WebSphere MQ for AIX

Quick Beginnings

Version 6.0

GC34-6478-01

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GC34-6478-01

Note!
Before using this information and the product it supports, be sure to read the general information under notices at the back of this book.

Second edition (October 2006)

This edition of the book applies to the following products:

- IBM WebSphere MQ for AIX, Version 6.0

and to all subsequent releases and modifications until otherwise indicated in new editions.

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Welcome to WebSphere MQ

This book describes IBM® WebSphere® MQ for AIX®, Version 6.0 and explains how to plan for the product, install it, and verify that the installation has worked.

See the:

- *WebSphere MQ Bibliography and Glossary* for an explanation of terms used in this book
- *WebSphere MQ System Administration Guide* for further information on using the control commands *crtmqm*, *strmqm*, and *endmqm*

Road map

Use Table 1 to find the information that you need to get started with WebSphere MQ for AIX.

Table 1. Getting started road map

If you want to...	Refer to...
Learn about system requirements for WebSphere MQ for AIX	"Preparing for installation" on page 3
Install the WebSphere MQ for AIX server	"Installation procedure" on page 11
Install the WebSphere MQ for AIX client	"Installing WebSphere MQ" on page 34 and "Verifying the client installation" on page 38
Read more about WebSphere MQ	Chapter 7, "WebSphere MQ Documentation," on page 49
Apply maintenance to WebSphere MQ for AIX	Chapter 5, "Applying maintenance," on page 45
Uninstall a WebSphere MQ for AIX server or client	Chapter 6, "Uninstalling WebSphere MQ," on page 47

Conventions

Knowing the conventions used in this book will help you to use it more efficiently.

- The terms click, double-click, and right-click are used to describe item selection with the mouse.
- The term enter means type the relevant text or command, then press the Enter key.
- **Boldface type** indicates the name of an item that you need to select or the name of a command.
- *Italics type* indicates new terms, book titles, or variable information that must be replaced by an actual value.
- `Monospace type` indicates an example (such as a fictitious path or file name) or text that is displayed on the screen.

Conventions

What's new in WebSphere MQ for AIX, Version 6.0

WebSphere MQ for AIX, Version 6.0 provides the following new and changed functions:

- Queue managers are now 64-bit. As such WebSphere MQ for AIX, Version 6.0 now requires 64-bit hardware. Queue manager processes are 64-bit only. For information on the implications of migrating to use the new 64-bit capabilities see the *WebSphere MQ Migration Information* book.
- WebSphere MQ introduces the ability for queue managers to communicate using the IPv6 protocol in addition to the existing, IPv4, protocol. For further information for migrating customers see the *Migration* book.
- Support for DCE exits, the DCE name service and DCE thread support features has been removed. For further information for migrating customers see the *Migration* book.
- A new form of license management is implemented for this release of the product. WebSphere MQ for AIX, Version 6.0 supports IBM Tivoli® License Manager.
- Recent security improvements in WebSphere MQ Version 6.0 have affected the behavior of the AMQ6183 message. Users who are not in the mqm group cannot have message AMQ6183 written to the System error log file. Message AMQ6183 indicates that a FDC record has been written due to an FFST™ being generated. As a result, users can no longer rely on these messages for information regarding processes run by users who are not members of group mqm. See the Security book for further information on security changes.
- Support for UDP transport protocol on AIX removed
- The SSL runtime cryptography on WebSphere MQ for AIX, Version 6.0 provides a cryptography package called IBM Crypto for C (ICC). On AIX the ICC software complies with the National Institute of Standards and Technology (NIST) Federal Information Processing Standards (FIPS) Cryptomodule Validation Program (CMVP).

Release notes

Before starting to install WebSphere MQ, review the release notes file, which you will find on the product CD-ROM in the `\Readmes` folder for each national language. This file contains any additional information about the WebSphere MQ for AIX, Version 6.0 product and might update information in this book.

Chapter 1. Migrating to WebSphere MQ Version 6.0

If you want to migrate to WebSphere MQ Version 6.0, complete this task. For further information about migrating to WebSphere MQ Version 6.0 see the *WebSphere MQ Migration Information* book.

1. End all WebSphere MQ activity.
   a. Log in as root.
   b. Use the **endmqm** command to stop all running queue managers.
   c. Stop any listeners associated with the queue managers, using the command:
      `endmqlsr -m QMgrName`
   d. To check that you have stopped all of them, enter the following:
      ```
      ps -ef | grep mq
      ```
      Check that there are no processes listed that are running command lines beginning `amq` or `runmq`. Ignore any that start with `amqi`.
2. Function supplied by the SupportPacs in the table below has been superseded by function in WebSphere MQ Version 6.0. Remove these SupportPacs before installing WebSphere MQ Version 6.0.

Table 2. SupportPacs superseded by WebSphere MQ Version 6.0

SupportPac™ Number	Description
MA0C	MQSeries® Publish/subscribe
MA0R	WebSphere MQ transport for SOAP
MA88	MQSeries Classes for Java™ and WebSphere MQ classes for Java Message Service
MACS	MQSeries Client libraries for AIX (64-bit)

   Note: If you installed SupportPac MACS, remove the directory `/usr/mqm/inc64` and its contents.
   Please review any other installed SupportPacs for their applicability to WebSphere MQ Version 6.0.
3. Uninstall WebSphere MQ and any WebSphere MQ service updates.
4. Install WebSphere MQ Version 6.0 by following the tasks set out in the book.

Important information for Beta driver users

If you have previously installed a WebSphere MQ Version 6.0 Beta driver, you **must** uninstall this driver and clean up any remaining files **before** you install the GA version of WebSphere MQ Version 6.0

After you have migrated to WebSphere MQ Version 6.0

Immediately after you migrate to WebSphere MQ Version 6.0, you must start your queue manager at least once to migrate your file system structure before you start any WebSphere MQ listeners. Otherwise, you will not be able to start WebSphere MQ listeners after migration.

If you cannot connect to a migrated queue manager and receive the error message "SYSTEM.MQEXPLORER.REPLY.MODEL not defined", run the following command on that queue manager:

```
strmqm -c
```

This command refreshes the default system objects, and creates the queue required by the WebSphere MQ Explorer.

Chapter 2. Installing a WebSphere MQ server

This chapter describes how to install a WebSphere MQ Version 6.0 server. The information covers topics such as preparing for installation and verifying your installation, as well as installation itself. If you already have an installation of WebSphere MQ, and are migrating to WebSphere MQ Version 6.0 see Chapter 1, "Migrating to WebSphere MQ Version 6.0," on page 1 before installing WebSphere MQ Version 6.0.

WebSphere MQ for AIX can be installed as a server or a client.

A WebSphere MQ server is an installation of one or more queue managers that provide queueing services to one or more clients. All the WebSphere MQ objects, for example queues, exist only on the queue manager machine (the WebSphere MQ server machine), and not the client. A WebSphere MQ server can also support local WebSphere MQ applications.

A WebSphere MQ client is a component that allows an application running on one system to communicate with a queue manager running on another system. The output from the call is sent back to the client, which passes it back to the application. To install a WebSphere MQ client see, Chapter 3, "Installing a WebSphere MQ client," on page 27.

It is possible to have both a server and a client installation on the same machine, for instructions on how to do this see, Chapter 4, "Installing a client on the same machine as a server," on page 43.

See the *WebSphere MQ System Administration Guide* for an introduction to WebSphere MQ concepts and objects.

For information on the components that can be included in the server and client installations see, "WebSphere MQ Components" on page 12.

The installation process is divided into the following set of tasks, complete all of these tasks in sequence:

- "Preparing for installation"
- "Installation procedure" on page 11
- "Verifying your installation" on page 14

Preparing for installation

Before you install WebSphere MQ, complete the following tasks.

- "Checking prerequisite hardware and software" on page 4
- "Creating WebSphere MQ file systems" on page 7
- "Setting up the user ID and group ID" on page 8

Additionally, if you require messages in a language other than U.S. English see, "Displaying messages in your national language" on page 10.

Checking prerequisite hardware and software

This section details the operating system requirements, the prerequisite software and optional software required for using WebSphere MQ Version 6.0.

- "Checking the operating environment"
- "Checking optional software" on page 5

Checking the operating environment

Before you install WebSphere MQ Version 6.0, you must check that your system meets the hardware and operating system software requirements set for this product and the particular components you intend to install on it.

Note: WebSphere MQ does not support host names that contain spaces. If you install WebSphere MQ on a computer with a host name that contains spaces, you will be unable to create any queue managers.

Hardware

WebSphere MQ for AIX, Version 6.0 runs on any machine that supports the AIX5L V5.2 or AIX5L V5.3 operating systems capable of running 64-bit programs whether from IBM or other vendors.

Operating System

The operating systems supported by WebSphere MQ for AIX, Version 6.0 are:

- AIX5L V5.2 (plus maintenance Level 3)
- AIX5L V5.3

Use the oslevel -r command to determine the level of the operating system you are running, including the maintenance level.

Connectivity Requirements

Check that the system has 64-bit compatible communications hardware that supports at least one of the following:

- TCP/IP
- SNA LU6.2: If you want to use the SNA LU6.2 support on WebSphere MQ you need the IBM Communications Server for AIX Version 6.1.

UDP is no longer supported, existing channels should either be deleted or migrated to one of the supported protocols listed above. To migrate UDP channels to an alternative protocol alter the channel TRPTYPE attribute. For information about this channel attribute see the *Intercommunication* book.

Storage Requirements

The storage requirements for the WebSphere MQ for AIX, Version 6.0 depend on which components you install, and how much working space you need. This, in turn, depends on the number of queues that you use, the number and size of the messages on the queues, and whether the messages are persistent. You also require archiving capacity on disk, tape or other media. The approximate amount of storage space required for a server installation is detailed in the table below.

