profile name>
```

- ► <backupDir> is the migration snapshot directory that contains the backup configuration of the source deployment manager. It is `/tmp/migrate/#tempdir#` on z/OS. The #tempdir# parameter is the one you had defined in the WebSphere Process Server migration job BPZWMG3D for the deployment manager in "Edit and submit the migration job BPZWMG3D" on page 374.

- ► <cluster> is the cluster name that will be migrated.

The BPMMigrateCluster script should be executed from the target deployment manager `bin` directory.

Perform the following steps to migrate the cluster:

1. Log on to z/OS via **telnet** or **ssh**.

2. Change the working directory to the target deployment manager `bin` directory. On our z/OS system, it is `/was70config/l1cell/l1dmnode/DeploymentManager/bin`.

3. There is only one cluster in the source environment on z/OS, so we execute the BPMMigrateCluster script once:

   `./BPMMigrateCluster.sh /tmp/migrate/V7.00DMGR l1cl01 default`

4. The BPMMigrateCluster.sh generated log files are under `<backupDir>/logs`. The log file names are:

   - `BPMMigrateCluster.<Dmgr Name>.<Time Stamp>.log`

   - `BPMMigrateCluster.<Dmgr Name>.<Time Stamp>.trace`

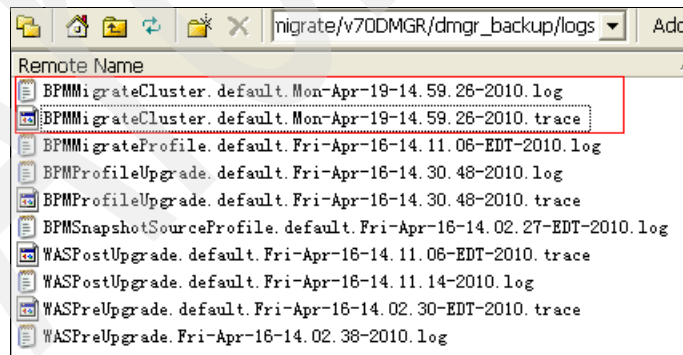   Examine the output to make sure that the cluster migration process completed successfully.

Figure 7-74   Generated log files for the BPMMigrateCluster.sh script

7.3.8 Synchronizing the nodes

> **STOP:** Back up the file system of the target WebSphere Process Server V7.0 installation. This backup is needed in case the **syncNode** command fails.
>
> If the synchronization procedure fails, you need restore the backup and redo the synchronization. Refer to the Technote found at the following address:
>
> `http://www.ibm.com/support/docview.wss?uid=swg21410474`
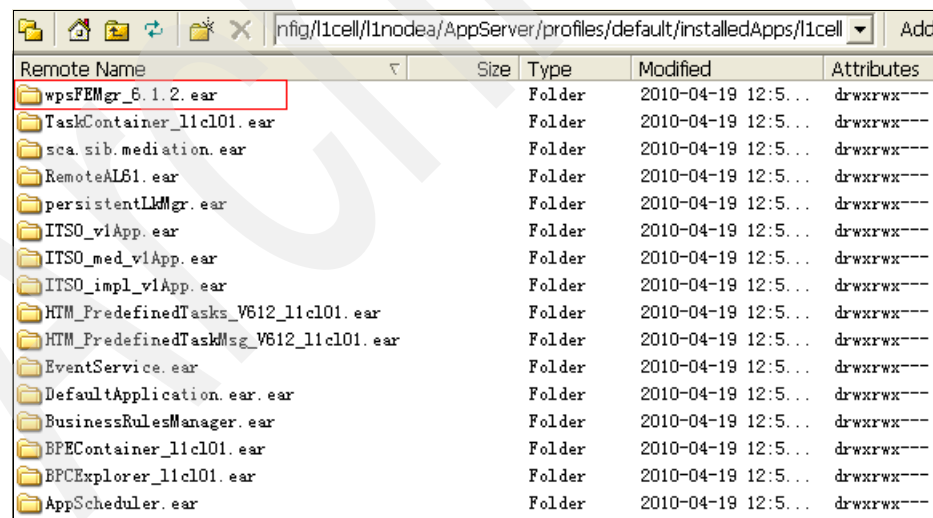
After cluster migration, all managed nodes need be synchronized with the running target deployment manager. This is done by executing the **syncNode** script from each managed node `bin` directory.

If, before running the synchronization, you check the installed applications under the `<V7.0_CUSTOM_PROFILE_ROOT>`/`installedApps/`<`CELL_NAME`> directory, you will see that some applications (Failed Event Manager, Remote AL and BPC Container, and so on) are still at Version 6.1.2, so this synchronization step is mandatory.

Figure 7-75 shows the installed applications in `/was70config/l1cell/l1nodea/AppServer/profiles/default/installedApps/l1cell` in our environment before synchronization.

Figure 7-75   Applications in the primary node before synchronization

For the TaskContainer and BPEContainer application, their version can be determined from MANIFEST.MF of the EAR file. Example 7-18 shows the MANIFEST.MF content of `TaskContainer_l1cl01.ear` before synchronization.

Example 7-18   MANIFEST.MF of TaskContainer_l1cl01.ear before synchronization

```
Manifest-Version: 1.0
Ant-Version: Apache Ant 1.6.5
Specification-Vendor: IBM Corp.
Implementation-Vendor: IBM Corp.
Created-By: 2.3 (IBM Corporation)
Implementation-Title: task.ear
Implementation-Version: 6.1.2.3 WBI612.BPCSRVR [o0924.02]
Specification-Title: task.ear
Specification-Version: 6.0
```

From the primary node `bin` directory, execute the syncNode script, as shown in Figure 7-76.


```
XIEZHIQ @ SC61:/was70config/llcell/llnodea/AppServer/bin>./syncNode.sh wtsc61.itso.ibm.com 9002
ADMU0116I: Tool information is being logged in file
          /was70config/llcell/llnodea/AppServer/profiles/default/logs/syncNode.log

*** SSL SIGNER EXCHANGE PROMPT ***
SSL signer from target host 9.12.4.32 is not found in trust store safkeyring:///WASKeyring.L1CELL.

Here is the signer information (verify the digest value matches what is displayed at the server):

Subject DN:    CN=wtsc61.itso.ibm.com, OU=L1CELL, O=IBM
Issuer DN:     CN=WAS CertAuth for Security Domain, OU=L1CELL
Serial number: 2
Expires:       Mon Dec 31 22:59:59 EST 2018
SHA-1 Digest:  2A:54:5A:90:AD:D0:3C:5D:F0:96:B3:8E:2C:18:67:FF:A4:00:2C:E4
MD5 Digest:    8B:33:14:63:5A:C7:B2:16:8F:D4:7F:5F:F8:F2:42:7D

Subject DN:    CN=WAS CertAuth for Security Domain, OU=L1CELL
Issuer DN:     CN=WAS CertAuth for Security Domain, OU=L1CELL
Serial number: 0
Expires:       Mon Dec 31 22:59:59 EST 2018
SHA-1 Digest:  2A:54:5A:90:AD:D0:3C:5D:F0:96:B3:8E:2C:18:67:FF:A4:00:2C:E4
MD5 Digest:    8B:33:14:63:5A:C7:B2:16:8F:D4:7F:5F:F8:F2:42:7D

Add signer to the trust store now? (y/n) y
Realm/Cell Name: <default>
Username: lladmin
Password:
 ADMU0401I: Begin syncNode operation for node llnodea with Deployment Manager
           wtsc61.itso.ibm.com: 9002
ADMU0016I: Synchronizing configuration between node and cell.
ADMU0402I: The configuration for node llnodea has been synchronized with
           Deployment Manager wtsc61.itso.ibm.com: 9002
```

Figure 7-76   Execute the syncNode script for the primary node

From the secondary node `bin` directory, execute the syncNode script, as shown in Figure 7-77.

```
XIEZHIQ @ SC61:/was70config/llcell/llnodeb/AppServer/bin>./syncNode.sh wtsc61.itso.ibm.com 9002
ADMU0116I: Tool information is being logged in file
          /was70config/llcell/llnodeb/AppServer/profiles/default/logs/syncNode.log

*** SSL SIGNER EXCHANGE PROMPT ***
SSL signer from target host 9.12.4.32 is not found in trust store safkeyring:///WASKeyring.L1CELL.

