IBM Product Connectivity Scenarios information center
Version 1 Release 0

Migrating from Version 6 to Version 8.5 of WebSphere Application Server and Version 7.5 of WebSphere MQ

IBM

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Chapter 1. Scenario: Migrating from Version 6 to Version 8.5 of WebSphere Application Server and Version 7.5 of WebSphere MQ

Starting with an existing WebSphere® Application Server and WebSphere MQ Version 6 installation, this scenario leads you through the key tasks that are required to migrate to Version 8.5 of WebSphere Application Server and Version 7.5 of WebSphere MQ. This scenario focuses on the migration of the product connectivity, and does not provide detail about general migration of each product beyond what is needed to migrate the product connectivity.

This scenario was developed by using a sample WebSphere Application Server and WebSphere MQ installation. If you want to try the scenario, you can set up a copy of the sample installation as described in the scenario. You can use the sample applications that are provided with the scenario to verify your progress through each stage.

Note: For the post-migration configuration, this scenario applies to the use of WebSphere Application Server Version 8.5 with WebSphere MQ version 7.5.

Notes

This scenario applies to the use of WebSphere Application Server Version 8.5 with WebSphere MQ version 7.5.
> For the post-migration configuration, this scenario applies to the use of WebSphere Application Server Version 8.5 with WebSphere MQ version 7.5.

Optional information to help you learn while you implement the solution
> The scenario contains blocks of optional information marked by Why? or What else?. You do not need to read this information to complete the scenario, but might choose to learn more:

> **Why?**   Describes *why* you are instructed to do something. For example:

> > ┌─ **Why am I doing this?** ─────────────────────┐
> > You use the **Scope** property to set the level at which the
> > activation specification is visible. The cell scope is the highest
> > level, giving the activation specification the greatest visibility.
> > └──┘

> **What else?**
> > Describes *what else* you might do, or want to learn about, related to what you are reading in the main window. For example:

> > ┌─ **What else might I do or be interested in?** ─────┐
> > You can also create activation specifications at other levels.
> > For example, if you have multiple servers you might create
> > an activation specification for each server, using the server
> > scope, so that you can specify different settings to be used for
> > each server.
> > └──┘

> **Tip:** Some "Why?" and "What else?" information provides links that would take you to information resources outside the scenario. To complete a scenario, you do not need to follow such links; they are provided only as optional aids for your learning.

Related information:
This scenario in IBM Knowledge Center
This scenario in the Scenarios and Patterns information center

➦ Product web page
WebSphere Application Server product web page

➦ Library page
WebSphere Application Server library page

➦ Product web page
WebSphere MQ product web page

➦ Library page
WebSphere MQ library page

What's new?

This scenario has been updated to add an electronic book (ebook) version of the scenario in EPUB format.

The EPUB file is linked in the "Related resource" list on the scenario welcome page.

You can read EPUB files with many eBook readers; for example, the iBooks app for Apple products, a variety of ebook reader apps for Android devices, and dedicated eBook reader devices like the Barnes & Noble Nook eReader range and the Sony Reader. You can also read ePub files in your web browser with EPUBReader add-on for Firefox and MagicScroll for Chrome. If you want to read an EPUB file on the Amazon Kindle, you can convert EPUB files to kindle format with a converter like Calibre.

Chapter 2. Planning the solution

Review the topics in this section to understand what is covered in this scenario, the reasons why a business might want to follow the scenario, the user roles involved, and an overview of the solution proposed by the scenario.

Assumptions

This scenario makes several assumptions about the system that you are using to set up and work with the sample IT configuration. These assumptions include the operating system and version of the products that you are using, and whether you have security configured for WebSphere MQ.

This scenario assumes the following points:

- You are using the Windows operating system.
- You are using WebSphere Application Server and WebSphere MQ on one computer.

  Note: Clustering is not described in this scenario. Instructions are provided for installing a sample WebSphere MQ and WebSphere Application Server single server configuration that you can use as a starting point for trying out the scenario in the same way as it was originally developed.

- You are using the following versions of WebSphere MQ and WebSphere Application Server:
  - For the initial Version 6 sample configuration, you are using WebSphere MQ Version 6.0.2 with Fix Pack 10, and WebSphere Application Server Version 6.1.0 with the latest available fix pack. (This scenario was developed by using WebSphere Application Server Version 6.1.0 Fix Pack 35.)
  - For the post-migration configuration, you are using WebSphere MQ Version 7.5, and WebSphere Application Server Version 8.5.

  > **Why am I doing this?**
  > Earlier versions of the products might require configuration that is not covered in this scenario.

  Note: For the post-migration configuration, this scenario applies to the use of WebSphere Application Server Version 8.5 with WebSphere MQ version 7.5.

- You do not have security configured for WebSphere MQ. This scenario does not describe security configuration. However, if you do have security configured for WebSphere MQ you are still able to complete the scenario.
- You use graphical user interfaces of WebSphere MQ and WebSphere Application Server, rather than the command-line equivalents, to complete the tasks that are described in this scenario.

Business overview

A company wants to migrate an existing IT environment provided by WebSphere MQ Version 6 integrated with WebSphere Application Server Version 6 to an equivalent IT environment provided by WebSphere MQ Version 7.5 and WebSphere Application Server Version 8.5.

To date, company A has a business solution that uses a messaging infrastructure that is provided by WebSphere MQ Version 6. WebSphere MQ is connected to WebSphere Application Server Version 6 so that Java EE applications on WebSphere Application Server can consume and work with messages from WebSphere MQ. Through the WebSphere MQ messaging provider in WebSphere Application Server, Java EE applications can exploit the Java Message Service (JMS) with WebSphere MQ as an external provider of JMS messaging resources.

The company decides to migrate their business solution to WebSphere MQ Version 7.5 connected to WebSphere Application Server Version 8.5 to gain business value, including the following:

- Maintaining the software environment at a recent supported version
- Reducing software operation and maintenance costs
- Benefiting from the enhanced JMS provided by a re-architecture of WebSphere MQ to be a more-integrated, higher-performing JMS provider
- Using new and updated functions available in Version 7.5 of WebSphere MQ and Version 8.5 of WebSphere Application Server.

Related information:

➥ WebSphere Application Server features and benefits web page

User roles and interactions

This scenario focuses on migrating an existing solution that involves migrating WebSphere Application Server from Version 6 to Version 8.5, and WebSphere MQ from Version 6 to Version 7.5. The user roles and interactions described are the main ones involved in migration activities for the product connectivity.

Migrate the solution

Migrate the solution for production use, by installing, configuring, and testing new versions of the components that provide the solution.

Administrator
> The Administrator installs and configures the components that support the solution, in this case WebSphere MQ and WebSphere Application Server. The business might have a different Administrator for each product, or one Administrator might perform installation and configuration for all components. If the Administrators are different, they might need to exchange information. For example, in this scenario the WebSphere MQ administrator must give the name of the queue and queue manager to the WebSphere Application Server administrator.
>
> The Administrator also deploys the software components given to them by the Developer.
>
> The maintenance of components used for messaging between WebSphere Application Server and WebSphere MQ has changed:

- In Version 6, the WebSphere MQ messaging provider installed as part of WebSphere Application Server includes a cut-down version of the WebSphere MQ Version 6 JMS Client, which Java™ EE applications can use to create client-mode connections to either a local or remote WebSphere MQ queue manager.
- In Version 6, the WebSphere MQ messaging provider uses WebSphere MQ client classes for JMS included in WebSphere Application Server. Therefore, the WebSphere Application Server administrator is responsible for maintaining those classes, by applying WebSphere Application Server fix packs.
- In Version 7.5, the WebSphere MQ messaging provider uses the WebSphere MQ Resource Adapter included in WebSphere Application Server. Therefore, the WebSphere Application Server administrator is responsible for maintaining that resource adapter, by applying WebSphere Application Server fix packs.

Test Implementer

The Test Implementer runs the tests to validate the solution and that the solution is ready for production use. For example, can the solution be started, stopped, backed up, and recovered after a system failure as well as be maintained?
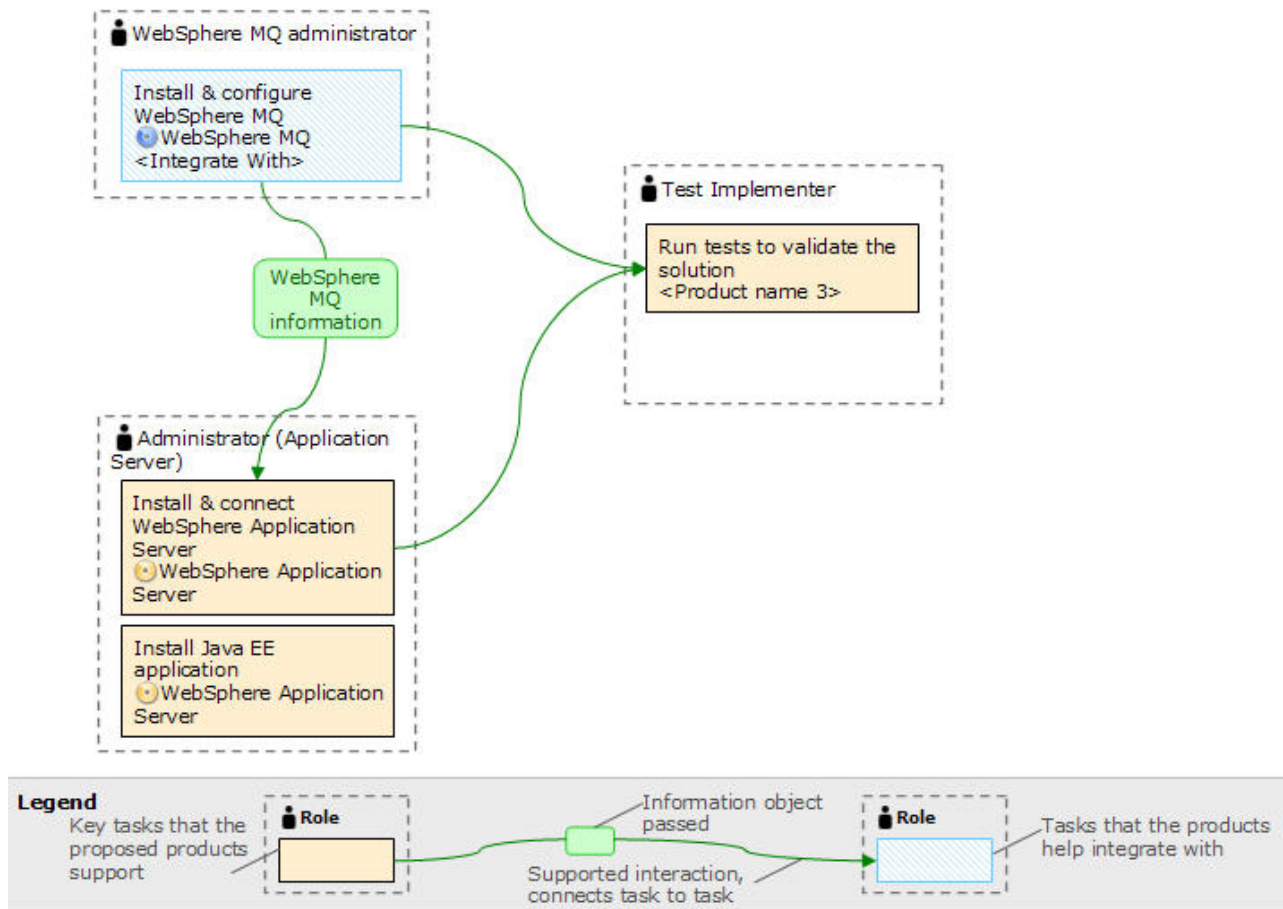
Figure 1. User role interactions to deploy the solution

Technical solution

This scenario describes one way of migrating an existing WebSphere Application Server and WebSphere MQ solution from Version 6 to Version 8.5 of WebSphere Application Server and Version 7.5 of WebSphere MQ.

Overview: Initial IT configuration

Company A uses an existing IT configuration provided by WebSphere MQ Version 6 integrated with WebSphere Application Server Version 6. This scenario describes migrating that initial IT configuration to an equivalent IT configuration provided by Version 7.5 of WebSphere MQ and Version 8.5 of WebSphere Application Server.

In this scenario, the initial configuration that is to be migrated to an equivalent configuration provided by Version 7.5 of WebSphere MQ and Version 8.5 of WebSphere Application Server includes a Java EE application on WebSphere Application Server Version 6 that uses a message-driven bean (MDB) to consume and work with messages received on a queue provided by WebSphere MQ Version 6. The Java EE application also sends reply messages back to the requester client of the JMS application.

Tip: This scenario was developed by using a sample version of the initial IT configuration that is described in this topic. If you want to try the scenario, follow the instructions in "Creating a sample initial Version 6 IT configuration" on page 20 to set up a copy of the sample IT configuration.

The initial multi-product configuration includes several components that an administrator configures or uses, as shown in Figure 2 on page 7, and described after the figure.
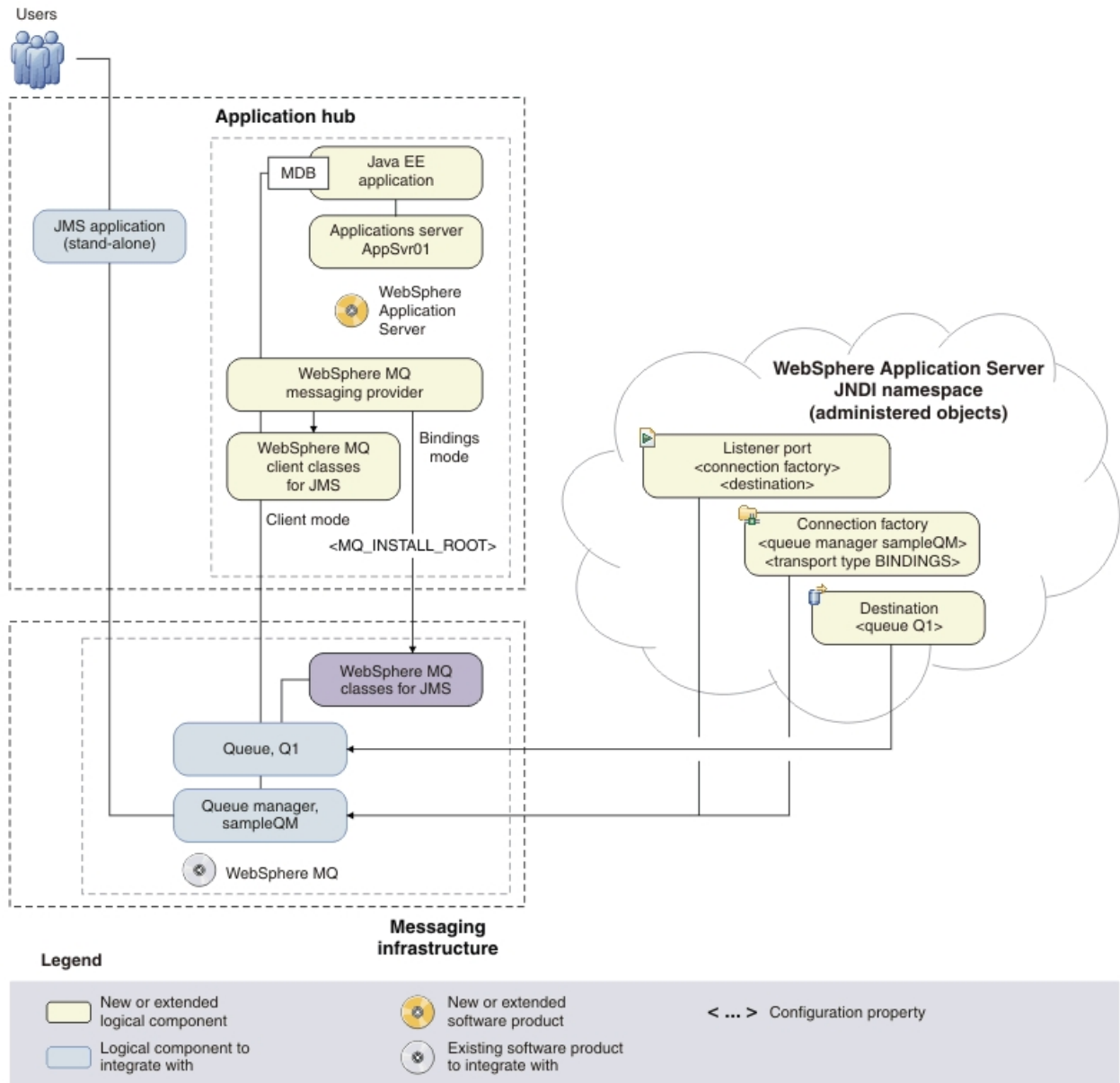
Figure 2. The initial multi-product configuration. The high-level logical topology diagram for software functions delivered by integrating WebSphere Application Server into the initial WebSphere MQ messaging infrastructure. This logical topology shows the new functions as new or extended logical components, integrated with the software functions and products from the initial logical topology.

WebSphere MQ as a *messaging provider* **for WebSphere Application Server**

The WebSphere MQ messaging provider in WebSphere Application Server makes JMS messaging available to WebSphere Application Server applications by using the existing capabilities in the WebSphere MQ environment.

> **Why am I doing this?**
> WebSphere Application Server applications can interact with WebSphere MQ destinations to send and receive messages in the same way as any JMS application in the WebSphere MQ environment.

• You can connect a WebSphere MQ network to a service integration bus within WebSphere Application Server, by using WebSphere MQ links. A WebSphere MQ link provides support for sender-receiver channels between the service integration bus and a WebSphere MQ queue manager or queue-sharing group. This option requires more complex configuration in WebSphere Application Server; you must configure a service integration bus and messaging engines.

• You can add a WebSphere MQ server (representing a queue manager or queue-sharing group) as a member of a service integration bus within WebSphere Application Server. A WebSphere MQ server provides a direct client or bindings connection between a service integration bus and queues on a WebSphere MQ queue manager. This option also requires you to configure a service integration bus and messaging engines in WebSphere Application Server.

Bindings mode transport between WebSphere Application Server and WebSphere MQ

In this scenario, bindings mode transport is used for communication between WebSphere Application Server and WebSphere MQ. Bindings mode transport uses WebSphere MQ classes for JMS, included in WebSphere MQ.

┌─ **Why am I doing this?** ─────────┐

Bindings mode usually has better performance than client mode because communication between the two products is done using shared memory. Bindings mode can be used only when WebSphere Application Server and WebSphere MQ are installed on the same computer and operating system image.

┌─ **What else might I do or be interested in?** ─────────┐

Client mode is used for communication between WebSphere Application Server and WebSphere MQ installed on different computers, and can be used for communication if both products are installed on the same computer and operating system image. Client mode transport generally offers lower performance than bindings mode. By default, client mode transport uses the WebSphere MQ client classes for JMS, included in WebSphere Application Server.

WebSphere MQ client classes for JMS, included in WebSphere Application Server

The WebSphere MQ client classes for JMS are installed as part of WebSphere Application Server into `WAS_INSTALL_ROOT\lib\WMQ\java\lib`. Using these classes, JMS applications on WebSphere Application Server can connect to WebSphere MQ in client mode.

The WebSphere MQ client classes for JMS included in WebSphere Application Server are maintained by applying WebSphere

Application Server fix packs. For information about which version of WebSphere MQ is included, see Which version of WebSphere MQ is shipped with WebSphere Application Server.

WebSphere MQ classes for JMS, included in WebSphere MQ
The WebSphere MQ classes for JMS installed as part of WebSphere MQ include Java Native Interface (JNI) libraries that are needed for bindings mode transport. When WebSphere MQ is installed on the same computer as WebSphere Application Server, JMS applications on WebSphere Application Server can use these classes to connect to WebSphere MQ in bindings mode. The location of the WebSphere MQ classes for JMS is specified by the WebSphere Application Server environment variable MQ_INSTALL_ROOT.

The WebSphere MQ classes for JMS included in WebSphere MQ are maintained by applying WebSphere MQ fix packs.

Java EE application
The application consumes and works with messages on the WebSphere MQ queue, Q1. This application runs on an *application server* of the WebSphere Application Server product that has been installed and connected with WebSphere MQ.

The sample application in this scenario provides a *message-driven bean (MDB)* as an asynchronous message consumer. When a message arrives at the queue, the MDB automatically processes the message without the application having to explicitly poll the queue.

> **Why am I doing this?**
> MDBs are activated by the EJB container in WebSphere Application Server on receipt of a message. A typical MDB performs messaging functions, and calls one or more session beans to perform business logic. Because of this separation of function, you can easily change and reuse units of business logic without affecting the messaging function of the application.

Application server
A server program in WebSphere Application Server that provides the environment in which Java EE application programs run.

WebSphere Application Server JNDI namespace
WebSphere Application Server includes a name server that provides access to the following JMS administered objects through the Java Naming and Directory Interface (JNDI). The use of JNDI, the connection factory, and the destination, are the same as described for the initial IT configuration in "Overview: Initial IT configuration" on page 6.

Listener port, PiShopReplyMDBLstener
A listener port defines the association between a connection factory, destination, and a deployed MDB. The listener port provides the configuration necessary for the MDB to listen for messages arriving at a destination. The listener port processes inbound messages to the MDB.

> **Why am I doing this?**
>
> The WebSphere MQ messaging provider in WebSphere Application Server Version 6 does not have a Java EE Connector architecture (JCA) 1.5 resource adapter. If you want to use MDBs with a messaging provider that does not have a JCA 1.5 resource adapter, you cannot use activation specifications and therefore you must configure your MDBs against a listener port.

> **What else might I do or be interested in?**
>
> Activation specifications are part of the JCA 1.5 standard, which provides a standard way to integrate JMS providers, such as WebSphere MQ Version 7, with Java EE application servers such as WebSphere Application Server.

Connection factory, myCF

A JMS connection factory object defines a set of standard configuration properties for connections. An application uses a connection factory to create a connection to WebSphere MQ.

If your application uses an MDB, as the sample application does, the connection factory is used for outbound messages only; an inbound message is received by the listener port, which passes the message to a new instance of a message-driven bean for processing.

Destination, myQueue

A JMS destination can be a topic or a queue. In this scenario, the destination is a queue, and identifies the WebSphere MQ queue that applications send messages to, or from which an application receives messages, or both. An application looks up the destination in the JNDI namespace to create a connection to the WebSphere MQ queue.

In this scenario, when creating JMS objects in WebSphere Application Server, you specify full details rather than use a *client channel definition table (CCDT)* that has been exported from WebSphere MQ.

> **Why am I doing this?**
>
> A CCDT makes configuring objects in WebSphere Application Server easier because it contains information that is required to connect to WebSphere MQ. If you do not specify a CCDT, you must enter this information yourself. This scenario does not use a CCDT so that you can see more clearly what information is required to make a connection.

> **What else might I do or be interested in?**
> A CCDT is particularly useful if your client applications might need to connect to a number of alternative queue managers. This scenario does not cover that situation.

Overview: The delivered logical topology

The company has migrated WebSphere Application Server from Version 6 to Version 8.5 and WebSphere MQ from Version 6 to Version 7.5.

The delivered IT configuration includes several components that an administrator configures or uses differently in newer versions when compared to Version 6, as shown in Figure 3 on page 12. The description of components in this topic builds on the description given for the equivalent Version 6 components in "Overview: Initial IT configuration" on page 6.
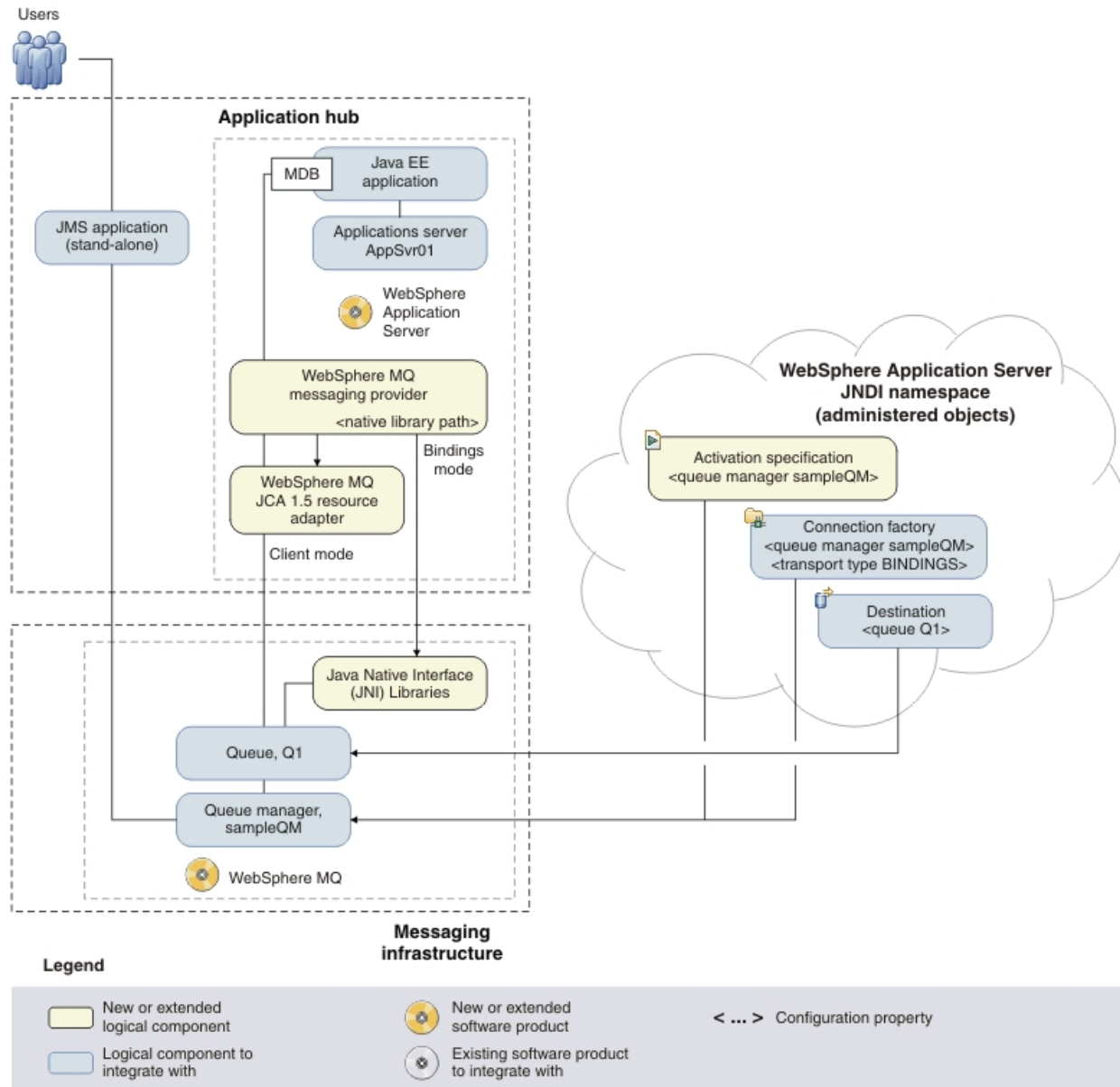
Figure 3. Delivered logical topology. The high-level logical topology diagram for software functions delivered by migrating WebSphere Application Server from Version 6 to Version 8.5 and WebSphere MQ from Version 6 to Version 7.5. This logical topology shows the new functions as new or extended logical components, integrated with the software functions and products from the initial logical topology.

WebSphere MQ as a *messaging provider* **for WebSphere Application Server**

The WebSphere MQ messaging provider in WebSphere Application Server makes JMS messaging available to WebSphere Application Server applications by using the existing capabilities in the WebSphere MQ environment.

Bindings mode transport between WebSphere Application Server and WebSphere MQ

In this scenario, bindings mode transport is used for communication between WebSphere Application Server and WebSphere MQ. Bindings mode transport uses WebSphere MQ classes for JMS, included in WebSphere MQ.

> **Why am I doing this?**
>
> Bindings mode usually has better performance than client mode because communication between the two products is done using shared memory. Bindings mode can be used only when WebSphere Application Server and WebSphere MQ are installed on the same computer and operating system image.

> **What else might I do or be interested in?**
>
> Client mode is used for communication between WebSphere Application Server and WebSphere MQ installed on different computers, and can be used for communication if both products are installed on the same computer and operating system image. Client mode transport generally offers lower performance than bindings mode. By default, client mode transport uses the WebSphere MQ client classes for JMS, included in WebSphere Application Server.

WebSphere MQ JCA 1.5 Resource Adapter, included in WebSphere Application Server

WebSphere MQ Version 7.5 classes for JMS are built in to WebSphere Application Server Version 8.5 as a JCA 1.5 resource adapter, wmq.jmsra.rar. By configuring activation specifications and connection factories to use the WebSphere MQ messaging provider, JMS applications on WebSphere Application Server can use the resource adapter to connect to WebSphere MQ in client mode.

The WebSphere MQ JCA 1.5 resource adapter included in WebSphere Application Server is maintained by applying WebSphere Application Server fix packs. For information about which version of the WebSphere MQ JCA resource adapter is included, see Which version of WebSphere MQ is shipped with WebSphere Application Server.