Table 3. Storage requirements for a WebSphere MQ server

Storage Requirements	Storage Requirement in MB in /opt
WebSphere MQ Server installation	325

You can use the df command to determine the amount of free space on your system.

Disk storage is also required for

- Prerequisite software
- Optional software
- Your application programs

File descriptors

When running a multi-threaded process such as the agent process, you might reach the soft limit for file descriptors. This gives you the WebSphere MQ reason code `MQRC_UNEXPECTED_ERROR (2195)` and, if there are enough file descriptors, a WebSphere MQ FFST file.

To avoid this problem, you can increase the process limit for the number of file descriptors. To do this, alter the `nofiles` attribute in `/etc/security/limits` to 10,000 for the `mqm` user id or in the default stanza. For information about the `mqm` user id see, "Setting up the user ID and group ID" on page 8.

System Resource Limits

Set the system resource limit for data segment and stack segment to unlimited using the following commands in a command prompt:

```
ulimit -d unlimited
ulimit -s unlimited
```

Checking optional software

Check through this topic to identify which additional software is supported for use with WebSphere MQ.

Compilers

The following compilers are supported for WebSphere MQ for AIX applications:

C/C++

- IBM VisualAge® C++ Professional for AIX Version V5.0, V6.0 and V7.0
- IBM C for AIX V5.0, V6.0 and V7.0

COBOL

- Micro Focus Server Express V4.0
- IBM COBOL Set for AIX V1.1 (32-bit application only)

Java

- IBM SDK for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 32-bit
- IBM SDK for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 64-bit

These Java SDKs are supplied with WebSphere MQ, and can be installed during the installation process described in this document.

Databases

The following databases are supported:

- DB2 Universal Database™ V8.2
- Oracle9*i*Release 2 with Patch Set 4 (9.2.0.5)
- Oracle 10g
- Sybase Adaptive Server Enterprise (ASE) 12.5.1
- Informix® Dynamic Server (IDS) V9.40 plus Client SDK V2.90

Transaction monitors

The following transaction processing monitors (coordination through X/Open XA interface) are supported:

- BEA Tuxedo V8.1
- IBM WebSphere Application Server (WAS) V5.1
- IBM TXSeries® for AIX V5.1
- WebLogic V8.1

WebSphere MQ for AIX, Version 6.0 supports WebSphere Application Server as an XA coordinator. For more information about the WebSphere MQ application adaptor, see the WebSphere Application Server Enterprise Edition WebSphere MQ Application Adaptor Development Guide, SC09-4444.

Java Messaging and SOAP transport

If you want to use Java Messaging and SOAP (Simple Object Access Protocol) Support, you need a Java Runtime Environment Version 1.4.2 or later. An appropriate runtime environment is provided in the JDKs provided on the WebSphere MQ Server CD- ROM. These JDK packages can be selected for install during the installation procedure described in this book, see "WebSphere MQ Components" on page 12 for package information.

The JDKs available on the server CD-ROM are:

- IBM SDK for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 32-bit
- IBM SDK for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 64-bit

These JDKs provide support for SOAP and are FIPS 140-2 compliant.

Note that to use the JDK shipped with WebSphere MQ for AIX, Version 6.0, the fileset `Java14.ext.java3d 1.4.2.0` requires the following fileset updates:

- OpenGL.OpenGL_X.rte.base 5.1.0.50
- OpenGL.OpenGL_X.rte.soft 5.1.0.50

An error message will be displayed when you install the JDK if you do not have these updates.

For a list of alternative JDKs, see

www.ibm.com/software/integration/websphere/mqplatforms/supported.html

For further information about using Java with WebSphere MQ see, *Using Java*.

For further information about SOAP see, *WebSphere MQ Transport For SOAP* book.

If you use a JDK other than the one supplied by WebSphere MQ Version 6.0 you should be aware that:

- The JDK may not be FIPS level 140-2 compliant and by using it with WebSphere MQ, WebSphere MQ for AIX, Version 6.0 will not comply the FIPS 140-2 standards.
- SOAP is not supported.

On AIX, the 32-bit and 64-bit JDKs are typically installed to different locations, for example, the 32-bit JDK is located in `/usr/java14` and the 64-bit JDK is located in `/usr/java14_64`. Ensure that the PATH variable is correctly set for your applications that use Java. To use the JMS Postcard application described in "Verifying the installation using the JMS Postcard application" on page 19 you need to use a 32-bit JDK. You can check the version installed using the following command:

```
java -version
```

Secure Sockets Level (SSL)

If you want to use the SSL support, you need IBM Global Security Kit V7. This is supplied with WebSphere MQ as one of the components available for installation. If you are migrating from WebSphere MQ Version 5.3 and have no other requirement for the IBM Global Security Kit V6, you can uninstall it using the process described in Chapter 6, "Uninstalling WebSphere MQ," on page 47, the package name is `gskak.rte`.

You must also have installed version 6.0.0.2 (or later) of the C++ runtime to use the SSL support.

Creating WebSphere MQ file systems

The installation directory for the WebSphere MQ product code is `/usr/mqm`. Working data is stored in `/var/mqm`. You cannot change these locations. The GSKit must also be installed into its default location.

The topics contained in this section describe how to prepare your file system for installing WebSphere MQ. Perform these tasks before installation.

Creating a file system for the product code

The WebSphere MQ product code is installed in `/usr/mqm`. If you cannot install the product code in the `/usr/mqm` file system because the file system is too small to contain the product, you can do one of the following:

1. Create a new file system and mount it as `/usr/mqm`. If you choose this option, the new file system must be created and mounted before installing the product code.
2. Create a new directory anywhere on your machine, and create a symbolic link from `/usr/mqm` to this new directory. For example:

   ```
   mkdir /bigdisk/mqm
   ln -s /bigdisk/mqm /usr/mqm
   ```

   If you choose this option, the new directory must be created, and the link created, before installing the product code.

3. Allow the install program to expand the file system.

The file system into which the code is installed can be a remote network device, for example, NFS. However, you must define the mount options defined on that device to allow **setuid** programs, including those which are **setuid** root, to run.

Creating a file system for the working data

Before you install WebSphere MQ for AIX, create and mount a file system called `/var/mqm`. If possible, use a partition strategy with a separate volume for the data. This means that other system activity is not affected if a large amount of WebSphere MQ work builds up.

To determine the size of the `/var/mqm` file system for a server installation, consider:

- The maximum number of messages in the system at one time
- Contingency for message buildups, if there is a system problem
- The average size of the message data, plus 500 bytes for the message header
- The number of queues
- The size of log files and error messages
- The amount of SSL trace that is written to the `/var/mqm/trace` directory

Allow 50 MB as a minimum for a WebSphere MQ server and 15 MB as a minimum for a WebSphere MQ client.

Creating separate file systems for working data

You can also create separate file systems for your log data (`/var/mqm/log`) and error files (`/var/mqm/errors`). If possible, store log files on a different physical volume from the WebSphere MQ queues (`/var/mqm`).

If you create separate file systems:

- The `/var/mqm` and `/var/mqm/log` directories ***must*** be on a local file system.
- The `/var/mqm/errors` directory can be NFS mounted. However, if you choose to NFS-mount `/var/mqm/errors`, the error logs might be lost if the network fails.

If you are creating separate file systems, allow a minimum of 30 MB of storage for `/var/mqm` for a server installation and 15 MB of storage for `/var/mqm` for a client installation. Also allow 20 MB of storage for `/var/mqm/log`, and 4 MB of storage for `/var/mqm/errors` for both client and sever installations.

If you want to use individual queues that will hold more than 2 GB of data, you must enable `/var/mqm` to use large files.

The size of the log file depends on the log settings that you use. The minimum sizes above are for circular logging using the default settings. For further information on log sizes see the *WebSphere MQ System Administration Guide*.

Setting up the user ID and group ID

WebSphere MQ requires a user ID of the name `mqm`, with a primary group of `mqm`. The `mqm` user ID owns the directories and files that contain the resources associated with the product. Create the user ID and group IDs as described in the following sections.

- “Creating the user ID and group” on page 9

- "Adding existing user IDs to the group"

Creating the user ID and group

Create the required user ID and group ID ***before*** you install WebSphere MQ. Both user ID and group ID must be set to mqm. For stand-alone machines, you can create the new user ID and group IDs locally; for machines administered in a network information services (NIS) domain, an administrator must create the IDs on the NIS master server machine.

You can use the System Management Interface Tool (**smitty**), for which you require root authority.

1. To create the mqm group, display the required window using this sequence:

   ```
   Security & Users
     Groups
       Add a Group
   ```

   Set the group name field to mqm.
2. To create the new user, mqm, display the required window using this sequence:

   ```
   Security & Users
     Users
       Add a User
   ```

   Set the user name field to mqm.
3. To add a password to the new user ID, display the required window using this sequence:

   ```
   Security & Users
      Passwords
       Change a User's Password
   ```

   Set the password as required.

It is also suggested that you set the mqm user's home directory to /var/mqm.

Adding existing user IDs to the group

If you want to run administration commands, for example **crtmqm** (create queue manager) or **strmqm** (start queue manager), your user ID must be a member of the mqm group.

Users do not need mqm group authority to run applications that use the queue manager; it is needed only for the administration commands.

You can use **smitty** to add an existing user ID to the mqm group. Display the required menu using this sequence:

```
Security & Users
  Users
    Change / Show Characteristics of a User
```

Enter the name of the user in the **User Name** field and press Enter. Add mqm to the **Group SET** field, which is a comma-separated list of the groups to which the user belongs. Users need not have their primary group set to mqm. Provided that mqm is in their set of groups, they can use the administration commands.

Displaying messages in your national language

Messages in the language specified by the locale selected on your machine are installed by default. If you require messages in a different language, ensure that:

To find out which language are currently in use, use the **locale** command.