Here is the signer information (verify the digest value matches what is displayed at the server):

Subject DN:    CN=wtsc61.itso.ibm.com, OU=L1CELL, O=IBM
Issuer DN:     CN=WAS CertAuth for Security Domain, OU=L1CELL
Serial number: 2
Expires:       Mon Dec 31 22:59:59 EST 2018
SHA-1 Digest:  2A:54:5A:90:AD:D0:3C:5D:F0:96:B3:8E:2C:18:67:FF:A4:00:2C:E4
MD5 Digest:    8B:33:14:63:5A:C7:B2:16:8F:D4:7F:5F:F8:F2:42:7D

Subject DN:    CN=WAS CertAuth for Security Domain, OU=L1CELL
Issuer DN:     CN=WAS CertAuth for Security Domain, OU=L1CELL
Serial number: 0
Expires:       Mon Dec 31 22:59:59 EST 2018
SHA-1 Digest:  2A:54:5A:90:AD:D0:3C:5D:F0:96:B3:8E:2C:18:67:FF:A4:00:2C:E4
MD5 Digest:    8B:33:14:63:5A:C7:B2:16:8F:D4:7F:5F:F8:F2:42:7D

Add signer to the trust store now? (y/n) y
Realm/Cell Name: <default>
Username: lladmin
Password:
 ADMU0401I: Begin syncNode operation for node llnodeb with Deployment Manager
           wtsc61.itso.ibm.com: 9002
ADMU0016I: Synchronizing configuration between node and cell.
ADMU0402I: The configuration for node llnodeb has been synchronized with
           Deployment Manager wtsc61.itso.ibm.com: 9002
```

Figure 7-77   Execute the syncNode script for the secondary node

The syncNode.sh script generates a log file under *<profile_root>*/`logs` called `syncNode.log`. Examine the output to make sure that the syncNode process completed successfully.

Example 7-19 shows the output in
`/was70config/llcell/llnodea/AppServer/profiles/default/logs/syncNode.log`.

Example 7-19   syncNode.log of the primary node

```
************ Start Display Current Environment ************

...
[4/19/10 16:26:17:794 EDT] 00000001 AppBinaryProc I   BBOO0222I:
ADMA7021I: Distribution of application BusinessRulesManager completed
successfully.
```

```
[4/19/10 16:26:17:984 EDT] 00000001 AppBinaryProc I   BB000222I:
ADMA7021I: Distribution of application
HTM_PredefinedTasks_V7.000_l1cl01 completed successfully.
[4/19/10 16:26:17:993 EDT] 00000001 NodeSyncTask  I
com.ibm.ws.management.sync.NodeSyncTask doSync ADMS0003I: The
configuration synchronization completed successfully.
[4/19/10 16:26:17:995 EDT] 00000001 NodeSyncTask  A   BB000222I:
ADMS0003I: The configuration synchronization completed successfully.
[4/19/10 16:26:21:225 EDT] 00000000 AdminTool     A   BB000222I:
ADMU0402I: The configuration for node l1nodea has been synchronized
with Deployment Manager wtsc61.itso.ibm.com: 9002
```

After synchronization, all applications are at the Version 7.0 level. Figure 7-78 shows the installed applications on the primary node after synchronization

Figure 7-78   Applications in the primary node after synchronization

Recheck the **T**askContainer_l1cl01.ear version in MANIFEST.MF after synchronization (Example 7-20).

Example 7-20   MANIFEST.MF of TaskContainer_l1cl01.ear after synchronization

```
Manifest-Version: 1.0
DeployVersion: 6.2.0.0
Ant-Version: Apache Ant 1.6.5
Specification-Vendor: IBM Corp.
Implementation-Vendor: IBM Corp.
```

```
Created-By: 2.4 (IBM Corporation)
Implementation-Title: task.ear
Implementation-Version: 7.0.0.1 WBI70.BPCSRVR [of0950.17]
Specification-Title: task.ear
Specification-Version: 6.0
```

7.3.9 Upgrading the Business Process Choreographer database

In this section, we upgrade the Business Process Choreographer (BPC) database. The source environment uses the BPC database for storing the BPEL and human task related data. Before cluster members of the l1cl01 cluster are started, you need to migrate the BPC database.

This migration can be done manually or by using the Dbdesign generator and upgradeDB.sh scripts. In our example, we update it manually by performing the following steps:

1. Locate the directory that contains the migration upgrade scripts for the BPC database. These scripts are generated in database-specific directories within the dbscripts directory of the target deployment manager.

In this example, the BPC database version we used was DB2 z/OS V9, and the directory where the BPC upgrade scripts are located is `/was70config/l1cell/l1dmnode/wpssmpe/dbscripts/ProcessChoreographer/DB2zOSV9/` (Figure 7-79).

Remote Name	Size	Modified	Attributes
createDatabase.sql	1,212	2009-12-14 00:04:47	-rwxr-xr-x
createDatabase_Observer.sql	1,270	2009-12-14 00:06:17	-rwxr-xr-x
createFunctionsJava_Observer.sql	3,569	2009-12-14 00:00:19	-rwxr-xr-x
createFunctionsSql_Observer.sql	3,529	2009-12-13 23:58:43	-rwxr-xr-x
createSchema.sql	188,595	2009-12-13 23:56:47	-rwxr-xr-x
createSchema_Observer.sql	58,092	2009-12-13 23:51:26	-rwxr-xr-x
createTablespace.sql	33,317	2009-12-13 23:52:42	-rwxr-xr-x
createTablespace_Observer.sql	2,720	2009-12-13 23:45:40	-rwxr-xr-x
dropFunctions_Observer.sql	1,558	2009-12-13 23:47:58	-rwxr-xr-x
dropSchema.sql	8,263	2009-12-14 00:01:01	-rwxr-xr-x
dropSchema_Observer.sql	2,587	2009-12-14 00:00:25	-rwxr-xr-x
dropTablespace.sql	10,608	2009-12-13 23:56:00	-rwxr-xr-x
dropTablespace_Observer.sql	1,693	2009-12-13 23:50:07	-rwxr-xr-x
upgradeSchema602.sql	83,867	2009-12-13 23:55:30	-rwxr-xr-x
upgradeSchema602DB2zOSV7.sql	81,978	2009-12-13 23:46:59	-rwxr-xr-x
upgradeSchema610.sql	78,472	2009-12-14 00:06:28	-rwxr-xr-x
upgradeSchema610DB2zOSV7.sql	76,730	2009-12-14 00:01:13	-rwxr-xr-x
upgradeSchema612.sql	70,357	2009-12-14 00:05:47	-rwxr-xr-x
upgradeSchema612DB2zOSV7.sql	68,923	2009-12-13 23:56:33	-rwxr-xr-x
upgradeSchema620.sql	65,869	2009-12-13 23:50:14	-rwxr-xr-x
upgradeSchema620DB2zOSV7.sql	64,285	2009-12-13 23:53:48	-rwxr-xr-x
upgradeTablespace602.sql	12,532	2009-12-13 23:49:16	-rwxr-xr-x
upgradeTablespace602DB2zOSV7.sql	5,921	2009-12-13 23:44:31	-rwxr-xr-x
upgradeTablespace610.sql	11,283	2009-12-14 00:04:15	-rwxr-xr-x
upgradeTablespace610DB2zOSV7.sql	5,741	2009-12-14 00:07:13	-rwxr-xr-x
upgradeTablespace612.sql	9,889	2009-12-13 23:56:27	-rwxr-xr-x
upgradeTablespace612DB2zOSV7.sql	4,661	2009-12-13 23:58:26	-rwxr-xr-x
upgradeTablespace620.sql	6,194	2009-12-13 23:47:26	-rwxr-xr-x
upgradeTablespace620DB2zOSV7.sql	2,499	2009-12-14 00:07:46	-rwxr-xr-x

Figure 7-79   The SQL scripts for BPC database

2. In the directory, look for any SQL files that contain the name `upgrade` and a version number (of the source server) of `612`. We found two SQL files in this directory that we can use to upgrade the BPC database:

   – `upgradeSchema612.sql`

   – `upgradeTablespace612.sql`

3. Edit the values in the SQL files to suit your needs. Replace the following parameters of the BPC database according to the actual database configuration. Example 7-21 shows the parameters we used in our z/OS. All the parameters in @*@ have been replaced with the actual values of the BPC database configuration.

Example 7-21 Parameters of BPC database to be replaced

```
-- @DB_NAME@         = DB2 Database name           = L1CELLDB
-- @SCHEMA@          = DB2 SQLID (Schema Qualifier) = L1CELL
-- @STOGRP@          = DB2 Storage group name       = L1DBSTO
-- @BPTABLE4K@       = Buffer Pool of 4k Size       = BP1
-- @BPTABLE8K@       = Buffer Pool of 8k Size       = BP8K0
-- @BPINDEX@         = Buffer Pool Index            = BP2
-- @BPLOB4K@         = Buffer Pool Lobs             = BP3
```

4. Save the edited files. Because the DBUtility.sh script will be used to execute these SQL files and it uses ASCII input, you do *not* need to convert the SQL files from ASCII to EBCDIC.

5. Copy the two SQL files to your working directory, for example, /u/<username>/Migration/DB/, and assign the appropriate permissions.

6. Create the corresponding scripts to execute the SQL files. In these scripts, the SQL file is executed by running the **DBUtility.sh** command.

The command parameters for **DBUtility.sh createTable** are shown in
Figure 7-80.