WebSphere MQ classes for JMS, included in WebSphere MQ

The Java Native Interface (JNI) libraries that are needed for bindings mode transport are included in WebSphere MQ. When WebSphere MQ is installed on the same computer as WebSphere Application Server, JMS applications on WebSphere Application Server can use these classes to connect to WebSphere MQ in bindings mode. The location of the WebSphere MQ native libraries is specified in WebSphere Application Server, by the WebSphere MQ messaging provider property Native library path.

> **Why am I doing this?**
>
> The WebSphere MQ messaging provider property **Native library path** is used instead of the *MQ_INSTALL_ROOT* variable, which is no longer required and by default is not migrated from Version 6.

The WebSphere MQ native libraries are maintained by applying WebSphere MQ fix packs.

WebSphere Application Server JNDI namespace

WebSphere Application Server includes a name server that provides access to the following JMS administered objects through the Java Naming and Directory Interface (JNDI). The use of JNDI, the connection factory, and the destination, are the same as described for the initial IT configuration in "Overview: Initial IT configuration" on page 6.

Activation specification, myActSpec

A JMS activation specification can be associated with one or more message-driven beans (MDBs) and provides the configuration necessary for them to listen for messages arriving at a destination. Activation specifications process inbound messages to the MDB.

┌─ **Why am I doing this?** ─────────────────────┐
│ Activation specifications are part of the Java EE Connector │
│ architecture (JCA) 1.5 standard. JCA 1.5 provides a standard │
│ way to integrate JMS providers, such as WebSphere MQ, with │
│ Java EE application servers such as WebSphere Application │
│ Server. │
└──┘

┌─ **What else might I do or be interested in?** ─────┐
│ Use of listener ports is an older configuration method for │
│ MDBs to listen for messages arriving at a destination. The use │
│ of listener ports is stabilized in WebSphere Application Server │
│ Version 7 and later. If you are using WebSphere Application │
│ Server for the first time, avoid using listener ports. │
└──┘

Resources for this scenario

This scenario provides sample resources that you can use to verify each task phase. Instructions for downloading resources, and creating resources, are given at appropriate steps in the tasks for this scenario.

Tip: You can download resources when instructed in the scenario tasks, or before then when you read this topic.

Resources for Version 6

1. The following download files are required for "Creating a sample initial Version 6 IT configuration" on page 20:
   - To download the sample JMS application package, click the following link and save the file to the machine that hosts WebSphere Application Server: WAS-WMQ-101-V6.zipWAS-WMQ-101-V6.zip (in online information center), then extract the contents. The package contains a sample JMS application `.jar` file and batch files for running the application.
   - To download the sample MDB application, click the following link and save the file to the machine that hosts WebSphere Application Server: sampleMDBv6.earsampleMDBv6.ear (in online information center).
2. When Configuring the JNDI namespace and administered objects, you create the following resources using the WebSphere MQ Explorer:

- A queue manager, `sampleQM`, for the sample application.

  This queue manager uses a dead-letter queue, `SYSTEM.DEAD.LETTER.QUEUE`.
- The JNDI namespace context to use a directory on the local file system `C:\JNDI-Directory`:
- A connection factory administered object, `myCF`, to connect to the base queue manager, `sampleQM`.
- A destination administered object, `myQueue`, for the queue, `Q1`.
- The WebSphere MQ queue, `Q1`.

3. When Configuring WebSphere Application Server Version 6, you create the following resources in the WebSphere Application Server administrative console:
- A listener port, `PiShopReplyMDBListener`, to find a connection factory and destination configured in the WebSphere Application Server JNDI namespace.
- A connection factory, `PiShopReplyCF`, with JNDI name `jms/PiShopReplyCF`, configured to connect to the queue manager `sampleQM`.
- A queue, `wasQueue`, with the JNDI name `jms/wasQueue`, WebSphere MQ queue, `Q1`.

Resources for Version 7 & 8

1. The following download files are required for "Option 1: Migrating WebSphere Application Server before WebSphere MQ" on page 53 and "Option 2: Migrating WebSphere MQ before WebSphere Application Server" on page 83:
- Sample JMS application package

  To download the sample JMS application package, click the following link and save the file to the machine that hosts WebSphere Application Server: sampleJMSApp.zipsampleJMSApp.zip (in online information center), then extract the contents. The package contains a sample JMS application `.jar` file and batch files for running the application.
- Sample MDB application

  To download the sample MDB application, click the following link and save the file to the machine that hosts WebSphere Application Server: sampleMDB.earsampleMDB.ear (in online information center)

2. Resources created on Version 7.5 of WebSphere MQ and Version 8.5 of WebSphere Application Server during this scenario:
- When migrating your configuration, you create the same resources as for Version 6, to show that the applications and resources work on the newer versions.
- On WebSphere Application Server, you can convert the listener port to an activation specification. For more information, see Migrating WebSphere Application Server listener ports to activation specifications.

  Note: No additional resources are created in WebSphere MQ Explorer for this stage of the scenario.

Choosing which product to migrate first

When migrating WebSphere Application Server to Version 8.5 and WebSphere MQ to Version 7.5, you cannot migrate both products simultaneously. You must migrate one product before the other. Your choice depends on several considerations, and includes a period of time with an intermediate migration mode configuration.

You need to understand any functional and performance implications of running with an intermediate migration mode configuration.

Considerations for migrating WebSphere Application Server to Version 8.5 before WebSphere MQ

You need to understand several considerations for choosing to migrate WebSphere Application Server to Version 8.5 before WebSphere MQ, and the consequences of running with an intermediate migration mode configuration of WebSphere Application Server Version 8.5 with WebSphere MQ Version 6.

Use the intermediate migration mode configuration only as a short-term solution

WebSphere Application Server Version 8.5 uses its WebSphere MQ resource adapter to connect to a queue manager running on WebSphere MQ Version 6, so Version 7 features of WebSphere MQ are not available. As a result, the WebSphere MQ classes for JMS in the resource adapter run in migration mode, which has a performance and function cost.

This migration mode configuration facilitates migration from Version 6 to Version 8.5, but should not be considered as a long term solution if performance is important.

For more information about the performance impact, see the section "Avoiding running in Migration/Compatibility Mode" in the SupportPac MP07: WebSphere MQ - JMS V7 Performance Evaluations

Migration mode is set automatically.

Considerations for migrating WebSphere Application Server first

Have a minimum fix pack level before starting migration.
In general, you should be at the latest fix pack level to benefit from the latest maintenance available. In some circumstances, you need to be at a minimum fix pack level:

- For WebSphere Application Server Version 8.5 to connect in bindings mode to WebSphere MQ Version 6, WebSphere MQ must be at level 6.0.2.5 or later. This scenario was developed by using WebSphere MQ Version 6.0.2 with Fix Pack 10 (6.0.2.10)
- This scenario was developed by using WebSphere Application Server Version 6.1.0 Fix Pack 35

Install WebSphere Application Server Version 8.5, then migrate the Version 6 configuration to Version 8.5
You can install WebSphere Application Server Version 8.5 to coexist with WebSphere Application Server Version 6.

> **Why am I doing this?**
> This preserves the existing WebSphere Application Server Version 6 configuration untouched (as a backup) while testing can be performed on the WebSphere Application Server Version 8.5 connection with WebSphere MQ.

Considerations for migrating WebSphere MQ to Version 7.5 before WebSphere Application Server

You need to understand several considerations for choosing to migrate WebSphere MQ to Version 7.5 before WebSphere Application Server, and the consequences of running with an intermediate migration mode configuration of WebSphere MQ Version 7.5 with WebSphere Application Server Version 6.

You can use the intermediate migration mode configuration as a long-term solution

WebSphere Application Server Version 6 uses WebSphere MQ Version 7.5 JMS Classes to connect to a queue manager running on WebSphere MQ Version 7.

This migration mode configuration can be used as a long-term solution if it meets business requirements. This configuration is stable and supported.

Considerations for migrating WebSphere MQ first

Can migrate WebSphere MQ only in place
MQ_INSTALL_ROOT will then point to WebSphere MQ Version native libraries

For bindings connection, the application server must also be configured to locate the WebSphere MQ V7 native libraries by using the JVM argument -Djava.library.path set to the location of the libraries. Use the **Classpath** property on the Java virtual machine settings page of the administrative console (see Java virtual machine settings).

Changes to WebSphere MQ classes for JMS
You might encounter JMS application migration problems, as a result of changes to the WebSphere MQ classes for JMS. If your solution requires connection to a V7.5 queue manager, you might be able to bypass some problems by continuing to use the version 6.0 WebSphere MQ classes for JMS. Alternatively, install the version 6 WebSphere MQ client on the same server as the application server and set $MQ_INSTALL_ROOT to the WebSphere MQ installation directory. Connect the JMS application to the version 7.5 queue manager in client mode.

Have a minimum fix pack level before starting migration.
In general, you should be at the latest fix pack level to benefit from the latest maintenance available. In some circumstances, you need to be at a minimum fix pack level:

- This scenario was developed by using WebSphere Application Server Version 6.1.0 Fix Pack 35

For client mode applications, everything is the same as for the starting environment.

Chapter 3. Implementing the solution

Implementing the solution in this scenario involves migrating WebSphere Application Server from Version 6 to Version 8.5 and WebSphere MQ from Version 6 to Version 7.5.

Before you begin

If you want to try out the scenario, you first need to follow the instructions to set up a copy of the sample messaging infrastructure as described in "Creating a sample initial Version 6 IT configuration" on page 20. This sample configuration is based on WebSphere Application Server and WebSphere MQ Version 6.

About this task
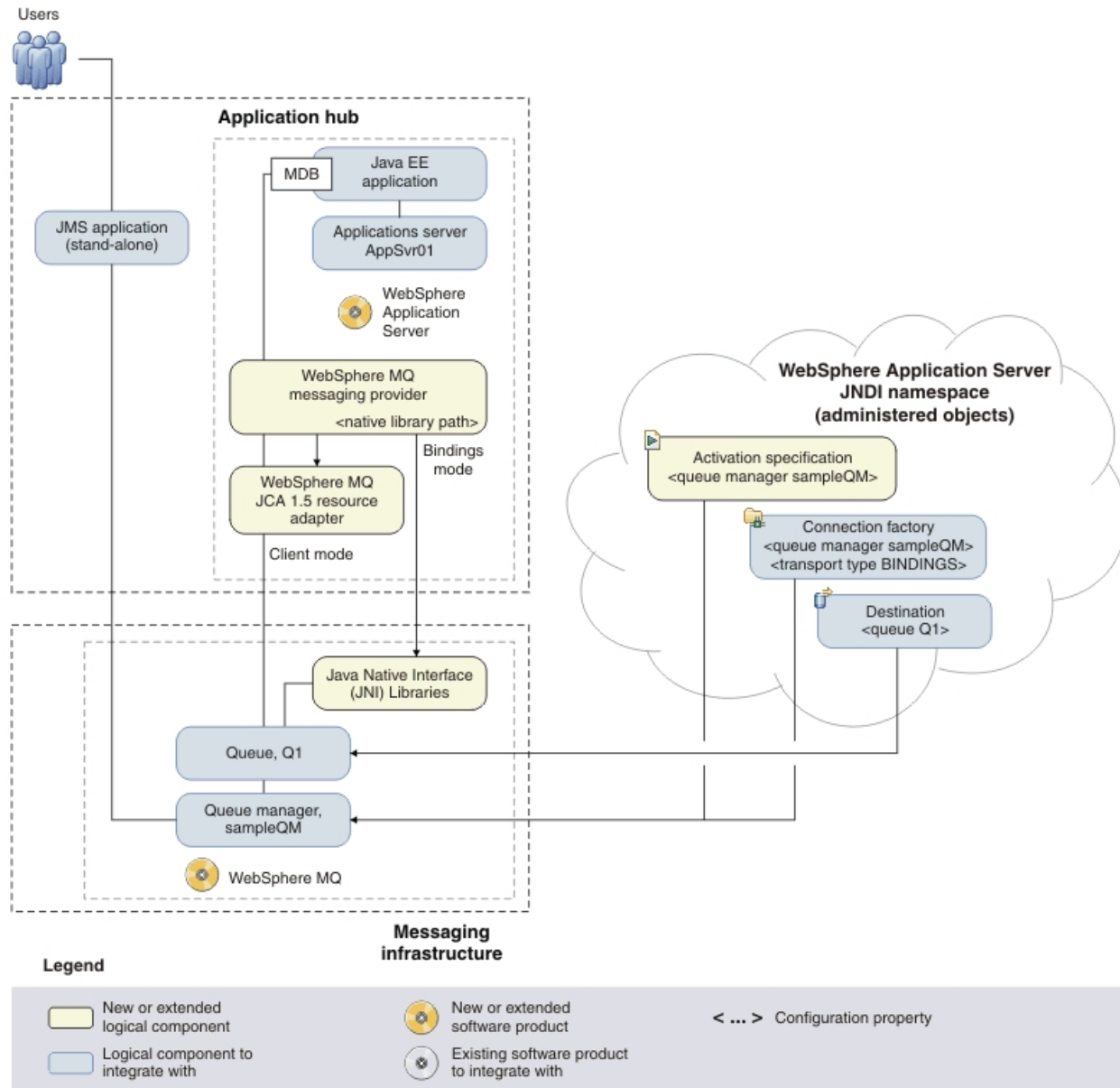
Figure 4. Delivered logical topology, including WebSphere Application Server. The high-level logical topology diagram for new software functions delivered by integrating WebSphere Application Server into the initial WebSphere MQ messaging infrastructure. This delivered logical topology shows the new functions as new or extended logical components, integrated with the software functions and products from the initial logical topology.

After connecting WebSphere Application Server to WebSphere MQ, you can use the connection by deploying a Java EE application to run on WebSphere Application Server. This scenario describes use of a sample Java EE application that is deployed onto WebSphere Application Server and used to verify the solution.

Creating a sample initial Version 6 IT configuration

This scenario was developed using a sample initial IT configuration. Follow the instructions to set up this sample configuration to try out the scenario in the same way as it was originally developed.

Installing WebSphere MQ Version 6.0

Check and install software requirements, specify network information, then install WebSphere MQ using the installation wizard. After completing the installation, optionally create a default configuration, then use the Postcard application supplied with WebSphere MQ to verify the installation.

Before you begin

In order for the sample MDB application to connect in bindings mode, the minimum required level for WebSphere MQ is Version 6.0.2 with Fix Pack 5. This scenario was tested using WebSphere MQ Version 6.0.2 with Fix Pack 10.

What else might I do or be interested in?

If you were using a client mode connection, you could use any level of WebSphere MQ Version 6.

Before starting this task, complete the following checks:

- You must have local administrator authority when you are installing. Define this authority through the Windows facilities.
- Ensure that the computer name does not contain any spaces.
- Ensure that you have sufficient disk space, up to 600 MB, to fully install WebSphere MQ for Windows.
- Determine whether any WebSphere MQ users are defined on Windows 2000 or later domain controllers.

Why am I doing this?

WebSphere MQ checks that only authorized users can access queue managers or queues. When a user attempts such access, WebSphere MQ uses its own local account to query information about the user. However, domain controllers running on Windows 2000 or later can be configured such that WebSphere MQ cannot use local accounts to make these queries. In this situation, you must provide WebSphere MQ with a special account to use. This account is necessary when both of the following conditions apply:

- Any domain controller on your network is running on Windows 2000 or later
- Local user accounts are not authorized to query the group membership of the domain user accounts

If you require a special account, refer your domain administrator to the instructions in topic wq10840_ "Creating and setting up domain accounts for WebSphere MQ" in the WebSphere MQ V6 downloadable Information Center.

If you want to investigate the requirements for installing WebSphere MQ in more detail, see System Requirements for IBM® MQ.

About this task

This task describes the basic steps to install the WebSphere MQ 6.0.2.10 refresh pack on the Windows XP Professional (SP2 or later) operating system. This refresh pack is a full installation image that contains WebSphere MQ 6.0.2 and Fix Pack 10 combined.

> **What else might I do or be interested in?**
> If you already have WebSphere MQ Version 6.0.0, 6.0.1 or 6.0.2 you can instead obtain and install WebSphere MQ 6.0.2 Fix Pack 10. For more information, see Readme for WebSphere MQ V6, Fix Pack 6.0.2.10.

The installation programs contain links to more information if you require it during the installation process. The installation process has four parts:

1. Use the Launchpad to check and install software requirements, specify network information, and start the WebSphere MQ installation wizard.
2. Use the WebSphere MQ installation wizard to install the software, and start the Prepare WebSphere MQ wizard.
3. Use the Prepare MQ wizard to start the WebSphere MQ service and start the Default Configuration wizard.
4. Optionally, use the Default Configuration wizard to create objects for verifying the installation by using the Postcard application supplied with WebSphere MQ.

> **Why am I doing this?**
> The Postcard application provides a fast and simple way to verify that your WebSphere MQ installation completed successfully. It uses the default queue manager that is created during the default configuration. If you want to use the Postcard application for verification, and you do not have any existing queue managers, run the Default Configuration wizard first.

Procedure

1. Insert the WebSphere MQ for Windows Server CD into the CD-ROM drive. If autorun is enabled, the installation process starts. Otherwise, double-click the **Setup** icon in the root folder of the CD to start the installation process.
2. Check that you have the correct version of the required software. Click **Software Requirements** on the Launchpad then, on the Software Requirements page, check that you have the correct version of the WebSphere Eclipse Platform. WebSphere Eclipse Platform 3.0.1 is required for using the WebSphere MQ Explorer and File Transfer Application components. If Eclipse 3.0.1 is not found, you can use the launchpad to install this software:

   a. Choose whether to install Eclipse 3.0.1 from a CD or your file system, After you have selected your chosen option, the Launchpad opens a dialog box with the Eclipse Setup.exe program selected.

   b. Click **Open** to run the WebSphere Eclipse Platform Version 3.0.1 installation wizard.

   c. After installing, click **Refresh** in the Launchpad to update the status of the software requirements.

3. If you want to configure WebSphere MQ for users defined on Windows 2000 or later domain controllers, click **Network Configuration** on the Launchpad, then select **Yes** on the Network Configuration page. If you have WebSphere MQ users defined on Windows 2000 or later domain controllers, you must make a special network configuration to provide WebSphere MQ with a special account for those users. You can either indicate that you want to configure WebSphere MQ for such users on the Network Configuration page, or select (or change) the option later during WebSphere MQ installation.

Why am I doing this?

WebSphere MQ checks that only authorized users can access queue managers or queues. When a user attempts such access, WebSphere MQ uses its own local account to query information about the user. However, domain controllers running on Windows 2000 or later can be configured such that WebSphere MQ cannot use local accounts to make these queries. In this situation, you must provide WebSphere MQ with a special account to use. This account is necessary when both of the following conditions apply:

- Any domain controller on your network is running on Windows 2000 or later

- Local user accounts are not authorized to query the group membership of the domain user accounts

If you require a special account, refer your domain administrator to the instructions in topic wq10840_ "Creating and setting up domain accounts for WebSphere MQ" in the WebSphere MQ V6 downloadable Information Center.

---

4. On the WebSphere MQ Installation page of the Launchpad, click **Launch IBM WebSphere MQ Installer** to start the WebSphere MQ installation wizard.

5. Follow the instructions in the wizard, choosing a typical setup type to install WebSphere MQ. The following features are installed:
   - WebSphere MQ Server
   - WebSphere MQ Explorer: a graphical interface for administering and monitoring WebSphere MQ resources.
   - WebSphere MQ Development Toolkit
   - Java and .NET Messaging and Web Services

   At the end of the process, the WebSphere MQ Setup window displays the message `The WebSphere MQ Installation Wizard has successfully installed WebSphere MQ`. Click **Finish**; the Prepare WebSphere MQ wizard starts automatically.

6. Follow the instructions in the Prepare WebSphere MQ wizard.

Why am I doing this?

The Prepare WebSphere MQ wizard helps you to configure WebSphere MQ files and a user account for your network. You must run the wizard to configure the WebSphere MQ Service before you can start any queue managers.

---

   a. On the first page of the wizard, click **Next**. The wizard begins the configuration and displays status messages, and then displays the

WebSphere MQ Network Configuration page. The contents of this page varies according to your use of domain controllers.

 b. To proceed, select either the `Yes` or `No` check box, as appropriate to your use of Windows 2000 or later domain controllers, then click **Next**.

> **What else might I do or be interested in?**
> If you used the Network Configuration page on the Launchpad to indicate whether you need to configure WebSphere MQ users defined on Windows 2000 or later domain controllers, then the option you chose is already selected.

 c. Follow the instructions for network configuration then click **Next** to continue through the wizard until the wizard displays the `Status: Starting the WebSphere MQ service` message, followed by the Recommended tasks page.

7. Optional: On the Recommended tasks page, set up the default configuration If you want to use the WebSphere MQ Postcard application to verify your installation, click the **Setup the Default Configuration** link to display, after a short delay, the WebSphere MQ Default Configuration window.

> **Why am I doing this?**
> The default configuration creates objects, such as a queue manager called QM_*computer_name*, that you can use to verify the success of your installation by using the Postcard application that is supplied as part of WebSphere MQ. If you do not create the default configuration, you can still use the Postcard application later on after you have created your own objects in WebSphere MQ.

Note: If you have already created other queue managers, you cannot create the default configuration; you must first delete the other queue managers then run the Default Configuration wizard.

 a. On the first page of the Default Configuration wizard, click **Next**.

 b. Click **Next**, to continue to the Select Options page.

 c. On the Select Options page, clear the check box **Allow remote administration of the queue manager**, but leave the check box **Join the queue manager to the default cluster** selected, then click **Next**.

> **Why am I doing this?**
> This scenario assumes that you have one computer on which you are installing WebSphere Application Server and WebSphere MQ. You therefore do not need to administer the queue from another machine. Clustering is not described in this scenario.With the default configuration of WebSphere MQ Version 6.0, if you do not join the queue manager to the default cluster then you will get error messages when running the Postcard application later. To configure the default cluster, and join the default queue manager to the default cluster, do not clear the check box **Join the queue manager to the default cluster**.

 d. On the Join Default Cluster page, select the check box **Yes, make it the repository for the cluster**, the click **Next**.

> **Why am I doing this?**
> This scenario assumes that you have one computer on which you are installing WebSphere Application Server and WebSphere MQ. WebSphere MQ requires that the first computer in the default cluster be made the repository for the cluster.

   e. On the summary page, click **Finish**. A dialog box is displayed while the default configuration is created.

> **What else might I do or be interested in?**
> You can use this window after installation to change the default configuration. To display this window after installation, use the Windows **Start** menu to start the Prepare WebSphere MQ wizard, then follow the steps.

   The existing WebSphere MQ Default Configuration window is updated with the results of the configuration.

   f. Click **Close** to close the Default Configuration wizard.

8. In the Prepare WebSphere MQ wizard, click **Next** to display the Completing the Prepare WebSphere MQ Wizard page.

9. Select the **Launch WebSphere MQ Explorer** check box and the **Launch WebSphere MQ Getting Started Help**, and choose whether to start Notepad to view the release notes, then click **Finish**. The WebSphere MQ Explorer and WebSphere MQ Getting Started windows start.

10. If you created a default configuration, verify your installation by using the Postcard application that is supplied with WebSphere MQ.

> **What else might I do or be interested in?**
> If you find that you cannot run the JMS postcard application from WebSphere MQ Getting Started, run the batch file from `C:\Program Files\IBM\WebSphere MQ\Java\bin`.

   a. In the WebSphere MQ Getting Started window, click the link **Start an instance of MQI Postcard**.

> **What else might I do or be interested in?**
> You can also start an instance of JMS Postcard; using the two types of the Postcard application are the same. Sometimes, the JMS Postcard application does not start correctly from the WebSphere MQ Getting Started window. Instead of clicking the **Start an instance of JMS Postcard** link in the WebSphere MQ Getting Started window, you can start instances of the JMS Postcard application by using the `mq_inst\Java\bin\postcard.bat`.
>
> **Tip:** If failing to start the JMS Postcard immediately after installing WebSphere MQ, sometimes it helps to restart the workstation.

   b. Optional: Click **Help** in this and other Postcard application dialog boxes to view instructions about running the Postcard application.

c. In the **Nickname** field, type a nickname to use for sending and receiving postcards; for example: John. It does not matter what name you choose.

d. Click **OK** to continue. The Postcard window opens.

e. Move the Postcard window to one side of your screen (to allow room for more windows).

f. Start a second MQI Postcard for another nickname; for example: George. Move the Postcard window to one side of your screen (so that you can see both Postcard windows).

g. Send a postcard message from John, through WebSphere MQ, to George.

   1) In the MQI Postcard - John window, click in the **Message** box, then type the text to go on the postcard message; for example: Hello. How are you doing?.

   2) In the **To** field, type the nickname of the person to send the postcard to; for example: George

   3) Click **Send**. After a moment, the postcard is listed as sent in the **Postcards sent and received** table.

   4) In the Postcard window for George the postcard is listed as received in the **Postcards sent and received** table.

   5) In the MQI Postcard - George window, double-click the postcard row. The postcard is opened in a new window to show the text, sender, date, and other details. Move or close the Postcard from John window.

   6) Send a reply. In the MQI Postcard - George window, click **Reply...**, type some text in the Message box, then click **Send**. The postcard is listed as sent in the **Postcards sent and received** table and, in the MQI Postcard - John window is listed as received.

   The successful transmission of send and reply messages show that WebSphere MQ is working.

h. Close the MQI Postcard windows.

If you did not create a default configuration, you can still follow these steps to verify your installation, but you must first configure a queue manager as described in the next task of this scenario.

Note: Running the Postcard application on a non-default configuration automatically creates a queue called postcard on your queue manager. You can delete this queue after using the postcard application.

Results

You have installed WebSphere MQ and are ready to configure objects such as queues and queue managers.

If there were problems during installation, use the .log files in the C:\Documents and Settings*userID*\Local Settings\Temp directory, and the amqmsccw.txt and amqmjpse.txt files in the installation directory, to investigate. The default installation directory is C:\Program Files\IBM\WebSphere.

What to do next

Follow the instructions in "Configuring the JNDI namespace and administered objects" on page 27 to configure WebSphere MQ for use by the sample application.

Configuring the JNDI namespace and administered objects

Add an initial context to define the root of the JNDI namespace in which the administered objects are stored, then connect MQ Explorer to the initial context of the JNDI namespace. Define in the namespace the administered objects that the sample application can use to connect to WebSphere MQ.

About this task

Before an application can retrieve administered objects from a JNDI namespace, an administrator must first create the administered objects. The administrator can use the WebSphere MQ JMS administration tool or WebSphere MQ Explorer to create and maintain administered objects in a JNDI namespace.

This scenario demonstrates the following aspects of configuring WebSphere MQ:

- Use of a JNDI namespace located in a local file system. A file system is used, because it is the simplest JNDI mechanism for a sample scenario.

> **What else might I do or be interested in?**
> The JNDI namespace can be on a file system, Lightweight Directory Access Protocol (LDAP) server, or on another JNDI implementation. If you want to use a JNDI namespace on an LDAP server or another JNDI implementation, you must configure the JNDI namespace and modify the sample application to reference the JNDI namespace, as required by the implementation.

- Use of the WebSphere MQ Explorer to create administered objects in the JNDI namespace. The JMS application can look up the administered objects to connect to WebSphere MQ and access destinations with which to send or receive messages.

  Remember: In this example, you use the JMS Administered Objects functions of WebSphere MQ Explorer. The JMS administration support in WebSphere MQ Explorer is only available if you have installed the required WebSphere MQ Fix Pack.

In this task, you create the following objects in WebSphere MQ:

WebSphere MQ

Queue manager
sampleQM

Queue Q1

JMS

Connection
factory
<queue manager
sampleQM>

Destination
<queue Q1>

**WebSphere MQ
JNDI namespace**

Connection
factory
<queue manager
sampleQM>

Destination
<queue Q1>
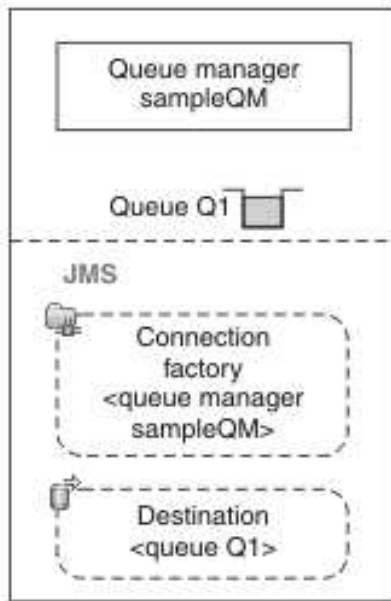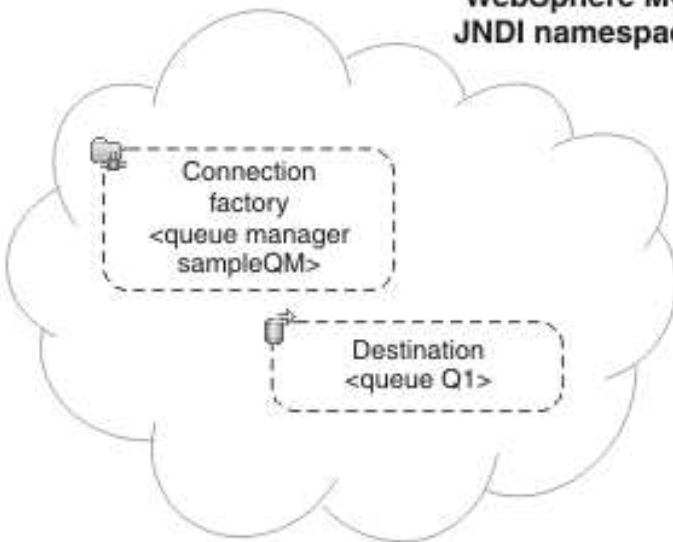
Legend

< ... > Configuration property

Figure 5. Objects created in WebSphere MQ

Procedure

1. Create the JNDI namespace folder in the local file system. Use Windows facilities to create the folder `C:\JNDI-Directory`

> **What else might I do or be interested in?**
>
> It is convenient to create the JNDI namespace folder before continuing with the sample. Alternatively, you can create the folder later when prompted for "Where is the JNDI namespace located?".