If you require messages in a different language, ensure that you:

1. Install the appropriate message catalog (see "WebSphere MQ Components" on page 12).
2. To select messages in a different language, use the following command with the identifier for the language you want to install:

   ```
   export LANG=message identifier
   ```

   The message identifiers for the message catalogs are as follows:
   - de_DE (German)
   - es_ES (Spanish)
   - fr_FR (French)
   - it_IT (Italian)
   - ja_JP (Japanese)
   - ko_KR (Korean)
   - pt_BR (Brazilian Portuguese)
   - zh_CN (Simplified Chinese)
   - zh_TW (Traditional Chinese)

Implications of a 64-bit queue manager

When using the new 64-bit queue manager, the use of the LIBPATH and LD_LIBRARY_PATH environment variable is not advised. Setting these environment variables might result in you not being able to run any WebSphere MQ commands. By default, the installation will operate as in previous versions of WebSphere MQ, with symbolic links being created from `/usr/lib`, `/usr/bin` and `/usr/include` to the appropriate files within the WebSphere MQ tree structure. In the case of `/usr/lib` the symbolic links will be to the 32-bit WebSphere MQ libraries provided for customer 32-bit applications.

Note: No symbolic links are required for the 64-bit WebSphere MQ libraries required by WebSphere MQ commands.

All WebSphere MQ commands are 64-bit and have a built in path to the WebSphere MQ 64-bit libraries, however, this can be overridden by the use of LIBPATH and thus can cause WebSphere MQ commands to fail to run. The recommended way of using WebSphere MQ commands and your applications is as follows:

- Unset LIBPATH and LD_LIBRARY_PATH and build your applications with a built in path to the appropriate WebSphere MQ libraries, this is detailed in the appropriate WebSphere MQ book for your type of WebSphere MQ application.
- If you need to set LIBPATH or LD_LIBRARY_PATH, consider not including `/usr/lib` in the path you specify in the variable. If you need to include `/usr/lib` in your LIBPATH or LD_LIBRARY_PATH then in order to avoid errors running 64-bit WebSphere MQ applications or WebSphere MQ commands, consider removing the symbolic links from `/usr/lib` to the 32-bit WebSphere MQ libraries

using the **dltmqlnk** command. The symbolic links can be restored with the **crtmqlnk** command. You also need to build your applications with a built in path to the appropriate WebSphere MQ libraries.

Note that both the **dltmqlnk** command and the **crtmqlnk** command are scripts, and take no parameters.

- If you cannot use either of the first two options, run your applications in a different environment to the one which issues any WebSphere MQ commands.

  Note: WebSphere MQ libraries are in the following locations: `/usr/mqm/lib` (32-bit libraries) and `/usr/mqm/lib64` (64-bit libraries).

Installation procedure

This section tells you how to install the WebSphere MQ for AIX server. If you want to install the WebSphere MQ client see "Installing WebSphere MQ" on page 34.

Before you start the installation procedure, make sure you have prepared your system as described in "Preparing for installation" on page 3.

The installation method allows you to select which components you would like to install, for a list of the components and their corresponding filesets see "WebSphere MQ Components" on page 12.

To install on a local machine, see "Installation Method"

To install on a remote machine, see "Remote Installation" on page 12

Installation Method

WebSphere MQ is supplied as a set of filesets that are installed using AIX's standard installation tools. The procedure below uses the system management interface tool (SMIT), but you may chose to use installp, geninstall or the Web-based System Manager. You may select which components you want to install. The components and filesets are listed in "WebSphere MQ Components" on page 12; you must install at least the Runtime, and Server components.

1. Log in as root.
2. Insert the WebSphere MQ Server CD-ROM into the CD-ROM drive.
3. Enter the following command to mount the CD-ROM:

   ```
   mount /cdrom
   ```

4. Select the required **smit** window using the following sequence:

   ```
   Software Installation and Maintenance
    Install and Update Software
     Install and Update from ALL Available Software
   ```

   Alternatively you can use a fastpath command (`smitty install_latest`), however this does not give you the opportunity to install the language filesets.
5. Click **List** to display the input device or directory for the software, select the location that contains the installation images.
6. Use the **SOFTWARE to install** field to obtain a list of available filesets, and select the filesets you want to install. Ensure that you include the appropriate message catalog if you require a messages in a language different than that specified by the locale selected on your machine.
7. Make sure that **Include corresponding LANGUAGE filesets?** is set to **yes**.

8. Change **Preview new LICENSE agreements?** to **yes** and press Enter to view the license agreements.
9. Change **ACCEPT new license agreements?** to **yes** and press Enter to accept the license agreements and install WebSphere MQ.

Remote Installation

To install WebSphere MQ on a remote machine, you can use standard WebSphere MQ for AIX, Version 6.0 techniques. To do this, log on to both systems as root. Put the WebSphere MQ for AIX, Version 6.0 Server CD-ROM in the CD-ROM drive of the machine from which you are going to take the copy. Follow this procedure for each target machine on which you want to install the product:

1. Create a CD-ROM file system on the local machine, and mount the CD-ROM file system on the local machine (`mount /cdrom`).
2. Using **smit**, export this file system using NFS to the target machine.
3. Log on to the remote machine and use NFS to mount the CD-ROM file system that you created (`mount local_machine:/cdrom`).
4. Use **smit** to install WebSphere MQ for AIX, Version 6.0 from the target directory that you specified as specified in "Installation Method" on page 11.

WebSphere MQ Components

When you install WebSphere MQ for AIX, you can choose which components to install.

Table 4. WebSphere MQ components and filesets

Component	Description	Fileset	Server	Client
Runtime	Mandatory component. Needed for application development and provides support for external applications.	mqm.base.runtime	X	X
SDK	Required for compiling applications.	mqm.base.sdk	X	X
Server	The server feature allows you to run queue managers on your computer and connect to other computers over a network. Provides messaging and queuing services to applications, and support for WebSphere MQ client connections.	mqm.server.rte	X	
Client	The WebSphere MQ client is a small subset of WebSphere MQ, without a queue manager. Provides remote access to WebSphere MQ. Must be connected to a server. To install a client on the same machine as a server, use the Server CD-ROM; otherwise use the Clients CD-ROM.	mqm.client.rte	X	X
Sample programs	Sample application programs. Needed if you want to check your WebSphere MQ installation using the verification procedures described in "Verifying the installation using the JMS Postcard application" on page 19.	mqm.base.samples	X	X
Java messaging	The files needed for messaging using Java (includes Java Messaging Service).	mqm.java.rte	X	X

Table 4. WebSphere MQ components and filesets (continued)

SSL support	Support for SSL key management	mqm.keyman.rte	X	X
U.S. English Message catalogs	A message catalog in U.S. English is installed automatically.	mqm.msg.en_US	X	X
Brazilian Portuguese Message catalogs	Brazilian Portuguese message catalogs	mqm.msg.pt_BR	X	X
French Message catalogs	French message catalogs	• mqm.msg.fr_FR • mqm.msg.Fr_FR	X	X
German Message catalogs	German message catalogs	• mqm.msg.de_DE • mqm.msg.De_DE	X	X
Italian Message catalogs	Italian message catalogs	• mqm.msg.it_IT • mqm.msg.It_IT	X	X
Japanese Message catalogs	Japanese message catalogs	• mqm.msg.ja_JP • mqm.msg.Ja_JP	X	X
Korean Message catalogs	Korean message catalogs	mqm.msg.ko_KR	X	X
Spanish Message catalogs	Spanish message catalogs	• mqm.msg.es_ES • mqm.msg.Es_ES	X	X
Simplified Chinese Message catalogs	Simplified Chinese message catalogs	• mqm.msg.zh_CN • mqm.msg.Zh.CN	X	X
Traditional Chinese Message catalogs	Traditional Chinese message catalogs	• mqm.msg.zh_TW • mqm.msg.Zh_TW	X	X
Man pages	UNIX® man pages, in U.S. English, for the following: • Control commands • Message Queue Interface (MQI) commands • MQSC commands	mqm.man.en_US.data	X	X
Extended Transactional Client	WebSphere MQ component that allows a client application, within the same unit of work: • To put messages to, and get messages from, queues that are owned by the queue manager to which it is connected. • To update the resources of a resource manager other than a WebSphere MQ queue manager.	mqm.txclient.rte	X	

Table 5. Other products supplied with WebSphere MQ

Component	Description	Fileset	Server	Client
IBM Global Security Kit V7	Certificate and SSL Base Runtime - 32 bit	gskta.rte	X	X
IBM Global Security Kit V7	Certificate and SSL Base Runtime - 64 bit.	gsksa.rte	X	X

Table 5. Other products supplied with WebSphere MQ (continued)

IBM Java SDK (32-bit)	IBM SDK for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 32-bit	• Java14.ext • Java14.license • Java14.msg.ja_JP • Java14.msg.Ja_JP • Java14.msg.ko_KR • Java14.msg.zh_CN • Java14.msg.Zh_CN • Java14.msg.zh_TW • Java14.msg.Zh_TW • Java14.samples • Java14.sdk	X	X
IBM Java SDK (64-bit)	IBM SDK for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 64-bit	• Java14_64.ext • Java14_64.license • Java14_64.msg.ja_JP • Java14_64.msg.Ja_JP • Java14_64.msg.ko_KR • Java14_64.msg.zh_CN • Java14_64.msg.Zh_CN • Java14_64.msg.zh_TW • Java14_64.msg.Zh_TW • Java14_64.samples • Java14_64.sdk	X	X

Verifying your installation

The following set of tasks describes how to verify that the WebSphere MQ for AIX server has been correctly installed and configured. You can verify a WebSphere MQ server installation at different levels:

- To verify a local (stand-alone) installation that has no communication links with other WebSphere MQ installations, see "Verifying a local installation."
- To verify a server-to-server installation that includes communication links to other WebSphere MQ installations, see "Verifying a server-to-server installation" on page 16.

See "Verifying the client installation" on page 38 if you have a client/server installation that includes communication links between a server machine and a WebSphere MQ client.