```
"createTable" is the action, following args are needed:
    -DprofilePath=<profilePath>    The path of profile
    -DprofileName=<profileName>    The name of the profile
    -DdbDelayConfig=<boolean>      The Flag is to be false to create Tables
    -DdbType=<dbtype>              The database type
    -DdbName=<dbName>              The database name or alias name
    -DsqlScriptPath.default=<defautlSqlPath>
                                   The default sql script for creating table
                                   DBUtility will attempt to find sql script for each database type
                                   in this naming convention <defautlSqlPath>_<dbType>.sql.
                                   DBUtility will run <defautlSqlPath>,
                                   if <defautlSqlPath>_<dbType>.sql does not exist.
    -DsqlScriptName.default=<defautlSqlScriptName>
                                   The default sql script for creating table
                                   DBUtility will attempt to form a sql script path for each database
                                   in this naming convention <defautlSqlScriptName>_<dbType>.sql.
                                   DBUtility will run <defautlSqlScriptName>,
                                   if <defautlSqlScriptName>_<dbType>.sql does not exist.
    -DdbHostName=<dbHostName>      The host name or IP address for database server
    -DdbServerPort=<dbServerPort>  The JDBC port number for database server
    -DdbJDBCClasspath=<dbJDBCClasspath>
                                   The directory path which contains JDBC driver files
    -DdbUserId=<dbUserId>          The user id to access database
    -DdbPassword=<dbPassword>      The password to access the database
    -DdbInstance=<dbInstance>      The database instance name --only required for Informix
    -DdbSchemaName=<dbSchemaName>  The schema name
    -DdbConnectionLocation=<dbConnectionLocation>
                                   The database connection location --only required for zOS
    -DdbStorageGroup=<dbStorageGroup>
                                   The database storage group --only required for zOS
    -DdbJDBCProperties=<dbJDBCProperties>
                                   The directory containing DB2JccConfiguration.properties --only re
```

Figure 7-80   The parameters for DBUtility.sh createTable

The script shown in Example 7-22 was created to execute
upgradeTablespace612.sql against the BPC database on our z/OS system.

Example 7-22   Script to execute upgradeTablespace612.sql

```
./DBUtility.sh createTable
-DprofilePath=/was70config/l1cell/l1dmnode/DeploymentManager/profile
s/default -DprofileName=default -DdbDelayConfig=false
-DdbType=DB2UDBOS390_V9_1 -DdbName=DB9K
-DsqlScriptPath.default=/u/<username>/Migration/DB/upgradeTablespace
612.sql -DsqlScriptName.default=upgradeTablespace612.sql
-DdbHostName=wtsc61.itso.ibm.com -DdbServerPort=38340
-DdbJDBCClasspath=/usr/lpp/db2/db9k/db2910_jdbc/classes
-DdbUserId=peise1 -DdbPassword=IBM1q2w -DdbSchemaName=L1CELL
-DdbConnectionLocation=DB9K -DdbStorageGroup=L1DBSTO
-DdbJDBCProperties=/etc/db9k
```

```
>/u/<username>/Migration/DB/log/output.out
2>>/u/<username>/Migration/DB/log/error.out
```

For the script to execute upgradeSchema612.sql, modify the SQL file name with the -DsqlScriptPath.default and -DsqlScriptName.default parameters.

7. Convert the scripts from ASCII to EBCDIC. You can achieve this task by using code editing software (such as UltraEdit, Notepad++, and so on) or by the using the **iconv** command to convert the file to EBCDIC, as shown in Example 7-23.

Example 7-23   Using the iconv command

```
iconv -t IBM-1047 -f ISO8859-1 Script_upgradeSchema612_CommonDB.sh >
Script_upgradeSchema612_CommonDB_EBCDIC.sh
```

8. Put the scripts into the bin directory of the target deployment manager profile. (/was70config/l1cell/l1dmnode/DeploymentManager/bin in our environment). Assign the appropriate permissions to them.

9. Change the working directory in UNIS System Service to /was70config/l1cell/l1dmnode/DeploymentManager/bin. Execute the two scripts, one at a time.

10. Check the output of the SQL files in /u/<username>/Migration/DB/log/output.out and /u/<username>/Migration/DB/log/error.out. The output of upgradeSchema612.sql in our environment is shown in Example 7-24:.

Example 7-24   Output for executing upgradeSchema612.sql

```
BEGIN COPYRIGHT
...
execSQLScript:
     [echo] JDBCDriver: com.ibm.db2.jcc.DB2Driver
     [echo] DB_URL: jdbc:db2:DB9K
     [echo] dbUserId: peise1
     [echo] sqlScriptPath:
/u/peise1/Migration/DB/upgradeSchema612.sql
     [echo] JDBC_DRIVER_FILE_STATIC:
/etc/db9k;/usr/lpp/db2/db9k/db2910_jdbc/classes/db2jcc.jar;/usr/lpp/
db2/db9k/db2910_jdbc/classes/db2jcc_license_cu.jar;/usr/lpp/db2/db9k
/db2910_jdbc/classes/db2jcc_license_cisuz.jar
     [echo] common.executeComplexSQL: false
     [echo] delimiter: ;
     [echo] delimitertype: normal
     [echo] keepformat: false
     [echo] common.sqlonerror: continue
```

```
            [echo] UserId: peise1
            [echo] SysUserId:
            [echo] dbCommonUserId: ${dbCommonUserId}
             [sql] Executing file:
/u/peise1/Migration/DB/upgradeSchema612.sql
            [sql] 372 of 372 SQL statements executed successfully

BUILD SUCCESSFUL
Total time: 47 seconds
```

7.3.10 Migrating the Business Process Choreographer runtime data

After migrating a cluster that has BPC configured, you might need to perform a one-time data migration of the runtime data before you start the migrated server or any migrated cluster member. This step is applicable only if you are migrating from versions earlier than Version 6.2.x. Because we are migrating from WebSphere Process Server V6.1.2, we have to migrate the runtime data.

This task can be accomplished by running the migrateDB.py script from one of the cluster nodes' `bin` directory. In our example, we execute the migrateDB.py script in `/was70config/l1cell/l1nodea/AppServer/bin`. The command we use in our environment is:

```
wsadmin.sh -conntype NONE -profileName default -tracefile
migrateDB.py_trace -f
/<wps_install_dir>/ProcessChoreographer/admin/migrateDB.py -cluster
l1cl01 -dbSchema L1CELL -dbUser <dbuser> -dbPassword <dbpswd>
```

Examine the generated tracefile to make sure the BPC runtime data migration completed successfully. Example 7-25 shows the generated trace file in our environment.

Example 7-25 The generated tracefile for BPC data migration

```
[4/19/10 17:35:43:349 EDT] 00000001 TablespaceMig I   CWWBB0656I:
'Table 1/7 100.0%' completed.
[4/19/10 17:35:43:663 EDT] 00000006 TablespaceMig I   CWWBB0656I:
'Table 6/7 100.0%' completed.
[4/19/10 17:35:51:144 EDT] 00000000 TablespaceMig I   CWWBB0647I:
Tablespace migration successfully completed.
[4/19/10 17:35:51:180 EDT] 00000000 DataMigration I   CWWBB0651I: Data
migration finished successfully.
```

The migrateDB.py script migrates the data related to BPEL and human tasks instances running in the source Version 6.1.2 environment. Migrating runtime data allows these instances to be valid after the migration. Users can work on these instances in the target Version 7.0 environment after the migration.

> **Note:**
>
> ► Migration of runtime data should be run only once from one of the nodes. It should be run after migration and before you start any cluster members.
>
> ► The time required to complete this step depends on the database content. Refer to the Technote "Complementary data migration documentation". which can be found at the following address:
>
> http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg21327385

7.3.11 Start the migrated environment

After migrating the BPC runtime data, perform the following steps before starting the migrated nodes and application servers in the target environment:

1. Before starting the migrated primary node, the start JCL procedures in your JCL procedure library need to be updated for the primary node. Because the Version 7.0 start procedures have a different format than Version 6.x, the old Version 6.1.2 procedures need be replaced:

   a. Locate the BBOMCPY1 job in the PDS where the jobs that were used for creating the primary node were stored.

In our environment, we found the job in the WPSCFG.NODEAV7.0.CNTL PDS (Figure 7-81).