2. Start WebSphere MQ Explorer, if it is not already started, by clicking **Start** > **All Programs** > **IBM WebSphere MQ** > **WebSphere MQ Explorer**. If WebSphere MQ Explorer is running and displaying the Welcome page, close the Welcome page to start administering WebSphere MQ objects.

3. Create a queue manager to use for the sample application.

   a. Right click **Queue Managers** then select **New** > **Queue Manager....** The Create Queue Manager wizard starts.

   b. In the **Queue manager name** field type `sampleQM`

   > **What else might I do or be interested in?**
   >
   > You can choose a different name for the queue manager, but you must remember to use it in later configuration steps, in place of `sampleQM`.
   >
   > **Note:** The name must have no more 48 characters, from the following set:
   > - Uppercase or lowercase A-Z
   > - Numerics 0-9
   > - Period (.)
   > - Forward slash (/)
   > - Underscore (_)
   > - Percent sign (%)
   >
   > Names are case-sensitive. Objects of the same type must have different names. For example two queues cannot have the same name, but a queue manager and a queue can.

   c. In the **Dead-letter queue** field type `SYSTEM.DEAD.LETTER.QUEUE` This field is the name of the dead-letter queue that is automatically created when you create the queue manager.

   > **Why am I doing this?**
   >
   > A dead-letter queue stores messages that cannot be delivered to their correct destination, for example because the queue is full. All queue managers should have an associated dead-letter queue.

   d. Leave the other fields empty and click **Finish**, or if that button is disabled, click **Next**. The **Finish** button is disabled if the port number conflicts with an existing queue manager, for example the queue manager that is created as part of the default configuration. You must continue through the wizard to change the default port number.

   e. If you clicked **Next**, continue to accept the defaults and click **Next** on each page until you get to the final page of the wizard, when the **Finish** button becomes available. Change the specified port number, for example to 1415, then click **Finish**.

WebSphere MQ displays a dialog window while the queue manager is created and started.

4. Add an initial context for the *JNDI namespace* then connect WebSphere MQ Explorer to that context

a. In the MQ Explorer - Navigator pane, right-click **JMS Administered Objects**, then select **Add Initial Context...**.

   Tip: If **JMS Administered Objects** is not visible in the MQ Explorer - Navigator pane, install the required Fix Pack then return to this step. The **Add Initial Context...** action displays the "Connection details" page.

b. Under "Where is the JNDI namespace located?", select the **File system** check box.

c. In the **Bindings directory** field, type `C:\JNDI-Directory`.

> **Tip:** If the `C:\JNDI-Directory` directory does not exist on your workstation, the window displays the message `Specified location does not exist or is not readable`. To create the `JNDI-Directory` folder, you can click **Browse...** to open a file system window, navigate to `Local Disk (C:)`, then click **Make New Folder**. Finally, click **OK**.
>
> Click **Next**.

d. On the User preferences page, leave the default settings.

┌─ **Why am I doing this?** ─────────────────────────────────────┐
│ • **Context nickname**: The location of the JNDI namespace will be used │
│   as the nickname to display the initial context in WebSphere MQ │
│   Explorer. │
│ • **Connect immediately on finish**: This option connects WebSphere │
│   MQ Explorer to the JNDI namespace when you finish creating the │
│   initial context so that you can create administered objects │
│   immediately. │
│ • **Automatically reconnect to context on startup**: This option is not │
│   selected because usually you do not need WebSphere MQ Explorer │
│   to automatically reconnect to the initial context every time that you │
│   close and reopen WebSphere MQ Explorer. │
└──┘

┌─ **What else might I do or be interested in?** ────────────────┐
│ If you routinely use WebSphere MQ Explorer to create or manage │
│ administered objects in the JNDI namespace, you can select the │
│ **Automatically reconnect to context on startup** check box to cause │
│ WebSphere MQ Explorer to automatically reconnect to the initial │
│ context whenever WebSphere MQ Explorer is started. This option │
│ saves you having to manually connect WebSphere MQ Explorer to the │
│ initial context. │
└──┘

Click **Finish** to create and display the initial context.

5. Create a connection factory administered object.

┌─ **Why am I doing this?** ─────────────────────────────────────┐
│ A connection factory administered object defines a set of standard │
│ configuration properties for connections. An application uses a connection │
│ factory to create a connection to WebSphere MQ. │
└──┘

a. In the MQ Explorer - Navigator pane, expand **JMS Administered Objects**, then expand the initial context, labeled **file:/C:/JNDI-Directory/**.

> **Tip:** If there are no folders, such as **Connection Factories**, visible under the initial context, ensure that you have connected to that context. For example, right-click the initial context, and then click **Connect**.

b. Right-click **Connection Factories**, then select **New** > **Connection Factory...**. This action displays the New Connection Factory wizard

c. In the **Name** field, type `myCF`

> **Why am I doing this?**
>
> The sample JMS application contains code that looks up a connection factory with the name myCF. If you must use a different name, you must modify the application to match.WebSphere MQ is used for the messaging provider because the sample application uses point-to-point messaging

Click **Next**.

d. Leave the type of connection factory as **Connection Factory** because this option is the most flexible for general JMS use.

> **Why am I doing this?**
>
> A domain-independent connection factory enables JMS applications to use both point-to-point messaging and publish/subscribe messaging, especially if you want the JMS application to perform both types of messaging under the same transaction.

> **What else might I do or be interested in?**
>
> If a JMS application is intended to use only point-to-point messaging or only publish/subscribe messaging, you can select the specific messaging domain when you create the connection factory and a domain-specific (queue or topic) connection factory is created.

e. Leave the **Support for XA transactions** check box as cleared.

> **Why am I doing this?**
>
> The sample application does not use XA-compliant transactions.

> **What else might I do or be interested in?**
>
> WebSphere MQ JMS supports XA-compliant transactions in bindings mode. If you want the sample application to use XA-compliant transactions, you must modify the sample application.

Click **Next**.

f. Leave the transport as **Bindings**.

> **Why am I doing this?**
>
> The sample JMS application that uses the connection factory runs on the same computer as the queue manager, so can use Bindings mode transport. This option means that the JMS application connects directly to the queue manager, and offers a performance advantage over the alternative client mode.

Restriction: If you are trying this example on Windows 64, change the transport from Bindings to Client because the sample application does not work in bindings mode on a 64-bit Windows platform.

> **Why am I doing this?**
> WebSphere MQ supports Java/JMS in Clients mode only on Windows 64-bit platform (i.e. Bindings mode is not supported).

Click **Next**, leave the **Create with attributes like an existing connection factory** check box blank, then click **Next**.

g. On the Change properties page, select **Connection** from the menu on the left. In the Connection pane use the **Select...** button for **Base queue manager** to select sampleQM as the base queue manager.

> **Why am I doing this?**
> The base queue manager is the queue manager that the application will connect to. Leave this value blank if you want the application to be able to connect to more than one queue manager.

Restriction: If you are trying this example on Windows 64, and changed the transport from Bindings to Client, the host name field defaults to `localhost` and the Port defaults to 1414. Change the port number to 1415, to match the port that you configured in step 3 on page 29 for the sampleQM queue manager.

> **Why am I doing this?**
> When creating a connection factory with Client transport, you must specify the host name and the port number of the queue manager. In step 3 on page 29, you created the sampleQM queue manager on this workstation (identified by "localhost") and configured that queue manager with the port number 1415.

h. Click **Finish**. WebSphere MQ displays a dialog window to show that the object was created successfully. Click **OK** to close the dialog window.

The new connection factory is now visible in the **Connection Factories** section under the Initial Context **JMS Administered Objects** > **file:/C:/JNDI-Directory/**.

6. Create a destination administered object for the message queue.

> **Why am I doing this?**
> A destination administered object identifies the WebSphere MQ queue that applications send messages to, or from which an application receives messages, or both. An application looks up the destination in the JNDI namespace to create a connection to the WebSphere MQ queue.

> **What else might I do or be interested in?**
> In publish/subscribe messaging, the destination identifies a topic rather than a queue.

a. In the MQ Explorer - Navigator pane, expand **JMS Administered Objects**, then expand the initial context, labeled **file:/C:/JNDI-Directory/**.
b. Right-click **Destinations**, then select **New** > **Destination...**. The New Destination wizard is displayed.
c. In the **Name** field, type myQueue, then click **Next**.
d. Leave **Type** as **Queue**.

> **Why am I doing this?**
> The sample JMS application contains code that looks up a destination with the name myQueue. The sample JMS application uses point-to-point messaging, so requires a destination of type queue. Destinations of type topic are used for publish/subscribe messaging.

Click **Next**.

Click **Next** again.

e. On the "Change properties" page, click **Select...** next to **Queue manager**. Select the sampleQM queue manager that you created earlier then click **OK**.
f. In the **Queue** field, type Q1 as the name of the WebSphere MQ queue.

> **Why am I doing this?**
> The destination object needs a matching WebSphere MQ queue.

> **What else might I do or be interested in?**
> You can choose a different name for the queue, but you must remember to use it in later configuration steps, in place of Q1.
>
> **Note:** The name must have no more 48 characters, from the following set:
> - Uppercase or lowercase A-Z
> - Numerics 0-9
> - Period (.)
> - Forward slash (/)
> - Underscore (_)
> - Percent sign (%)
>
> Names are case-sensitive. Objects of the same type must have different names. For example two queues cannot have the same name, but a queue manager and a queue can.

g. Click **Finish**. WebSphere MQ displays a dialog window to show that the object was created successfully. Click **OK** to close the dialog window.

The new destination is now visible in the **Destinations** section under the Initial Context **JMS Administered Objects** > **file:/C:/JNDI-Directory/**.

7. Create the WebSphere MQ Queue for the JMS destination.

> **Why am I doing this?**
> The destination administered object created earlier represents a WebSphere MQ queue. This queue is where the JMS messages are stored.

a. In the MQ Explorer - Navigator pane, expand the **sampleQM** queue manager, right-click **Queues**, then select **New** > **Local Queue...**.

b. Type Q1 as the name of the WebSphere MQ queue.

> **Why am I doing this?**
> The queue name must match the name of the WebSphere MQ queue that you specified when you created the destination administered object earlier.

c. Click **Finish** to create the WebSphere MQ Queue. WebSphere MQ displays a dialog window with the message that the object was created successfully.

The new queue is now visible in the **Queues** section under the queue manager.

Results

You have now created the WebSphere MQ objects that are required to use the sample JMS application.

What to do next

Follow the steps in "Testing the WebSphere MQ Version 6 configuration" to verify your configuration.

Related information:

➡ WebSphere MQ V6 documentation

Testing the WebSphere MQ Version 6 configuration

Run the sample JMS application to send and receive messages through WebSphere MQ, and verify that you configured WebSphere MQ correctly for use with the sample application.

Before you begin

Download the sample application package. Click the following link and save the file to the machine that hosts WebSphere Application Server: WAS-WMQ-101-V6.zipWAS-WMQ-101-V6.zip (in online information center), then extract the contents. The package contains a sample JMS application .jar file and batch files for running the application.

- The sample WAS-WMQ-101-V6.jar file and the v6.cmd files must be in the same directory.
- The v6.cmd files use environment variables to set the class path for running the JMS application. When running the JMS application, if you see a Java java.lang.NoClassDefFoundError, you might need to adjust the class path line in the command file.

Restriction: The sample application does not work in bindings mode on a 64-bit Windows platform. To run on a Windows 64 platform, ensure that you have created the connection factory with Client transport.

About this task

The JMS application comprises a requester client, which sends the initial message, and a responder client, which receives the message and sends a reply. The supplied batch files complete the following actions:

- `runresponderv6.cmd` opens a command prompt window in which the responder client starts then waits for a message.
- `runrequesterv6.cmd` opens a separate command prompt window in which the requester client starts then sends a request message and receives a reply.

With two command prompt windows, you can see the actions of the requester and responder separately and more clearly.

Procedure

1. Start WebSphere MQ Explorer, if it is not already started, by clicking **Start** > **All Programs** > **IBM WebSphere MQ** > **WebSphere MQ Explorer**. If WebSphere MQ Explorer is running and displaying the Welcome page, close the Welcome page to start administering WebSphere MQ objects.
2. Start the queue manager sampleQM , if it is not already started.
   a. In the Navigator view, expand the Queue Managers folder.
   b. Right-click the name of the queue manager, then click **Start**.
3. Double-click the `runresponderv6.cmd` file. In the command prompt window, labeled Responder window, the responder client starts then waits for a message.

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Created connection.

> Waiting for message.
```

4. Double-click the `runrequesterv6.cmd` file. In the Requester window, observe the requester messages. In the Responder window, observe the updated responder messages; the message it received (from the requester client) and the reply message that it sent.

Results

In the command prompt window, labeled Requester window, the requester client shows the connection status, the message it sent, then the reply message that it received from the responder client:

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Connection created.

> Sending stock request for 'BakedBeans'
> Sent Message ID=ID:414d5120514d5f4c33344c3238482020c3cd094d20002b02

> Received Message ID=ID:414d5120514d5f4c33344c3238482020c3cd094d20002902 for 'B
akedBeans - 15 tins in stock'

> Closing connection to QueueManager.
```

```
> Closed Connection.
---------------------------------------------------------
In this window, observe the messages sent through WebSphere MQ:
- The request message sent
- The reply message received
-----
When ready, press any key to close this window
Press any key to continue . . .
```

In the Responder window, observe the updated responder messages; the message it received (from the requester client) and the reply message that it sent:

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Created connection.

> Waiting for message.

> Received Message ID=ID:414d5120514d5f4c33344c3238482020c3cd094d20002b02 for 'B
akedBeans'

> Sending Reply Message 'BakedBeans - 15 tins in stock'
> Sent Message ID=ID:414d5120514d5f4c33344c3238482020c3cd094d20002902

> Closing connection to QueueManager.
> Closed connection.
---------------------------------------------------------
In this window, observe the updated responder messages
- The request message received (from the requester)
- The reply message sent
-----
When ready, press any key to close this window
Press any key to continue . . .
```

The messages shown in the two command windows verify that the requester and responder clients of the sample application can communicate with each other through WebSphere MQ.

You can close the two command prompt windows.

What to do next

Follow the instructions in "Installing WebSphere Application Server Version 6.1" to begin the WebSphere Application Server part of the scenario.

Installing WebSphere Application Server Version 6.1

Install WebSphere Application Server, using the graphical user interface to select the installation options and create the stand-alone application server profile required for this scenario, so that you are then ready to configure WebSphere Application Server to communicate with WebSphere MQ.

Before you begin

- You must have local administrator authority when you are installing. Define this authority through the Windows operating system facilities. The administrator ID must not contain spaces.
- Ensure that you have sufficient disk space, up to 2 GB for all components.

- Ensure that prerequisites and corequisites are at the required release levels. On the List of supported software for WebSphere Application Server V6.1 page, click the link for your platform to see information about supported operating systems, browsers, and hardware requirements.
- Download the IBM Update Installer for WebSphere Software package. You use this program to install updates to WebSphere Application Server. See Recommended fixes for WebSphere Application Server, and look under your release of WebSphere Application Server for a link to the Update Installer download page.

  Tip: Download the Version 7 Update Installer, which can be used with WebSphere Application Server Version 6.1 updates, and any future WebSphere Application Server Version 7 updates after you have completed the migration. Alternatively, if you prefer, you can download the latest Version 6.1 Update Installer.

  > **Why am I doing this?**
  > Early versions of the Update Installer, such as 6.1.0.0 and 6.1.0.1, cannot install newer fix packs. To install newer fix packs, you must use a Version 7 Update Installer or the latest Version 6.1. Update Installer.

- Download the latest WebSphere Application Server Version 6.1. fix pack `*.pak` file from IBM Support site for WebSphere Application Server. This scenario was tested with Fix Pack 35.

  Note: If your browser changes the download file extension from `.pak` to `.zip`, change the extension back to `.pak`.

For more details about requirements for installation, see the IBM Support pages.

About this task

This task describes the basic steps to install WebSphere Application Server 6.1 to the latest maintenance level on the Windows XP Professional (SP2 or later) operating system.

Tip: If you have Windows XP SP3 or later, the installation wizards display a message indicating that you do not have SP2; for example: `Detected Windows XP, but the following operating system patches are missing: Level: 2 Description: Service Pack 2`. You can ignore such messages.

Procedure

1. Insert the disk labeled WebSphere Application Server Network Deployment into the disk drive, or access the root directory of the downloaded Passport Advantage image on your hard disk.
2. Start the installation process by double-clicking the Launchpad icon.
3. On the Welcome page, click **Launch the installation wizard for WebSphere Application Server Network Deployment**. After a short delay, the installation wizard starts.
4. Follow the instructions in the wizard to move through the pages, choosing whether to install sample applications and language packs, and specifying an installation directory, until you reach the WebSphere Application Server environments page.

Note: Although you can install the sample applications and language packs at a later date, install them now if you might use them in the future. These features can be corrupted if you install them after applying maintenance.

5. On the WebSphere Application Server environments page, select the **Application server** option, then click **Next**.

> **Why am I doing this?**
> This option creates the simplest profile, for a stand-alone application server.

6. On the Enable Administrative Security page, choose whether to enable administrative security. If you accept the default option, to enable security, record the user name and password that you choose; without this information you will not be able to use the product.

> **Why am I doing this?**
> Administrative security activates the settings, such as the authentication of users, the use of Secure Sockets Layer (SSL), and the choice of user account repository, that protect your server from unauthorized users. Some environments, such as development systems, might not require security. However, in most environments enable administrative security to prevent unauthorized users from accessing the administrative console.

Click **Next**.

7. On the Installation Summary page, verify your choices, then click **Next** to install the product code. The installation wizard creates the uninstallation program and then displays a progress page that shows which components are being installed. This process might take several minutes.

8. The Installation results page is displayed. Examine the information on the page to check that there were no file system or other unusual errors while installing. If there were problems during installation, use the `logs/install/log.txt` file in the installation directory to investigate.

9. Clear the **Launch the First steps console** check box, then click **Finish** to close the installation wizard. Close the launchpad. You are now ready to install the fix pack.

   Note: If WebSphere Application Server is running, you cannot install the fix pack. If you must leave the task at this point and continue later, make sure that WebSphere Application Server is stopped before you continue. For example, if you restart the machine WebSphere Application Server starts automatically. To stop WebSphere Application Server, click **Start** > **All Programs** > **IBM WebSphere** > **Application Server Network Deployment V6.1** > **Profiles** > **AppSrv01** > **Stop the server**.

10. Unpackage the IBM Update Installer for WebSphere Software file into a temporary directory, then double-click the `UpdateInstaller\install.exe` file to start the Update Installer installation wizard.

11. Follow the instructions in the wizard to install the software, selecting the **Launch Update Installer for WebSphere Software on exit** option on the final page, which is displayed after installation completes. The Update Installer starts automatically when you click **Finish** to exit the wizard.

12. Follow the instructions in the Update Installer to move through the wizard until you reach the Maintenance Package Directory Selection page.
13. Click **Browse...**, select the directory where you stored the downloaded fix pack `*.pak` file, then click **Open**.

    Note: In this step you specify only the directory containing the fix pack file, not the fix pack file itself.
14. On the Available Maintenance Package to Install page, the fix pack `*.pak` file is already selected. Click **Next** to view the summary page, and **Next** again to install the fix pack.
15. When the fix pack installation has completed successfully, a success message is displayed.
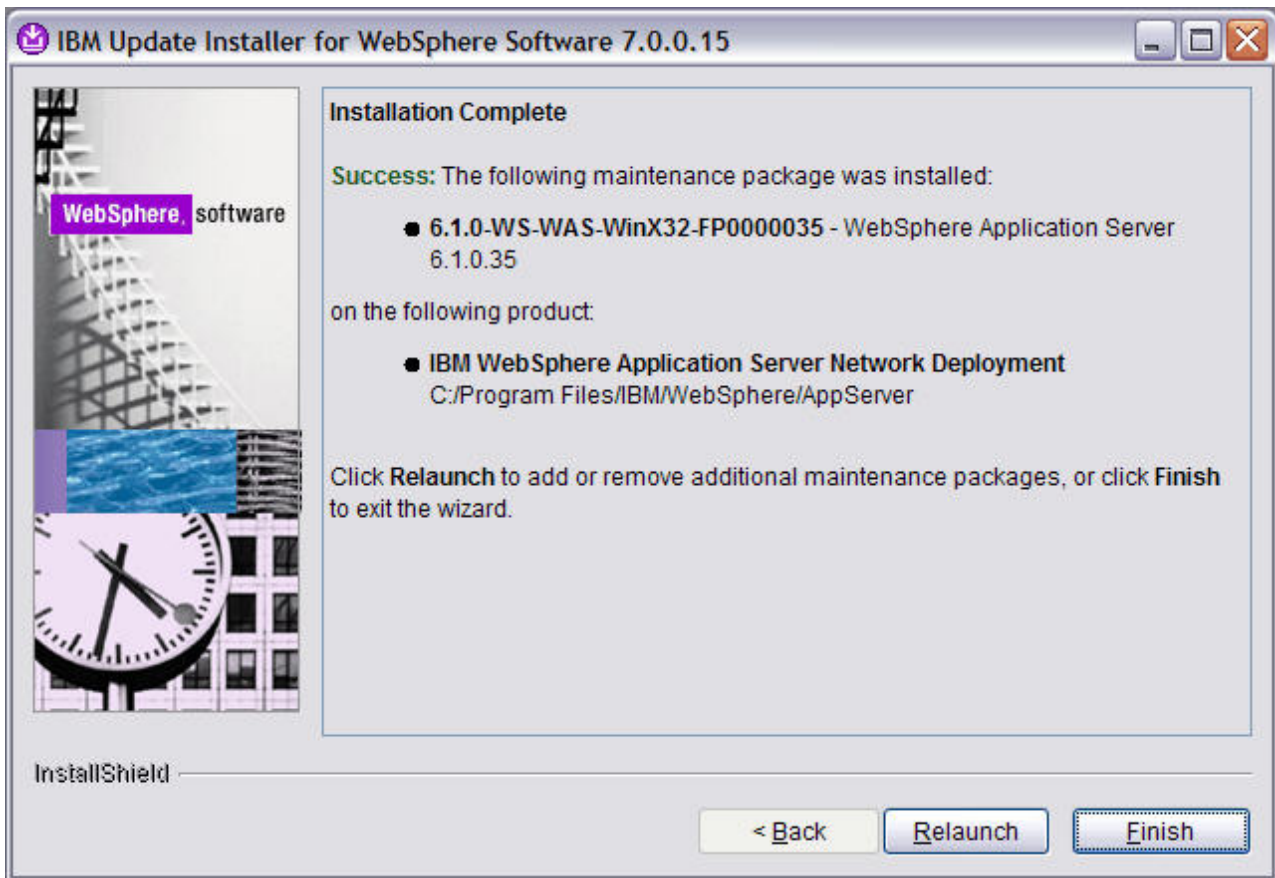
Figure 6. Update installation complete: Success window

Close the update installer, by clicking **Finish**.

Results

WebSphere Application Server is installed with the latest level of maintenance.

If you encountered a problem when installing WebSphere Application Server, see the topic Troubleshooting installation in the WebSphere Application Server information center, to resolve the issue.

If you encounter a problem when installing the fix pack, see the articles in the IBM Support Portal for WebSphere Application Server; for example:

http://www-01.ibm.com/support/docview.wss?uid=swg21268507

What to do next

Follow the instructions in "Configuring WebSphere Application Server Version 6.1"
to configure WebSphere Application Server to communicate with WebSphere MQ.

Configuring WebSphere Application Server Version 6.1

Create a listener port, connection factory, and queue for WebSphere Application
Server Version 6.1 applications to use to communicate with WebSphere MQ Version
6.0.

About this task

To use JMS messaging between WebSphere Application Server and WebSphere
MQ, you create the following objects in WebSphere Application Server.

* Listener port

> **Why am I doing this?**
> Needed to use a message-driven bean with WebSphere MQ as a JMS
> provider to WebSphere Application Server.

* Connection factory
* Queue (a type of JMS destination)

These objects are described in "Overview: Initial IT configuration" on page 6.

The following image shows these objects in WebSphere Application Server, and the
corresponding set of objects in WebSphere MQ that you created when you
configured WebSphere MQ for use by the sample application. When you create one
of these objects in WebSphere Application Server, it is stored in the WebSphere
Application Server JNDI namespace.
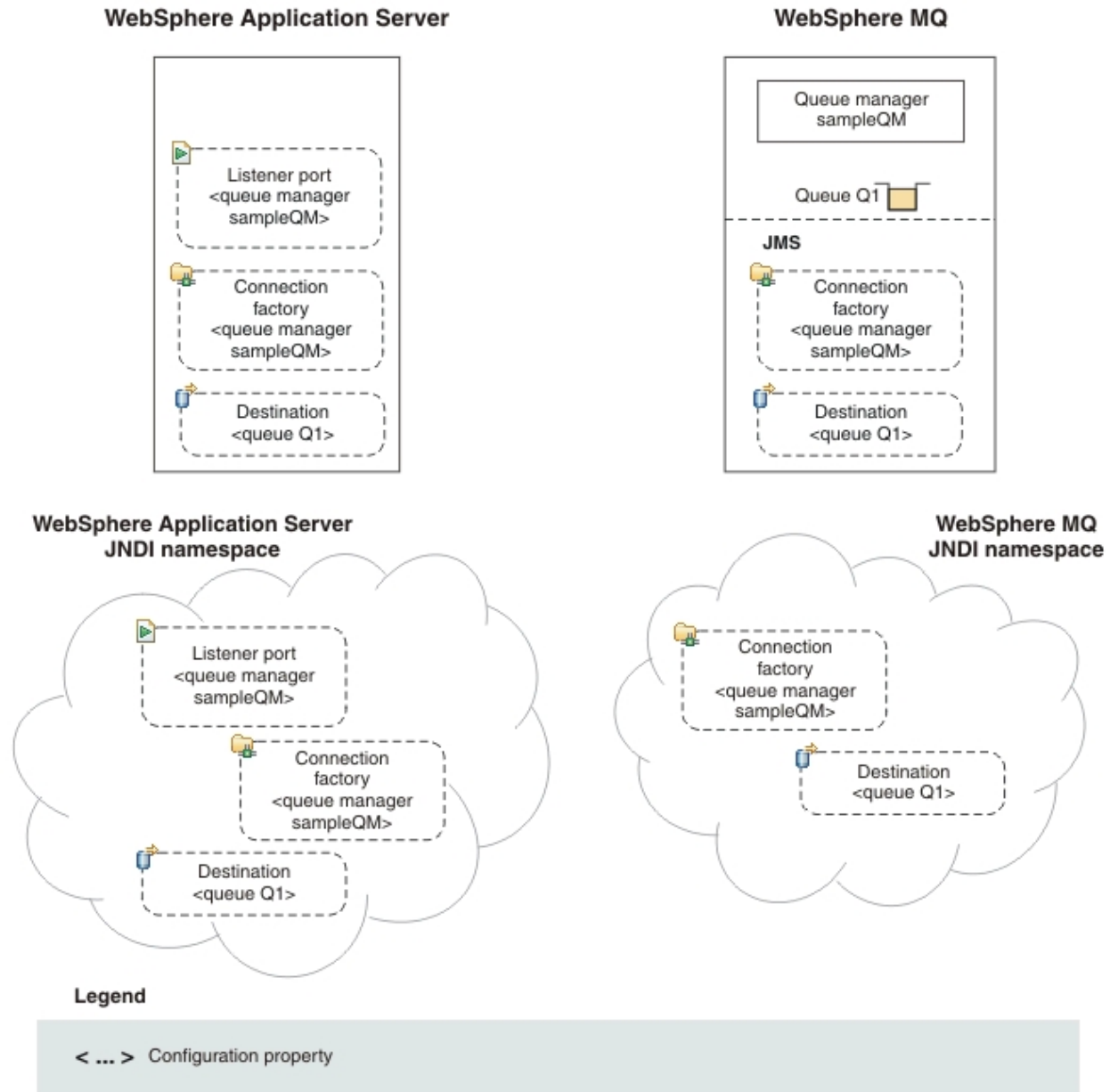
Figure 7. Objects created in WebSphere Application Server, and the corresponding objects in WebSphere MQ

Procedure

1. If WebSphere Application Server is not already started, click **Start** > **All Programs** > **IBM WebSphere** > **Application Server Network Deployment V6.1** > **Profiles** > **AppSrv01** > **Start the server**. A command window is displayed until the server is started; this process might take a few minutes.

2. Log on to the administrative console. If the console is not already started, click **Start** > **All Programs** > **IBM WebSphere** > **Application Server Network Deployment V6.1** > **Profiles** > **AppSrv01** > **Administrative console**.

   Note: You must log on even if you did not enable administrative security when you installed the product. If you did not enable administrative security, the user ID is used only to distinguish changes that you make in the administrative console from changes made by other users.

Tip: You can check that you have the expected maintenance version of WebSphere Application Server. The version level is displayed on the welcome page, in the Welcome pane and with more detail in the pane labelled About this Integrated Solutions Console; for example:

```
Integrated Solutions Console, 6.1.0.35
Build Number: cf351044.07
Build Date: 11/5/10
---------------------------------------
```

3. Create a listener port.

> **Why am I doing this?**
> If you want to use message-driven beans with a messaging provider that does not have a JCA 1.5 resource adapter (for example the WebSphere MQ messaging provider), you cannot use activation specifications and therefore you must configure your beans against a listener port.

a. In the administrative console, click **Servers** > **Application Servers** > *server_name* > **[Communications] Messaging** > **Message Listener Service** > **[Additional Properties] Listener Ports**.

b. Click **New**.

c. Specify the following required properties for the listener port:

   Name   A name of your choice; for example, `PiShopReplyMDBListener`

   Initial state
   > Started

   Connection factory JNDI name
   > The JNDI name for the JMS connection factory to be used by the listener port: `jms/PiShopReplyCF`.
   >
   > **Tip:** This name must match what you specify later when you configure the connection factory.

   Destination JNDI name
   > The JNDI name for the destination to be used by the listener port:`jms/wasQueue`.
   >
   > **Tip:** This name must match what you specify later when you configure the queue.

d. Click **OK**.

4. Create a connection factory.

> **Why am I doing this?**
> A JMS connection factory contains information about how to create a connection. When an application needs a JMS connection, the factory creates a connection instance. The connection factory is used for outbound messages from the MDB, whereas the listener port is used for inbound messages.

a. In the administrative console, click **Resources** > **JMS** > **Connection
   factories**.

b. Ensure that the scope is set to **Cell=*cell_name*,** then click **New**.

c. Select **WebSphere MQ messaging provider**, then click **OK**. The Connection
   Factory Settings page is displayed.

d. On the Connection Factory Settings page, under General Properties,
   complete the required fields as follows:

Name   Specify a name of your choice; for example: `PiShopReplyCF`

JNDI name
          Specify `jms/PiShopReplyCF`

          Tip: This name must match what you specified earlier when you
          configured the listener port.

Queue manager
          Specify `sampleQM`

Transport type
          Leave as the default setting, **BINDINGS**.

e. Leave the default settings for all other fields on the Connection Factory
   Settings page, then click **OK**

5. Create a queue.

> **Why am I doing this?**
> A queue is a type of JMS destination, used for point-to-point messaging. A destination identifies the messaging target or source.

> **What else might I do or be interested in?**
> In a publish/subscribe scenario, you create a topic instead of a queue.

   a. In the administrative console, click **Resources** > **JMS** > **Queues**.

   b. Ensure that the scope is set to **Cell=*cell_name*,** then click **New**.

   c. Select **WebSphere MQ messaging provider** then click **OK**.

   d. Under General Properties, enter the following values for the required fields.

      Name A name of your choice; for example: `wasQueue`

           This name is used to display the queue in the administrative console.

      JNDI name
          `jms/wasQueue`

          The JNDI name is used to reference this queue in the WebSphere Application Server JNDI namespace.

          Tip: This name must match what you specified earlier when you configured the listener port.

      Base queue name
          `Q1`

          This value is the administrative name of the queue in WebSphere MQ that you want to communicate with. This is different from the JNDI name of the queue.

> **What else might I do or be interested in?**
> Specify a **Queue manager or Queue-sharing group name** if you want WebSphere Application Server to send messages to a queue that is on a different queue manager from the one connected to by the listener port or connection factory. The queue managers must be configured to communicate with each other, as described in the topic ic10240_ "What is intercommunication?" in the WebSphere MQ V6 downloadable Information Center.

   e. Click **OK**

6. Configure the WebSphere MQ messaging provider with native libraries information.

> **Why am I doing this?**
>
> When you created the connection factory you specified a transport mode of **Bindings**. To use bindings mode, the WebSphere MQ messaging provider within WebSphere Application Server requires native libraries, for example `.dll` or `.so` files, from WebSphere MQ. You must configure the WebSphere Application Server environment variable MQ_INSTALL_ROOT to the directory where WebSphere MQ is installed.

    a. In the administrative console, click **Environment** > **WebSphere variables**.

    b. Make sure that the **Scope** property is set to Node. The Scope value should contain only `Node=nodename`

    c. In the table of variables, make sure that the value for MQ_INSTALL_ROOT is the full path to the directory where WebSphere MQ is installed. For a default installation of WebSphere MQ, the path is `C:\Program Files\IBM\WebSphere MQ`.

       If you need to change the value, click the MQ_INSTALL_ROOT link, type the correct value into the Value field, then click **OK** to return to the table of variables.

7. Click the **Save** link in the Messages section at the top of the pane to save your changes to the master configuration.

8. Stop the application server. Click **Start** > **All Programs** > **IBM WebSphere** > **Application Server Network Deployment v6.1** > **Profiles** > **AppSrv01** > **Stop the server**, then wait for the command window to disappear.

9. Start the application server. Click **Start** > **All Programs** > **IBM WebSphere** > **Application Server Network Deployment v6.1** > **Profiles** > **AppSrv01** > **Start the server**.

Results

You have configured WebSphere Application Server with the necessary objects to enable communication with WebSphere MQ.

What to do next

Follow the instructions in "Deploying the sample MDB application to WebSphere Application Server Version 6.1" to deploy the sample MDB application.

Deploying the sample MDB application to WebSphere Application Server Version 6.1

Using the WebSphere Application Server administrative console, install the Version 6 sample message driven bean (MDB) application so that you can use it to verify that WebSphere Application Server is communicating with WebSphere MQ. When you install the MDB application, you associate it with the listener port name and connection factory JNDI name that you specified when you configured WebSphere Application Server.

Before you begin

Before starting this task, download the Version 6 sample MDB application. Click the following link and save the file to the machine that hosts WebSphere

Application Server: sampleMDBv6.earsampleMDBv6.ear (in online information center).

About this task

The sample MDB application, `sampleMDBv6.ear`, is designed to use the objects that you created earlier in WebSphere Application Server. The MDB application uses these objects to send a message to WebSphere MQ, for receipt by the sample JMS application requester client that you used in "Testing the WebSphere MQ Version 6 configuration" on page 35.

The following diagram shows a message traveling from the sample JMS client to WebSphere MQ, and then on to WebSphere Application Server, where it is passed to the MDB running within WebSphere Application Server. A response message travels from the MDB to WebSphere MQ, and then on to the JMS client.
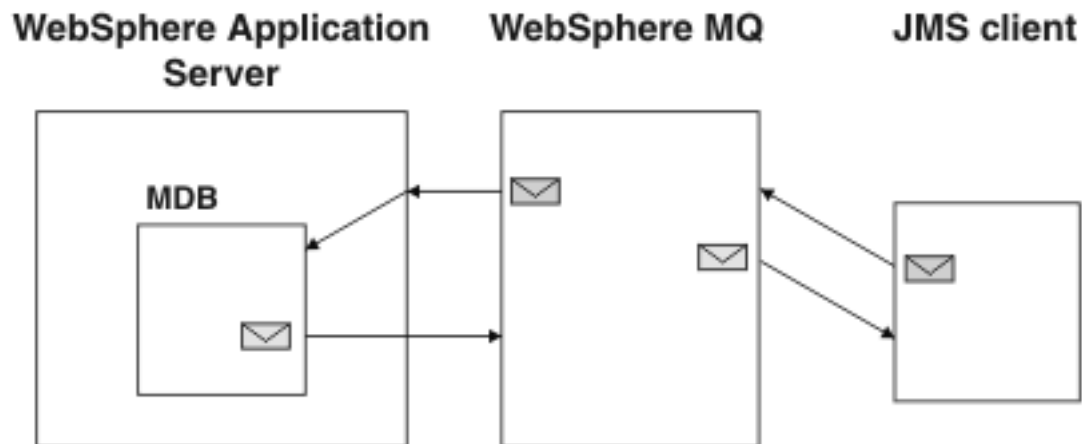
Figure 8. A message traveling from the sample JMS client to WebSphere MQ, then onward to the MDB on WebSphere Application Server

Procedure

1. If WebSphere Application Server is not already started, click **Start** > **All Programs** > **IBM WebSphere** > **Application Server Network Deployment V6.1** > **Profiles** > **AppSrv01** > **Start the server**.
2. Click **Start** > **All Programs** > **IBM WebSphere** > **Application Server Network Deployment V6.1** > **Profiles** > **AppSrv01** > **Administrative console** to start the administrative console.
3. Click **Applications** > **Install New Application**.
4. On the Preparing for the application installation page, select **Local file system**, then browse to the folder where you downloaded the sample MDB application, `sampleMDBv6.ear`.
   a. Select the application then click **Open**.
   b. Leave all other fields unchanged and click **Next**.

> **What else might I do or be interested in?**
> Unless you specify otherwise, the name of the installed application is derived from the name of the MDB EAR file, which in the case of this scenario is `sampleMDBv6.ear`. If you prefer, you can give the application a different name. To do this, click the **Step 1** link to go to the Select installation options page then specify your chosen **Application name**.

5. On the Install New Application page, click the **Step 3** link to go to the Bind listeners for message-driven beans page.

> **What else might I do or be interested in?**
> To save having to specify the binding whenever you deploy the MDB EAR file, you can bind the MDB to a listener port name using an assembly tool. For more information, see the topic Preparing for application installation binding settings in the WebSphere Application Server information center.

6. On the Bind listeners for message-driven beans page specify the listener port name to which the sample MDB application must be bound.

> **Why am I doing this?**
> An MDB must be associated with either a listener port name or activation specification JNDI name. Since this stage of this scenario is using a listener port, the MDB must be bound to the listener port name

   a. Under **Listener Bindings**, select **Listener port**.

      Tip: You do not need to select the EJB module, was61MDB, because it is the only EJB module in the EAR file.
   b. Type the **Name** of the listener port that you created as described in "Configuring WebSphere Application Server Version 6.1" on page 41: `PiShopReplyMDBListener`.
   c. Click **Next**.
7. On the Map resource references to resources page, map the connection factory resource reference defined in the sample MDB application to the JNDI name of the connection factory.

> **Why am I doing this?**
> Each resource reference that is defined in an application must be mapped to an actual resource that has been configured for use by the application. A resource reference allows an application to access a resource by using a logical name rather than the actual name that is defined for the resource in the runtime environment. Resource references eliminate the need to change your application code when you change resource runtime configurations.

   a. Under **Target Resource JNDI Name**, click **Browse** to display a list of resources that are available to be used to bind the resource reference of the MDB.

> **Tip:** For this scenario, the resource that you need to select is the connection factory PiShopReplyCF that you created as described in "Configuring WebSphere Application Server Version 6.1" on page 41.

    b. Select `PiShopReplyCF` then click **Apply**.

    c. Leave all other fields unchanged and click **Next**.

8. On the Summary page, click **Finish**. The program displays messages to indicate that the application is being installed.

9. When the application installs successfully, click the **Save** link that is displayed at the end of the messages, to save your changes to the master configuration. If the application does not install successfully, examine the messages to identify why the installation failed. Correct the problems as needed and try installing the application again.

Results

You have deployed the MDB application, which is now visible in the Enterprise Applications page. To view this page, click **Applications** > **Enterprise Applications**.

What to do next

Follow the instructions in "Verifying the sample IT configuration" to run the sample applications and verify that messages can be passed between the two products.

Verifying the sample IT configuration

Use the Version 6 sample JMS and message driven bean (MDB) applications to send and receive messages so that you can verify that WebSphere MQ and WebSphere Application Server can communicate with each other.

Before you begin

You must have configured WebSphere Application Server and WebSphere MQ as described in "Configuring WebSphere Application Server Version 6.1" on page 41 and "Configuring the JNDI namespace and administered objects" on page 27.

About this task

In "Testing the WebSphere MQ Version 6 configuration" on page 35, you ran the supplied JMS sample application to verify that the requester and responder clients of the application could communicate through WebSphere MQ. In "Deploying the sample MDB application to WebSphere Application Server Version 6.1" on page 46, you installed an MDB application. In this task, you run the requester application as before, but this time the reply comes from the MDB application instead of the previous responder application, verifying that messages are being passed between WebSphere MQ and WebSphere Application Server.

WebSphere Application Server

WebSphere MQ

JMS Client

MDB

Listener port
<connection factory>
<destination>

Connection
factory
<queue manager
sampleQM>

Connection
factory
<queue manager
sampleQM>

Listener port
<connection factory>
<destination>

Destination
<queue Q1>

Destination
<queue Q1>

Queue manager
sampleQM

Queue Q1

JMS

Connection
factory
<queue manager
sampleQM>

Destination
<queue Q1>

Q1

Connection
factory
<queue manager
sampleQM>

Destination
<queue Q1>

**WebSphere Application Server
JNDI namespace**

Listener port
<connection factory>
<destination>

Connection
factory
<queue manager
sampleQM>

Destination
<queue Q1>

**WebSphere MQ
JNDI namespace**

Connection
factory
<queue manager
sampleQM>

Destination
<queue Q1>

Legend

< ... > Configuration property

Procedure

1. Start WebSphere MQ Explorer, if it is not already started, by clicking **Start** >
   All Programs > **IBM WebSphere MQ** > **WebSphere MQ Explorer**. If
   WebSphere MQ Explorer is running and displaying the Welcome page, close
   the Welcome page to start administering WebSphere MQ objects.
2. Start the queue manager sampleQM, if it is not already started.
   a. In the Navigator view, expand the Queue Managers folder.
   b. Right-click the name of the queue manager, then click **Start**.
3. If WebSphere Application Server is not already started, click **Start** > **All
   Programs** > **IBM WebSphere** > **Application Server Network Deployment V6.1**
   > **Profiles** > **AppSrv01** > **Start the server**.
4. Click **Start** > **All Programs** > **IBM WebSphere** > **Application Server Network
   Deployment V6.1** > **Profiles** > **AppSrv01** > **Administrative console** then log in
   to the administrative console.

5. Check the status of the listener port PiShopReplyMDBListener then, if it is not already started, start it.

   a. In the administrative console, click **Servers** > **Application Servers** > *server_name* > **[Communications] Messaging** > **Message Listener Service** > **Listener Ports**.

   b. Check whether the status of the listener port is started. If listener port is running, the status is shown as a green arrow. If the listener port is not running, the status is shown as a red cross.

   c. If the listener port is not already started, select it then click **Start**. The status of the listener port changes to a green arrow.

6. Check whether the Version 6 sample MDB application is already running then, if it is not running, start it.

   a. Click **Applications** > **Enterprise Applications** to display a list of installed applications.

   b. Check whether the application status of `sampleMDBv6` is started. If `sampleMDBv6` is running, the application status is shown as a green arrow. If `sampleMDBv6` is not running, the application status is shown as a red cross.

   c. If `sampleMDBv6` is not already running, select it then click **Start**. The application status changes to a green arrow. The MDB application is now waiting to receive a message.

   If you see an error message similar to the following message, there might be a mismatch between your WebSphere Application Server configuration and the information contained in the sample application. Check the WebSphere Application Server error logs in *install_directory*\profiles\AppSrv01\ logs\server1 for more information.

```
Error sampleMDB failed to start. Check the logs for server server1 on node
    mymachineNode01 for details.
Error An error occurred while starting sampleMDBv6. Check the logs for
    server server1 on node mymachineNode01 for more information.
```

7. Run the `runrequesterv6.cmd` batch file In Windows Explorer, navigate to the folder to which you downloaded the sample applications, then double-click the `runrequesterv6.cmd` batch file in the sample package. This command file opens a Command Prompt window then runs the sample JMS requester client, which sends a message to WebSphere MQ. The `runrequesterv6.cmd` file uses environment variables to set the class path for running the JMS application. If you see a Java `java.lang.NoClassDefFoundError`, you might need to adjust the class path line in the command file.

Results

The sample requester application sends the same request message as before, but the response now comes from the MDB application. The following output, showing sent and received messages, is displayed in the requester application Command Prompt window:

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Connection created.

> Sending stock request for 'BakedBeans'
> Sent Message ID=ID:414d5120514d5f574153494e5354414c423fe14c20010602

> Received Message ID=ID:414d512073616d706c65514d202020209468684e20001204 for 'From
```

```
V6 MDB: BakedBeans - 6 tins in stock. More available on V7 !'

> Closing connection to QueueManager.
> Closed Connection.
```

The MDB application also adds a message to the server SystemOut log at
install_directory\profiles\AppSrv01\logs\server1\SystemOut.log:

```
... ApplicationMg A   WSVR0221I: Application started: sampleMDBv6
...
... SystemOut      O  sampleMDBv6 is processing messages.
```

If you see errors similar to the following error in the WebSphere Application Server logs, check that the name of the queue in WebSphere Application Server matches the administrative name (not the JNDI name) of the queue in WebSphere MQ:

```
WebSphere MQ call failed with compcode '2' ('MQCC_FAILED') reason '2085'
    ('MQRC_UNKNOWN_OBJECT_NAME')

com.ibm.msg.client.jms.DetailedInvalidDestinationException: JMSWMQ2008:
    Failed to open MQ queue 'myQueue'. JMS attempted to perform an MQOPEN,
    but WebSphere MQ reported an error. Use the linked exception to determine
    the cause of this error. Check that the specified queue and queue manager
    are defined correctly.
```

Note: If you update the WebSphere Application Server configuration you must restart the application server for the changes to take effect.

You have finished implementing the solution, and verified that WebSphere Application Server can connect to WebSphere MQ for the successful transmission of messages.

Optional: If you would like to show that the message received through WebSphere MQ did come from the MDB on WebSphere Application Server, you can stop the MDB then rerun the requester application, as follows:

1. Click **Applications** > **Enterprise Applications** to display a list of installed applications.

2. Check whether the application status of sampleMDBv6 is started.

3. If sampleMDBv6 is running, select it then click **Stop**.

   The application status changes to a red cross.

4. Run the runrequesterv6.cmd batch file. In Windows Explorer, navigate to the folder to which you downloaded the sample applications, then double-click the runrequesterv6.cmd batch file in the sample package.

   The requester application does not complete, leaving the application window open in a suspended state waiting for the MDB:

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Connection created.

> Sending stock request for 'BakedBeans'
> Sent Message ID=ID:414d512073616d706c65514d202020206e005c4e2000b902
```

5. If you now start the MDB (as described in step 6 on page 51 of the main procedure), the response message is received:

```
> Received Message ID=ID:414d512073616d706c65514d202020209468684e20001204 for 'From
V6 MDB: BakedBeans - 6 tins in stock. More available on V7 !'

> Closing connection to QueueManager.
> Closed Connection.
```

Tip: If the MDB is left running, it will respond every time the requester application is started. The MDB listens for a message to be put on the queue, and is coded to send a response message to whichever requester put the message onto the queue.

Option 1: Migrating WebSphere Application Server before WebSphere MQ

In Option 1, you first migrate your WebSphere Application Server Version 6 configuration to Version 8.5 and use the Version 6 sample applications to check that your migrated configuration can still communicate with WebSphere MQ, which is still at Version 6. You then migrate WebSphere MQ to Version 7.5 and use the sample Version 7 applications to check that messages can still be passed between WebSphere MQ and WebSphere Application Server.

Before you begin

The starting point for this scenario is the sample Version 6 IT configuration described in "Overview: Initial IT configuration" on page 6.
- If you have not already created the sample Version 6 IT configuration, complete the tasks described in "Creating a sample initial Version 6 IT configuration" on page 20.
- If you have already completed "Option 2: Migrating WebSphere MQ before WebSphere Application Server" on page 83, and you now want to try "Option 1: Migrating WebSphere Application Server before WebSphere MQ," you first must uninstall both products used in the other option (to reset the installation), and then set up the sample Version 6 IT configuration again as described in the following topics:
  1. "Uninstalling WebSphere MQ" on page 79
  2. "Uninstalling WebSphere Application Server Version 8.5" on page 80
  3. "Uninstalling WebSphere Application Server Version 6.1" on page 82
  4. "Creating a sample initial Version 6 IT configuration" on page 20

Phase 1: Migrating WebSphere Application Server to Version 8.5

Make a backup copy of your WebSphere Application Server Version 6.1 configuration, and then install Version 8.5. After completing the installation, migrate the WebSphere Application Server resources to Version 8.5, and then check that the migration of these resources and of the sample MDB application has been successful.

Before you begin

The starting point for this scenario is a clean sample Version 6 IT configuration. If you have not already done so, read the section "Before you begin" in the topic "Option 1: Migrating WebSphere Application Server before WebSphere MQ," and complete any appropriate actions described there.

About this task

Phase 1 of this scenario covers the migration of WebSphere Application Server from Version 6 to Version 8.5. At the end of this phase, your WebSphere MQ

configuration is still at Version 6 but messages can be passed between WebSphere MQ Version 6.0 and WebSphere Application Server Version 8.5 using the sample applications.

The migration process for WebSphere Application Server involves installing a Version 8.5 environment alongside the existing Version 6 environment, then migrating your Version 6 configuration to the Version 8.5 environment.

Procedure

1. Follow the instructions in "Preparing to migrate to WebSphere Application Server Version 8.5" on page 55 to prepare for migrating to WebSphere Application Server Version 8.5.
2. Follow the instructions in "Installing WebSphere Application Server Version 8.5" on page 57 to install WebSphere Application Server Version 8.5.
3. Follow the instructions in "Migrating your WebSphere Application Server configuration to Version 8.5" on page 59 to migrate your WebSphere Application Server Version 6.1 configuration to Version 8.5, using the main migration wizard.

What else might I do or be interested in?

This scenario does not require the use of any migration tools other than the migration wizard. However, in more complex scenarios, you might need to use additional migration tools to complete any upgrades that are not done automatically by the migration wizard; for example, upgrade of JSP objects or Derby databases.

---

4. Follow the steps in "Confirming migration of WebSphere Application Server resources to Version 8.5" on page 62 to check that the listener port, connection factory, and queue from your WebSphere Application Server Version 6 installation have successfully migrated to WebSphere Application Server Version 8.5.
5. Follow the steps in "Verifying the migrated sample MDB application" on page 65 to test that the migrated MDB application in WebSphere Application Server Version 8.5 can communicate with WebSphere MQ Version 6.

Results

You have migrated WebSphere Application Server from Version 6 to Version 8.5. At the end of this phase, your WebSphere MQ configuration is still at Version 6, but you have confirmed that the migrated MDB application in WebSphere Application Server Version 8.5 can communicate with WebSphere MQ Version 6.

What to do next

When you have confirmed that your migrated WebSphere Application Server is working as required in Version 8.5, you can, if required, remove WebSphere Application Server Version 6.1 using the uninstaller program that is created during installation. The uninstaller program removes registry entries, uninstalls the product, and removes all related features. You might also need to do some manual cleaning up, as the uninstaller program does not remove log files in the installation root directory. For more information, see "Uninstalling WebSphere Application Server Version 6.1" on page 82.

Note: If you migrate any profiles to a new version of the product, you must either shut down the new migrated deployment managers before uninstalling the product, or include the `removeProfilesOnUninstall="false"` parameter on the uninstall command. Either of these options prevents the migrated profiles from being deleted when you uninstall the old version of the product.

After completing the phase 1 tasks, move on to "Phase 2: Migrating WebSphere MQ to Version 7.5" on page 67.

Preparing to migrate to WebSphere Application Server Version 8.5

Prepare to migrate your WebSphere Application Server Version 6.1 configuration to Version 8.5 by reviewing premigration considerations and making a backup copy of your Version 6.1 configuration. At the end of this task you will be ready to install WebSphere Application Server Version 8.5 with the latest level of maintenance.

Before you begin

- You must have local administrator authority when you are installing. Define this authority through the Windows operating system facilities. The administrator ID must not contain spaces.
- Ensure that you have sufficient disk space, up to 2 GB for all components.
- The backup configuration utility creates an archive file into a folder of your choice. If the folder does not already exist, create it now before continuing.

For more details about requirements for installation, see the IBM Support pages.

About this task

This task describes the steps for preparing to install WebSphere Application Server to the latest maintenance level on the Windows XP Professional (SP2 or later) operating system.

Procedure

1. Review the Premigration considerations topic in the WebSphere Application Server Version 8.5 information center.

   Tip: You do not need to complete this step for this scenario, because the information and actions needed are provided within the scenario to make it easier for you to proceed. However, it is good general practice to review the latest premigration considerations, especially if preparing to migrate your own WebSphere Application Server Version 6 environment.

2. Make a backup copy of your existing Version 6.1 configuration and make a note of the exact name and location of the backed-up configuration.

   > **Why am I doing this?**
   > The migration tools create a backup copy of the configuration from the previous version, as a file in zip format. Backing up your existing configuration before you start the migration allows you to restore the configuration to its previous state after migration.

> **What else might I do or be interested in?**
> You can use either the **backupConfig** utility or your own preferred backup utility to create the backup. The backupConfig command is a simple utility to back up the configuration of your node to a file. By default, all servers on the node stop before the backup is made so that partially synchronized information is not saved. If you do not have root authority, you must specify a path for the backup file in a location where you have write permission. The backup file will be in zip format and a .zip extension is recommended.

Prerequisite: The directory into which you want to create the backup file must exist before running the **backupConfig** command.

a. Open a command prompt window.

b. Change to the `profile_root\bin` directory, for example: `C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\bin`.

c. Enter the following command to run the backupConfig utility, specifying the target directory and file name.

```
backupConfig.bat migbackupdir\backupfile.zip
```

> **Why am I doing this?**
> If you want to save the backup archive file in a specific location of your own choice, you must include the complete pathname when you run `backupConfig.bat`. If you do not specify a pathname the backup archive file is placed in the same directory as the one from which you ran `backupConfig.bat.`

> **What else might I do or be interested in?**
> To avoid user ID and password prompts when you use this command, add the user ID and password information to the soap.client.props file located in `profile_root/properties/soap.client.props`.

For example:

```
backupConfig.bat C:\migbackupdir\myBackup.zip
```

After a short pause, the backup process starts, and information messages, similar to those in the following example, are shown in the Command Prompt window.