Verifying a local installation

To verify a local installation using a simple configuration of one queue manager and one queue, complete the following tasks.

- "Setting up the installation" on page 15
- "Testing the installation" on page 15

Note: WebSphere MQ object definitions are case-sensitive. Any text entered as an MQSC command in lowercase is converted automatically to uppercase unless you enclose it in single quotation marks. Make sure that you type the examples exactly as shown.

The procedures outlined in this section describe how to configure your default queue manager from the command line.

Setting up the installation

To verify your installation you must first perform this task. From a shell window, use these steps to create a queue manager and a queue:

1. Log in as a user in the mqm group
2. Create a default queue manager called venus.queue.manager by entering the following command:

   ```
   crtmqm -q venus.queue.manager
   ```

   You will see messages telling you that the queue manager has been created, and that the default WebSphere MQ objects have been created.
3. To start the queue manager, type:

   ```
   strmqm
   ```

   A message tells you when the queue manager has started.
4. Enable MQSC commands by typing:

   ```
   runmqsc
   ```

   A message tells you that an MQSC session has started. MQSC has no command prompt.
5. Define a local queue called ORANGE.QUEUE by entering the following command:

   ```
   define qlocal (orange.queue)
   ```

   A message tells you when the queue has been created.
6. Stop MQSC by typing:

   ```
   end
   ```

   You will see some messages, followed by the command prompt.

You have now defined:

- A default queue manager called venus.queue.manager
- A queue called ORANGE.QUEUE

Now proceed to "Testing the installation" to verify your installation.

Testing the installation

Before completing this task you must have created a queue manager called venus.queue.manager and a local queue called ORANGE.QUEUE. For instructions on how to do this see Setting up the installation.

To test the queue manager and queue, use the **amqsput** sample program to put a message on the queue, and the **amqsget** sample program to get the message back from the queue:

1. Log on as a user in group mqm, if you are not already.
2. Change into the /usr/mqm/samp/bin directory, which contains the sample programs.
3. Put a message on the queue using the following command:

   ```
   ./amqsput ORANGE.QUEUE
   ```

   The following messages are displayed:

```
Sample AMQSPUT0 start
target queue is ORANGE.QUEUE
```

4. Type some message text, on one or more lines, followed by a blank line. The following message is displayed:

   ```
   Sample AMQSPUT0 end
   ```

   Your message is now on the queue and the command prompt is displayed again.
5. To get the message from the queue, use the following command:

   ```
   ./amqsget ORANGE.QUEUE
   ```

   The sample program starts, and your message is displayed. After a pause, the sample ends and the command prompt is displayed again.

You have now successfully verified your local installation.

Verifying a server-to-server installation

To verify a server-to-server installation using two servers, one as a sender and one as a receiver, complete the following tasks.

- "Setting up the sender server"
- "Setting up the receiver server" on page 17
- "Testing communication between the servers" on page 18

To verify a server-to-server installation you need to check the communications link between the two machines. Before you can do this, you must ensure that the communications protocol has been installed and configured on both systems. WebSphere MQ for AIX supports both TCP and SNA. The tasks in this section explain how to verify your installation and use TCP in the examples; if you are using an alternative protocol, refer to the *WebSphere MQ Intercommunications* manual.

The verification procedure assumes that both systems are UNIX machines; if this is not the case, some of the commands are different (for details, refer to the documentation for that system).

Note: WebSphere MQ object definitions are case-sensitive. Any text entered as an MQSC command in lowercase is converted automatically to uppercase unless you enclose it in single quotation marks. Make sure that you type the examples exactly as shown.

Setting up the sender server

In order to verify a server-to-server installation you must first set up a sender server. From a shell window, follow these steps to set up the sender server.

1. Log in as a user in the `mqm` group.
2. Create a default queue manager called `saturn.queue.manager` with the following command:

   ```
   crtmqm -q saturn.queue.manager
   ```

   Messages tell you that the queue manager has been created, and that the default WebSphere MQ objects have been created.
3. To start the queue manager, type:

   ```
   strmqm
   ```

A message tells you when the queue manager has started.

4. Start MQSC commands by typing:

   ```
   runmqsc
   ```

   A message tells you that an MQSC session has started. MQSC had no command prompt.

5. Define a local queue called TRANSMIT1.QUEUE (to be used as a transmission queue) by entering the following command:

   ```
   define qlocal (transmit1.queue) usage (xmitq)
   ```

   A message tells you when the queue has been created.

6. Define a local definition of the remote queue with the following command:

   ```
   define qremote (local.def.of.remote.queue) rname (orange.queue)
   rqmname ('venus.queue.manager') xmitq (transmit1.queue)
   ```

   The name specified by the **rname** parameter must be the same as the name of the queue to which you are sending the message (ORANGE.QUEUE on the receiver workstation).

7. Define a sender channel with the following command:

   ```
   define channel (first.channel) chltype (sdr)
   conname ('con-name(port)') xmitq (transmit1.queue) trptype (tcp)
   ```

   The value *con-name* is the TCP address of the receiver workstation, and *port* is the port number, port 1414 is the default port number.

8. End MQSC by typing:

   ```
   end
   ```

   Some messages are displayed, followed by the shell prompt.

You have now defined the following objects:

- A default queue manager called saturn.queue.manager
- A transmission queue called TRANSMIT1.QUEUE
- A local definition of a remote queue called LOCAL.DEF.OF.REMOTE.QUEUE
- A sender channel called FIRST.CHANNEL

Now to set up the receiver server so that you can verify your server-to-server installation, see "Setting up the receiver server."

Setting up the receiver server

After you have completed the task, "Setting up the sender server" on page 16, follow these steps to set up the receiver server:

1. Log in as a user in the mqm group.
2. Create a default queue manager called venus.queue.manager by entering the following command:

   ```
   crtmqm -q venus.queue.manager
   ```

   Messages tell you that the queue manager has been created, and that the default WebSphere MQ objects have been created.

3. To start the queue manager, type:

   ```
   strmqm
   ```

A message tells you when the queue manager has started.

4. Enable MQSC commands by typing:

   ```
   runmqsc
   ```

   A message tells you that an MQSC session has started. MQSC has no command prompt.

5. Define a local queue called `ORANGE.QUEUE` by entering the following command:

   ```
   define qlocal (orange.queue)
   ```

   A message tells you when the queue has been created.

6. Define a listener by entering the following command:

   Note: If you do not specify the port that the listener should listen on, the default of 1414 is used. If you specified a port other than 1414 in step 7 of "Setting up the sender server" on page 16, you must include the port parameter in the command, as shown below.

   ```
   define listener (listener1) trptype (tcp) control (qmgr) port (port_number)
   ```

   Where

   port_number
   is the name of the port the listener should run on. This must be the same as the number used when defining your sender channel.

7. Start the listener by entering the following command:

   ```
   start listener (listener1)
   ```

   Note: It is not recommended to start the listener in the background from any shell that automatically lowers the priority of background processes.

8. Define a receiver channel with the following command:

   ```
   define channel (first.channel) chltype (rcvr) trptype (tcp)
   ```

   A message tells you when the channel has been created.

9. End MQSC by typing:

   ```
   end
   ```

   Some messages are displayed, followed by the shellprompt.

You have now defined the following objects:

- A default queue manager called `venus.queue.manager`
- A queue called `ORANGE.QUEUE`
- A receiver channel called `FIRST.CHANNEL`

Now to test communications between your sender and receiver workstations, see "Testing communication between the servers."

Testing communication between the servers

After completing, "Setting up the sender server" on page 16, and "Setting up the receiver server" on page 17, use this topic to test communications between sender and receiver workstations using sample programs. Use the **amqsput** sample program to put a message from the sender server to a queue at the receiver server, and the **amqsget** sample program on the receiver server to get the message from the queue:

1. Log in to both servers as a user in the mqm group.
2. If the queue managers on the two servers have stopped, restart them now by typing the following on both servers:
   ```
   strmqm
   ```
3. On the **sender** server, start the sender channel using the MQSC START CHANNEL command and specify the channel name:
   ```
   START CHANNEL(FIRST.CHANNEL)
   ```
   The receiver channel on the receiver server starts automatically when the sender channel starts.
4. On the **sender** server, change into the /usr/mqm/samp/bin directory, which contains the sample programs.
5. To put a message on the local definition of the remote queue (which in turn specifies the name of the remote queue), use the following command:
   ```
   ./amqsput LOCAL.DEF.OF.REMOTE.QUEUE
   ```
   You will see the following messages:
   ```
   Sample amqsput0 start
   target queue is LOCAL.DEF.OF.REMOTE.QUEUE
   ```
6. Type some message text on one or more lines, followed by a blank line. You will see the following message:
   ```
   Sample amqsput0 end
   ```
   Your message is now on the queue and the command prompt is displayed again.
7. On the **receiver** server, change into the /usr/mqm/samp/bin directory, which contains the sample programs.
8. To get the message from the queue at the receiver, enter the following command:
   ```
   ./amqsget ORANGE.QUEUE
   ```
   The sample program starts, and your message is displayed. After a pause, the sample ends and the command prompt is displayed again.

You have now successfully verified the server-to-server installation.

Verifying the installation using the JMS Postcard application

Use the **JMS Postcard** application to verify that WebSphere MQ is successfully installed, the associated communication links are working properly, and that WebSphere MQ Java Messaging Support is successfully installed.

To set up your system to use the **JMS Postcard**, see "Setting up your system to run the JMS postcard" on page 20.

To use the **JMS Postcard** application to verify a *local* installation (which does not have any communication links with other WebSphere MQ installations), see "Using the JMS postcard application to verify a local installation" on page 21.

To use the **JMS Postcard** application to verify communication between your machine and the machine of another named user, where that machine is running WebSphere MQ and using TCP/IP, see "Using the JMS postcard application to verify a server-to-server installation" on page 22.