```
VIEW        WPSCFG.NODEAV7.CNTL(BBOMCPY1) - 01.00          Columns 00001 00072
Command ===> submit_____ Scroll ===> PAGE
****** ******************************* Top of Data ******************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001 //BBOMCPY1  JOB (999,POK),'WPS SETUP',CLASS=A,REGION=0M,
000002 //             MSGCLASS=H,NOTIFY=&SYSUID
000003 /*JOBPARM S=SC61
000004 //*
000005 //COPY1 EXEC  PGM=IEBCOPY
000006 //* Copy customized members to the installation proclib
000007 //SYSPRINT  DD SYSOUT=*
000008 //INPUT     DD DISP=SHR,
000009 //            DSN=WPSCFG.NODEAV7.CNTL
000010 //OUTPUT    DD DISP=SHR,DSN=SYS1.PROCLIB
000011 //SYSIN     DD *
000012  C INDD=INPUT,OUTDD=OUTPUT
000013  S M=((BBOPDMN3,L1DEMNA,R))
000014  S M=((BBOPASR2,L1ASRA,R))
000015  S M=((BBOPACR2,L1ACRA,R))
```

Figure 7-81   The BBOMCPY1 job for the primary node

b. Submit the BBOMCPY1 job (Figure 7-82). Because we use the same JCL start procedure names in Version 6.1.2 and Version 7.0.0, the BBOMCPY1 job will overwrite the existing JCL start procedures in your JCL procedure library.

```
VIEW        WPSCFG.NODEAV7.CNTL(BBOMCPY1) - 01.00            Columns 00001 00072
Command ===> submit                                           Scroll ===> PAGE
****** ***************************** Top of Data ***************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>          your edit profile using the command RECOVERY ON.
000001 //BBOMCPY1  JOB (999,POK),'WPS SETUP',CLASS=A,REGION=0M,
000002 //             MSGCLASS=H,NOTIFY=&SYSUID
000003 /*JOBPARM S=SC61
000004 //*
000005 //COPY1 EXEC  PGM=IEBCOPY
000006 //* Copy customized members to the installation proclib
000007 //SYSPRINT  DD SYSOUT=*
000008 //INPUT     DD DISP=SHR,
000009 //          DSN=WPSCFG.NODEAV7.CNTL
000010 //OUTPUT    DD DISP=SHR,DSN=SYS1.PROCLIB
000011 //SYSIN     DD *
000012  C INDD=INPUT,OUTDD=OUTPUT
000013  S M=((BBOPDMN3,L1DEMNA,R))
JOB BBOMCPY1(JOB24550) SUBMITTED
*** _
```

Figure 7-82   Submit the BBOMCPY1 job

c. Wait until the console shows that the BBOMCPY1 job has finished (Figure 7-83).

```
17.51.22 JOB24550 $HASP165 BBOMCPY1 ENDED AT WTSCPLX1
*** _
```

Figure 7-83   The finished BBOMCPY1 job

d. Check the BBOMCPY1 job status via SDSF in an TSO session (Figure 7-84).

```
IEB167I FOLLOWING MEMBER(S) COPIED FROM INPUT DATA SET REFERENCED BY INPUT
IEB155I L1AARA   HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB155I L1ACRA   HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB155I L1ADMSH  HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB155I L1ASRA   HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB155I L1DEMNA  HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB1098I 5 OF 5 MEMBERS COPIED FROM INPUT DATA SET REFERENCED BY INPUT
IEB144I THERE ARE 821 UNUSED TRACKS IN OUTPUT DATA SET REFERENCED BY OUTPUT
IEB149I THERE ARE 428 UNUSED DIRECTORY BLOCKS IN OUTPUT DIRECTORY
IEB147I END OF JOB - 0 WAS HIGHEST SEVERITY CODE
```

Figure 7-84 Check the BBOMCPY1 job status via SDSF

2. Before starting the migrated secondary node, the start JCL procedures in your JCL procedure library also need to be updated:

a. Locate the BBOMCPY1 job in PDS where the jobs that were used to create the secondary node were stored. In our environment, we found it in the WPSCFG.NODEBV7.0.CNTL PDS.

```
VIEW       WPSCFG.NODEBV7.CNTL(BBOMCPY1) - 01.00          Columns 00001 00072
Command ===> submit_____ Scroll ===> PAGE
****** ***************************** Top of Data ******************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>          your edit profile using the command RECOVERY ON.
000001 //BBOMCPY1  JOB (999,POK),'WPS SETUP',CLASS=A,REGION=0M,
000002 //           MSGCLASS=H,NOTIFY=&SYSUID
000003 /*JOBPARM S=SC61
000004 //*
000005 //COPY1 EXEC  PGM=IEBCOPY
000006 //* Copy customized members to the installation proclib
000007 //SYSPRINT  DD SYSOUT=*
000008 //INPUT     DD DISP=SHR,
000009 //          DSN=WPSCFG.NODEBV7.CNTL
000010 //OUTPUT    DD DISP=SHR,DSN=SYS1.PROCLIB
000011 //SYSIN     DD *
000012  C INDD=INPUT,OUTDD=OUTPUT
000013  S M=((BBOPDMN3,L1DEMNB,R))
000014  S M=((BBOPASR2,L1ASRB,R))
000015  S M=((BBOPACR2,L1ACRB,R))
```

Figure 7-85 The BBOMCPY1 job for the secondary node

b. Submit the BBOMCPY1 job in WPSCFG.NODEBV7.0.CNTL.

c. The console shows that the BBOMCPY1 job finished (Figure 7-86).

```
17.53.07 JOB24551 $HASP165 BBOMCPY1 ENDED AT WTSCPLX1
***  _
```

Figure 7-86   The finished BBOMCPY1 job

d. Check the BBOMCPY1 job status via SDSF in a TSO session (Figure 7-87).