```
AMDU0116I: Tool information is being logged in file
    C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\logs\backup.Config.log
AMDU5001I: Backing up config directory C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\config
    to file C:\migbackupdir\myBackup.zip
AMDU0505I: Servers found in configuration:
AMDU0506I: Server name: server1
AMDU2010I: Stopping all server processes for node mylocalpcNode02
```

When the backup is complete, a message confirming this is displayed in the Command Prompt window:

```
AMDU5002I: 599 files successfully backed up
```

3. Ensure that prerequisites and corequisites are at the required release levels. On the WebSphere Application Server detailed system requirements web page,

click the link for your platform to see information about supported operating systems, browsers, and hardware requirements.

Tip: You do not need to complete this step for this scenario, because the information and actions needed are provided within the scenario to make it easier for you to proceed. However, it is good general practice to verify prerequisites and corequisites, especially if preparing to migrate your own WebSphere Application Server V6 environment.

Results

You are now ready to install WebSphere Application Server Version 8.5 with the latest level of maintenance.

What to do next

Follow the instructions in "Installing WebSphere Application Server Version 8.5" to install WebSphere Application Server Version 8.5.

Installing WebSphere Application Server Version 8.5

Install WebSphere Application Server 8.5 by using Installation Manager. At the end of this task, you are ready to configure WebSphere Application Server to communicate with WebSphere MQ.

Before you begin

- You must have local administrator authority when you are installing. Define this authority through the Windows operating system facilities. The administrator ID must not contain spaces.
- Ensure that you have sufficient disk space. You require up to 2 GB for all components.
- Ensure that prerequisites and corequisites are at the required release levels. On the WebSphere Application Server detailed system requirements page, click the link for your operating system and the link for software to see information about supported operating systems and browsers, and hardware requirements.

About this task

This task describes the basic steps to install WebSphere Application Server 8.5 on the Windows XP (SP2) operating system by using Installation Manager.

Procedure

1. If you haven't installed IBM Installation Manager before, install it.
   a. Extract the Installation Manager archive file.
   b. Switch to Installation Manager archive directory and double-click the `install.exe` file.
   c. In the Install Packages window, select the version number, for example **Version 1.5.2** , and then click **Next**.
   d. Click **I accept the terms in the license agreement**, and then click **Next.**
   e. In **Installation Manager Directory** field, type the file path. The file path is the location where you want to install IBM Installation Manager.
   f. Click **Next**, and then click **Install**. A progress bar is displayed, which shows that the installation is in progress.

When the installation is complete, a window is displayed, indicating that IBM Installation Manager is installed.

2. Click **Restart Installation Manager** in the lower right of the window. Alternatively, you can click **Start** > **All Programs** > **IBM Installation Manager** > **IBM Installation Manager** to start Installation Manager.

3. Click **Install**.

4. If a message is displayed that states `Installation Manager cannot find any packages to install`, add WebSphere Application Server to the repository.

   a. Click the **Repositories** link in the **Repository connections** field.

   b. Click **Add Repository** in the upper right of the Preference window.

   c. Click **Browse** and find the `repository.config` file for WebSphere Application Server.

   d. Click **OK**.

   e. Click **Test Connections** on the right of the Preference window. If a message is displayed that states `All the selected repositories are connected`, WebSphere Application Server is added to the repository.

   f. Click **OK** to close the window and click **OK** again to confirm adding the repository.

5. Select **Version 8.5.0.0**, and then click **Next**.

6. Click **I accept the terms in the license agreement**, and then click **Next.**

7. Click **Next**, then click **Next** again.

8. Select the languages that you want and click **Next**.

9. Select the components that you want and click **Next**.

10. Click **Install**. A progress bar is displayed, which shows that the installation is in progress.

11. When the installation is complete, a window is displayed, which indicates that the packages are installed. Click **Profile Management Tool to create a profile**, and then click **Finish**. WebSphere Application Server is successfully installed and "WebSphere Customization Toolbox" is displayed.

    If "WebSphere Customization Toolbox" window is not displayed, click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Tools** > **Profile Management Tool** to start it.

12. Create an application server profile

    a. In the "WebSphere Customization Toolbox" window, click **Profile Management Tool** among the three buttons on the top.

    b. In the Profile Management Tool, click **Create**.

    c. In Environment Selection window, expand **WebSphere Application Server**, and click **Application server**, and then click **Next**.

    d. In Profile Creation Options window, leave the option as **Typical profile creation**, and then click **Next**.

    e. Choose whether to enable administrative security and click **Next**. If you choose to enable it, every time you use the Administrative Console, you must prove your identity.

    f. Confirm your settings and click **Create**.

    g. When the profile creation is complete, the Profile Creation Complete window is displayed. Clear **Launch the First steps console** and click **Finish**. An application server profile is successfully created.

Results

WebSphere Application Server is installed. If you encountered a problem when installing, see the IBM Installation Manager Information Center. For further information about where to find this information center, see About IBM Installation Manager Information Center.

What to do next

Follow the instructions in "Migrating your WebSphere Application Server configuration to Version 8.5" to migrate your Version 6.1 configuration to Version 8.5.

Related information:

➡ Installing the Update Installer for WebSphere Software

➡ Installing WebSphere Application Server

Migrating your WebSphere Application Server configuration to Version 8.5

Use the migration wizard to migrate the listener port, connection factory, and queue from WebSphere Application Server Version 6.1 to Version 8.5 so that you can then view and configure these resources in the Version 8.5 administrative console.

Before you begin

Before starting this task, follow the instructions in "Installing WebSphere Application Server Version 8.5" on page 57 to install WebSphere Application Server Version 8.5.

About this task

This task covers migration of the stand-alone application server profile that you created in "Installing WebSphere Application Server Version 6.1" on page 37.

> **What else might I do or be interested in?**
> The wizard is the graphical interface to the primary Version 8.5 command-line migration tools, which are the **WASPreUpgrade** and **WASPostUpgrade** commands. You can also use those commands directly to complete a migration.

The migration wizard includes an option to back up your Version 6.1 configuration before migrating to Version 8.5. This enables you to restore the configuration to its previous state after migration.

> **What else might I do or be interested in?**
> Before migrating a WebSphere Application Server Version 5.1.x or Version 6.x application server, you can use the backupConfig command or your own preferred backup utility to back up your existing configuration.

Procedure

1. If you have not already done so, stop the WebSphere Application Server Version 6.1 application server. Click **Start** > **All Programs** > **IBM WebSphere** > **Application Server Network Deployment V6.1** > **Profiles** > **AppSrv01** > **Stop the server**, then wait for the command window to disappear.

2. Start the migration wizard. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSpehere Application Server V8.5** > **Tools**, then click **Configuration Migration Tool**.

3. Click **Migration Sources**, then click **New**.

4. On the "Detected versions of WebSphere Application Server" page, from the list of detected versions of WebSphere Application Server that exist on your computer, select your Version 6.1 installation. For example, IBM WebSphere Application Server Network Deployment Version 6.1.0.35.

   Click **Next**.

5. On the "Source profile selection" page, select the source profile that you want to migrate, for example AppSrv01, then click **Next**.

6. On the ""Profile Migration Output"" page, specify the location of the migration backup directory in which you want to place a backup copy of the configuration from the previous version, then click **Next**.

   > **What else might I do or be interested in?**
   > If the directory does not already exist, it is created. If the directory already exists, it must be empty because otherwise the backup installation might overwrite existing backup files that are still needed.

7. On the "Target profile selection" page, complete the following steps:

   a. Click **Migrate to an existing profile**.

   b. Select the target profile to which you want to migrate the selected Version 6 source profile, for example AppSrv01.

   > **What else might I do or be interested in?**
   > This page also offers you the option to create a new profile. If you did not create a profile when you installed WebSphere Application Server Version 8.5 you must select **Create new profile** here, then enter the parameters for creating the new profile.

   c. Select **Create a backup of the target profile**.

   > **Why am I doing this?**
   > If necessary you can then use the **restoreConfig** command to restore the configuration after migration.

   d. Click **Next**.

8. On the "Application migration" page, leave the default option **Migrate and install the applications as part of the migration process** selected.

> **Why am I doing this?**
> In this scenario, the sample applications used on Version 6 are to be used on Version 8.5 without any change, so are included as part of the migration.

9. In the **Application installation directory** field, leave the default option **Install the applications in the default directory of the target version** selected, then click **Next**.

> **What else might I do or be interested in?**
> The other options are to keep the same application installation directories as the previous version or to install the applications into the specified application installation directory. If you select the option to install your applications in the specified application installation directory, you also need to specify where the migrated applications should be located.

10. On the "Port value" page, select the option **Use the port values assigned to the target profile**, then click **Next**.

> **Why am I doing this?**
> Because WebSphere Application Server Version 8.5 was installed on the same computer as the existing WebSphere Application Server Version 6, the port numbers used by the Version 8.5 profile were incremented to avoid port conflicts with the Version 6 profile. Selecting the option **Use the port values assigned to the target profile** causes the migration wizard to use the port numbers already assigned to the Version 8.5 profile.

> **What else might I do or be interested in?**
> You could select the option **Use the port values assigned to the previous (source) profile** to cause the migration wizard to try to use the port numbers from the Version 6 profile. By default, any port conflict is resolved by incrementing the port number of the target profile by one until an unused port number is found. You can specify a starting port number to be used when a conflict is detected. If the starting port number is in use, it is incremented by one until an unused port number is found.

11. On the ""Additional Migration Options"" page, complete the following steps:
    a. In the **Scripting compatibility** field, clear **Migrate object types to support script compatibility**.

> **Why am I doing this?**
> This is a temporary transition option that minimizes the impact of the migration on existing administrative scripts. This is meant to provide a temporary transition until all of the nodes in the environment are at the Version 8.5 level.

b. In the **Administrative console "My Tasks"** field, click **Use the default workspace user root directory**.

> **Why am I doing this?**
>
> In this scenario, you did not create a special task view for the My Tasks view in the administrative console navigation. By default, "My Tasks" user information in the Version 6 installation would be stored in the default workspace user root location.

> **What else might I do or be interested in?**
>
> If you had changed the location of the workspace root location, you would use the option **Specify the workspace user root location**. For more information about changing the location, see Changing the location of the wstemp temporary workspace directory in the WebSphere Application Server information center.

12. Check the information on the "Migration summary" page, then click **Migrate** to start the migration.

13. When the wizard indicates that each stage of the process has been successful, click **Next** to move to the next stage.

    Tip: In the output from the post-upgrade processing, you should see a message that the sample application has been migrated to the Version 8.5 profile: MIGR0339I: Application sampleMDBv6.ear is deploying using the wsadmin command.

    If any problems occur, correct them and then start the migration process again.

14. On the "Migration Output" page, click **Next**.

15. On the "Migration Results" page, click **Finish**.

Results

You have migrated the listener port, connection factory, and queue from WebSphere Application Server Version 6.1 to Version 8.5, and are ready to check that you can view these resources in the Version 8.5 administrative console.

What to do next

To confirm that the migration of the Version 6.1 resources has been successful, follow the instructions in "Confirming migration of WebSphere Application Server resources to Version 8.5."

Confirming migration of WebSphere Application Server resources to Version 8.5

Using the administrative console, check that the listener port, connection factory, and queue have been successfully migrated from WebSphere Application Server Version 6.1 to Version 8.5.

About this task

To use JMS messaging between WebSphere Application Server Version 8.5 and WebSphere MQ Version 6, you must check that following WebSphere Application Server objects have been successfully migrated from Version 6.1.

- Listener port

> **Why am I doing this?**
> Listener ports can be used to enable message-driven beans to be used with WebSphere MQ as a JMS provider to WebSphere Application Server.

> **What else might I do or be interested in?**
> In WebSphere Application Server Version 8.5, you can continue to configure EJB 3, EJB 2.1, and EJB 2.0 message-driven beans against a listener port, for example for compatibility with existing message-driven bean applications. However, listener ports are stabilized for WebSphere Application Server Version 8.5, and you should plan to migrate all your message-driven beans to use JCA 1.5-compliant resources. Activation specifications are part of the JCA 1.5 standard, which provides a standard way to integrate JMS providers, such as WebSphere MQ Version 7.5, with Java EE application servers such as WebSphere Application Server.

- Connection factory
- Queue (a type of JMS destination)

These objects are described in "Overview: Initial IT configuration" on page 6.

Procedure

1. If WebSphere Application Server is not already started, click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Start the server**. A command window is displayed until the server is started; this process might take a few minutes.

2. Log on to the administrative console. If the console is not already started, click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Administrative console**.

   Note: You must log on even if you did not enable administrative security when you installed the product. If you did not enable administrative security, the user ID is used only to distinguish changes that you make in the administrative console from changes made by other users.

   Tip: You can check that you have the expected maintenance version of WebSphere Application Server. The version level is displayed on the welcome page, in the Welcome pane and with more detail in the pane labeled About this Integrated Solutions Console; for example:

```
Integrated Solutions Console, 8.5.0.0
Build Number: gm1218.01
Build Date: 5/1/12
---------------------------------------
```

3. Check the listener port settings.

a. In the administrative console, click **Servers** > **[Server Types] WebSphere application servers** > *server_name* > **[Communications] Messaging** > **Message Listener Service** > **[Additional Properties] Listener Ports**.

b. Select **PiShopReplyMDBListener**. The Listener Port settings page is displayed.

c. Check that the following values appear in the required fields:

Name PiShopReplyMDBListener

Initial state
> Started

Connection factory JNDI name
> jms/PiShopReplyCF

Destination JNDI name
> jms/wasQueue

d. If everything is set up correctly, click **Cancel**, otherwise make any required changes, then click **OK**.

4. Check the connection factory settings.

a. In the administrative console, click **Resources** > **JMS** > **Connection factories**.

b. Click **PiShopReplyCF**. The Connection factories settings page is displayed.

c. On the Connection factories settings page, under General Properties, check that the following values appear in the required fields:

Name PiShopReplyCF

JNDI name
> jms/PiShopReplyCF

Queue manager
> sampleQM

Transport type
> Bindings

d. If everything is set up correctly, click **Cancel**, otherwise make any required changes, then click **OK**.

5. Check the queue settings.

a. In the administrative console, click **Resources** > **JMS** > **Queues**. The Queues settings page is displayed.

b. Click **wasQueue**.

c. Check that the following values appear in the required fields.

Name wasQueue

JNDI name
> jms/wasQueue

Base queue name
> Q1

d. If everything is set up correctly, click **Cancel**, otherwise make any required changes, then click **OK**.

6. If you have made any changes, save these changes to the master configuration, then stop and then restart the application server.

a. Click the **Save** link in the Messages section at the top of the pane to save your changes to the master configuration.

b. Stop the application server. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Stop the server**, then wait for the command window to disappear.

c. Start the application server. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Start the server**.

Results

You have confirmed that the listener port, connection factory, and queue from your WebSphere Application Server Version 6.1 installation have successfully migrated to WebSphere Application Server Version 8.5.

What to do next

Follow the instructions in "Verifying the migrated sample MDB application" to verify that messages are being passed between WebSphere MQ Version 6.0 and WebSphere Application Server Version 8.5.

Verifying the migrated sample MDB application

After migrating to WebSphere Application Server to Version 8.5, use the Version 6 sample applications to verify that messages are being passed between WebSphere MQ Version 6.0 and WebSphere Application Server Version 8.5.

About this task

The migration of your WebSphere Application Server Version 6.1 configuration to Version 8.5 included the Version 6 sample MDB application. In this task, you use the Version 6 sample JMS requester application running in WebSphere MQ Version 6.0 to communicate with the Version 6 sample MDB application running in WebSphere Application Server Version 8.5. If the requester application successfully receives a reply from the MDB application, it confirms that messages are being passed between WebSphere MQ Version 6.0 and WebSphere Application Server Version 8.5.

Procedure

1. If WebSphere Application Server is not already started, start the server. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Start the server**.

2. Start, then log in to, the administrative console. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Administrative console**

3. Check the status of the listener port PiShopReplyMDBListener then, if it is not already started, start it:

   a. In the administrative console, click **Servers** > **Server Types** > **WebSphere application servers** > *server_name* > **[Communications] Messaging** > **Message Listener Service** > **Listener Ports**.

   b. Check whether the status of the listener port is started. If listener port is running, the status is shown as a green arrow. If the listener port is not running, the status is shown as a red cross.

   c. If the listener port is not already started, select it then click **Start**. The status of the listener port changes to a green arrow.

4. Check whether the sample MDB application, `sampleMDBv6`, is already running then, if it is not running, start it:

a. Click **Applications** > **Application Types** > **WebSphere enterprise applications** to display a list of installed applications.

b. Check whether the application status of `sampleMDBv6` is started. If `sampleMDBv6` is running, the application status is shown as a green arrow. If `sampleMDBv6` is not running, the application status is shown as a red cross.

c. If `sampleMDBv6` is not already running, select it then click **Start**. The application status changes to a green arrow. The MDB application is now waiting to receive a message.

   If you see an error message similar to the following message, there might be a mismatch between your WebSphere Application Server configuration and the information contained in the sample application. Check the WebSphere Application Server error logs in *install_directory*\profiles\AppSrv01\ logs\server1 for more information.

```
Error sampleMDB failed to start. Check the logs for server server1 on node
    mymachineNode01 for details.
Error An error occurred while starting sampleMDB. Check the logs for
    server server1 on node mymachineNode01 for more information.
```

> **Note:** If you update the WebSphereApplication Server configuration, you must restart the application server for the changes to take effect.

5. Locate then double-click the `runrequesterv6.cmd` batch file. This command file opens a Command Prompt window then runs the sample JMS requester client, which sends a message to WebSphere MQ. The `runrequesterv6.cmd` file uses environment variables to set the class path for running the JMS application. If you see a Java `java.lang.NoClassDefFoundError`, you might need to adjust the class path line in the command file.

Results

The sample requester application sends the request message, and then waits for a response from the sample MDB application. The following output, showing sent and received messages, is displayed in the requester application Command Prompt window:

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Connection created.

> Sending stock request for 'BakedBeans'
> Sent Message ID=ID:414d5120514d5f574153494e5354414c423fe14c20010602

> Received Message ID=ID:414d512073616d706c65514d202020209468684e20001204 for 'From
V6 MDB: BakedBeans - 6 tins in stock. More available on V7 !'

> Closing connection to QueueManager.
> Closed Connection.
```

You have finished verifying that your WebSphere Application Server configuration can still connect to WebSphere MQ Version 6.0 for the successful transmission of messages, following the migration of WebSphere Application Server to Version 8.5.

Troubleshooting:

- If you see errors similar to the following error in the WebSphere Application Server logs, check that the `Queue name` attribute of the queue, wasqueue, in WebSphere Application Server matches the administrative name (not the JNDI name) of the queue in WebSphere MQ. For example, the name Q1 should have been used in both places:

```
WebSphere MQ call failed with compcode '2' ('MQCC_FAILED') reason '2085'
    ('MQRC_UNKNOWN_OBJECT_NAME')
com.ibm.msg.client.jms.DetailedInvalidDestinationException: JMSWMQ2008:
    Failed to open MQ queue 'myQueue'. JMS attempted to perform an MQOPEN,
    but WebSphere MQ reported an error. Use the linked exception to determine
    the cause of this error. Check that the specified queue and queue manager
    are defined correctly.
JMSExceptionL E   WMSG0018E: Error on JMSConnection for MDB Mdb ,
    JMSDestination jms/wasQueue  : javax.jms.JMSException: MQJMS2008:
    failed to open MQ queue 'Q12'.
```

> **Note:** If you update the WebSphere Application Server configuration you must restart the application server for the changes to take effect.

- For any other errors, see the Troubleshooting and support section of the WebSphere Application Server information center.

What to do next

Follow the instructions in "Phase 2: Migrating WebSphere MQ to Version 7.5" to begin phase 2 of this scenario.

Phase 2: Migrating WebSphere MQ to Version 7.5

Make a backup copy of the queue manager data, then migrate WebSphere MQ from Version 6.0 to Version 7.5. After completing the migration, check that you can send and receive messages through WebSphere MQ Version 7.5 using the provided sample JMS application.

About this task

In this scenario, WebSphere MQ Version 6.0 is not uninstalled before the migration starts. You can also migrate to WebSphere MQ Version 7.5 on a system where a previous version has been uninstalled but where the queue manager data has been retained.

Procedure

1. Follow the instructions in "Preparing for then migrating to WebSphere MQ Version 7.5" on page 68 to back up the queue manager data and migrate WebSphere MQ from Version 6.0 to Version 7.5.
2. Follow the instructions in "Testing the Version 7 sample JMS application" on page 72 to run the Version 7 sample JMS application to send and receive messages through WebSphere MQ, and confirm that your migrated WebSphere MQ configuration works correctly with the Version 7 sample application.

Results

WebSphere MQ Version 7.5 is now installed, and all persistent items have been migrated from the previous version of WebSphere MQ. You have successfully run the Version 7 sample JMS application to send and receive messages through WebSphere MQ.

What to do next

After completing the phase 2 tasks, move on to "Phase 3: Verifying the solution" on page 74.

Related information:

⤷ WebSphere MQ V6 documentation

Preparing for then migrating to WebSphere MQ Version 7.5

Back up the queue manager data, then migrate WebSphere MQ from Version 6.0 to Version 7.5 by using the Launchpad and selecting the **Update** option of the installation wizard.

Before you begin

The general prerequisites for installing WebSphere MQ Version 7.5 are much the same as for installing WebSphere MQ Version 6. If you created the sample initial Version 6 IT configuration, then you have already satisfied these prerequisites. For more information, see the "Before you begin" section in "Installing WebSphere MQ Version 6.0" on page 21.

About this task

This task describes the steps for migrating using WebSphere MQ 7.5.0.1 on the Windows XP Professional (Service Pack 2 or later) operating system. This scenario was tested using WebSphere MQ 7.5.0.1, which is a full installation image that contains WebSphere MQ 7.5.0 and Fix Pack 1 combined.

The installation programs contain links to further information if you require it during the installation process. The installation process has four parts:

1. Use the Launchpad to check and install software requirements, specify network information, and start the WebSphere MQ installation wizard.
2. Use the WebSphere MQ installation wizard to install the software, and start the Prepare WebSphere MQ wizard.
3. Use the Prepare MQ wizard to start the WebSphere MQ service and start the Default Configuration wizard.
4. Optionally, use the Default Configuration wizard to create objects for verifying the installation by using the Postcard application supplied with WebSphere MQ.

Installing WebSphere MQ Version 7.5 migrates (updates) the existing Version 6 installation to Version 7.5.

Procedure

1. Stop the queue manager.

> **Why am I doing this?**
> If you try to take a backup of a running queue manager, the backup might not be consistent because of any updates that were in progress when the files were copied.

   a. Open the WebSphere MQ Explorer. Click **Start** > **All Applications** > **IBM WebSphere MQ** > **WebSphere MQ Explorer**.
   b. In the Navigator View, right-click the queue manager sampleQM.
   c. Click **Stop.....** The End Queue Manager window opens.
   d. Select **Controlled**, then click **OK**.

> **Why am I doing this?**
> You should stop your queue manager in a controlled, orderly way.

> **What else might I do or be interested in?**
> Alternatively you can select **Immediate**, which forces the queue manager to stop. This is typically used only if a controlled start fails to complete successfully.

   The queue manager stops. In the WebSphere MQ Explorer, the icon next to sampleQM is changed to include a red arrow that points downward.

   e. Close the WebSphere MQ Explorer.

2. Back up the queue manager data for the queue manager sampleQM, and the default queue manager, if you have created one. Take copies of all of the following data, making sure that you include all backup directories:
   - The queue manager data in `C:\Program Files\IBM\WebSphere MQ\Qmgrs`.
   - The log file directories for the queue managers in `C:\Program Files\IBM\WebSphere MQ\log`, including the log control file `amqhlctl.lfh`.
   - The configuration files in the `C:\Program Files\IBM\WebSphere MQ\Config`.
   - The default configuration file, `JMSAdmin.config` in `C:\Program Files\IBM\WebSphere MQ\Java\bin`. This file is overwritten when upgrading to WebSphere MQ Version 7.5, so must be backed up before starting the migration.

   Some of the directories might be empty, but you need them all if you need to restore the backup later, so save them too.

> **Why am I doing this?**
> If you migrate from a previous level of WebSphere MQ without first backing up your system, you cannot revert to your previous level. Backing up your system before you install the new version enables you to back out the upgrade if necessary. If you back out the upgrade, however, you cannot recover any work, such as changes to messages and objects, carried out by WebSphere MQ Version 7.5.

3. Stop the WebSphere MQ Service. Right-click the **WebSphere MQ** icon in the system tray, then click **Stop WebSphere MQ**. A dialog box with the following message is displayed:

```
Shutting down WebSphere MQ will terminate all running queue managers and
WebSphere MQ processes. Are you sure you want to continue? (AMQ4102)
```

4. Click **Yes**, then wait for WebSphere MQ to stop.

5. When WebSphere MQ has stopped, right-click the **WebSphere MQ** icon in the system tray, then click **Exit**.

6. Insert the WebSphere MQ Version 7.5 Server CD into the CD-ROM drive. If autorun is enabled, the Launchpad starts automatically. If not, run **setup.exe** from the CD-ROM.

7. Optional: Choose whether or not you want to configure WebSphere MQ for users defined on Windows 2000 or later domain controllers Click the **Network Configuration** option, then select either the Yes or No check box, as appropriate to your use of Windows 2000 or later domain controllers.

8. Start the installation. In the Launchpad, click the **WebSphere MQ Installation** option, check the pre-installation status, select the language if you are asked to do so, and then click **Launch IBM WebSphere MQ Installer**. For this scenario, you do not need to click the **Network Configuration** option because the installation is being completed on only one computer without users defined. The installation wizard for WebSphere MQ starts.

9. On the Welcome page of the installation wizard, click **Next**.

10. Choose the **Update** option then follow the instructions in the wizard to install WebSphere MQ Version 7.5.

> **Why am I doing this?**
> The **Update** option installs WebSphere MQ Version 7.5 with the same features as the previous version, so that all the objects that you previously created (for example, your queue managers) are maintained. The components that were previously installed are preselected in the feature options when you install the new level. Following the migration you can keep or reinstall these components as required.

> **What else might I do or be interested in?**
> The **Custom** option allows you to add or remove components for the new version. If you clear any components that were installed in the previous version, the installation process uninstalls them.

11. Confirm the displayed installation details, then click **Install** to start the installation. Follow any on-screen instructions, and restart your computer if asked to do so. At the end of the process, the WebSphere MQ Setup page displays the message `Installation Wizard Completed Successfully`. Click **Finish**. The Prepare WebSphere MQ wizard starts automatically.

12. Configure the WebSphere MQ Service by following the instructions in the Prepare WebSphere MQ wizard.

> **Why am I doing this?**
> The Prepare WebSphere MQ wizard helps you to configure WebSphere MQ files and a user account for your network. You must run the wizard to configure the WebSphere MQ Service before you can start any queue managers.

> **What else might I do or be interested in?**
> If you subsequently need to make further changes to the domain, user ID, and password information, you can do this using the DCOMCNFG.EXE tool, shipped with Windows system.

   a. On the first page of the wizard, click **Next**. The wizard completes some configuration and displays status messages, and then displays the WebSphere MQ Network Configuration page. The contents of this page varies according to your use of domain controllers.

   b. On the WebSphere MQ Network Configuration page, select the required options for network configuration.

> **Note:** When selecting the network configuration options, normal DHCP considerations apply.

    c. Click **Next** to continue through the wizard until the wizard displays the `Status: Starting the WebSphere MQ service` message, followed by the Completing the WebSphere MQ wizard page.

    d. On the Completing the WebSphere MQ wizard page, leave the **Launch WebSphere MQ Explorer** check box selected, choose whether to start Notepad to view the release notes, then click **Finish**.

    e. If you see an information message window that new attributes have been added to new WebSphere MQ Explorer objects, click **OK**.

The WebSphere MQ Explorer starts.

13. Verify your installation by using the Postcard application that is supplied with WebSphere MQ.

    a. Start the queue manager `sampleQM`, if it is not already started. In the Navigator view, expand the Queue Managers folder, right-click the name of the **sampleQM**, then click **Start**. In the Start Method window, click **OK** to start the queue manager as it was configured.

    b. If "MQ Explorer - Content" page is not displayed, display the page. Click **Window** > **Show View** > **MQ Explorer - Content**.

    c. On the "MQ Explorer - Content" page, click the **Launch Postcard** link.

> **What else might I do or be interested in?**
> If you find that you cannot run the Postcard application from the "MQ Explorer - Content" page, run the `postcard.bat` batch file from `C:\Program Files\IBM\WebSphere MQ\java\bin`.

    d. In the Postcard - Sign On window in the **Nickname** field, type a nickname to use for sending and receiving postcards; for example: `John`. It does not matter what name you choose.

    e. Click **OK** to continue. The Postcard - John window opens.

    f. Move the Postcard - John window to one side of your screen (to allow room for more windows).

    g. Repeat steps c to e to open a second Postcard window for another nickname, for example `George`. Move the Postcard - George window to one side of the Postcard - John window (so that you can see both Postcard windows).

    h. Send a postcard message from John, through WebSphere MQ, to George.

       1) In the Postcard - John window, click in the **Message** box, then type the text to go on the postcard message; for example: `Hello. How are you doing?`.

       2) In the **To** field, type the nickname of the person to send the postcard to; for example: `George`

       3) Click **Send**. After a moment, the postcard is listed as sent in the **Postcards sent and received** table.

       4) In the Postcard - George window, the postcard is listed as received in the **Postcards sent and received** table.

       5) In the Postcard - George window, double-click the postcard row. The postcard is opened in a new Postcard from John window to show the text, sender, date, and other details. Move or close the Postcard from John window.

6) Send a reply. In the Postcard - George window, click **Reply...**, type some text in the Message box, then click **Send**. The postcard is listed as sent in the **Postcards sent and received** table and, in the Postcard - John window, is listed as received.

The successful transmission of send and reply messages show that WebSphere MQ is working.

i. Close the Postcard windows.

If you did not create a default configuration, you can still follow these steps to verify your installation, but you must first configure a queue manager as described in the next task of this scenario.

Note: Running the Postcard application on a non-default configuration automatically creates a queue called `postcard` on your queue manager. You can delete this queue after using the postcard application.

Results

WebSphere MQ Version 7.5 is now installed, and all persistent items have been migrated from the previous version of WebSphere MQ. You can use the launchpad to view the Quick Beginnings, Release Notes®, or Product Tour before finishing.

What to do next

Follow the instructions in "Testing the Version 7 sample JMS application" to test that the Version 7 sample application will run in your migrated configuration.

Testing the Version 7 sample JMS application
Run the Version 7 sample JMS application to send and receive messages through WebSphere MQ, and confirm that your migrated WebSphere MQ configuration works correctly with the Version 7 sample application.