Setting up your system to run the JMS postcard

Before you can run the **JMS Postcard** application, you must ensure that:

- You must install the optional WebSphere MQ Java component.
- You must have a working JRE (Java Runtime Environment).
- You are a member of the WebSphere MQ administrators group (mqm).

Setting the PATH variable:

To use any Java language application described in this book, including the JMS postcard application, you must have a Java Runtime Environment (JRE) installed. For further information about supported JREs, see "Checking optional software" on page 5 in this book. To ensure that WebSphere MQ installation can use the installed JRE, ensure that the location of the JRE is set in your PATH environment variable.

See the documentation accompanying your JRE or JDK to find out where the JRE or JDK will be installed to.

On AIX, the 32-bit and 64-bit JDKs are typically installed to different locations, for example, the 32-bit JDK is located in `/usr/java14/bin` and the 64-bit JDK is located in `/usr/java14_64/bin`. Ensure that the PATH variable is correctly set, to use the JMS Postcard application you need to use a 32-bit JDK. You can check the version installed using the following command:

```
java -version
```

For further information about using a JDK see "Checking optional software" on page 5.

Setting environment variables using setjmsenv:
Before performing this task ensure you have removed any hardcoded links to the Java libraries as described in "Setting the PATH variable."

For WebSphere MQ Version 6.0 Java scripts to function properly a number of environment variables must be set. The **setjmsenv** script can be used to set these variables, and is located in `/usr/mqm/java/bin`. The environment variables that **setjmsenv** sets are as follows:

CLASSPATH	`/usr/mqm/java/lib/com.ibm.mq.jar:`
	`/usr/mqm/java/lib/com.ibm.mqjms.jar:`
	`/usr/mqm/samp/java/base:`
	`/usr/mqm/samp/java/jms:`

MQ_JAVA_INSTALL_PATH	`/usr/mqm/java`
MQ_JAVA_DATA_PATH	`/var/mqm`
MQ_JAVA_LIB_PATH	`/usr/mqm/java/lib (32-bit libraries)`

Use either the 32-bit libraries or the 64-bit libraries. Use the 64-bit libraries only if you are running your application in a 64-bit Java virtual machine (JVM) on a 64-bit platform. Otherwise, use the 32-bit libraries.

The setjmsenv script sets MQ_JAVA_LIB_PATH to the location of the 32-bit libraries so that you can run the postcard application. If you use setjmsenv to set your environment variables you need to set your PATH to use a 32-bit JVM as described in "Setting the PATH variable" on page 20.

You can choose to use this script in a variety of ways:

- You can use the **setjmsenv** script as a basis for setting the required environment variables, as shown in the table, or add them to the .profile using a text editor. If you have a non-typical setup, edit the script contents as necessary.
- Alternatively, you can run **setjmsenv** in every session from which JMS startup scripts are to be run. If you choose this option you need to run the **setjmsenv** script in every shell window you start, during the JMS verification process by typing:

  ```
  . ./setjmsenv
  ```

For further information about using Java with WebSphere MQ, see the *Using Java* book.

When you have configured your system you are able to verify that WebSphere MQ Version 6.0 has installed correctly as described in "Verifying your installation" on page 14.

Using the JMS postcard application to verify a local installation

To verify that the local installation is working, you can run two instances of the *JMS Postcard* application on the same machine and send messages between them. This shows that WebSphere MQ messaging is working correctly on the machine, and that WebSphere MQ Java Messaging support is successfully installed.

Note: The *JMS Postcard* application has a graphical interface, to view this interface, your system requires the ability to view a graphical display. If you want the *JMS Postcard* application to use font and color settings different from the Java Virtual Machine defaults, change the Postcard.ini file. For more information see *WebSphere MQ Using Java*.

1. Log on as a user in group mqm.
2. Change directory to `/usr/mqm/java/bin`
3. If you have not already run setjmsenv as described in "Setting environment variables using setjmsenv" on page 20 do so now.
4. Run the postcard shell script.

   ```
   ./postcard
   ```

   If there are no queue managers on your machine, you are invited to run the Default Configuration wizard to create a queue manager to use with the *JMS Postcard* application before signing on to the JMS postcard application.

   If you already have a queue manager on your machine you will go straight to the JMS sign on window.
5. At the JMS Postcard - Sign On window , type in a nickname to use to send messages within the postcard application (for example, `user1`).
6. Select the queue manager to use as the mailbox:
   - If the only queue manager on your machine is the default queue manager that you created by running the Default Configuration wizard, this queue manager is used automatically as your mailbox for postcards.

- If you have created one or more of your own queue managers, but you have not run the Default Configuration wizard, select the appropriate queue manager from the list displayed.
- If you have run the Default Configuration wizard and you want to use the default queue manager, but there is more than one queue manager on your machine, select the **Advanced** checkbox, then select **Use Default Configuration as mailbox**.
- If you have run the Default Configuration wizard and also created one or more of your own queue managers, and you do not want to use the default queue manager, select the **Advanced** checkbox, select **Choose queue manager as mailbox**, then select the appropriate queue manager from the list displayed.

When your selection is complete, click **OK** to display your first postcard window.

7. Run the Postcard shell script again in a different shell window. This opens a second postcard window.
8. The JMS Postcard - Sign On panel is displayed again. Type in a second nickname to use to send messages within the Postcard application (for example, `user2`).
9. Repeat the selection of the queue manager that you want to use as the mailbox (as described in step 5). The queue manager you select for this second postcard must either be the same queue manager, be in the same cluster as the queue manager for the first postcard, or communication links must have been set up between them. You now have two postcards, one with the nickname `user1` and one with the nickname `user2`.
10. In one of the postcards (for example, `user1`), enter the nickname for the other postcard application in the **To:** field and the queue manager it is using in the **On:** field.
11. Type a message in the **Message:** field and click **Send**.
12. The **Postcards sent and received** area of the postcard shows details of the message. In the sending postcard, the message is displayed as *sent*. In the receiving postcard, the message is displayed as *received*.
13. From the receiving postcard, double-click the message in the **Postcards sent and received** area to view it.

Depending on your situation, you might want to do the following:

- Install WebSphere MQ on other machines. Follow the same installation procedure that you used for the first machine. Ensure that you use the Join Default Cluster window in the Default Configuration wizard to add the other machines to your first machine's cluster.
- Install the WebSphere MQ client on other machines. See the Chapter 3, "Installing a WebSphere MQ client," on page 27.
- Continue with further administration tasks. See the *WebSphere MQ System Administration Guide*.

Using the JMS postcard application to verify a server-to-server installation

To verify that the communication between two machines, the sender of the message and the receiver, are working correctly, and that the WebSphere MQ Java messaging support is successfully installed, you can use the JMS Postcard application. Both machines must use TCP/IP.

To use the **JMS Postcard** application for this type of verification one of the following must be true;

- Both queue managers must be in the same cluster, this is the simplest method. To ensure that both queue managers are in the same cluster you can run the **JMS Postcard** application before creating any local queue managers on each machine. The **JMS Postcard** application detects that there are no local queue managers defined for that machine, and displays the Default Configuration wizard so that you can create the default queue managers and link them to the default cluster. This topic describes how to use the Default Configuration wizard.

  You can use the **JMS Postcard** application with existing queue managers, as long as both queue managers belong to the same cluster. If you have already completed the Default Configuration wizard but did not put the two queue managers into the same cluster you can create your own new queue managers on both machines, create a cluster, and ensure that the queue managers that you create on each machine belong to the same cluster.
- Alternatively if the queue managers are not in the same cluster you can configure channels to communicate between the two machines. For instructions on how to see up the channels see, "Setting up the sender server" on page 16 and "Setting up the receiver server" on page 17. Once you have set up communication you can use the postcard application, starting at step 6.

On the sender machine:

1. Log on as a user in group mqm.
2. Change directory to `/usr/mqm/java/bin`
3. If you have not already run setjmsenv as described in "Setting environment variables using setjmsenv" on page 20 do so now.
4. Run the postcard shell script.

   ```
   ./postcard
   ```

   If there are no queue managers on your machine, you are invited to run the Default Configuration wizard to create a queue manager to use with the *JMS Postcard* application before signing on to the JMS postcard application.

   If you already have a queue manager on your machine you will go straight to the JMS sign on window (step 6). You can use the **JMS Postcard** application with existing queue managers, as long as both queue managers belong to the same cluster. If your existing queue manager does not belong to the appropriate cluster refer to the introduction of this topic for information on how to proceed.
5. Work through the Default Configuration wizard. When you get to the option to join the queue manager to the default cluster, tick the checkbox. On the next screen select **yes, make it the repository for the cluster**. Once you have completed the wizard you are taken back to the JMS Postcard - Sign On window.
6. At the JMS Postcard - Sign On window , type in a nickname to use to send messages within the postcard application (for example, `user1`).
7. Select the queue manager to use as the mailbox:
   - If the only queue manager on your machine is the default queue manager that you created by running the Default Configuration wizard, this queue manager is used automatically as your mailbox for postcards.
   - If you have created one or more of your own queue managers, but you have not run the Default Configuration wizard, select the appropriate queue manager from the list displayed.

- If you have run the Default Configuration wizard and you want to use the default queue manager, but there is more than one queue manager on your machine, select the **Advanced** checkbox, then select **Use Default Configuration as mailbox**.
- If you have run the Default Configuration wizard and also created one or more of your own queue managers, and you do not want to use the default queue manager, select the **Advanced** checkbox, select **Choose queue manager as mailbox**, then select the appropriate queue manager from the list displayed.

When your selection is complete, click **OK** to display your second postcard window.

On the receiver machine:

1. Log on as a user in group mqm.
2. Change directory to `/usr/mqm/java/bin`
3. If you have not already run setjmsenv as described in "Setting environment variables using setjmsenv" on page 20, do so now.
4. Run the postcard shell script.