```
IEB155I L1AARB   HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB155I L1ACRB   HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB155I L1ADMSH  HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB155I L1ASRB   HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB155I L1DEMNB  HAS BEEN SUCCESSFULLY COPIED AND IS A NEW NAME
IEB1098I 5 OF 5 MEMBERS COPIED FROM INPUT DATA SET REFERENCED BY INPUT
IEB144I THERE ARE 820 UNUSED TRACKS IN OUTPUT DATA SET REFERENCED BY OUTPUT
IEB149I THERE ARE 428 UNUSED DIRECTORY BLOCKS IN OUTPUT DIRECTORY
IEB147I END OF JOB - 0 WAS HIGHEST SEVERITY CODE
```

Figure 7-87   Check the BBOMCPY1 job status via SDSF

3. Start the primary and secondary nodes in the target environment.

4. Start the application servers.

5. Check for any errors in the server logs.

7.3.12 Apply the adapter fix for running Version 6.1.2 adapters on WebSphere Process Server V7.0

If your applications deployed on the source environment included the Version 6.1.x and Version 6.2.x adapters, you need to apply the mandatory adapter fix for running Version 6.1.x and Version 6.2.x adapters on WebSphere Process Server V7.0.

For more information about the mandatory adapter fix and the instructions for how to apply them in the target environment, refer to 5.3.3, "Adapter migration considerations" on page 146.

7.4 Post-migration verification

This section describes the steps for performing the post-migration verifications. We examine the target environment and verify if the migration process has successfully created the corresponding objects in the target environment.

You will, in the target environment:

1. Verify that the profiles are properly created.

2. Verify that the deployment environment is migrated.

3. Verify that the system and user applications are migrated.

4. Verify that the failed events generated in the source environment are migrated to the target environment.

5. Verify that the pending BPEL and human tasks instances are migrated to the target environment.

The items listed in this section were verified in our target environment on z/OS.

Verify the target software versions after migration
Log into the administrative console of the target environment, and you can see the target software versions after migration (Figure 7-88).

Figure 7-88   The target software versions after migration

Verify the log files
After starting the target environment, you should first check the `SystemOut.log` files for each server. On each machine, navigate to the `<target_profile_root>`/`logs`/`<Server_Name>` directory and check `SystemOut.log`. There should be not fatal errors and similar messages.

Check the messaging engine's status
Check the messaging engine's status to ensure that all the messaging engines are running. Perform the following steps:

1. Log in to the administrative console.

2. Navigate to **Service integration** → **Buses** and click one of the bus names (for example, BPC.l1cell.Bus).

3. Select **Topology** → **Messaging engines**.

4. The messaging engine should be in the started status (Figure 7-89).
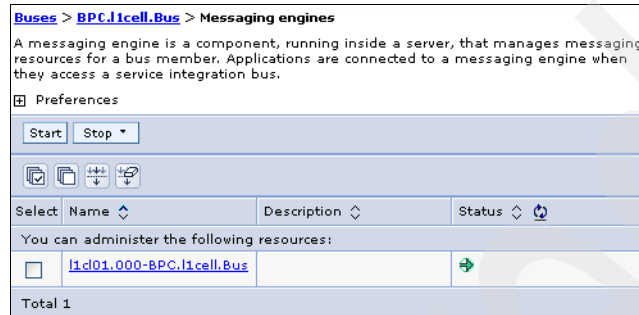

Figure 7-89   Messaging engine's status

5. Perform steps 1 on page 438 through 4 to check the messaging engine's status for all the other buses.

6. If any of the messaging engines are not in the started status, check `SystemOut.log` of the corresponding application server for the root cause.

Verify the cell topology after migration

Open the administrative console and see if the source environment is migrated to the target environment *as is*. The cell topology is the same as in the source environment, as shown in Figure 7-90.
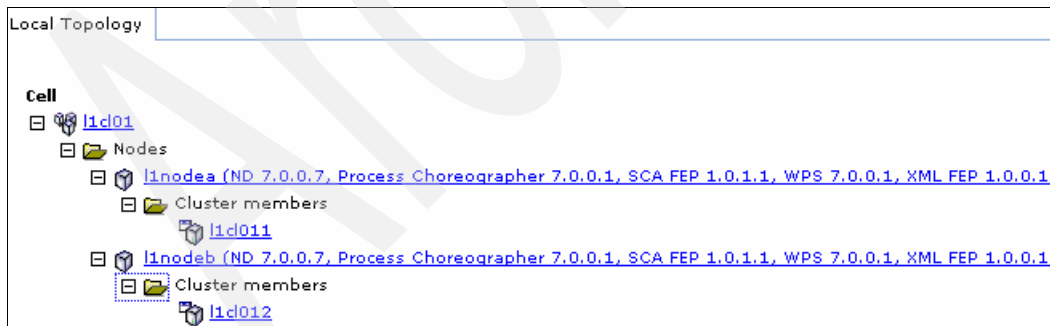

Figure 7-90   Cell topology

Verify the enterprise applications

You can check the status of the enterprise applications, including the system and sample applications, in the administrative console. If there are running instances of the old predefined human task applications, they are not uninstalled during migration, which means that after migration, both the new and old versions of the predefined human task applications are in your system.

> **Note:** If any applications are not in the started status, check the `SystemOut.log` file of the application server and the previous migration log file.

Figure 7-91   Verifying the enterprise applications

Verify the process instances

If you have long running BPEL instances left before migration. you can log in to Business Process Choreographer Explorer to check the legacy instances by performing the following steps:

1. Log in to the Business Process Choreographer Explorer at `http://<host>:<port>/bpc`.

2. Navigate to **Process Instances** → **Administrated By Me**. We can see all of the legacy BPEL instances (Figure 7-92).

Figure 7-92   Legacy BPEL instances

Verify Business Rule Manager

Please verify that the business rules can be viewed and edited in the Business Rule Manager of the target environment by performing the following steps:

1. Log in to the Business Process Choreographer Explorer at `http://<host>:<port>/br`.

2. Navigate to **Business Rule Groups**.

3. Expand one of the business rules (for example, **RatingService** →
performRiskRating → **performRiskRating**) and check the details
(Figure 7-93).

Figure 7-93   Business Rule Manager

Verify the failed events

If there are WebSphere Process Server failed events left before migration, check
those failed events from the administrative console to make sure no failed events
are lost during migration.

Perform the following steps:

1. Log in to the administrative console at `http://<host>:<port>/ibm/console`.

2. Navigate to **Integration Applications** → **Failed Event Manager**.

3. Check the recovery sub-system status and application server version
information at the right-top corner.

Figure 7-94   Recovery sub-system status

4. Click **Get all failed events**, and you should see all of the legacy failed events there. In the failed event list, we can see that more failed events (for example, the failed event from the BPC module) are shown. This is a new feature in WebSphere Process Server V7.0. The failed event manager also displays the failed event from the BPC application.

☐	355FD953380CC86A..	SCA	ITSO_impl_v1	(exportlink)ITSO..
☐	355FD953380CC86A..	SCA	ITSO_impl_v1	(exportlink)ITSO..
☐	355FD953380CC86A..	SCA	ITSO_impl_v1	(exportlink)ITSO..
☐	355FD953380CC86A..	SCA	ITSO_impl_v1	(exportlink)ITSO..
☐	355FD953380CC86A..	SCA	ITSO_impl_v1	(exportlink)ITSO..
☐	PI:90030127.de0..	BPC	ITSO_v1	NewLoanProcess_v1
☐	PI:90030127.de1..	BPC	ITSO_v1	NewLoanProcess_v1
☐	PI:90030127.de1..	BPC	ITSO_v1	NewLoanProcess_v1
☐	PI:90030127.de1..	BPC	ITSO_v1	NewLoanProcess_v1
☐	PI:90030127.de1..	BPC	ITSO_v1	NewLoanProcess_v1
☐	PI:90030127.dee..	BPC	ITSO_v1	NewLoanProcess_v1

Figure 7-95   Failed events after migration

5. Check the first one of these failed events (Figure 7-96).

Failed event details

Message ID

355FD953380CC86A_8000001

Session ID

9.12.4.32;ITSO_v1;;processLoan;1270755407130;1797548836

Interaction type

invokeAsync

Source module

ITSO_v1

Source component

NewLoanProcess_v1

Destination module

ITSO_impl_v1

Destination component

(exportlink)ITSO_GenerationExport

Destination method

operation1

Failure time

April 8, 2010 7:36 PM

Deployment Target of Failure

cluster=l1cl01

Exception text

```
com.ibm.websphere.sca.ServiceRuntimeException: caused by:
com.ibm.websphere.sca.ServiceRuntimeException: ServiceRuntimeException
com.ibm.wsspi.sca.async.bean.impl.ServiceSIBusMessageBean.processMessage(ServiceS
IBusMessageBean.java:326)
com.ibm.wsspi.sca.async.bean.impl.ServiceSIBusMessageBean.access$000(ServiceSIBu
sMessageBean.java:52)
com.ibm.wsspi.sca.async.bean.impl.ServiceSIBusMessageBean$1.onMessage(ServiceSIB
usMessageBean.java:76)
com.ibm.wbiserver.manualrecovery.ejb.RecoveryMDBHandler.processMessage(RecoveryM
DBHandler.java:126)
com.ibm.wbiserver.manualrecovery.ejb.RecoveryMDBHandler.onMessage(RecoveryMDBHa
```

Figure 7-96   The first failed event

6. Check the business data of the first failed event (Figure 7-97).

Figure 7-97   The business data of the first failed event

The content and business data of this failed event remain the same after the migration.

7.5 Troubleshooting

In this section, we describe the issues we encountered during our migration procedure.

The zWPSConfig.sh script failed with a RC=2048

The zWPSConfig.sh script fails and produced the RC=2048 error.

Symptom

When you run zWPSConfig.sh for the deployment manager when adding WebSphere Process Server to the deployment manager in Version 7.0, zWPSConfig.sh failed with a RC=2048 error.

In the log file at
`/was70config/l1cell/l1dmnode/DeploymentManager/logs/manageprofiles/default_create.log`, there is no clear cause, but in the `../manageprofiles/default` directory, `first.ant.log` showed a `java.langOutOfMemoryError` error.

Root cause

Both these problems occurred because the .profile of the user submitting the job contained `_BPX_SHAREAS=YES`. Refer to the following Technote for more information:

`http://www.ibm.com/support/docview.wss&uid=swg21377885`

Solution

Make sure `/etc/profile` has `_BPX_SHAREAS=NO` set. Make sure that the .profile of the user running the job has `_BPX_SHAREAS=NO` set, or comment out `_BPX_SHAREAS=YES.UnsatisfiedLinkError` for the starting node.

UnsatisfiedLinkError error when starting a node

There is an `UnsatisfiedLinkError` error when starting a node.

Symptom

When starting nodes on z/OS, a SqlException exception with a `java.lang.UnsatisfiedLinkError` is thrown out:

```
java.sql.SQLException: [jcc][10389][12245][3.58.90] Failure in loading
native library db2jcct2zos_64, java.lang.UnsatisfiedLinkError:
/pp/db2v9/D100210/db2910_jdbc/lib/libdb2jcct2zos_64.so (EDC5205S DLL
module not found. (errno2=0xC40B0025)):  ERRORCODE=-4472,
SQLSTATE=nullDSRA0010E: SQL State = null, Error Code = -4,472
```

Root cause

The current syntax for PATH and LIBPATH does not allow you to add MVS™ data sets to these variable settings.

Solution

If you are familiar with running a program in a UNIX shell, the kernel looks for the program you want to run in the list of directories defined to your PATH or LIBPATH environment variable settings. In z/OS UNIX System Services, this same concept applies for programs that reside in the z/OS UNIX System Services file system. However, there are some special things that we have to do to access products that ship their programs (load modules) in MVS data sets, such as DB2.

The order of search for MVS load modules is STEPLIB/JOBLIB, LPA list, and then LNKLST. STEPLIB/JOBLIB are searches done at the TSO user or batch job level, while LPA and LNKLST are searches done at the system level.

DB2 ships some of its programs and executables in the z/OS UNIX System Services file system and some others in MVS data sets. The current syntax for PATH and LIBPATH does not allow you to add MVS data sets to these variable settings.

z/OS UNIX System Services has a special file attribute called an external link that allows a file to link to an object outside of the z/OS UNIX System Services file system. In this case, it allows access to MVS load modules stored in an MVS data set.

For example, if we display one of the DB2 programs in the z/OS UNIX System Services file system, we see that the external link bit is on and the contents of the link points to a member of a MVS data set called DSNAQJL2 (Example 7-26).

Example 7-26   External link setting in the symbolic link attributes

```
]Symbolic Link Attributes

 Pathname : /pp/db2v9/D100210/db2910_jdbc/lib/libdb2jcct2zos.so
 External link  . . : 1
 File size  . . . . ...: 8
 File owner . . . . .: ROOT(0)
 Group owner  . . .: SYS1(0)
 Last modified  . . .: 2007-03-21 15:06:10
 Last changed . . . : 2007-03-21 15:06:10
 Last accessed  . . : 2010-02-19 12:48:43
 Created  . . . . . : 2007-03-21 15:06:10
 Link count . . . . : 1
 Device number  . . : D7
 Inode number . . . : 4
]Symbolic Link Attributes

 Pathname : /pp/db2v9/D100210/db2910_jdbc/lib/libdb2jcct2zos.so
 External link  . . : 1
 File size  . . . . ...: 8
 File owner . . . . .: ROOT(0)
 Group owner  . . .: SYS1(0)
 Last modified  . . .: 2007-03-21 15:06:10
 Last changed . . . : 2007-03-21 15:06:10
 Last accessed  . . : 2010-02-19 12:48:43
 Created  . . . . . : 2007-03-21 15:06:10
 Link count . . . . : 1
 Device number  . . : D7
 Inode number . . . : 4
Seclabel . . . . . :
 Symbolic link contents:
                                                              More:
    DSNAQJL2
```

DSNAQJL2 happens to be a MVS load module that resides in the DB9K9.SDSNLOD2 data set. The following error says that WebSphere Process Server tried to execute libdb2jcct2zos.so (external link to DSNAQJL2) and could not find it:

```
com.ibm.db2.jcc.am.SqlException: [jcc][10389][12245][3.58.90] Failure
in loading native library db2jcct2zos, java.lang.UnsatisfiedLinkError:
```

```
/pp/db2v9/D100210/db2910_jdbc/lib/libdb2jcct2zos.so (EDC5205S DLL
module not found. (errno2=0xC40B0025)): ERRORCODE=-4472, SQLSTATE=null
```

The fix is to add the following STEPLIBs to all the WebSphere Process Server
procedures that point to the DB2 libraries:

```
//STEPLIB  DD DISP=SHR,DSN=DB9K9.SDSNEXIT
//         DD DISP=SHR,DSN=DB9K9.SDSNLOAD
//         DD DISP=SHR,DSN=DB9K9.SDSNLOD2
```

In our z/OS environment, we performed the following steps:

> **Note:** L1 is the CELL description. If you have any other cell names, change L1
> to your cell name.

1. Open and browse to SYS1.PROCLIB.
2. For the deployment manager:
   a. Stop your environment completely.
   b. Search for DMGR procs, such as L1DCR and L1DSR.
   c. Add the STEPLIB to the procedure. for example, for
      SYS1.PROCLIB(L1DCR):

   ```
   //STEPLIB  DD DISP=SHR,DSN=DB9K9.SDSNEXIT
   //         DD DISP=SHR,DSN=DB9K9.SDSNLOAD
   //         DD DISP=SHR,DSN=DB9K9.SDSNLOD2
   i.e. for SYS1.PROCLIB(L1DSR):
   //STEPLIB  DD DISP=SHR,DSN=DB9K9.SDSNEXIT
   //         DD DISP=SHR,DSN=DB9K9.SDSNLOAD
   //         DD DISP=SHR,DSN=DB9K9.SDSNLOD2
   ```

   d. Save the procs for your DMGR.
3. For the managed node:
   a. Search for the node's procedures, for example, for NodeA, L1ACRA,
      L1ASRA, and L1AARA.
   b. Add the STEPLIB to the procedure. For example, add the following lines to
      SYS1.PROCLIB(L1ACRA):

   ```
   //STEPLIB  DD DISP=SHR,DSN=DB9K9.SDSNEXIT
   //         DD DISP=SHR,DSN=DB9K9.SDSNLOAD
   //         DD DISP=SHR,DSN=DB9K9.SDSNLOD2
   i.e. for SYS1.PROCLIB(L1ASRA):
   //STEPLIB  DD DISP=SHR,DSN=DB9K9.SDSNEXIT
   //         DD DISP=SHR,DSN=DB9K9.SDSNLOAD
   //         DD DISP=SHR,DSN=DB9K9.SDSNLOD2
   ```

```
i.e. for SYS1.PROCLIB(L1AARA):
//STEPLIB  DD DISP=SHR,DSN=DB9K9.SDSNEXIT
//         DD DISP=SHR,DSN=DB9K9.SDSNLOAD
//         DD DISP=SHR,DSN=DB9K9.SDSNLOD2
```

Failed to initialize cursor error when starting server

There was a failed to initialize cursor error when the server started.

Symptom

After migration, you see the following exception thrown when starting the
application servers. This can occur if you have used JDBC adapters in your
source environment:

```
BB000220E: CNTR0020E: EJB threw an unexpected (non-declared) exception
during invocation of method
"transactionNotSupportedActivitySessionNotSupported" on bean
"BeanId(ITSO_med_v1App#ITSO_med_v1EJB.jar#Module, null)". Exception
data: com.ibm.websphere.sca.ServiceRuntimeException: DataBinding
Exception thrown in J2CMethodBindingImpl.invoke()
commonj.connector.runtime.DataBindingException: Failed to initialize
cursor at
com.ibm.ws.sca.binding.j2c.J2CMethodBindingImpl.invoke(J2CMethodBinding
Impl.java:1447)
```

Root cause

Your applications deployed on the source environment included the Version 6.1.x
or Version 6.2.x adapters.

Solution

Apply the mandatory adapter fix for running Version 6.1.x and Version 6.2.x
adapters on WebSphere Process Server V7.0 to make them work in the target
Version 7.0 environment. For the instructions about how to apply them in the
target environment, refer to 5.3.3, "Adapter migration considerations" on
page 146.

Part 3

Appendixes

In this part, we provide supplemental information related to the migration examples.

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A

Migration checklist

This appendix contains a sample migration check list. It reflects the planning process used before performing the migration in Chapter 6, "Migrating BPM V6.1.2 to WebSphere Dynamic Process Edition V7.0" on page 195. The check lists here are similar to those found in 1.6, "Migration questionnaire" on page 21. They have been modified to contain only the questions relevant to the migration scenario.

Migration check list for a distributed system

These check lists (Table A-1 through Table A-11 on page 463) were created in preparation for the sample migration in Chapter 6, "Migrating BPM V6.1.2 to WebSphere Dynamic Process Edition V7.0" on page 195.

Table A-1   Migration goals

Migration goal questions	Action
Do you want to use the features or functions provided in Version 7.0 of the product? What are the features you want to use?	No. Currently, no new features are planned. Only new applications will be developed and deployed using Version 7.0. We will prepare WebSphere Integration Developer V7.0 and import all the required applications for future updates.
Do you want to be as up-to-date as possible with the latest of Business Process Management product versions and fixes?	Yes. We plan to collect the latest Fix Packs required for Version 7.0 and any critical fixes.
Are you migrating due to a current problem with any of the products? If so, what problem and what product?	No. We do not have any current BPM issues.
What are the other reasons for migrating?	To be able to create new business applications that take advantage of new features in the product.

Table A-2   Migration experience

Migration experience questions	Action
Is this your first migration project for your team?	No. We have results from the test team to compare. We also have leading practices available to us (documented throughout Chapter 6, "Migrating BPM V6.1.2 to WebSphere Dynamic Process Edition V7.0" on page 195).
What WebSphere products have you migrated before?	All WebSphere BPM products.
What difficulties did you experience last time? What mitigation strategies are planned for this migration project?	None.
What leading practices from last time will you want to reuse in this migration project?	We have documented best practices from the migration discussed in Chapter 6, "Migrating BPM V6.1.2 to WebSphere Dynamic Process Edition V7.0" on page 195. In particular, we plan to pay special attention to our readiness to roll back any changes before, during, or after migration.
Who are the people with experience with WebSphere products, topology, customer applications, security strategy, and migration experience?	WebSphere BPM subject matter experts with a wide range of experience in migration (BPM SMEs). WebSphere BPM test team members. Development teams.

Table A-3   Migration time frame

Migration time frame related questions	Action
What is the target date for beginning the migration project?	March 29th, 2010.
When should the migration project be completed?	April 23rd. It is a simple migration.
Do we have a go live date, dictated by the customer's commitment to their customers?	No.
What is the maximum downtime that is allowed for the migration?	Downtime is not an issue. There is a planning downtime of 2 days.
Will the DBAs and security administrators and application experts be available during the downtime period?	Yes.

Table A-4   What to migrate

Questions about what to migrate	Action
Runtime migration	
Do you have applications that can be migrated *as is*?	Yes. A list of existing applications has been documented and the applications have been evaluated to ensure that they will continue to work *as is* in the new environment.
Do you have the current and target environment on the same hardware?	Yes. The same hardware will be used and the new Version 7.0 products have been installed.
Do you have to migrate a deployment environment, including deployed applications?	Yes.
Have you verified that the operating system used, database used, and their release levels are supported by both the current and target environment?	Yes. Minor updates have been identified and installed.
Conclusion: This will be an ideal case for runtime migration.	
Applications to be migrated	
Do you have applications that can be migrated *as is*?	Yes.
Do you have long running business processes?	Yes.
Do you have human tasks?	Yes.
How many applications are used in the system?	2.
How many applications are business critical?	2.
How many applications can be deprecated?	None.
How many applications will have to be updated to use the new features of the product?	None.
How many WebSphere Business Monitor models are deployed?	1.
How many WebSphere Business Services Fabric associate applications are deployed?	None.
Source migration	
Do you need to migrate the application source?	No.
Are these user applications included in the production critical time line?	Not applicable.

Questions about what to migrate	Action
Do you have deprecated features? The list is available at the following address: `http://publib.boulder.ibm.com/infocenter/dmnd help/V7.0r0mx/topic/com.ibm.websphere.wps.doc /doc/gmig_deprecationlist.html`	Not applicable.

Table A-5   System maintenance

System maintenance questions	Action
Is the system maintained on a regular schedule?	No.
What is the schedule?	Not applicable.
How is the system shutdown? What is the procedure and in what order are the components shut down?	We shut down the components down in the following sequence: 1. Dashboard clusters. 2. Application clusters. 3. Support clusters. 4. Message engine clusters. 5. Node agents. 6. Deployment manager.
How is the system restarted? What is the procedure and in what order are the components restarted?	We start the components in the following sequence: 1. Verify that the database is available 2. Start the deployment manager. Verify that start by checking `SystemOut.log`. 3. Start the node agents. Verify. 4. Start the message engine cluster. Verify. 5. Start the support cluster. Verify. 6. Start the applications cluster. Verify. 7. Start the dashboard clusters.
Will the DBA be available during this scheduled maintenance? Do we need any special security clearance to execute the database scripts?	Yes, and no security clearance is required.
Will the security administrator be available during this maintenance window?	Yes.
Will the network administrator be available and can the ports be opened during this period?	Yes.

Table A-6   Resources

Resource question	Identified resource	Resource availability
Who will be the dedicated resource for the migration project?	Migration project manager	BPM SME team.
Do you have reusable assets from previous migration efforts?	Automated migration test bucket	Yes.
Who are the dedicated resources for the:	Migration method	BPM SME team. (Available)
	Migration testing	BPM SME team. (Available)
	Environment creation	BPM SME team (Available)
	Applications	BPM SME team. (Available)
	Profiles	BPM SME team. (Available)
	Database	BPM SME team. (Available)
	Operating systems	BPM SME team. (Available)
	Network and fire wall	BPM SME team. (Available)
	Customer software process	BPM SME team. (Available)
Name of the migration expert or consultant		BPM SME team. (Available)
Hardware resource. (Verify that there is adequate hardware.)	Cell name	WDPECell01.
	System type	All are Windows systems
	Memory	See "Hardware requirements" on page 219.
	Operating system	Windows 2003 Standard Edition Service Pack 2.
	Disk space	See "Disk space requirements" on page 221.
	Host names	See Table 6-3 on page 200.
	Remote access capability	Yes.
Software licenses.	For IBM products and others	Arranged.

Table A-7   Product information

Product	Current version	Target version
WebSphere Dynamic Process Edition server	Package not installed	Version 7.0
WebSphere Process Server	Version 6.1.2.3	Version 7.0
Associated (Process Server) WebSphere Application Server	Version 6.1.0.23	Version 7.0.0.0.7 + Feature Pack for XML 1.0
WebSphere Integration Developer	Version 6.1.2	Version 7.0
WebSphere Business Modeler	Version 6.1.2	Version 7.0
WebSphere Business Monitor	Version 6.1.2.5	Version 7.0
Associated (Monitor) WebSphere Application Server	Version 6.1.0.17	Version 7.0.0.0.7 + Feature Pack for XML 1.0
WebSphere Enterprise Service Bus	Installed as part of WebSphere Process Server	Installed as part of WebSphere Process Server
Business Space	Version 6.1.2	7
Database	DB2 V9.5	DB2 V9.5

Table A-8   Product maintenance

Product	Fix Pack information
WebSphere Dynamic Process Edition server	7.0.0.0. The Fix Pack was not available when we started the migration.
WebSphere Process Server	7.0.0.0. The Fix Pack was not available when we started the migration.
WebSphere Application Server	Version 7.0.0.0.7
WebSphere Integration Developer	Version 7.0.0.0.0
WebSphere Business Modeler	Version 7.0.0.0.0
WebSphere Business Fabric	Version 7.0.0.0.0
WebSphere Business Monitor	Version 7.0.0.0.0
WebSphere Enterprise Service Bus	Version 7.0.0.0.0
Business Space	There is no separate interim fix or Fix Pack. It will be included in the base component.

Table A-9   System requirements

Software type	BPM product	Detail	Current version	Target version
Database	WebSphere Process Server	Common DB (WPRCSDB), BPC tables (BPEDB), Message Engine DB (MEDB), and Common Event Infrastructure tables (EVENT)	DB2 V9.5	DB2 V9.5
	WebSphere Business Monitor	WebSphere Business Monitor database	DB2 V9.5	DB2 V9.5
Operating system	Server environment	BPM runtime nodes	Windows 2003 Server Standard Edition with Service Pack 2	Windows 2003 Server Standard Edition with Service Pack 2
	Tooling Environment	WebSphere Integration Developer	Varies; installed on the developer workstations	Refer to the following address: http://www-01.ibm.com/software/integration/wid/sysreqs/
	Database Node	IBM DB2	Windows 2003 Server Standard Edition with Service Pack 2	Windows 2003 Server Standard Edition with Service Pack 2