Before you begin

If you have not already done so, download the Version 7 sample JMS application package. Click the following link and save the file to the machine that hosts WebSphere Application Server: sampleJMSApp.zipsampleJMSApp.zip (in online information center), then extract the contents. The package contains a sample JMS application `.jar` file and batch files for running the application.
- The sample `sampleJMSApp.jar` file and the `.cmd` files must be in the same directory
- The `.cmd` files use environment variables to set the class path for running the JMS application. When running the JMS application, if you see a Java `java.lang.NoClassDefFoundError`, you might need to adjust the class path line in the command file.

About this task

The JMS application comprises a requester client, which sends the initial message, and a responder client, which receives the message and sends a reply. The supplied batch files complete the following actions:
- The `runresponder.cmd` file opens a Command Prompt window in which the responder client starts then waits for a message.
- The `runrequester.cmd` file opens a separate Command Prompt window in which the requester client starts then sends a request message and receives a reply.

With two Command Prompt windows, you can see the actions of the requester and responder separately and more clearly.

Procedure

1. Start WebSphere MQ Explorer, if it is not already started, by clicking **Start** > **All Programs** > **IBM WebSphere MQ** > **WebSphere MQ Explorer (Installation 1)**.
2. Start the queue manager sampleQM, if it is not already started.
   a. In the Navigator view, expand the Queue Managers folder.
   b. Right-click the name of the queue manager, sampleQM, then click **Start**.
3. Start the responder client by double-clicking the runresponder.cmd file. In the Command Prompt window, labeled Responder window, the responder client starts then waits for a message.

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Created connection.

> Waiting for message.
```

4. Start the requester client by double-clicking the runrequester.cmd file. In the Command Prompt window, labeled Requester window, the requester client shows the connection status, the message it sent, then the reply message that it received from the responder client:

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Connection created.

> Sending stock request for 'BakedBeans'
> Sent Message ID=ID:414d5120514d5f4c33344c3238482020c3cd094d20002b02

> Received Message ID=ID:414d5120514d5f4c33344c3238482020c3cd094d20002902 for 'B
akedBeans - 15 tins in stock'

> Closing connection to QueueManager.
> Closed Connection.
--------------------------------------------------------
In this window, observe the messages sent through WebSphere MQ:
- The request message sent
- The reply message received
-----
When ready, press any key to close this window
Press any key to continue . . .
```

The Command Prompt window labeled Responder window shows the updated responder messages; the message the responder client received from the requester client and the reply message that it sent:

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Created connection.

> Waiting for message.

> Received Message ID=ID:414d5120514d5f4c33344c3238482020c3cd094d20002b02 for 'B
akedBeans'

> Sending Reply Message 'BakedBeans - 15 tins in stock'
> Sent Message ID=ID:414d5120514d5f4c33344c3238482020c3cd094d20002902

> Closing connection to QueueManager.
```

```
> Closed connection.
---------------------------------------------------------
In this window, observe the updated responder messages
- The request message received (from the requester)
- The reply message sent
-----
When ready, press any key to close this window
Press any key to continue . . .
```

5. After checking the messages, close the two Command Prompt windows.

Results

The requester and responder clients of the sample application can communicate with each other through WebSphere MQ, as confirmed by the messages shown in the two Command Prompt windows

What to do next

Follow the instructions in "Phase 3: Verifying the solution" on page 101 to confirm that WebSphere Application Server and WebSphere MQ can still communicate with each other following the migration of both products.

Phase 3: Verifying the solution

Verify that WebSphere Application Server and WebSphere MQ can still communicate with each other following the migration of WebSphere Application Server from Version 6 to Version 8.5 and WebSphere MQ from Version 6 to Version 7.5.

Procedure

1. Follow the instructions in "Deploying the Version 8 sample MDB application" to deploy the sample MDB that you need to use to complete the final phase of testing.
2. Follow the instructions in "Verifying the migrated IT configuration" on page 77 to complete the final stage of testing the migrated WebSphere Application Server and WebSphere MQ configuration.

Results

Following the migration of WebSphere Application Server from Version 6 to Version 8.5 and WebSphere MQ from Version 6 to Version 7.5, WebSphere Application Server can still connect to WebSphere MQ and messages can be transmitted successfully between the two products.

What to do next

After completing phase 3, you are ready to move on to the final stage of the scenario, which involves replacing the migrated listener port with an activation specification. To complete this final stage, follow the instructions in "Migrating WebSphere Application Server listener ports to activation specifications" on page 107.

Deploying the Version 8 sample MDB application

Using the WebSphere Application Server administrative console, install the Version 8 sample message driven bean (MDB) application so that you can use it to verify that WebSphere Application Server is communicating with WebSphere MQ

following the migration of WebSphere Application Server from Version 6 to Version 8.5 and WebSphere MQ from Version 6 to Version 7.5.

Before you begin

If you have not already done so, download the Version 8 sample MDB application. Click the following link and save the file to the machine that hosts WebSphere Application Server: sampleMDB.ear">sampleMDB.earsampleMDB.ear (in online information center).

About this task

The Version 8 sample MDB application, `sampleMDB.ear`, should now be able to use the objects that you migrated from WebSphere Application Server Version 6 to Version 8.5. The MDB application uses these objects to send a message to WebSphere MQ, for receipt by the sample JMS application requester client that you used in "Testing the Version 7 sample JMS application" on page 72.

Procedure

1. If WebSphere Application Server is not already started, start the server. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server 8.5** > **Profiles** > **AppSrv01** > **Start the server**.

2. Start the administrative console. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server 8.5** > **Profiles** > **AppSrv01** > **Administrative console** then log in to the administrative console.

3. Click **Applications** > **New Application** > **[Install a New Application] New Enterprise Application**.

4. On the first Preparing for the application installation page, select the MDB application that you want to upload and install:

    a. Select **Local file system**, then click **Browse**. The File Upload window opens.

    b. In the File Upload window, browse to the folder where you downloaded the sample MDB application, select `sampleMDB.ear`, then click **Open**.

    c. Leave all other fields on the first Preparing for the application installation page unchanged, then click **Next**.

    > **What else might I do or be interested in?**
    > Unless you specify otherwise, the name of the installed application is derived from the name of the MDB EAR file, which in the case of this scenario is `sampleMDB.ear`. If you prefer, you can give the application a different name. To do this, click the **Step 1** link to go to the Select installation options page then specify your chosen **Application name**.

5. On the second Preparing for the application installation page, leave all fields unchanged, then click **Next**.

6. On the Install New Application page, click the **Step 3** link to go to the Bind listeners for message-driven beans page.

> **What else might I do or be interested in?**
> To save having to specify the binding whenever you deploy the MDB EAR file, you can bind the MDB to a listener port name by using an assembly tool. For more information, see the topic Preparing for application installation binding settings in the WebSphere Application Server information center.

7. On the Bind listeners for message-driven beans page specify the listener port name to which the sample MDB application must be bound:

   a. Select `sampleMDB.ear`.

   b. Under **Listener Bindings**, select **Listener port**.

   c. Type the **Name** of the listener port: `PiShopReplyMDBListener`

      Tip: This is the listener port that you migrated from WebSphere Application Server Version 6.1 as described in "Migrating your WebSphere Application Server configuration to Version 8.5" on page 59.

   d. Click **Next**.

8. On the Map resource references to resources page, map the connection factory resource reference defined in the sample MDB application to the JNDI name of the connection factory.

   a. Under **Target Resource JNDI Name**, click **Browse** to display a list of resources that are available to be used to bind the resource reference of the MDB.

   b. Select `PiShopReplyCF` then click **Apply**.

      Tip: For this scenario, the resource that you select is the connection factory PiShopReplyCF that you migrated from WebSphere Application Server Version 6.1 as described in "Migrating your WebSphere Application Server configuration to Version 8.5" on page 59.

   c. Leave all other fields unchanged and click **Next**.

9. On the Summary page, click **Finish**. The program displays messages to indicate that the application is being installed. If the application does not install successfully, examine the messages to identify why the installation failed. Correct the problems as needed and try installing the application again.

10. When the application installs successfully, click the **Save** link that is displayed at the end of the messages, to save your changes to the master configuration.

11. Stop the server. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server 8.5** > **Profiles** > **AppSrv01** > **Stop the server**.

> **Why am I doing this?**
> To complete the configuration changes, you need to stop then restart the application server. You start the server again in the next task before the resources are used to verify the migrated IT configuration.

Results

You have deployed the MDB application, which is now visible in the Enterprise Applications panel. To view this panel, click **Applications** > **Application Types** > **WebSphere enterprise applications**.

What to do next

Follow the instructions in "Verifying the migrated IT configuration" to run the sample applications and verify that messages can be passed between the two products.

Verifying the migrated IT configuration

Run the sample JMS and message drive bean (MDB) applications to verify that your migrated WebSphere Application Server and WebSphere MQ configurations can communicate with each other.

About this task

In "Testing the Version 7 sample JMS application" on page 72, you ran the supplied JMS sample application to verify that the requester and responder clients of the application could communicate through WebSphere MQ. In this task, you run the requester application as before, but this time the reply comes from the MDB application that you installed in "Deploying the Version 8 sample MDB application" on page 74, instead of from the responder application, verifying that messages are being passed between WebSphere MQ and WebSphere Application Server.

Procedure

1. Start WebSphere MQ Explorer, if it is not already started, by clicking **Start** > **All Programs** > **IBM WebSphere MQ** > **WebSphere MQ Explorer (Installation 1)**.
2. Start the queue manager sampleQM, if it is not already started. In the Navigator view, expand the Queue Managers folder, right-click the name of the queue manager, then click **Start**.
3. If WebSphere Application Server is not already started, click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Start the server**.
4. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Administrative console**, then log in to the administrative console.
5. Check the status of the listener port PiShopReplyMDBListener then, if it is not already started, start it:
   a. In the administrative console, click **Servers** > **Server Types** > **WebSphere application servers** > *server_name* > **Communications** > **Messaging** > **Message Listener Service** > **[Additional Properties] Listener Ports**.
   b. Check whether the status of the listener port is started. If listener port is running, the status is shown as a green arrow.
   c. If the listener port is not already started, select it then click **Start**. The status of the listener port changes to a green arrow.
6. Check whether the Version 8 sample MDB application, sampleMDB, is already running then, if it is not running, start it:
   a. Click **Applications** > **Application Types** > **WebSphere enterprise applications** to display a list of installed applications.
   b. Check whether the application status of sampleMDB is started. If sampleMDB is running, the application status is shown as a green arrow.
   c. If the sampleMDB is not already running, start it. Select the check box next to sampleMDB, then click **Start**. The application status changes to a green arrow. The MDB application is now waiting to receive a message.

If you see an error message similar to the following message, there might be a mismatch between your WebSphere Application Server configuration and the information contained in the sample application. Check the WebSphere Application Server error logs in *install_directory*\profiles\AppSrv01\ logs\server1 for more information.

```
Error sampleMDB failed to start. Check the logs for server server1 on node
    mymachineNode01 for details.
Error An error occurred while starting sampleMDB. Check the logs for
    server server1 on node mymachineNode01 for more information.
```

7. Optional: Stop the Version 6 MDB application, sampleMDBv6, if it is running. Select the check box next to sampleMDBv6, then click **Stop**.

> **Why am I doing this?**
> You do not need to stop the Version 6 MDB application, sampleMDBv6, to be able to run the Version 8 MDB. However, stopping the Version 6 MDB better makes it clear that the message handling is being done by the Version 8 MDB.

8. Double-click the runrequester.cmd batch file that was downloaded in the Version 7 sample JMS application package. This command file opens a Command Prompt window then runs the sample JMS requester client, which sends a message to WebSphere MQ. The runrequester.cmd file uses environment variables to set the class path for running the JMS application. If you see a Java java.lang.NoClassDefFoundError, you might need to adjust the class path line in the command file.

Results

The sample requester application sends the same request message as before, but the response now comes from the MDB application. The following output, showing sent and received messages, is displayed in the requester application Command Prompt window:

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Connection created.

> Sending stock request for 'BakedBeans'
> Sent Message ID=ID:414d512073616d706c65514d20202020bcec684e20002302

> Received Message ID=ID:414d512073616d706c65514d20202020bcec684e20002005 for
'From MDB: BakedBeans - 15 tins in stock. Expected delivery time 1 day'
> Closing connection to QueueManager.
> Closed Connection.
--------------------------------------------------------
In this window, observe the messages sent through WebSphere MQ:
- The request message sent
- The reply message received
-----
When ready, press any key to close this window
Press any key to continue . . .
```

If you see errors similar to the following error in the WebSphere Application Server logs, check that the name of the queue in WebSphere Application Server matches the administrative name (not the JNDI name) of the queue in WebSphere MQ:

```
WebSphere MQ call failed with compcode '2' ('MQCC_FAILED') reason '2085'
    ('MQRC_UNKNOWN_OBJECT_NAME')
```

```
com.ibm.msg.client.jms.DetailedInvalidDestinationException: JMSWMQ2008:
    Failed to open MQ queue 'myQueue'. JMS attempted to perform an MQOPEN,
    but WebSphere MQ reported an error. Use the linked exception to determine
    the cause of this error. Check that the specified queue and queue manager
    are defined correctly.
```

> **Note:** If you update the WebSphere Application Server configuration, you must restart the application server for the changes to take effect.

You have finished migrating WebSphere Application Server from Version 6 to Version 8.5 and then WebSphere MQ from Version 6 to Version 7, and verified that, following the migration, WebSphere Application Server can still connect to WebSphere MQ for the successful transmission of messages.

You have now completed Option 1 of this scenario.

What to do next

At this point, the Version 8.5 sample MDB application is still using the listener port that you migrated from WebSphere Application Server Version 6 to connect to WebSphere MQ. To complete the delivered logical topology described in "Overview: The delivered logical topology" on page 11, you now need to create an activation specification and configure the Version 8 sample MDB application to use this activation specification instead of the listener port to listen for and respond to messages received from WebSphere MQ. To complete this final stage of the scenario, follow the instructions in "Migrating WebSphere Application Server listener ports to activation specifications" on page 107.

Uninstalling WebSphere MQ and WebSphere Application Server

If you want to try one migration option then the other, you should uninstall the WebSphere MQ and WebSphere Application Server files that are used by the first option before starting the second option. After finishing this scenario, you might also want to uninstall all WebSphere MQ and WebSphere Application Server files used for the scenario.

About this task

The subtopics provide instructions to uninstall all applications that are involved in the migration. The subtopics can be used both individually or as a complete uninstallation procedure. The topics ensure that other programs and platforms installed throughout the Migration process, such as, WebSphere Update Installer and Eclipse platform are removed from your system. There are details about folders that should be deleted, which are left behind after the uninstallation is complete, which is important to prevent problems occurring when reinstalling.

Uninstalling WebSphere MQ

Stop, and then uninstall WebSphere MQ Version 7.5. If you are not using the IBM WebSphere Eclipse environment for any other purposes, remove IBM WebSphere Eclipse Platform Version 3.0.1. Finally, delete any folders or files that have been left behind. At the end of this task, you will be ready to reinstall WebSphere MQ.

About this task

This task describes the basic steps to uninstall WebSphere MQ on the Windows XP Professional (SP2 or later) operating system.

Procedure

1. Stop the WebSphere MQ Service.

   a. Right-click on the **WebSphere MQ** icon in the system tray, then click **Stop WebSphere MQ**. A dialogue with the following message is displayed:

   ```
   Shutting down WebSphere MQ installation "Installation1" will terminate all running queue manag
   WebSphere MQ processes for that installation, except those under Microsoft Failover Cluster co
   Are you sure you want to continue?
   ```

   b. Click **Yes** and then wait for the WebSphere MQ to stop.

   c. When WebSphere MQ has stopped, right-click the **WebSphere MQ** icon in the system tray, then click **Exit**

2. Remove WebSphere MQ.

   a. Click **Start** > **Control Panel** > **Add or Remove Programs**. Wait for the list of currently installed programs to load.

   b. Select **IBM WebSphere MQ (Installation1)**.

   c. Click **Remove**. A window with the following message is displayed:

   ```
   Are you sure you want to uninstall IBM WebSphere MQ (Installation1)?
   ```

   Click **Yes**. After a short delay, the IBM WebSphere MQ window opens and gathers the required information and configures IBM WebSphere MQ. This takes a few minutes. When the initial uninstallation configuration has completed, the IBM WebSphere MQ window is closed.

3. Remove IBM WebSphere Eclipse Platform V3.0.1 for the WebSphere MQ Explorer Version 6.1. Remove this only if you are not using the IBM WebSphere Eclipse environment for any other purposes.

   a. Click **Start** > **Control Panel** > **Add or Remove Programs**. Wait for the list of currently installed programs to load.

   b. Select **IBM WebSphere Eclipse Platform V3.0.1** .

   c. Click **Remove** A dialog with the following message is displayed:

   ```
   Are you sure you want to remove IBM WebSphere Eclipse Platform V3.0.1 from your computer?
   ```

   d. Click **Yes**. The IBM WebSphere Eclipse Platform V3.0.1 window opens.

   e. This window closes when the uninstallation process is complete.

4. Remove any folders left behind.

   a. Navigate to the IBM WebSphere MQ folder. The default file path is `C:\Program Files\IBM\WebSphere MQ`.

   b. Delete the `WebSphere MQ` folder, which deletes all folders left behind from the uninstall.

   c. Delete the `JNDI-Directory` folder. The default file path for this folder is `C:\JNDI-Directory`. This folder is left behind by the uninstallation and it is important for it to be deleted because it interferes with any new WebSphere Application Server installs.

Results

WebSphere MQ Version 7.5 and WebSphere Eclipse Platform Version 3.0.1 have been uninstalled. Any folders that were left behind from the uninstallation process have been removed.

Uninstalling WebSphere Application Server Version 8.5

Stop, and then uninstall WebSphere Application Server Version 8.5. Delete any folders or files that are left behind. At the end of this task, you will be ready to reinstall WebSphere Application Server Version 8.5.

About this task

This task describes the steps to uninstall WebSphere Application Server Version 8.5 on the Windows XP Professional (SP2 or later) operating system.

Procedure

1. Stop the WebSphere Application Server Version 8.5 application server. Click **Start** > **All Programs** > **IBM WebSphere** > **WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Stop the server**, then wait for the command window to disappear.

2. Remove WebSphere Application Server Version 8.5.

   a. Start IBM Installation Manager. Click **Start** > **All Programs** > **IBM Installation Manager** > **IBM Installation Manager**. A few seconds later, the IBM Installation Manager window is displayed.

   b. Click **Uninstall**

   c. In the Uninstall Packages windows, select **IBM WebSphere Application Server V8.5**, and then click **Next**.

   d. In the Prerequisite window, click **Next**. If the following message is displayed, stop the servers in all profiles of WebSphere Application Server V8.5, and click **Recheck Status**.

`Running processes have been detected that may interfere with the current operation. Stop all WebSphere and related proces`

   e. Check the uninstallation summary, and then click **Uninstall** to start the uninstallation process. When the uninstallation process is completed successfully, a success message is displayed.

   f. Click the **View Log File** link to view the details of the uninstallation, and then click **Finish**.

3. Remove IBM Installation Manager. Only remove this if you are not using any product of IBM that is Version 8 or later.

   a. Click **Start** > **Control Panel** > **Add or Remove Programs**. Wait for the list of currently installed programs to load.

   b. Select **IBM Installation Manager**.

   c. Click **Remove**. The Uninstall Packages window is displayed.

   d. Select **IBM Installation Manager**, and then click **Next**.

   e. Check the uninstallation summary, and then click **Uninstall** to start the uninstallation process. When the uninstallation process is completed successfully, a success message is displayed.

   f. Click the **View Log File** link to view the details of the uninstallation, and then click **Finish**.

4. Remove any folders that are left behind.

   a. Delete the WebSphere Application Server Version 8.5 folder, by default, it is `C:\Program Files\IBM\WebSphere\AppServer1`.

   b. Delete the **IBM WebSphere Application Server V8.5** folder from the start menu.

Results

WebSphere Application Server Version 8.5 is uninstalled.

If you encountered a problem when uninstalling, restart your computer then try the failing steps of the uninstallation process again.

> **Why am I doing this?**
>
> Sometimes, active processes can interfere with the uninstallation of software, and restarting your computer can revert it to a state that enables the uninstallation to complete successfully.

Uninstalling WebSphere Application Server Version 6.1

Stop, and then uninstall WebSphere Application Server Version 6.1 and delete any folders or files that are left behind. At the end of this task, you will be ready to reinstall WebSphere Application Server Version 6.1.

About this task

This task describes the steps to uninstall WebSphere Application Server on the Windows XP Professional (SP2 or later) operating system.

Procedure

1. Stop the WebSphere Application Server Version 6.1 application server. Click **Start** > **All Programs** > **IBM WebSphere** > **Application Server Network Deployment V6.1** > **Profiles** > **AppSrv01** > **Stop the server**, then wait for the command window to disappear.

2. Uninstall WebSphere Application Server using **Add or Remove Programs**.

   a. Click **Start** > **Control Panel** > **Add or Remove Programs**. Wait for the list of currently installed programs to load.

   b. Select **IBM WebSphere Application Server Network Deployment V6.1**.

   c. Click **Change/Remove**. After a short delay, the InstallShield Wizard starts.

   d. The IBM WebSphere Application Server V6.1.0.0 uninstall wizard opens. Click **Next**.

   e. Leave the **Remove all profiles** check box selected, and then click **Next**.

   f. Check the uninstallation summary, for IBM WebSphere Application Server Network Deployment, then click **Next**. The uninstallation process begins.

   g. When the uninstallation process has completed successfully, a success message is displayed. Close the installation wizard by clicking **Finish**. A log file, `uninstall\log.txt` is created during the uninstallation process. By default this file is created in `C:\Program Files\IBM\WebSphere\AppServer\logs\`.

3. Remove any folders left behind.

   a. Delete the WebSphere Application Server V6.1 folder, by default, it is `C:\Program Files\IBM\WebSphere\AppServer`. If you see an error message saying the process is unable to delete the `Profiles` folder because it is being used in another application, ensure that the IBM WebSphere Application Server service has been stopped, and then try again.

   b. Now all WebSphere Application Server packages have been unistalled from your computer. You can delete the `WebSphere` folder. You should only delete this folder if there are no other WebSphere products installed in this folder.

   c. Delete the IBM WebSphere folder from the start menu.

Results

WebSphere Application Server Version 6.1 has been uninstalled.

If you encountered a problem when uninstalling, restart your computer then try the failing steps of the uninstallation process again.

> **Why am I doing this?**
> Sometimes, active processes can interfere with the uninstallation of software, and restarting your computer can revert it to a state that enables the uninstallation to complete successfully.

> **What else might I do or be interested in?**
> For general help with problems uninstalling WebSphere Application Server, see the Uninstalling the product topic in the WebSphere Application Server information center.

Option 2: Migrating WebSphere MQ before WebSphere Application Server

In Option 2, you first migrate your WebSphere MQ Version 6 configuration to Version 7.5 and use the Version 6 sample applications to check that your migrated configuration can still communicate with WebSphere Application Server, which is still at Version 6. You then migrate WebSphere Application Server to Version 8.5 and use the sample Version 8 applications to check that messages can still be passed between WebSphere MQ and WebSphere Application Server.

Before you begin

The starting point for this scenario is the sample Version 6 IT configuration described in "Overview: Initial IT configuration" on page 6.

- If you have not already created the sample Version 6 IT configuration, complete the tasks described in "Creating a sample initial Version 6 IT configuration" on page 20.
- If you have already completed "Option 1: Migrating WebSphere Application Server before WebSphere MQ" on page 53, and you now want to try "Option 2: Migrating WebSphere MQ before WebSphere Application Server," you first must uninstall both products used in the other option (to reset the installation), and then set up the sample Version 6 IT configuration again as described in the following topics:
  1. "Uninstalling WebSphere MQ" on page 79
  2. "Uninstalling WebSphere Application Server Version 8.5" on page 80
  3. "Uninstalling WebSphere Application Server Version 6.1" on page 82
  4. "Creating a sample initial Version 6 IT configuration" on page 20

Phase 1: Migrating WebSphere MQ to Version 7.5

Make a backup copy of the queue manager data, and then migrate WebSphere MQ from Version 6.0 to Version 7.5. After completing the migration, check that you can send and receive messages through WebSphere MQ Version 7.5 using the provided sample JMS application.

Before you begin

The starting point for this scenario is a clean sample Version 6 IT configuration. If you have not already done so, read the section "Before you begin" in the topic "Option 2: Migrating WebSphere MQ before WebSphere Application Server" on page 83, and complete any appropriate actions described there.

About this task

In this scenario, WebSphere MQ Version 6.0 is not uninstalled before the migration starts. You can also migrate to WebSphere MQ Version 7.5 on a system where a previous version has been uninstalled but where the queue manager data has been retained.

Procedure

1. Follow the instructions in "Preparing for then migrating to WebSphere MQ Version 7.5" to back up the queue manager data and migrate WebSphere MQ from Version 6.0 to Version 7.5.
2. Follow the instructions in "Testing the Version 7 sample JMS application" on page 89 to run the Version 7 sample JMS application to send and receive messages through WebSphere MQ, and confirm that your migrated WebSphere MQ configuration works correctly with the Version 7 sample application.

Results

WebSphere MQ Version 7.5 is now installed, and all persistent items have been migrated from the previous version of WebSphere MQ. You have successfully run the Version 7 sample JMS application to send and receive messages through WebSphere MQ.

What to do next

After completing the phase 1 tasks, move on to "Phase 2: Migrating WebSphere Application Server to Version 8.5" on page 91.

Related information:

➥ WebSphere MQ V6 documentation

Preparing for then migrating to WebSphere MQ Version 7.5

Back up the queue manager data, then migrate WebSphere MQ from Version 6.0 to Version 7.5 by using the Launchpad and selecting the **Update** option of the installation wizard.

Before you begin

The general prerequisites for installing WebSphere MQ Version 7.5 are much the same as for installing WebSphere MQ Version 6, such as you would already have satisfied if you created the sample initial Version 6 IT configuration. For more information, see the "Before you begin" section in "Installing WebSphere MQ Version 6.0" on page 21.

About this task

This task describes the steps for migrating using WebSphere MQ 7.5.0.1 on the Windows XP Professional (Service Pack 2 or later) operating system. This scenario

was tested using WebSphere MQ 7.5.0.1, which is a full installation image that contains WebSphere MQ 7.5.0 and Fix Pack 1 combined.

The installation programs contain links to further information if you require it during the installation process. The installation process has four parts:

1. Use the Launchpad to check and install software requirements, specify network information, and start the WebSphere MQ installation wizard.

2. Use the WebSphere MQ installation wizard to install the software, and start the Prepare WebSphere MQ wizard.

3. Use the Prepare MQ wizard to start the WebSphere MQ service and start the Default Configuration wizard.

4. Optionally, use the Default Configuration wizard to create objects for verifying the installation using the Postcard application supplied with WebSphere MQ.

Installing WebSphere MQ Version 7.5 migrates (updates) the existing Version 6 installation to Version 7.5.

Procedure

1. Stop the queue manager.

> **Why am I doing this?**
> If you try to take a backup of a running queue manager, the backup might not be consistent because of any updates that were in progress when the files were copied.

   a. Open the WebSphere MQ Explorer. Click **Start** > **All Applications** > **IBM WebSphere MQ** > **WebSphere MQ Explorer**.

   b. In the Navigator View, right-click the queue manager sampleQM.

   c. Click **Stop**. The End Queue Manager window opens.

   d. Select **Controlled**, then click **OK**.

> **Why am I doing this?**
> You should stop your queue manager in a controlled, orderly way.

> **What else might I do or be interested in?**
> Alternatively you can select **Immediate**, which forces the queue manager to stop. This is typically used only if a controlled start fails to complete successfully.

   The queue manager stops. In the WebSphere MQ Explorer, the icon next to sampleQM is changed to include a red arrow that points downward.

   e. Close the WebSphere MQ Explorer.

2. Back up the queue manager data for the queue manager sampleQM, and the default queue manager, if you have created one. Take copies of all of the following data, making sure that you include all backup directories:

   • The queue manager data in `C:\Program Files\IBM\WebSphere MQ\Qmgrs`.

   • The log file directories for the queue managers in `C:\Program Files\IBM\WebSphere MQ\log`, including the log control file `amqhlctl.lfh`.

   • The configuration files in the `C:\Program Files\IBM\WebSphere MQ\Config`.

- The default configuration file, JMSAdmin.config in `C:\Program Files\IBM\WebSphere MQ\Java\bin`. This file is overwritten when upgrading to WebSphere MQ Version 7.5, so must be backed up before starting the migration.

Some of the directories might be empty, but you need them all if you need to restore the backup later, so save them too.

> **Why am I doing this?**
> If you migrate from a previous level of WebSphere MQ without first backing up your system, you cannot revert to your previous level. Backing up your system before you install the new version enables you to back out the upgrade if necessary. If you back out the upgrade, however, you cannot recover any work, such as changes to messages and objects, carried out by WebSphere MQ Version 7.5.