   ```
   ./postcard
   ```

   If there are no queue managers on your machine, you are invited to run the Default Configuration wizard to create a queue manager to use with the *JMS Postcard* application before signing on to the JMS postcard application.

   If you already have a queue manager on your machine you will go straight to the JMS Sign On window (step 6). You can use the **JMS Postcard** application with existing queue managers, as long as both queue managers belong to the same cluster. If your existing queue manager does not belong to the appropriate cluster refer to the introduction of this topic for information on how to proceed.
5. Work through the Default Configuration wizard:
   a. When you get the option to join the queue manager to the default cluster, tick the checkbox.
   b. In the next window click **No another computer has already joined the cluster as a repository**. Click Next.
   c. When requested, enter the location of the repository, by typing the machine name of the sender machine. Click Next.
   d. Complete the Default Configuration wizard. Once you have completed the wizard you are taken back to the JMS Postcard Application- Sign On window.
6. At the JMS Postcard - Sign On window, type in a nickname to use to send messages within the postcard application (for example, `user2`).
7. Select the queue manager to use as the mailbox:
   - If the only queue manager on your machine is the default queue manager that you created by running the Default Configuration wizard, this queue manager is used automatically as your mailbox for postcards.
   - If you have created one or more of your own queue managers, but you have not run the Default Configuration wizard, select the appropriate queue manager from the list displayed.

- If you have run the Default Configuration wizard and you want to use the default queue manager, but there is more than one queue manager on your machine, select the **Advanced** checkbox, then select **Use Default Configuration as mailbox**.
- If you have run the Default Configuration wizard and also created one or more of your own queue managers, and you do not want to use the default queue manager, select the **Advanced** checkbox, select **Choose queue manager as mailbox**, then select the appropriate queue manager from the list displayed.

When your selection is complete, click **OK** to display your first postcard window.

8. In one of the postcards (for example, `user1`), enter the nickname for the other postcard application the **To:** field and the queue manager it is using in the **On:** field.
9. Type a message in the **Message:** field and click **Send**.
10. The **Postcards sent and received** area of the postcard shows details of the message. In the sending postcard, the message is displayed as *sent*. In the receiving postcard, the message is displayed as *received*.
11. In the sent and received area of the postcard, details of the new message are displayed. The message is displayed as *received*. When this message arrives, this verifies that WebSphere MQ and the Java messaging support are correctly installed and that your communication link between the two machines is working correctly.

When all installation and verification is complete, you are ready to start using WebSphere MQ (see the *WebSphere MQ System Administration Guide*).

Chapter 3. Installing a WebSphere MQ client

This chapter describes how to install a WebSphere MQ Version 6.0 client. The information covers topics such as preparing for installation and verifying your installation, as well as installation itself. If you already have an installation of WebSphere MQ, and are migrating to WebSphere MQ Version 6.0 see Chapter 1, "Migrating to WebSphere MQ Version 6.0," on page 1 before installing WebSphere MQ Version 6.0.

WebSphere MQ for AIX can be installed as a server or a client.

A WebSphere MQ client is a component that allows an application running on one system to communicate with a queue manager running on another system. The output from the call is sent back to the client, which passes it back to the application.

A WebSphere MQ server is an installation of one or more queue managers that provide queueing services to one or more clients. All the WebSphere MQ objects, for example queues, exist only on the queue manager machine (the WebSphere MQ server machine), and not the client. A WebSphere MQ server can also support local WebSphere MQ applications. To install a WebSphere MQ server see, Chapter 2, "Installing a WebSphere MQ server," on page 3.

It is possible to have both a server and a client installation on the same machine, for instructions on how to do this see, Chapter 4, "Installing a client on the same machine as a server," on page 43.

See the *WebSphere MQ System Administration Guide* for an introduction to WebSphere MQ concepts and objects.

For information on the components that can be included in the server and client installations see, "WebSphere MQ Components" on page 12.

The following set of tasks take you through the process of installing a WebSphere MQ client, complete all of these tasks in sequence.

- "Checking hardware and software requirements" on page 28
- "Installing WebSphere MQ" on page 34
- "Verifying the client installation" on page 38

Preparing to install

Before you install WebSphere MQ, complete the following tasks.

- "Checking hardware and software requirements" on page 28
- "Creating WebSphere MQ file systems" on page 7
- "Setting up the user ID and group ID" on page 8

Additionally, if you require messages in a language other than U.S. English see, "Displaying messages in your national language" on page 10.

Checking hardware and software requirements

This section details the operating system requirements, the prerequisite software and optional software required for using WebSphere MQ Version 6.0.

- "Checking the operating environment"
- "Checking optional software" on page 29

Checking the operating environment

Before you install WebSphere MQ Version 6.0, you must check that your system meets the hardware and operating system software requirements set for this product and the particular components you intend to install on it.

Note: WebSphere MQ does not support host names that contain spaces. If you install WebSphere MQ on a computer with a host name that contains spaces, you will be unable to create any queue managers.

Hardware

WebSphere MQ for AIX, Version 6.0 runs on any machine that supports the AIX5L V5.2 or AIX5L V5.3 operating systems capable of running 64-bit programs whether from IBM or other vendors.

Operating System

The operating systems supported by WebSphere MQ for AIX, Version 6.0 are:

- AIX5L V5.2 (plus maintenance Level 3)
- AIX5L V5.3

Use the oslevel -r command to determine the level of the operating system you are running, including the maintenance level.

Connectivity Requirements

Check that the system has 64-bit compatible communications hardware that supports at least one of the following:

- TCP/IP
- SNA LU6.2: If you want to use the SNA LU6.2 support on WebSphere MQ you need the IBM Communications Server for AIX Version 6.1.

UDP is no longer supported, existing channels should either be deleted or migrated to one of the supported protocols listed above. To migrate UDP channels to an alternative protocol alter the channel TRPTYPE attribute. For information about this channel attribute see the *Intercommunication* book.

Storage Requirements

The storage requirements for the WebSphere MQ for AIX, Version 6.0 depend on which components you install, and how much working space you need. This, in turn, depends on the number of queues that you use, the number and size of the messages on the queues, and whether the messages are persistent. You also require archiving capacity on disk, tape or other media. The approximate amount of storage space required for a server installation is detailed in the table below.

Table 6. Storage requirements for a WebSphere MQ client

Storage Requirements	Storage Requirement in MB in /opt
WebSphere MQ Client installation	276

You can use the df command to determine the amount of free space on your system.

Disk storage is also required for

- Prerequisite software
- Optional software
- Your application programs

File descriptors

When running a multi-threaded process such as the agent process, you might reach the soft limit for file descriptors. This gives you the WebSphere MQ reason code `MQRC_UNEXPECTED_ERROR (2195)` and, if there are enough file descriptors, a WebSphere MQ FFST file.

To avoid this problem, you can increase the process limit for the number of file descriptors. To do this, alter the `nofiles` attribute in `/etc/security/limits` to 10,000 for the `mqm` user id or in the default stanza. For information about the `mqm` user id see, "Setting up the user ID and group ID" on page 8.

System Resource Limits

Set the system resource limit for data segment and stack segment to unlimited using the following commands in a command prompt:

```
unlimit -d unlimited
unlimit -s unlimited
```

Checking optional software

Check through this topic to identify which additional software is supported for use with WebSphere MQ.

Compilers

The following compilers are supported for WebSphere MQ for AIX applications:

C/C++

- IBM VisualAge C++ Professional for AIX Version V5.0, V6.0 and V7.0
- IBM C for AIX V5.0, V6.0 and V7.0

COBOL

- Micro Focus Server Express V4.0
- IBM COBOL Set for AIX V1.1 (32-bit application only)

Java

- IBM Software Developer's Kit (SDK) for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 32-bit
- IBM Software Developer's Kit (SDK) for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 64-bit

These Java SDKs are supplied with WebSphere MQ, and can be installed during the installation process described in this document.

Transaction monitors

The following transaction processing monitors (coordination through X/Open XA interface) are supported for use with the Extended Transactional Client:

- BEA Tuxedo V8.1
- IBM WebSphere Application Server (WAS) V5.1
- IBM TXSeries for AIX V5.1
- WebLogic V8.1

WebSphere MQ for AIX, Version 6.0 supports WebSphere Application Server as an XA coordinator. For more information about the WebSphere MQ application adaptor, see the WebSphere Application Server Enterprise Edition WebSphere MQ Application Adaptor Development Guide, SC09-4444.

Java Messaging and SOAP transport

If you want to use Java Messaging and SOAP (Simple Object Access Protocol) Support, you need a Java Runtime Environment Version 1.4.2 or later. An appropriate runtime environment is provided in the JDKs provided on the WebSphere MQ Server CD- ROM. These JDK packages can be selected for install during the installation procedure described in this book, see "WebSphere MQ Components" on page 12 for package information.

The JDKs available on the server CD-ROM are:

- IBM Software Developer's Kit (SDK) for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 32-bit
- IBM Software Developer's Kit (SDK) for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 64-bit

These JDKs provide support for SOAP and are FIPS 140-2 compliant.

Note that to use the JDK shipped with WebSphere MQ for AIX, Version 6.0, the fileset `Java14.ext.java3d 1.4.2.0` requires the following fileset updates:

- OpenGL.OpenGL_X.rte.base 5.1.0.50
- OpenGL.OpenGL_X.rte.soft 5.1.0.50

An error message will be displayed when you install the JDK if you do not have these updates.

Note also that, by default, the IBM Software Developer's Kit (SDK) for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 64-bit uses the IPv6 extensions to the TCP/IP protocol.

On AIX Version 5.2, if your applications uses multicast sockets, or explicitly uses IPv6 format addresses, you must configure the network interfaces on your system to work with IPv6 addresses. The network interfaces can be configured to work with IPv6 using the System Management Interface Tool (**smitty**), or by using the `autoconf6`, or `ifconfig` commands.