Table A-10   Workload characteristics

Category	Characteristic	Description
Functionality	Business Process Execution Language (BPEL).	Yes.
	Number of long running processes.	1.
	BPEL micro flows.	No
	Human tasks.	2
	Business State machines.	No.
	SCA modules.	Yes, 3.
	Maps.	Yes.
	Mediations.	Yes.
	Business rules.	Yes.
	Common Event Infrastructure used for WebSphere Business Monitor.	Yes.
	Common Event Infrastructure used for Business Process Choreographer Observer function.	Yes.
	Other Common Event Infrastructure usage.	No.
	Web Services.	Yes
	Adapters.	IBM WebSphere Adapter for JDBC V6.1.0.4.
	Other functions used.	No.
Interaction styles	Web services: JMS.	No.
	Web services SCA.	Yes.
	Interactions: Synchronous?	Yes.
	Interactions: Asynchronous?	Yes.
Dependencies and sharing	Dependencies among deployed module?	No.
	Do you use a shared library?	No.

Category	Characteristic	Description
Workload volume	Number of new process instances started per second, minute, or day.	N/A.
	Duration of average long running process instance.	1 week.
	Number of users supported by the system.	2.
	Number of transactions per second, minute, or day.	Limited.
	Number of monitor models.	1.
	Number of KPIs.	10.
	Number of measures.	5.
	Number of counters.	1.
	Number of cubes.	1.
	Amount of historical data.	Limited.
	Usage of REST service.	Yes.
	Dashboard usage.	Yes.
	Other.	No.
Quality of service (QOS)	Quality of service considerations.	None.
Current Performance tuning settings	WebSphere Application Server. WebSphere Process Server. WebSphere Enterprise Server Bus. WebSphere Business Monitor. WebSphere Business Fabric. Other products.	Referred to the performance team for handling. They will ensure that the target environment has compatible settings.

Table A-11   Topology

Topology questions	Detail
Profile ► What type of topology is used? ► What are the profiles to be migrated? ► What are the host names of each system in the topology? ► What is the type of hardware used for each node? ► Where are the backups for the current profiles? ► Where are the backups for database backup?	See 6.1.1, "Source environment overview" on page 196 for details about the topology to be migrated. See 6.1.4, "Node and host names" on page 200 for host, node, and profile names. The IT staff will evaluate the hardware on each system to determine if it meets the requirements. Backups for profiles and product databases are taken on a nightly basis and stored on a server external to the topology. Additional backups will be taken at each stage of the migration.
Cluster ► Do you have a WebSphere Process Server Support cluster? (name and nodes for cluster members) ► Do you have a WebSphere Process Server Message Engine cluster? (name and nodes for cluster members) ► Do you have WebSphere Process Server Application clusters? (name and nodes for cluster members) ► Do you have a Monitor Support cluster? (name and nodes for cluster members) ► Do you have a Monitor Message Engine cluster? (name and nodes for cluster members) ► Do you have Monitor Application clusters? (name and nodes for cluster members) ► Do you have Monitor Web clusters? (name and nodes for cluster members)	See 6.1.1, "Source environment overview" on page 196.
Security ► What security strategy is used?	Refer to your security department for handling.

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

For information about ordering these publications, see "How to get Redbooks" on page 469. Note that some of the documents referenced here may be available in softcopy only.

► *IBM WebSphere Business Process Management V6.1 Performance Tuning*, REDP-4431

► *WebSphere Business Process Management 6.2.0 Performance Tuning*, REDP-4551

► *WebSphere Business Process Management V6.1.2 Production Topologies*, SG24-7665

► *WebSphere Business Process Management V7 Production Topologies*, SG24-7854

► *WebSphere Business Process Management and WebSphere Enterprise Service Bus V7 Performance Tuning*, REDP-4664

► *z/OS: WebSphere Business Process Management V7 Production Topologies*, SG24-7831

Online resources

These Web sites are also relevant as further information sources:

► Business Process Management Samples & Tutorials Version 7.0:

http://publib.boulder.ibm.com/bpcsamp/index.html

► Dojo Toolkit:

http://www.dojotoolkit.org/

► IBM Fix Central:

http://www.ibm.com/support/fixcentral/

- IBM Installation Manager Support Portal:

  http://www-947.ibm.com/support/entry/portal/Overview/Software/Ration al/IBM_Installation_Manager

- IBM WebSphere Business Process Management Version 6.0 Information Center:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/v6rxmx/index.jsp

- IBM WebSphere Business Process Management Version 6.1 Information Center:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r1mx/index.jsp

- IBM WebSphere Business Process Management Version 6.2 Information Center:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/v6r2mx/index.jsp

- IBM WebSphere Business Process Management Version 7.0 Information Center:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/index.jsp

WebSphere Dynamic Process Edition

- WebSphere Dynamic Process Edition Information Center:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com .ibm.wdpe.doc/Welcome/ic-homepage.html

- WebSphere Dynamic Process Edition system requirements:

  http://www-01.ibm.com/software/integration/wdpe/requirements/

WebSphere Process Server

- Complementary data migration documentation:

  http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg21327385

- Fixes for WebSphere Process Server:

  http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg27006649

- Interim fixes for installing WebSphere Process Server V7.0.0.0.0:

  http://www-01.ibm.com/support/docview.wss?uid=swg21414253

- java.lang.OutOfMemoryError: PermGen space issues might occur when you use installation scripts:

  http://www-01.ibm.com/support/docview.wss?uid=swg21410474

- Troubleshooting problems with the BBOWWPFC job:

  http://www-01.ibm.com/support/docview.wss?uid=swg21377885

- ► WebSphere Process Server Information Center for Multiplatforms:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
  .ibm.websphere.wps.doc/welcome_wps.html

- ► WebSphere Process Server Information Center for z/OS:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/index.jsp
  ?topic=/com.ibm.websphere.wps.z.doc/welcome_wpsz.html

- ► WebSphere Process Server migration planning worksheet:

  http://www-01.ibm.com/support/docview.wss?rs=2307&uid=swg27015595

- ► WebSphere Process Server system requirements:

  http://www-01.ibm.com/support/docview.wss?uid=swg27006205

WebSphere Integration Developer

- ► WebSphere Integration Developer system requirements:

  http://www-01.ibm.com/support/docview.wss?rs=2308&uid=swg27006409

WebSphere Business Modeler

- ► WebSphere Business Modeler Basic V7.0 Information Center:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
  .ibm.btools.modeler.basic.main.doc/welcome/dochome_bas.html

- ► WebSphere Business Modeler Advanced V7.0 Information Center:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
  .ibm.btools.modeler.advanced.main.doc/welcome/dochome_adv.html

- ► WebSphere Business Modeler system requirements:

  http://www-01.ibm.com/support/docview.wss?rs=2025&uid=swg27008331

WebSphere Business Services Fabric

- ► Fixes for WebSphere Business Services Fabric:

  http://www-01.ibm.com/support/docview.wss?uid=swg27008650

- ► WebSphere Business Services Fabric Information Center:

  http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
  .ibm.ws.fabric.icmaster.doc/ic-homepage.html

- ► WebSphere Business Services Fabric system requirements:

  http://www-01.ibm.com/software/integration/wbsf/sysreqs/

WebSphere Business Monitor

► Fixes for WebSphere Business Monitor:

http://www-01.ibm.com/support/docview.wss?uid=swg27010921

► WebSphere Business Monitor Information Center:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.btools.help.monitor.doc/home/home.html

► WebSphere Business Monitor system requirements (all versions):

http://www-01.ibm.com/support/docview.wss?rs=802&context=SSSRR3&uid=
swg27008414

► WebSphere Business Monitor V7.0 system requirements:

http://www-01.ibm.com/support/docview.wss?rs=802&context=SSSRR3&uid=
swg27016838

WebSphere Compass Server

► WebSphere Compass Server Information Center:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.btools.help.modeler.collab.publish.doc/welcome/home.html

► WebSphere Compass Server system requirements:

http://www-01.ibm.com/support/docview.wss?rs=2331&uid=swg27008946

WebSphere Enterprise Service Bus

► Fixes for WebSphere Enterprise Service Bus:

http://www-01.ibm.com/support/docview.wss?uid=swg27007485

► WebSphere Enterprise Service Bus Information Center:

http://publib.boulder.ibm.com/infocenter/dmndhelp/V7.0r0mx/topic/com
.ibm.websphere.wesb.doc/info/welcome.html

► WebSphere Enterprise Service Bus system requirements (all versions):

http://www-01.ibm.com/support/docview.wss?uid=swg27006912

WebSphere Adapters

► Compatibility Matrix: WebSphere Business Integration Adapters and
WebSphere Adapters (JCA):

http://www-01.ibm.com/support/docview.wss?rs=0&q1=compatibility+matr
ix:&q2=compatibility+matrix+adapters&q3=compatibility+matrix:+Websph
ere+Business+Integration+Adapters+and+WebSphere+Adapters&uid=swg2125
2626&loc=en_US&cs=utf-8&cc=us&lang=en

- Managing WebSphere Adapters more effectively through wsadmin in WebSphere Process Server:

  http://ltsbwass001.sby.ibm.com/cms/developerworks/websphere/library/techarticles/1001_yu/1001_yu.html

- WebSphere Adapters product documentation links:

  http://www-01.ibm.com/software/integration/wbiadapters/library/infocenter/index.html#wsa70

- WebSphere Adapters V6.1 fix list for WebSphere Integration Developer V6.1.2:

  http://www-01.ibm.com/support/docview.wss?uid=swg27017302

WebSphere Portal Server
- WebSphere Portal Server system requirements:

  http://www-01.ibm.com/support/docview.wss?uid=swg27007791

WebSphere Application Server
- Service Integration Bus Explorer:

  http://www.alphaworks.ibm.com/tech/sibexplorer/download

- WebSphere Application Server V7.0 Information Center:

  http://publib.boulder.ibm.com/infocenter/wasinfo/V7.0r0/index.jsp

- WebSphere Application Server system requirements:

  http://www-01.ibm.com/support/docview.wss?rs=180&uid=swg27006921

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► IBM WebSphere Process Server
► IBM WebSphere Enterprise Service Bus
► IBM WebSphere Business Modeler
► IBM WebSphere Business Monitor
► IBM WebSphere Business Services Fabric
► IBM WebSphere Adapters

This book includes planning information and leading practices for the migration of these products. It provides information about the steps required to perform the migration, and includes two scenarios that walk you through example migrations on distributed and IBM z/OS platforms.