3. Stop the WebSphere MQ Service. Right-click the **WebSphere MQ** icon in the system tray, then click **Stop WebSphere MQ**. A dialog box with the following message is displayed:

```
Shutting down WebSphere MQ will terminate all running queue managers and
WebSphere MQ processes. Are you sure you want to continue? (AMQ4102)
```

4. Click **Yes**, then wait for WebSphere MQ to stop.
5. When WebSphere MQ has stopped, right-click the **WebSphere MQ** icon in the system tray, then click **Exit**.
6. Insert the WebSphere MQ Version 7.5 Server CD into the CD-ROM drive. If autorun is enabled, the Launchpad starts automatically. If not, run **setup.exe** from the CD-ROM.
7. Optional: Choose whether you want to configure WebSphere MQ for users defined on Windows 2000 or later domain controllers Click the **Network Configuration** option, then select either the Yes or No checkbox, as appropriate to your use of Windows 2000 or later domain controllers.
8. Start the installation. In the Launchpad, click the **WebSphere MQ Installation** option, check the pre-installation status, select the language if you are asked to do so, then click **Launch IBM WebSphere MQ Installer**. For this scenario, you do not need to click the **Network Configuration** option because the installation is being completed on only one computer without users defined. The installation wizard for WebSphere MQ starts.
9. On the Welcome page of the installation wizard, click **Next**.
10. Choose the **Update** option then follow the instructions in the wizard to install WebSphere MQ Version 7.5.

> **Why am I doing this?**
> The **Update** option installs WebSphere MQ Version 7.5 with the same features as the previous version, so that all the objects that you previously created (for example, your queue managers) are maintained. The components that were previously installed are preselected in the feature options when you install the new level. Following the migration you can keep or reinstall these components as required.

> **What else might I do or be interested in?**
> The **Custom** option allows you to add or remove components for the
> new version. If you deselect any components that were installed in the
> previous version, the installation process uninstalls them.

11. Confirm the displayed installation details, then click **Install** to start the
    installation. Follow any on-screen instructions, and restart your computer if
    asked to do so. At the end of the process, the WebSphere MQ Setup page
    displays the message `Installation Wizard Completed Successfully`. Click
    Finish. The Prepare WebSphere MQ wizard starts automatically.

12. Configure the WebSphere MQ Service by following the instructions in the
    Prepare WebSphere MQ wizard.

> **Why am I doing this?**
> The Prepare WebSphere MQ wizard helps you to configure WebSphere
> MQ files and a user account for your network. You must run the wizard
> to configure the WebSphere MQ Service before you can start any queue
> managers.

> **What else might I do or be interested in?**
> If you subsequently need to make further changes to the domain, user
> ID, and password information, you can do this using the
> DCOMCNFG.EXE tool, shipped with Windows system.

   a. On the first page of the wizard, click **Next**. The wizard completes some
      configuration and displays status messages, then displays the WebSphere
      MQ Network Configuration page. The contents of this page varies
      according to your use of domain controllers.

   b. On the WebSphere MQ Network Configuration page, select the required
      options for network configuration.

      Note: When selecting the network configuration options, normal DHCP
      considerations apply.

   c. Click **Next** to continue through the wizard until the wizard displays the
      `Status: Starting the WebSphere MQ service` message, followed by the
      Completing the WebSphere MQ wizard page.

   d. On the Completing the WebSphere MQ wizard page, leave the **Launch
      WebSphere MQ Explorer** check box selected, choose whether to start
      Notepad to view the release notes, then click **Finish**.

   e. If you see an information message window that new attributes have been
      added to new WebSphere MQ Explorer objects, click **OK**.

   The WebSphere MQ Explorer starts.

13. Verify your installation by using the Postcard application that is supplied with
    WebSphere MQ.

   a. Start the queue manager `sampleQM`, if it is not already started. In the
      Navigator view, expand the Queue Managers folder, right-click
      sampleQM, then click **Start**. In the Start Method window, click **OK** to start
      the queue manager as it was configured.

b. If "MQ Explorer - Content" page is not displayed, display the page. Click **Window** > **Show View** > **MQ Explorer - Content**.

c. On the "MQ Explorer - Content" page, click the **Launch Postcard** link.

> ┌─ **What else might I do or be interested in?** ─────
> If you find that you cannot run the Postcard application from the "MQ Explorer - Content" page, run the `postcard.bat` batch file from `C:\Program Files\IBM\WebSphere MQ\java\bin`.

d. In the Postcard - Sign On window in the **Nickname** field, type a nickname to use for sending and receiving postcards; for example: `John`. It does not matter what name you choose.

e. Click **OK** to continue. The Postcard - John window opens.

f. Move the Postcard - John window to one side of your screen (to allow room for more windows).

g. Repeat steps c to e to open a second Postcard window for another nickname, for example `George`. Move the Postcard - George window to one side of the Postcard - John window (so that you can see both Postcard windows).

h. Send a postcard message from John, through WebSphere MQ, to George.

   1) In the Postcard - John window, click in the **Message** box, then type the text to go on the postcard message; for example: `Hello. How are you doing?`.

   2) In the **To** field, type the nickname of the person to send the postcard to; for example: `George`

   3) Click **Send**. After a moment, the postcard is listed as sent in the **Postcards sent and received** table.

   4) In the Postcard - George window, the postcard is listed as received in the **Postcards sent and received** table.

   5) In the Postcard - George window, double-click the postcard row. The postcard is opened in a new Postcard from John window to show the text, sender, date, and other details. Move or close the Postcard from John window.

   6) Send a reply. In the Postcard - George window, click **Reply...**, type some text in the Message box, then click **Send**. The postcard is listed as sent in the **Postcards sent and received** table and, in the Postcard - John window, is listed as received.

   The successful transmission of send and reply messages show that WebSphere MQ is working.

i. Close the Postcard windows.

If you did not create a default configuration, you can still follow these steps to verify your installation, but you must first configure a queue manager as described in the next task of this scenario.

Note: Running the Postcard application on a non-default configuration automatically creates a queue called `postcard` on your queue manager. You can delete this queue after using the postcard application.

Results

WebSphere MQ Version 7.5 is now installed, and all persistent items have been migrated from the previous version of WebSphere MQ. You can use the launchpad to view the Quick Beginnings, Release Notes, or Product Tour before finishing.

What to do next

Follow the instructions in "Testing the Version 7 sample JMS application" on page 72 to test that the Version 7 sample application will run in your migrated configuration.

Testing the Version 7 sample JMS application

Run the Version 7 sample JMS application to send and receive messages through WebSphere MQ, and confirm that your migrated WebSphere MQ configuration works correctly with the Version 7 sample application.

Before you begin

If you have not already done so, download the Version 7 sample JMS application package. Click the following link and save the file to the machine that hosts WebSphere Application Server: sampleJMSApp.zipsampleJMSApp.zip (in online information center), then extract the contents. The package contains a sample JMS application `.jar` file and batch files for running the application.

- The sample `sampleJMSApp.jar` file and the `.cmd` files must be in the same directory
- The `.cmd` files use environment variables to set the class path for running the JMS application. When running the JMS application, if you see a Java `java.lang.NoClassDefFoundError`, you might need to adjust the class path line in the command file.

About this task

The JMS application comprises a requester client, which sends the initial message, and a responder client, which receives the message and sends a reply. The supplied batch files complete the following actions:

- The `runresponder.cmd` file opens a Command Prompt window in which the responder client starts then waits for a message.
- The `runrequester.cmd` file opens a separate Command Prompt window in which the requester client starts then sends a request message and receives a reply.

With two Command Prompt windows, you can see the actions of the requester and responder separately and more clearly.

Procedure

1. Start WebSphere MQ Explorer, if it is not already started, by clicking **Start** > **All Programs** > **IBM WebSphere MQ** > **WebSphere MQ Explorer (Installation 1)**.
2. Start the queue manager sampleQM, if it is not already started.
   a. In the Navigator view, expand the Queue Managers folder.
   b. Right-click the name of the queue manager, sampleQM, then click **Start**.
3. Start the responder client by double-clicking the `runresponder.cmd` file. In the Command Prompt window, labeled Responder window, the responder client starts then waits for a message.

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Created connection.

> Waiting for message.
```

4. Start the requester client by double-clicking the `runrequester.cmd` file. In the Command Prompt window, labeled Requester window, the requester client shows the connection status, the message it sent, then the reply message that it received from the responder client:

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Connection created.

> Sending stock request for 'BakedBeans'
> Sent Message ID=ID:414d5120514d5f4c33344c3238482020c3cd094d20002b02

> Received Message ID=ID:414d5120514d5f4c33344c3238482020c3cd094d20002902 for 'B
akedBeans - 15 tins in stock'

> Closing connection to QueueManager.
> Closed Connection.
----------------------------------------------------------
In this window, observe the messages sent through WebSphere MQ:
- The request message sent
- The reply message received
-----
When ready, press any key to close this window
Press any key to continue . . .
```

The Command Prompt window labeled Responder window shows the updated responder messages; the message the responder client received from the requester client and the reply message that it sent:

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Created connection.

> Waiting for message.

> Received Message ID=ID:414d5120514d5f4c33344c3238482020c3cd094d20002b02 for 'B
akedBeans'

> Sending Reply Message 'BakedBeans - 15 tins in stock'
> Sent Message ID=ID:414d5120514d5f4c33344c3238482020c3cd094d20002902

> Closing connection to QueueManager.
> Closed connection.
----------------------------------------------------------
In this window, observe the updated responder messages
- The request message received (from the requester)
- The reply message sent
-----
When ready, press any key to close this window
Press any key to continue . . .
```

5. After checking the messages, close the two Command Prompt windows.

Results

The requester and responder clients of the sample application can communicate with each other through WebSphere MQ, as confirmed by the messages shown in the two Command Prompt windows

What to do next

Follow the instructions in "Phase 2: Migrating WebSphere Application Server to Version 8.5."

Phase 2: Migrating WebSphere Application Server to Version 8.5

Make a backup copy of your WebSphere Application Server Version 6.1 configuration, then install Version 8.5. After completing the installation, migrate the WebSphere Application Server resources to Version 8.5, then check that the migration of these resources and of the sample MDB application has been successful.

About this task

Phase 2 of this scenario covers the migration of WebSphere Application Server from Version 6 to Version 8.5. At the end of this phase, your WebSphere Application Server is at Version 8.5 and WebSphere MQ is at Version 7.5, and you are ready to test that messages can be passed between WebSphere MQ Version 7.5 and WebSphere Application Server Version 8.5 using the sample applications.

The migration process for WebSphere Application Server involves installing a Version 8.5 environment alongside the existing Version 6 environment, then migrating your Version 6 configuration to the Version 8.5 environment.

Procedure

1. Follow the instructions in "Preparing to migrate to WebSphere Application Server Version 8.5" on page 92 to prepare for migrating to WebSphere Application Server Version 7.0 and the latest fix pack.
2. Follow the instructions in "Migrating your WebSphere Application Server configuration to Version 8.5" on page 96 to migrate your WebSphere Application Server Version 6.1 configuration to Version 8.5, using the main migration wizard.

> **What else might I do or be interested in?**
> This scenario does not require the use of any migration tools other than the migration wizard. However, in more complex scenarios, you might need to use additional migration tools to complete any upgrades that are not done automatically by the migration wizard; for example, upgrade of JSP objects or Derby databases. For more information about migration tools, see the Migrating product configurations with migration tools topic in the WebSphere Application Server Version 8.5 information center.

3. Follow the steps in "Confirming migration of WebSphere Application Server resources to Version 8.5" on page 99 to check that the listener port, connection factory, and queue from your WebSphere Application Server Version 6.1 installation have successfully migrated to WebSphere Application Server Version 8.5.

Results

You have installed WebSphere Application Server Version 8.5 and migrated your WebSphere Application Server resources from Version 6 to Version 8.5. WebSphere

MQ is already at Version 7.5, so you are now ready to complete the final testing of your migrated IT configuration.

What to do next

When you have confirmed that your migrated WebSphere Application Server is working as required in Version 8.5, you can, if required, remove WebSphere Application Server Version 6.1 using the uninstaller program that is created during installation. The uninstaller program removes registry entries, uninstalls the product, and removes all related features. You might also need to do some manual cleaning up, as the uninstaller program does not remove log files in the installation root directory. For more information, see "Uninstalling WebSphere Application Server Version 6.1" on page 82.

Note: If you migrate any profiles to a new version of the product, you must either shut down the new migrated deployment managers before uninstalling the product, or include the `removeProfilesOnUninstall="false"` parameter on the uninstall command. Either of these options prevents the migrated profiles from being deleted when you uninstall the old version of the product.

After completing the phase 2 tasks, move on to "Phase 3: Verifying the solution" on page 101.

Preparing to migrate to WebSphere Application Server Version 8.5

Prepare to migrate your WebSphere Application Server Version 6.1 configuration to Version 8.5 by reviewing premigration considerations and making a backup copy of your Version 6.1 configuration. At the end of this task, you will be ready to install WebSphere Application Server Version 8.5 with the latest level of maintenance.

Before you begin

- You must have local administrator authority when you are installing. Define this authority through the Windows operating system facilities. The administrator ID must not contain spaces.
- Ensure that you have sufficient disk space, up to 2 GB for all components.
- The backup configuration utility creates an archive file into a folder of your choice. If the folder does not exist, create it now before continuing.

For more information about requirements for installation, see IBM Support pages.

About this task

This task describes the steps for preparing to install WebSphere Application Server to the latest maintenance level on the Windows XP Professional (SP2 or later) operating system.

Procedure

1. Review the Premigration considerations topic in the WebSphere Application Server Version 8.5 information center.

   Tip: You do not need to complete this step for this scenario because the information and actions needed are provided within the scenario to make it easier for you to proceed. However, it is good general practice to review the

latest premigration considerations, especially if preparing to migrate your own WebSphere Application Server Version 6 environment.

2. Make a backup copy of your existing Version 6.1 configuration and make a note of the exact name and location of the backed-up configuration.

Why am I doing this?

The migration tools create a backup copy of the configuration from the previous version, as a file in zip format. Backing up your existing configuration before you start the migration allows you to restore the configuration to its previous state after migration.

What else might I do or be interested in?

You can use either the **backupConfig** utility or your own preferred backup utility to create the backup. The backupConfig command is a simple utility to back up the configuration of your node to a file. By default, all servers on the node stop before the backup is made so that partially synchronized information is not saved. If you do not have root authority, you must specify a path for the backup file in a location where you have write permission. The backup file will be in zip format and a .zip extension is recommended.

Prerequisite: The directory into which you want to create the backup file must exist before running the **backupConfig** command.

a. Open a command prompt window.

b. Change to the `profile_root\bin` directory, for example: `C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\bin`.

c. Enter the following command to run the backupConfig utility, specifying the target directory and file name.

```
backupConfig.bat migbackupdir\backupfile.zip
```

Why am I doing this?

If you want to save the backup archive file in a specific location of your own choice, you must include the complete path name when you run `backupConfig.bat`. If you do not specify a path name, the backup archive file is placed in the same directory as the one from which you ran `backupConfig.bat`.

What else might I do or be interested in?

To avoid user ID and password prompts when you use this command, add the user ID and password information to the soap.client.props file in `profile_root/properties/soap.client.props`.

For example:

```
backupConfig.bat C:\migbackupdir\myBackup.zip
```

After a short pause, the backup process starts, and information messages, similar to those in the following example, are shown in the Command Prompt window.

```
AMDU0116I: Tool information is being logged in file
    C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\logs\backup.Config.log
AMDU5001I: Backing up config directory C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\config
    to file C:\migbackupdir\myBackup.zip
AMDU0505I: Servers found in configuration:
AMDU0506I: Server name: server1
AMDU2010I: Stopping all server processes for node mylocalpcNode02
```

> When the backup is complete, a message confirming this is displayed in the
> Command Prompt window:

```
AMDU5002I: 599 files successfully backed up
```

3. Ensure that prerequisites and corequisites are at the required release levels. On
the WebSphere Application Server detailed system requirements web page,
click the link for your platform to see information about supported operating
systems, browsers, and hardware requirements.

> **Tip:** You do not need to complete this step for this scenario, because the
> information and actions needed are provided within the scenario to make it
> easier for you to proceed. However, it is good general practice to verify
> prerequisites and corequisites, especially if preparing to migrate your own
> WebSphere Application Server V6 environment.

Results

You are now ready to install WebSphere Application Server Version 8.5 with the
latest level of maintenance.

What to do next

Follow the instructions in "Installing WebSphere Application Server Version 8.5" to
install WebSphere Application Server Version 8.5.

Installing WebSphere Application Server Version 8.5

Install WebSphere Application Server 8.5 by using Installation Manager. At the end
of this task, you are ready to configure WebSphere Application Server to
communicate with WebSphere MQ.

Before you begin

- You must have local administrator authority when you are installing. Define this
authority through the Windows operating system facilities. The administrator ID
must not contain spaces.
- Ensure that you have sufficient disk space. You require up to 2 GB for all
components.
- Ensure that prerequisites and corequisites are at the required release levels. On
the WebSphere Application Server detailed system requirements page, click the
link for your operating system and the link for software to see information
about supported operating systems and browsers, and hardware requirements.

About this task

This task describes the basic steps to install WebSphere Application Server 8.5 on
the Windows XP (SP2) operating system by using Installation Manager.

Procedure

1. If you haven't installed IBM Installation Manager before, install it.
   a. Extract the Installation Manager archive file.

b. Switch to Installation Manager archive directory and double-click the
       `install.exe` file.
   c. In the Install Packages window, select the version number, for example
       Version 1.5.2, and then click **Next**.
   d. Click **I accept the terms in the license agreement**, and then click **Next.**
   e. In **Installation Manager Directory** field, type the file path. The file path is
       the location where you want to install IBM Installation Manager.
   f. Click **Next**, and then click **Install**. A progress bar is displayed, which
       shows that the installation is in progress.

   When the installation is complete, a window is displayed, indicating that IBM
   Installation Manager is installed.
2. Click **Restart Installation Manager** in the lower right of the window.
   Alternatively, you can click **Start** > **All Programs** > **IBM Installation Manager**
   > **IBM Installation Manager** to start Installation Manager.
3. Click **Install**.
4. If a message is displayed that states `Installation Manager cannot find any`
   `packages to install`, add WebSphere Application Server to the repository.
   a. Click the **Repositories** link in the **Repository connections** field.
   b. Click **Add Repository** in the upper right of the Preference window.
   c. Click **Browse** and find the `repository.config` file for WebSphere
       Application Server.
   d. Click **OK**.
   e. Click **Test Connections** on the right of the Preference window. If a
       message is displayed that states `All the selected repositories are`
       `connected`, WebSphere Application Server is added to the repository.
   f. Click **OK** to close the window and click **OK** again to confirm adding the
       repository.
5. Select **Version 8.5.0.0**, and then click **Next**.
6. Click **I accept the terms in the license agreement**, and then click **Next.**
7. Click **Next**, then click **Next** again.
8. Select the languages that you want and click **Next**.
9. Select the components that you want and click **Next**.
10. Click **Install**. A progress bar is displayed, which shows that the installation is
    in progress.
11. When the installation is complete, a window is displayed, which indicates that
    the packages are installed. Click **None**, and then click **Finish**. WebSphere
    Application Server is successfully installed.

Results

WebSphere Application Server is installed. If you encountered a problem when
installing, see the IBM Installation Manager Information Center. For more
information about where to find this information center, see About IBM Installation
Manager Information Center.

What to do next

Follow the instructions in "Migrating your WebSphere Application Server
configuration to Version 8.5" on page 96 to migrate your Version 6.1 configuration
to Version 8.5.

Migrating your WebSphere Application Server configuration to Version 8.5

Use the migration wizard to migrate the listener port, connection factory, and queue from WebSphere Application Server Version 6.1 to Version 8.5 so that you can then view and configure these resources in the Version 8.5 administrative console.

Before you begin

Before starting this task, follow the instructions in "Installing WebSphere Application Server Version 8.5" on page 94 to install WebSphere Application Server Version 7 and the latest fix pack.

About this task

This task covers migration of the stand-alone application server profile that you created in "Installing WebSphere Application Server Version 6.1" on page 37.

> **What else might I do or be interested in?**
> The wizard is the graphical interface to the primary Version 8.5 command-line migration tools, which are the **WASPreUpgrade** and **WASPostUpgrade** commands. You can also use those commands directly to complete a migration.

The migration wizard includes an option to back up your Version 6.1 configuration before migrating to Version 7.0. This enables you to restore the configuration to its previous state after migration.

> **What else might I do or be interested in?**
> Before migrating a WebSphere Application Server Version 5.1.x or Version 6.x application server, you can use the backupConfig command or your own preferred backup utility to back up your existing configuration.

Procedure

1. If you have not already done so, stop the WebSphere Application Server Version 6.1 application server. Click **Start** > **All Programs** > **IBM WebSphere** > **Application Server Network Deployment V6.1** > **Profiles** > **AppSrv01** > **Stop the server**, then wait for the command window to disappear.
2. Start the migration wizard. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSpehere Application Server V8.5** > **Tools**, then click **Configuration Migration Tool**.
3. Click **Migration Sources**, then click **New**.
4. On the "Detected versions of WebSphere Application Server" page, from the list of detected versions of WebSphere Application Server that exist on your computer, select your Version 6.1 installation. For example, IBM WebSphere Application Server Network Deployment Version 6.1.0.35.
   Click **Next**.
5. On the "Source profile selection" page, select the source profile that you want to migrate, for example AppSrv01, then click **Next**.

6. On the ""Profile Migration Output"" page, specify the location of the migration backup directory in which you want to place a backup copy of the configuration from the previous version, then click **Next**.

> **What else might I do or be interested in?**
> If the directory does not exist, it is created. If the directory exists, it must be empty because otherwise the backup installation might overwrite existing backup files that are still needed.

7. On the "Target profile selection" page, complete the following steps:
   a. Select the target profile to which you want to migrate the selected Version 6 source profile, for example AppSrv01.

   > **What else might I do or be interested in?**
   > This page also offers you the option to create a profile. If you did not create a profile when you installed WebSphere Application Server Version 8.5 you must select **Create new profile** here, then enter the parameters for the new profile.

   b. Select **Create a backup of the target profile**.

   > **Why am I doing this?**
   > If necessary, you can then use the **restoreConfig** command to restore the configuration after migration.

   c. Click **Next**.
8. On the "Application migration" page, leave the default option **Migrate and install the applications as part of the migration process** selected.

   > **Why am I doing this?**
   > In this scenario, the sample applications used on Version 6 are to be used on Version 8.5 without any change, so are included as part of the migration.

9. In the **Application installation directory** field, leave the default option **Install the applications in the default directory of the target version** selected, then click **Next**.

   > **What else might I do or be interested in?**
   > The other options are to keep the same application installation directories as the previous version or to install the applications into the specified application installation directory. If you select the option to install your applications in the specified application installation directory, you also need to specify where the migrated applications should be located.

10. On the "Port value" page, leave the default option **Use the port values assigned to the previous (source) installation** selected, then click **Next**.

> **Why am I doing this?**
> You select this option to cause the migration wizard to try to use the port numbers from the Version 6 profile.

> **What else might I do or be interested in?**
> You could select the option **Use the port values assigned to the target profile** to cause the migration wizard to use the port numbers already assigned to the Version 8.5 profile. By default, any port conflict is resolved by incrementing the port number of the target profile by one until an unused port number is found. You can specify a starting port number to be used when a conflict is detected. If the starting port number is in use, it is incremented by one until an unused port number is found.

11. On the "Additional Migration Options" page, complete the following steps:

    a. In the **Scripting compatibility** field, clear **Migrate object types to support script compatibility**.

    > **Why am I doing this?**
    > This is a temporary transition option that minimizes the impact of the migration on existing administrative scripts. This is meant to provide a temporary transition until all of the nodes in the environment are at the Version 8.5 level.

    b. In the **Administrative console "My Tasks"** field, click **Use the default workspace user root directory**.

    > **Why am I doing this?**
    > In this scenario, you did not create a special task view for the My Tasks view in the administrative console navigation. By default, "My Tasks" user information in the Version 6 installation would be stored in the default workspace user root location.

    > **What else might I do or be interested in?**
    > If you had changed the location of the workspace root location, you would use the option **Specify the workspace user root location**. For more information about changing the location, see Changing the location of the wstemp temporary workspace directory in the WebSphere Application Server information center.

12. Check the information on the "Migration summary" page, then click **Migrate** to start the migration.

13. When the wizard indicates that each stage of the process has been successful, click **Next** to move to the next stage.

> **Tip:** In the output from the post-upgrade processing, you should see a message that the sample application has been migrated to the Version 8.5 profile: `MIGR0339I: Application sampleMDBv6.ear is deploying using the wsadmin command`.
>
> If any problems occur, correct them and then start the migration process again.

14. On the "Migration Output" page, click **Next**.
15. On the "Migration Results" page, click **Finish**.

Results

You have migrated the listener port, connection factory, and queue from WebSphere Application Server Version 6.1 to Version 8.5, and are ready to check that you can view these resources in the Version 8.5 administrative console.

What to do next

To confirm that the migration of the Version 6.1 resources has been successful, follow the instructions in "Confirming migration of WebSphere Application Server resources to Version 8.5."

Confirming migration of WebSphere Application Server resources to Version 8.5

Using the administrative console, check that the listener port, connection factory, and queue have been successfully migrated from WebSphere Application Server Version 6.1 to Version 8.5.

About this task

To use JMS messaging between WebSphere Application Server Version 8.5 and WebSphere MQ Version 6, you must check that following WebSphere Application Server objects have been successfully migrated from Version 6.1.

- Listener port

> ┌─ **Why am I doing this?** ──┐
> Listener ports can be used to enable message-driven beans to be used with WebSphere MQ as a JMS provider to WebSphere Application Server.
> └──┘

> ┌─ **What else might I do or be interested in?** ─────────────────────┐
> In WebSphere Application Server Version 8.5, you can continue to configure EJB 3, EJB 2.1, and EJB 2.0 message-driven beans against a listener port, for example for compatibility with existing message-driven bean applications. However, listener ports are stabilized for WebSphere Application Server Version 8.5, and you should plan to migrate all your message-driven beans to use JCA 1.5-compliant resources. Activation specifications are part of the JCA 1.5 standard, which provides a standard way to integrate JMS providers, such as WebSphere MQ Version 7.5, with Java EE application servers such as WebSphere Application Server.
> └──┘

- Connection factory
- Queue (a type of JMS destination)

These objects are described in "Overview: Initial IT configuration" on page 6.

Procedure

1. If WebSphere Application Server is not already started, click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Start the server**. A command window is displayed until the server is started; this process might take a few minutes.

2. Log on to the administrative console. If the console is not already started, click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Administrative console**.

   Note: You must log on even if you did not enable administrative security when you installed the product. If you did not enable administrative security, the user ID is used only to distinguish changes that you make in the administrative console from changes made by other users.

   Tip: You can check that you have the expected maintenance version of WebSphere Application Server. The version level is displayed on the welcome page, in the Welcome pane and with more detail in the pane labeled About this Integrated Solutions Console; for example:

```
Integrated Solutions Console, 8.5.0.0
Build Number: gm1218.01
Build Date: 5/1/12
----------------------------------------
```

3. Check the listener port settings.

   a. In the administrative console, click **Servers** > **[Server Types] WebSphere application servers** > *server_name* > **[Communications] Messaging** > **Message Listener Service** > **[Additional Properties] Listener Ports**.

   b. Select **PiShopReplyMDBListener**. The Listener Port settings page is displayed.

   c. Check that the following values are displayed in the required fields:

   Name PiShopReplyMDBListener

   Initial state
   > Started

   Connection factory JNDI name
   > jms/PiShopReplyCF

   Destination JNDI name
   > jms/wasQueue

   d. If everything is set up correctly, click **Cancel**, otherwise make any required changes, then click **OK**.

4. Check the connection factory settings.

   a. In the administrative console, click **Resources** > **JMS** > **Connection factories**.

   b. Click **PiShopReplyCF**. The Connection factories settings page is displayed.

   c. On the Connection factories settings page, under General Properties, check that the following values are displayed in the required fields:

   Name PiShopReplyCF

   JNDI name
   > jms/PiShopReplyCF

Queue manager
>   sampleQM

Transport type
>   Bindings

   d. If everything is set up correctly, click **Cancel**, otherwise make any required changes, then click **OK**.

5. Check the queue settings.

   a. In the administrative console, click **Resources** > **JMS** > **Queues**. The Queues settings page is displayed.

   b. Click **wasQueue**.

   c. Check that the following values are displayed in the required fields.

Name wasQueue

JNDI name
>   jms/wasQueue

Base queue name
>   Q1

   d. If everything is set up correctly, click **Cancel**, otherwise make any required changes, then click **OK**.

6. If you have made any changes, save these changes to the master configuration, then stop and then restart the application server.

   a. Click the **Save** link in the Messages section at the top of the pane to save your changes to the master configuration.

   b. Stop the application server. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Stop the server**, then wait for the command window to disappear.

   c. Start the application server. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Start the server**.

Results

You have confirmed that the listener port, connection factory, and queue from your WebSphere Application Server Version 6.1 installation have successfully migrated to WebSphere Application Server Version 8.5.

What to do next

Follow the instructions in "Phase 3: Verifying the solution" to confirm that WebSphere Application Server and WebSphere MQ can still communicate with each other following the migration of WebSphere MQ from Version 6.0 to Version 7.5 and WebSphere Application Server from Version 6.1 to Version 8.5.

Phase 3: Verifying the solution

Verify that WebSphere Application Server and WebSphere MQ can still communicate with each other following the migration of WebSphere Application Server from Version 6 to Version 8.5 and WebSphere MQ from Version 6 to Version 7.5.

Procedure

1. Follow the instructions in "Deploying the Version 8 sample MDB application" on page 74 to deploy the sample MDB that you need to use to complete the final phase of testing.
2. Follow the instructions in "Verifying the migrated IT configuration" on page 77 to complete the final stage of testing the migrated WebSphere Application Server and WebSphere MQ configuration.

Results

Following the migration of WebSphere Application Server from Version 6 to Version 8.5 and WebSphere MQ from Version 6 to Version 7.5, WebSphere Application Server can still connect to WebSphere MQ and messages can be transmitted successfully between the two products.

What to do next

After completing phase 3, you are ready to move on to the final stage of the scenario, which involves replacing the migrated listener port with an activation specification. To complete this final stage, follow the instructions in "Migrating WebSphere Application Server listener ports to activation specifications" on page 107.

Deploying the Version 8 sample MDB application

Using the WebSphere Application Server administrative console, install the Version 8 sample message driven bean (MDB) application so that you can use it to verify that WebSphere Application Server is communicating with WebSphere MQ following the migration of WebSphere Application Server from Version 6 to Version 8.5 and WebSphere MQ from Version 6 to Version 7.5.

Before you begin

If you have not already done so, download the Version 8 sample MDB application. Click the following link and save the file to the machine that hosts WebSphere Application Server: sampleMDB.ear">sampleMDB.earsampleMDB.ear (in online information center).

About this task

The Version 8 sample MDB application, `sampleMDB.ear`, should now be able to use the objects that you migrated from WebSphere Application Server Version 6 to Version 8.5. The MDB application uses these objects to send a message to WebSphere MQ, for receipt by the sample JMS application requester client that you used in "Testing the Version 7 sample JMS application" on page 89.

Procedure

1. If WebSphere Application Server is not already started, start the server. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server 8.5** > **Profiles** > **AppSrv01** > **Start the server**.
2. Start the administrative console. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server 8.5** > **Profiles** > **AppSrv01** > **Administrative console** then log in to the administrative console.
3. Click **Applications** > **New Application** > **[Install a New Application] New Enterprise Application**.

4. On the first Preparing for the application installation page, select the MDB application that you want to upload and install:

   a. Select **Local file system**, then click **Browse**. The File Upload window opens.

   b. In the File Upload window, browse to the folder where you downloaded the sample MDB application, select `sampleMDB.ear`, then click **Open**.

   c. Leave all other fields on the first Preparing for the application installation page unchanged, then click **Next**.

   What else might I do or be interested in?
   Unless you specify otherwise, the name of the installed application is derived from the name of the MDB EAR file, which in the case of this scenario is `sampleMDB.ear`. If you prefer, you can give the application a different name. To do this, click the **Step 1** link to go to the Select installation options page then specify your chosen **Application name**.
   ---

5. On the second Preparing for the application installation page, leave all fields unchanged, then click **Next**.

6. On the Install New Application page, click the **Step 3** link to go to the Bind listeners for message-driven beans page.

   What else might I do or be interested in?
   To save having to specify the binding whenever you deploy the MDB EAR file, you can bind the MDB to a listener port name using an assembly tool. For more information, see the topic Preparing for application installation binding settings in the WebSphere Application Server information center.
   ---

7. On the Bind listeners for message-driven beans page specify the listener port name to which the sample MDB application must be bound:

   a. Select `sampleMDB.ear`.

   b. Under **Listener Bindings**, select **Listener port**.

   c. Type the **Name** of the listener port: `PiShopReplyMDBListener`

      Tip: This port is the listener port that you migrated from WebSphere Application Server Version 6.1 as described in "Migrating your WebSphere Application Server configuration to Version 8.5" on page 96.

   d. Click **Next**.

8. On the Map resource references to resources page, map the connection factory resource reference defined in the sample MDB application to the JNDI name of the connection factory.

   a. Under **Target Resource JNDI Name**, click **Browse** to display a list of resources that are available to be used to bind the resource reference of the MDB.

   b. Select `PiShopReplyCF` then click **Apply**.

      Tip: For this scenario, the resource that you select is the connection factory PiShopReplyCF that you migrated from WebSphere Application Server Version 6.1 as described in "Migrating your WebSphere Application Server configuration to Version 8.5" on page 96.

   c. Leave all other fields unchanged and click **Next**.

9. On the Summary page, click **Finish**. The program displays messages to indicate that the application is being installed. If the application does not install successfully, examine the messages to identify why the installation failed. Correct the problems as needed and try installing the application again.

10. When the application installs successfully, click the **Save** link that is displayed at the end of the messages, to save your changes to the master configuration.

11. Stop the server. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server 8.5** > **Profiles** > **AppSrv01** > **Stop the server**.

> **Why am I doing this?**
> To complete the configuration changes, you need to stop then restart the application server. You start the server again in the next task, before the resources are used to verify the migrated IT configuration.

Results

You have deployed the MDB application, which is now visible in the Enterprise Applications panel. To view this panel, click **Applications** > **Application Types** > **WebSphere enterprise applications**.

What to do next

Follow the instructions in "Verifying the migrated IT configuration" to run the sample applications and verify that messages can be passed between the two products.

Verifying the migrated IT configuration

Run the sample JMS and message drive bean (MDB) applications to verify that your migrated WebSphere Application Server and WebSphere MQ configurations can communicate with each other.

About this task

In "Testing the Version 7 sample JMS application" on page 89, you ran the supplied JMS sample application to verify that the requester and responder clients of the application could communicate through WebSphere MQ. In this task, you run the requester application as before, but this time the reply comes from the MDB application that you installed in "Deploying the Version 8 sample MDB application" on page 102, instead of from the responder application, verifying that messages are being passed between WebSphere MQ and WebSphere Application Server.

Procedure

1. Start WebSphere MQ Explorer, if it is not already started, by clicking **Start** > **All Programs** > **IBM WebSphere MQ** > **WebSphere MQ Explorer (Installation 1)**.

2. Start the queue manager sampleQM, if it is not already started. In the Navigator view, expand the Queue Managers folder, right-click the name of the queue manager, then click **Start**.

3. If WebSphere Application Server is not already started, click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Start the server**.

4. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Administrative console**, then log in to the administrative console.

5. Check the status of the listener port PiShopReplyMDBListener then, if it is not already started, start it:

   a. In the administrative console, click **Servers** > **Server Types** > **WebSphere application servers** > *server_name* > **Communications** > **Messaging** > **Message Listener Service** > **[Additional Properties] Listener Ports**.

   b. Check whether the status of the listener port is started. If listener port is running, the status is shown as a green arrow.

   c. If the listener port is not already started, select it then click **Start**. The status of the listener port changes to a green arrow.

6. Check whether the Version 8 sample MDB application, sampleMDB, is already running then, if it is not running, start it:

   a. Click **Applications** > **Application Types** > **WebSphere enterprise applications** to display a list of installed applications.

   b. Check whether the application status of sampleMDB is started. If sampleMDB is running, the application status is shown as a green arrow.

   c. If the sampleMDB is not already running, start it. Select the check box next to sampleMDB, then click **Start**. The application status changes to a green arrow. The MDB application is now waiting to receive a message.

      If you see an error message similar to the following message, there might be a mismatch between your WebSphere Application Server configuration and the information contained in the sample application. Check the WebSphere Application Server error logs in *install_directory*\profiles\AppSrv01\logs\server1 for more information.

```
Error sampleMDB failed to start. Check the logs for server server1 on node
    mymachineNode01 for details.
Error An error occurred while starting sampleMDB. Check the logs for
    server server1 on node mymachineNode01 for more information.
```

7. Optional: Stop the Version 6 MDB application, sampleMDBv6, if it is running. Select the check box next to sampleMDBv6, then click **Stop**.

   > **Why am I doing this?**
   > You do not need to stop the Version 6 MDB application, sampleMDBv6, to be able to run the Version 8 MDB. However, stopping the Version 6 MDB better makes it clear that the message handling is being done by the Version 8 MDB.

8. Double-click the runrequester.cmd batch file that was downloaded in the Version 7 sample JMS application package. This command file opens a Command Prompt window then runs the sample JMS requester client, which sends a message to WebSphere MQ. The runrequester.cmd file uses environment variables to set the class path for running the JMS application. If you see a Java java.lang.NoClassDefFoundError, you might need to adjust the class path line in the command file.

Results

The sample requester application sends the same request message as before, but the response now comes from the MDB application. The following output, showing sent and received messages, is displayed in the requester application Command Prompt window:

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Connection created.

> Sending stock request for 'BakedBeans'
> Sent Message ID=ID:414d512073616d706c65514d20202020bcec684e20002302


> Received Message ID=ID:414d512073616d706c65514d20202020bcec684e20002005 for
'From MDB: BakedBeans - 15 tins in stock. Expected delivery time 1 day'
> Closing connection to QueueManager.
> Closed Connection.
-------------------------------------------------------
In this window, observe the messages sent through WebSphere MQ:
- The request message sent
- The reply message received
-----
When ready, press any key to close this window
Press any key to continue . . .
```

If you see errors similar to the following error in the WebSphere Application Server logs, check that the name of the queue in WebSphere Application Server matches the administrative name (not the JNDI name) of the queue in WebSphere MQ:

```
WebSphere MQ call failed with compcode '2' ('MQCC_FAILED') reason '2085'
    ('MQRC_UNKNOWN_OBJECT_NAME')

com.ibm.msg.client.jms.DetailedInvalidDestinationException: JMSWMQ2008:
    Failed to open MQ queue 'myQueue'. JMS attempted to perform an MQOPEN,
    but WebSphere MQ reported an error. Use the linked exception to determine
    the cause of this error. Check that the specified queue and queue manager
    are defined correctly.
```

Note: If you update the WebSphere Application Server configuration, you must restart the application server for the changes to take effect.

You have finished migrating WebSphere Application Server from Version 6 to Version 8.5 and then WebSphere MQ from Version 6 to Version 7, and verified that, following the migration, WebSphere Application Server can still connect to WebSphere MQ for the successful transmission of messages.

You have now completed Option 2 of this scenario.

What to do next

At this point, the Version 8.5 sample MDB application is still using the listener port that you migrated from WebSphere Application Server Version 6 to connect to WebSphere MQ. To complete the delivered logical topology described in "Overview: The delivered logical topology" on page 11, you now need to create an activation specification and configure the Version 8 sample MDB application to use this activation specification instead of the listener port to listen for and respond to messages received from WebSphere MQ. To complete this final stage of the scenario, follow the instructions in "Migrating WebSphere Application Server listener ports to activation specifications" on page 107.

Migrating WebSphere Application Server listener ports to activation specifications

Create an activation specification for the Version 8 sample MDB application to use, instead of the listener port that you migrated from Version 6, to connect to WebSphere MQ. After creating the activation specification, bind the MDB to the activation specification JNDI name, to replace the previous use of the listener port.

Before you begin

Listener ports are based on an optional, and now deprecated, part of the JMS specification and are stabilized for WebSphere Application Server Version 7 and later. Although you can continue to use listener ports in WebSphere Application Server Version 8.5, if you want to use JCA 1.5-compliant resources, you should plan to migrate your message-driven beans to activation specifications. Activation specifications are part of the JCA 1.5 specification, which provides a standard way to integrate JMS providers, such as WebSphere MQ, with Java EE application servers such as WebSphere Application Server.

For more information, see the topics Message-driven beans, activation specifications, and listener ports and Stabilized features in the WebSphere Application Server Version 8.5 information center.

> **What else might I do or be interested in?**
> You should not begin migrating your listener ports until you are sure that the application does not have to work on application servers earlier than WebSphere Application Server Version 7. For example, if you have an application server cluster with some members at Version 6.1 and some at Version 7, you should not migrate applications on that cluster to use activation specifications until after you migrate all the application servers in the cluster to Version 8.5.

EJB 2.0 message-driven beans cannot be configured against JCA 1.5-compliant resources. If you were using an MDB that was an EJB 2.0 application, you would need to upgrade it to EJB 3 or EJB 2.1 before completing this task.

About this task

In this task, the migration from a listener port to an activation specification is achieved by creating a new activation specification to replace the listener port that you created in "Configuring WebSphere Application Server Version 6.1" on page 41 and then migrated in "Migrating your WebSphere Application Server configuration to Version 8.5" on page 59.

An alternative way of migrating from a listener port to an activation specification is to use the wizard available in WebSphere Application Server. For more information about using this wizard, see the topic Migrating a listener port to an activation specification for use with the WebSphere MQ messaging provider in the WebSphere Application Server Version 8.5 information center.

Procedure

1. If WebSphere Application Server is not already started, click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** >

Profiles > **AppSrv01** > **Start the server**. A command window is displayed until the server is started; this process might take a few minutes.

2. If the administrative console is not already started, click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Administrative console**.

   Note: You must log on even if you did not enable administrative security when you installed the product. If you did not enable administrative security, the user ID is used only to distinguish changes that you make in the administrative console from changes made by other users.

3. In the administrative console, click **Resources** > **JMS** > **Activation specifications**.

4. Ensure that the scope is set to **Cell=***cell_name*, then click **New**.

   ```
   ┌─ Why am I doing this? ───────────────────────────────────────┐
   │  You use the Scope property to set the level at which the     │
   │  activation specification is visible. The cell scope is the   │
   │  highest level, giving the activation specification the       │
   │  greatest visibility.                                         │
   └──────────────────────────────────────────────────────────────┘
   ```

   ```
   ┌─ What else might I do or be interested in? ──────────────────┐
   │  You can also create activation specifications at other      │
   │  levels. For example, if you have multiple servers you might  │
   │  create an activation specification for each server, using    │
   │  the server scope, so that you can specify different          │
   │  settings to be used for each server.                         │
   └──────────────────────────────────────────────────────────────┘
   ```

5. Select **WebSphere MQ messaging provider** then click **OK**. The "Create WebSphere MQ JMS resource" wizard starts.

6. On the "Configure basic attributes" page, complete the following fields.

   Name `PiShopReplyAS`

   > The name by which the activation specification is to be known for administrative purposes. This name used to display the activation specification in the administrative console.

   JNDI name
   > `jms/PiShopReplyAS`

   > The JNDI name to be used to reference the object in the JNDI namespace.

   Click **Next**.

7. On the "Specify MDB destination data" page type `jms/wasQueue` in the **Destination JNDI name** field, then click **Next**. The destination type is `Queue` by default.

   Tip: This name must match what you specified for the **JNDI name** when you configured the queue in "Deploying the sample MDB application to WebSphere Application Server Version 6.1" on page 46.

> **Why am I doing this?**
> The sample application uses point-to-point messaging, which is achieved by using a queue destination. Topic destinations are used for publish/subscribe messaging. The JNDI name is used to reference the queue in the JNDI namespace. You use the same JNDI name when you create the queue object.

8. On the "Select connection method" page click **Next**, leaving the default option, **Enter all the required information into this wizard**, selected.

9. On the "Supply queue connection details" page type the name of the WebSphere MQ queue manager, `sampleQM` in the **Queue manager or queue-sharing group name** field, then click **Next**.

10. On the "Enter connection details" page, enter the following information, then click **Next**.

Transport mode
> Leave as the default setting, **Bindings, then client**.

> **Why am I doing this?**
> In this mode, WebSphere Application Server first attempts to connect in bindings mode, where the WebSphere MQ messaging provider within WebSphere Application Server connects directly to the WebSphere MQ queue manager. If this connection attempt fails, the WebSphere MQ messaging provider then attempts to connect by using client mode, which uses a TCP/IP-based network. Bindings mode usually has better performance, but can be used only when WebSphere Application Server and WebSphere MQ are installed on the same machine. The host name, port, and server connection channel information is required for client mode. Bindings mode requires the configuration of native library path information, which you will add in a later step in this task.

Host name
> The name of your machine.

> **Why am I doing this?**
> The host name is needed if the WebSphere MQ messaging provider has to connect by using client mode.

Port The port number of the WebSphere MQ queue manager sampleQM; for example, 1415

> This port number is displayed in WebSphere MQ Explorer under **Queue managers** > *sampleQM* > **Advanced** > **Listeners**, in the Port column in the LISTENER.TCP row.

Server connection channel
> The name of the WebSphere MQ channel to use for communication.

> If you do not have a specific channel that you want to use, specify the default channel that is created when you created the queue manager, SYSTEM.DEF.SVRCONN.

> **Tip:** To display the default channel in WebSphere MQ Explorer, click
> the **Show System Objects** icon at the upper right of the MQ Explorer
> - Content pane.

11. On the "Test connection" page, click **Test connection**.

> ┌─ **Why am I doing this?** ──────────────────────────────────────
> The **Test connection** button verifies that the activation specification
> contains the necessary details to create a connection to WebSphere MQ.

If successful, the wizard displays the message `A connection was successfully`
`made to WebSphere MQ`. If not successful, check that the queue manager name,
port, and server channel that you specified are correct, and match the
corresponding values in WebSphere MQ. For example, the following error
indicates that the channel name was not found on the queue manager that
you specified.

```
A connection could not be made to WebSphere MQ for the following reason:
    JMSCMQ0001: WebSphere MQ call failed with compcode '2' ('MQCC_FAILED')
    reason '2540' ('MQRC_UNKNOWN_CHANNEL_NAME').
```

12. Click **Next**, then on the Summary page click **Finish**.

13. Click the **Save** link in the Messages section of the administrative console page
to save your changes to the master configuration.

14. Bind the MDB to the activation specification JNDI name to replace the use of
the listener port.

    a. Click **Applications** > **Application Types** > **WebSphere enterprise
    applications** >

    b. Click **sampleMDB**

    c. Click **[Enterprise Java Bean Properties] Message Driven Bean listener
    bindings** A table of binding properties is displayed for the EJB module
    `pishopExampleReplyMDB`.

    d. In the Listener Bindings column, select the `Activation Specification`
    check box, then specify the JNDI name. In the **Target Resource JNDI
    Name** field, type `jms/PiShopReplyAS`

    This is the JNDI name of the activation specification that the MDB is to
    use instead of the listener port. The value must match the JNDI name that
    you specified in step 6.

    You do not need to set other properties, which are provided to allow you
    to override values configured on the activation specification. For example,
    in this scenario the MDB uses the JMS destination, `jms/wasQueue`, that you
    configured on the activation specification in step 6. (The optional
    Destination JNDI name field overrides the destination configured on the
    activation specification.)

15. Stop the application server. Click **Start** > **All Programs** > **IBM WebSphere** >
IBM WebSphere Application Server V8.5 > **Profiles** > **AppSrv01** > **Stop the
server**, then wait for the command window to disappear.

16. Start the application server. Click **Start** > **All Programs** > **IBM WebSphere** >
IBM WebSphere Application Server V8.5 > **Profiles** > **AppSrv01** > **Start the
server**.

What to do next

Test that the MDB can still listen for messages, based on the configuration provided by the activation specification instead of the listener port, as described in "Verifying the MDB with an activation specification."

Verifying the MDB with an activation specification

Run the sample JMS and message driven bean (MDB) applications to verify that your migrated WebSphere Application Server and WebSphere MQ configurations can communicate with each other using an activation specification instead of the listener port that was migrated.

Before you begin

Before starting this task, you must have configured the activation specification, and then bound it to the MDB, as described in "Migrating WebSphere Application Server listener ports to activation specifications" on page 107.

About this task

In the final stage of the migration options, you ran the supplied JMS sample application to verify that the requester and responder clients of the application could communicate through WebSphere MQ. The reply came from the Version 7 JMS application that you installed with a binding to the listener port that you had migrated from WebSphere Application Server Version 6.

This task is to test that the MDB still works after you have replaced the listener port with an activation specification.

Procedure

1. Start WebSphere MQ Explorer, if it is not already started, by clicking **Start** > **All Programs** > **IBM WebSphere MQ** > **WebSphere MQ Explorer**.
2. Start the queue manager sampleQM, if it is not already started. In the Navigator view, expand the Queue Managers folder, right-click the name of the queue manager, then click **Start**.
3. If WebSphere Application Server is not already started, click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Start the server**.
4. Click **Start** > **All Programs** > **IBM WebSphere** > **IBM WebSphere Application Server V8.5** > **Profiles** > **AppSrv01** > **Administrative console** then log in to the administrative console.
5. Check the status of the listener port PiShopReplyMDBListener then, if it is already started, stop it:
   a. In the administrative console, click **Servers** > **Server Types** > **WebSphere application servers** > *server_name* > **Communications** > **Messaging** > **Message Listener Service** > **[Additional Properties] Listener Ports**.
   b. Check whether the status of the listener port is started. If listener port is running, the status is shown as a green arrow.
   c. If the listener port is already started, select it then click **Stop**. The status of the listener port changes to a red cross.
6. Check whether the Version 8 sample MDB application, sampleMDB, is already running then, if it is not running, start it:

a. Click **Applications** > **Application Types** > **WebSphere enterprise applications** to display a list of installed applications.

b. Check whether the application status of sampleMDB is started. If sampleMDB is running, the application status is shown as a green arrow.

c. If the sampleMDB is not already running, start it. Select the check box next to sampleMDB, then click **Start**. The application status changes to a green arrow. The MDB application is now waiting to receive a message.

If you see an error message similar to the following message, there might be a mismatch between your WebSphere Application Server configuration and the information contained in the sample application. Check the WebSphere Application Server error logs in *install_directory*\profiles\AppSrv01\ logs\server1 for more information.

```
Error sampleMDB failed to start. Check the logs for server server1 on node
    mymachineNode01 for details.
Error An error occurred while starting sampleMDB. Check the logs for
    server server1 on node mymachineNode01 for more information.
```

7. Optional: Stop the Version 6 MDB application, sampleMDBv6, if it is running. Select the check box next to sampleMDBv6, then click **Stop**.

Why am I doing this?

You do not need to stop the Version 6 MDB application, sampleMDBv6, to be able to run the Version 8 MDB. However, stopping the Version 6 MDB better makes it clear that the message handling is being done by the Version 8 MDB.

---

8. Double-click the runrequester.cmd batch file that was downloaded in the Version 8 sample MDB application package. This command file opens a Command Prompt window then runs the sample JMS requester client, which sends a message to WebSphere MQ. The runrequester.cmd file uses environment variables to set the class path for running the JMS application. If you see a Java java.lang.NoClassDefFoundError, you might need to adjust the class path line in the command file.

Results

The sample requester application sends the same request message as before, but the response now comes from the MDB application. This time, the configuration necessary for the MDB to receive messages is provided by the activation specification instead of the listener port.

The following output, showing sent and received messages, is displayed in the requester application Command Prompt window:

```
> Connection factory located in JNDI.
> Destination located in JNDI.
> Creating connection to QueueManager.
> Connection created.

> Sending stock request for 'BakedBeans'
> Sent Message ID=ID:414d512073616d706c65514d20202020bcec684e20002302

> Received Message ID=ID:414d512073616d706c65514d20202020bcec684e20002005 for
'From MDB: BakedBeans - 15 tins in stock. Expected delivery time 1 day'
> Closing connection to QueueManager.
> Closed Connection.
--------------------------------------------------------
In this window, observe the messages sent through WebSphere MQ:
```

```
- The request message sent
- The reply message received
-----
When ready, press any key to close this window
Press any key to continue . . .
```

Troubleshooting:

- If you see errors similar to the following error in the WebSphere Application Server logs, check that the name of the queue in WebSphere Application Server matches the administrative name (not the JNDI name) of the queue in WebSphere MQ:

```
WebSphere MQ call failed with compcode '2' ('MQCC_FAILED') reason '2085'
    ('MQRC_UNKNOWN_OBJECT_NAME')

com.ibm.msg.client.jms.DetailedInvalidDestinationException: JMSWMQ2008:
    Failed to open MQ queue 'myQueue'. JMS attempted to perform an MQOPEN,
    but WebSphere MQ reported an error. Use the linked exception to determine
    the cause of this error. Check that the specified queue and queue manager
    are defined correctly.
```

> **Note:** If you update the WebSphere Application Server configuration, you must restart the application server for the changes to take effect.

- For any other errors, see the Troubleshooting and support section of the WebSphere Application Server information center.

Conclusion

You have finished migrating WebSphere Application Server from Version 6 to Version 8.5, and WebSphere MQ from Version 6 to Version 7.5, and verified that, following the migration, the MDB on WebSphere Application Server can use an activation specification to listen for and respond to messages received from WebSphere MQ.

Using either migration option 1 or option 2, and then migrating the listener port to an activation specification, you have achieved the logical topology shown in Figure 9 on page 114.
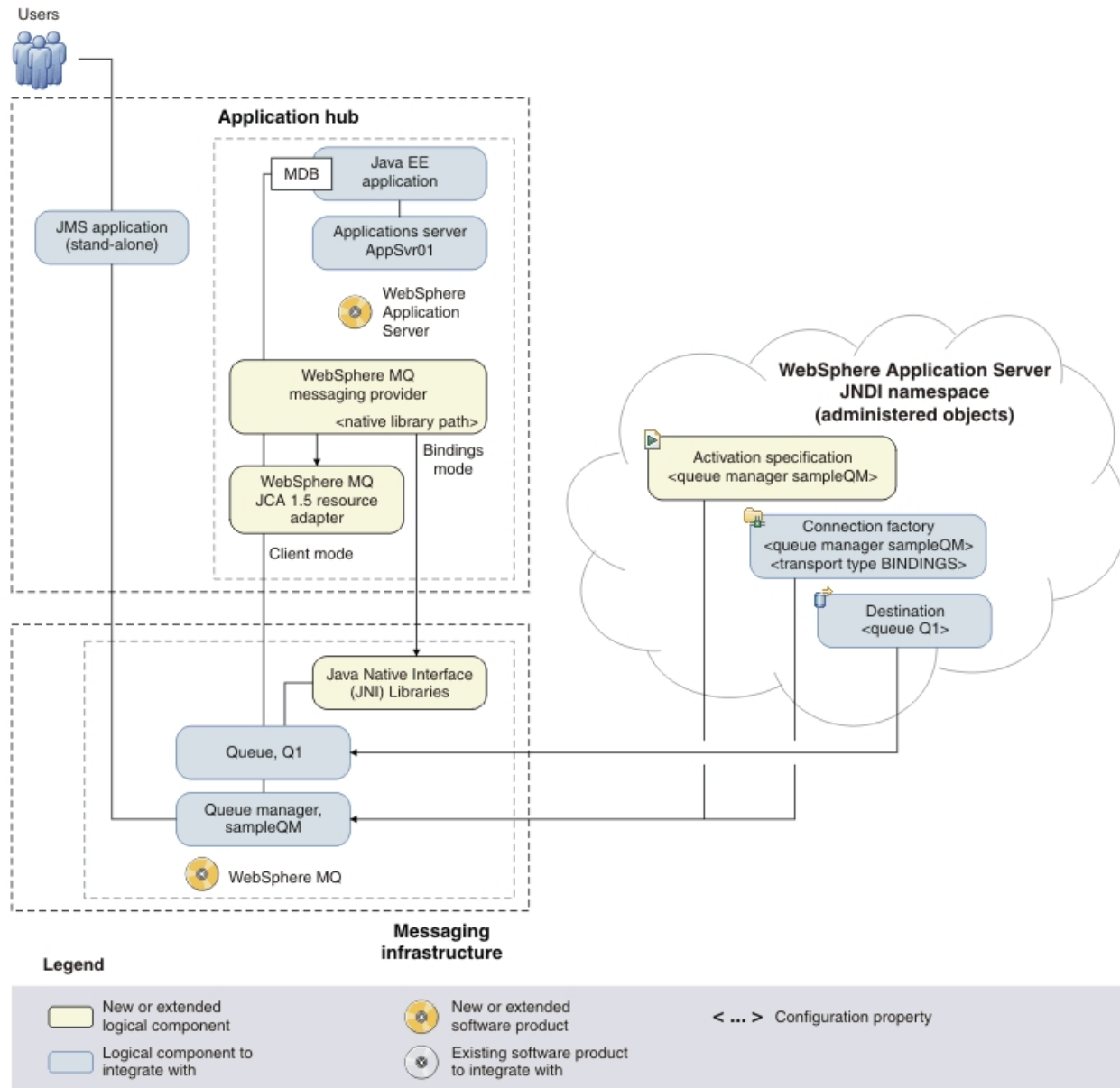
Figure 9. Delivered logical topology. The high-level logical topology diagram for software functions delivered by migrating WebSphere Application Server from Version 6 to Version 8.5 and WebSphere MQ from Version 6 to Version 7.5. This logical topology shows the new functions as new or extended logical components, integrated with the software functions and products from the initial logical topology.

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