Alternatively, if you do not want to use IPv6 protocols, you can force the use of IPv4 protocols by setting the `java.net.preferIPv4Stack` property of your class file to true using the following command:

```
java -Djava.net.preferIPv4Stack=true <classname>
```

Where <classname> is the name of your .class file.

For a list of alternative JDKs, see

www.ibm.com/software/integration/websphere/mqplatforms/supported.html

For WebSphere MQ Version 6.0 Java scripts to function properly a number of environment variables must be set. For information on setting these environment variables and general information about using Java with WebSphere MQ see, *Using Java*.

For further information about SOAP see, *WebSphere MQ Transport For SOAP* book.

If you use a JDK other than the one supplied by WebSphere MQ Version 6.0 you should be aware that:

- The JDK may not be FIPS level 140-2 compliant and by using it with WebSphere MQ, WebSphere MQ for AIX, Version 6.0 will not comply the FIPS 140-2 standards.
- SOAP is not supported.

Secure Sockets Level (SSL)

If you want to use the SSL support, you need IBM Global Security Kit V7. This is supplied with WebSphere MQ as one of the components available for installation. If you are migrating from WebSphere MQ Version 5.3 and have no other requirement for the IBM Global Security Kit V6, you can uninstall it using the process described in Chapter 6, “Uninstalling WebSphere MQ,” on page 47, the package name is gskak.rte.

You must also have installed version 6.0.0.2 (or later) of the C++ runtime to use the SSL support.

Creating WebSphere MQ file systems

The installation directory for the WebSphere MQ product code is /usr/mqm. Working data is stored in /var/mqm. You cannot change these locations. The GSKit must also be installed into its default location.

The topics contained in this section describe how to prepare your file system for installing WebSphere MQ. Perform these tasks before installation.

Creating a file system for the product code

The WebSphere MQ product code is installed in /usr/mqm. If you cannot install the product code in the /usr/mqm file system because the file system is too small to contain the product, you can do one of the following:

1. Create a new file system and mount it as /usr/mqm. If you choose this option, the new file system must be created and mounted before installing the product code.
2. Create a new directory anywhere on your machine, and create a symbolic link from /usr/mqm to this new directory. For example:

```
mkdir /bigdisk/mqm
ln -s /bigdisk/mqm /usr/mqm
```

If you choose this option, the new directory must be created, and the link created, before installing the product code.

3. Allow the install program to expand the file system.

The file system into which the code is installed can be a remote network device, for example, NFS. However, you must define the mount options defined on that device to allow **setuid** programs, including those which are **setuid** root, to run.

Creating a file system for the working data

Before you install WebSphere MQ for AIX, create and mount a file system called `/var/mqm`. For a client installation, the file system can be mounted on a remote network device, for example NFS.

To determine the size of the `/var/mqm` file system for a client installation, consider:

- The size of the error log files written to the `/var/mqm/errors` directory
- The amount of trace that is written to the `/var/mqm/trace` directory

If you are performing both a client and a server installation, the requirements of the server installation take precedence over the requirements of the client installation. For details about the requirements of the server installation, see "Creating a file system for the working data" on page 8.

Allow 50 MB as a minimum for a WebSphere MQ server and 15 MB as a minimum for a WebSphere MQ client.

Creating separate file systems for working data

You can also create separate file systems for your log data (`/var/mqm/log`) and error files (`/var/mqm/errors`). If possible, store log files on a different physical volume from the WebSphere MQ queues (`/var/mqm`).

If you create separate file systems:

- The `/var/mqm` and `/var/mqm/log` directories ***must*** be on a local file system.
- The `/var/mqm/errors` directory can be NFS mounted. However, if you choose to NFS-mount `/var/mqm/errors`, the error logs might be lost if the network fails.

If you are creating separate file systems, allow a minimum of 30 MB of storage for `/var/mqm` for a server installation and 15 MB of storage for `/var/mqm` for a client installation. Also allow 20 MB of storage for `/var/mqm/log`, and 4 MB of storage for `/var/mqm/errors` for both client and sever installations.

If you want to use individual queues that will hold more than 2 GB of data, you must enable `/var/mqm` to use large files.

The size of the log file depends on the log settings that you use. The minimum sizes above are for circular logging using the default settings. For further information on log sizes see the *WebSphere MQ System Administration Guide*.

Setting up the user ID and group ID

WebSphere MQ requires a user ID of the name `mqm`, with a primary group of `mqm`. The `mqm` user ID owns the directories and files that contain the resources associated with the product. Create the user ID and group IDs as described in the following sections.

- "Creating the user ID and group" on page 9
- "Adding existing user IDs to the group" on page 9

Creating the user ID and group

Create the required user ID and group ID ***before*** you install WebSphere MQ. Both user ID and group ID must be set to `mqm`. For stand-alone machines, you can create the new user ID and group IDs locally; for machines administered in a network information services (NIS) domain, an administrator must create the IDs on the NIS master server machine.

You can use the System Management Interface Tool (**smitty**), for which you require root authority.

1. To create the `mqm` group, display the required window using this sequence:

   ```
   Security & Users
     Groups
       Add a Group
   ```

   Set the group name field to `mqm`.
2. To create the new user, `mqm`, display the required window using this sequence:

   ```
   Security & Users
     Users
       Add a User
   ```

   Set the user name field to `mqm`.
3. To add a password to the new user ID, display the required window using this sequence:

   ```
   Security & Users
      Passwords
       Change a User's Password
   ```

   Set the password as required.

It is also suggested that you set the mqm user's home directory to `/var/mqm`.

Adding existing user IDs to the group

If you want to run administration commands, for example **crtmqm** (create queue manager) or **strmqm** (start queue manager), your user ID must be a member of the `mqm` group.

Users do not need `mqm` group authority to run applications that use the queue manager; it is needed only for the administration commands.

You can use **smitty** to add an existing user ID to the `mqm` group. Display the required menu using this sequence:

```
Security & Users
  Users
    Change / Show Characteristics of a User
```

Enter the name of the user in the **User Name** field and press Enter. Add `mqm` to the **Group SET** field, which is a comma-separated list of the groups to which the user belongs. Users need not have their primary group set to `mqm`. Provided that `mqm` is in their set of groups, they can use the administration commands.

Displaying messages in your national language

Messages in the language specified by the locale selected on your machine are installed by default. If you require messages in a different language, ensure that:

To find out which language are currently in use, use the **locale** command.

If you require messages in a different language, ensure that you:

1. Install the appropriate message catalog (see "WebSphere MQ Components" on page 12).
2. To select messages in a different language, use the following command with the identifier for the language you want to install:

   ```
   export LANG=message identifier
   ```

   The message identifiers for the message catalogs are as follows:
   - de_DE (German)
   - es_ES (Spanish)
   - fr_FR (French)
   - it_IT (Italian)
   - ja_JP (Japanese)
   - ko_KR (Korean)
   - pt_BR (Brazilian Portuguese)
   - zh_CN (Simplified Chinese)
   - zh_TW (Traditional Chinese)

Installing WebSphere MQ

This chapter tells you how to install the WebSphere MQ for AIX client. If you want to install the WebSphere MQ server see Chapter 2, "Installing a WebSphere MQ server," on page 3.

Before you start the installation procedure, make sure you have prepared your system as described in "Preparing for installation" on page 3.

There are three types of WebSphere MQ clients:

Standard client
This is the standard WebSphere MQ client. If you do **not** want to use Secure Sockets Layer (SSL) support, omit the following packages from the install commands:
- mqm.keyman.rte
- gsksa.rte
- gskta.rte

You can install this client from the Client CD-ROM or the Server CD-ROM.

Client with SSL
This is the standard WebSphere MQ client with additional code to allow you to use SSL support. You can install the client with SSL from either the client or the server CD.

Extended Transactional Client
This is additional code to allow a client application within the same unit of work to:

- To put messages to, and get messages from, queues that are owned by the queue manager to which it is connected.
- To update the resources of a resource manager other than a WebSphere MQ queue manager.

You can only install this from the server CD.

For more information about SSL, see the *WebSphere MQ Security* book.

To install a WebSphere MQ server, see "Installation Method" on page 11.

If you want to install the client on the same machine as a WebSphere MQ server, see Chapter 4, "Installing a client on the same machine as a server," on page 43.

Client Installation Procedure

This installation procedure uses the System Management Interface Tool (**smit**), enabling you to select which components you want to install. The components and filesets are listed in "WebSphere MQ Components" on page 12 link; you must install at least the Runtime, Base Kit, and Server components.

1. Log in as root.
2. Insert the WebSphere MQ Client CD-ROM 1 into the CD-ROM drive.
3. Enter the following command to mount the CD-ROM:

   ```
   mount /cdrom
   ```
4. Select the required **smit** window using the following sequence:

   ```
   Software Installation and Maintenance
    Install and Update Software
     Install and Update from ALL Available Software
   ```

   Alternatively you can use a fastpath command (`smitty install_latest`).
5. Click **List** to display the input device or directory for the software.
6. Select **/dev/cd0 (CD-ROM Drive)** and click **OK**.
7. Use the **SOFTWARE to install** field to obtain a list of available filesets, and select the filesets you want to install. Ensure that you include the appropriate message catalog if you require messages in a language different than that specified by the locale specified on your machine.
8. If you have a previous version of the product on your machine, change the **Automatically install requisite software** to **No** and overwrite same or newer versions to **Yes**.
9. Change **Preview new LICENSE agreements?** to **yes** and click **OK** to view the license agreements.
10. Change **ACCEPT new license agreements?** to **yes** and click **OK** to accept the license agreements and install WebSphere MQ.

WebSphere MQ Components

When you install WebSphere MQ for AIX, you can choose which components to install.

Table 7. WebSphere MQ components and filesets

Component	Description	Fileset	Server	Client

Table 7. WebSphere MQ components and filesets (continued)

Runtime	Mandatory component. Needed for application development and provides support for external applications.	mqm.base.runtime	X	X
SDK	Required for compiling applications.	mqm.base.sdk	X	X
Server	The server feature allows you to run queue managers on your computer and connect to other computers over a network. Provides messaging and queuing services to applications, and support for WebSphere MQ client connections.	mqm.server.rte	X	
Client	The WebSphere MQ client is a small subset of WebSphere MQ, without a queue manager. Provides remote access to WebSphere MQ. Must be connected to a server. To install a client on the same machine as a server, use the Server CD-ROM; otherwise use the Clients CD-ROM.	mqm.client.rte	X	X
Sample programs	Sample application programs. Needed if you want to check your WebSphere MQ installation using the verification procedures described in "Verifying the installation using the JMS Postcard application" on page 19.	mqm.base.samples	X	X
Java messaging	The files needed for messaging using Java (includes Java Messaging Service).	mqm.java.rte	X	X
SSL support	Support for SSL key management	mqm.keyman.rte	X	X
U.S. English Message catalogs	A message catalog in U.S. English is installed automatically.	mqm.msg.en_US	X	X
Brazilian Portuguese Message catalogs	Brazilian Portuguese message catalogs	mqm.msg.pt_BR	X	X
French Message catalogs	French message catalogs	• mqm.msg.fr_FR • mqm.msg.Fr_FR	X	X
German Message catalogs	German message catalogs	• mqm.msg.de_DE • mqm.msg.De_DE	X	X
Italian Message catalogs	Italian message catalogs	• mqm.msg.it_IT • mqm.msg.It_IT	X	X
Japanese Message catalogs	Japanese message catalogs	• mqm.msg.ja_JP • mqm.msg.Ja_JP	X	X
Korean Message catalogs	Korean message catalogs	mqm.msg.ko_KR	X	X
Spanish Message catalogs	Spanish message catalogs	• mqm.msg.es_ES • mqm.msg.Es_ES	X	X
Simplified Chinese Message catalogs	Simplified Chinese message catalogs	• mqm.msg.zh_CN • mqm.msg.Zh.CN	X	X

Table 7. WebSphere MQ components and filesets (continued)

Traditional Chinese Message catalogs	Traditional Chinese message catalogs	• mqm.msg.zh_TW • mqm.msg.Zh_TW	X	X
Man pages	UNIX man pages, in U.S. English, for the following: • Control commands • Message Queue Interface (MQI) commands • MQSC commands	mqm.man.en_US.data	X	X
Extended Transactional Client	WebSphere MQ component that allows a client application, within the same unit of work: • To put messages to, and get messages from, queues that are owned by the queue manager to which it is connected. • To update the resources of a resource manager other than a WebSphere MQ queue manager.	mqm.txclient.rte	X	

Table 8. Other products supplied with WebSphere MQ

Component	Description	Fileset	Server	Client
IBM Global Security Kit V7	Certificate and SSL Base Runtime - 32 bit	gskta.rte	X	X
IBM Global Security Kit V7	Certificate and SSL Base Runtime - 64 bit.	gsksa.rte	X	X
IBM Java SDK (32-bit)	IBM SDK for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 32-bit	• Java14.ext • Java14.license • Java14.msg.ja_JP • Java14.msg.Ja_JP • Java14.msg.ko_KR • Java14.msg.zh_CN • Java14.msg.Zh_CN • Java14.msg.zh_TW • Java14.msg.Zh_TW • Java14.samples • Java14.sdk	X	X
IBM Java SDK (64-bit)	IBM SDK for AIX, Java 2 Technology Edition for AIX, Version 1.4.2, 64-bit	• Java14_64.ext • Java14_64.license • Java14_64.msg.ja_JP • Java14_64.msg.Ja_JP • Java14_64.msg.ko_KR • Java14_64.msg.zh_CN • Java14_64.msg.Zh_CN • Java14_64.msg.zh_TW • Java14_64.msg.Zh_TW • Java14_64.samples • Java14_64.sdk	X	X

Verifying the client installation

The following set of tasks describes how to verify that the WebSphere MQ for AIX client has been correctly installed and configured.

To verify your WebSphere MQ client installation, you need a WebSphere MQ server with communication links with your client workstation. You can then complete the following tasks in order:

- "Setting up the server workstation"
- "Setting up the client workstation" on page 39
- "Testing communication between workstations" on page 40

The verification procedure assumes that:

- TCP/IP is configured and initialized on both the server and the client machines. If you are using SNA, refer to the *WebSphere MQ Intercommunications* manual.
- The WebSphere MQ server is installed on a Linux® or UNIX machine; if this is not the case, some of the commands will be different (for details, refer to the *WebSphere MQ Clients* book).

Note: WebSphere MQ object definitions are case-sensitive. Any text entered as an MQSC command in lowercase is converted automatically to uppercase unless you enclose it in single quotation marks. Make sure that you type the examples exactly as shown.

Setting up the server workstation

In order to verify your installation you must first perform this task. From a shell window, use these steps to install a queue manager and a queue on the server:

1. Create a default queue manager called `saturn.queue.manager` by entering the following command:

   ```
   crtmqm -q saturn.queue.manager
   ```

   You will see messages telling you that the queue manager has been created, and that the default WebSphere MQ objects have been created.
2. To start the queue manager, type:

   ```
   strmqm
   ```

   A message tells you when the queue manager has started.
3. Enable MQSC commands by typing:

   ```
   runmqsc
   ```

   A message tells you that an MQSC session has started. MQSC has no command prompt.
4. Define a local queue called `QUEUE1` by entering the following command:

   ```
   define qlocal (queue1)
   ```

   A message tells you when the queue has been created.
5. Define a server-connection channel by entering the following command on one line:

   ```
   define channel (channel1) chltype (svrconn) trptype (tcp) mcauser ('mqm')
   ```

A message tells you when the channel has been created.

6. Define a listener by entering the following command:

   Note: If you do not specify the port that the listener should listen on, by omitting the port parameter from the command below, the default of 1414 is used. If you want to specify a port other than 1414, you must include the port parameter in the command, as shown.

   ```
   define listener (listener1) trptype (tcp) control (qmgr) port (port_number)
   ```

   Where

   port_number
   is the name of the port the listener should run on. This must be the same as the number used when defining your client-connection channel in "Setting up the client workstation."

7. Start the listener by entering the following command:

   ```
   start listener (listener1)
   ```

8. Stop MQSC by typing:

   ```
   end
   ```

   You will see some messages, followed by the command prompt.

You have now defined the following objects on the server:

- A default queue manager called `saturn.queue.manager`
- A local queue called `QUEUE1`
- A server-connection channel called `CHANNEL1`

To continue with the verification process, see "Setting up the client workstation."

Setting up the client workstation

Before you complete this task you must have completed, "Setting up the server workstation" on page 38.

When a WebSphere MQ application is run on the WebSphere MQ client, the following information is required:

- The name of the MQI channel that connects the client to the server
- The communications protocol
- The address of the server

You provide this information by defining a client-connection channel with the name used for the server-connection channel defined on the server. This example uses the `MQSERVER` environment variable to define the client-connection channel.

1. Before starting, use the **ping** command to check that your TCP/IP software is correctly configured, and that your WebSphere MQ client and server TCP/IP sessions have been initialized. From the client, enter:

   ```
     ping server-hostname
   or
     ping n.n.n.n
   ```

   where

   server-hostname
   Is the host name of the server

n.n.n.n
Is the network address of the server

2. Press Ctrl-C to stop the **ping** command.
3. To create a client-connection channel, set the MQSERVER environment variable as follows:

```
export MQSERVER='CHANNEL1/TCP/server-hostname(port)'
```

where

CHANNEL1
Is the name of the server-connection channel already defined on the server

TCP Is the communications protocol.

server-address
Is the TCP/IP host name of the server.

port Is optional and is the port number that the server is listening on, you specified this in step 6 of "Setting up the server workstation" on page 38. If you do not give a port number, WebSphere MQ uses:

- The one specified in the qm.ini file.
- If no value is specified in the qm.ini file, WebSphere MQ uses the port number identified in the TCP/IP services file for the service name WebSphere MQ. If this entry in the services file does not exist, a default value of 1414 is used.

The client-connection channel and server listener program must use the same port number.

To continue with the verification process, see "Testing communication between workstations."

Testing communication between workstations

Before you complete this task you must have completed, "Setting up the client workstation" on page 39.

On the WebSphere MQ client workstation, use the **amqsputc** sample program to put a message on the queue at the server workstation, and the **amqsgetc** sample program to get the message from the queue back to the client:

1. Change into the /usr/mqm/samp/bin directory, which contains the sample programs.
2. Put a message on the queue at the server using the following command:

```
./amqsputc QUEUE1 saturn.queue.manager
```

This displays the following messages:

```
Sample amqsput0 start
target queue is QUEUE1
```

3. Type some message text on one or more lines, followed by a blank line. You will see the following message:

```
Sample amqsput0 end
```

Your message is now on the queue and the command prompt is displayed again.

4. To get the message from the queue located on the server, enter the following command:

   ```
   ./amqsgetc QUEUE1 saturn.queue.manager
   ```

   The sample program starts and your message is displayed. After a pause, the sample ends and the command prompt is displayed again.

You have now successfully verified the client installation.

Chapter 4. Installing a client on the same machine as a server

To install a WebSphere MQ for AIX client on a server machine, use the WebSphere MQ Server CD-ROM. Choose the Client component on the Server CD-ROM to install the client code on the server machine, and use the installation procedure described in “Installation procedure” on page 11.

If you install a WebSphere MQ client on the same machine as a WebSphere MQ server, the client is not connected to the server automatically. Configure the communication channel (an MQI channel) between the client and the server, as described in “Verifying the client installation” on page 38.

Chapter 5. Applying maintenance

This section describes how to maintain WebSphere MQ for AIX.

- "Applying service" describes the process of how to install service updates.
- "Restoring the previous service level" on page 46 details how to restore the previous service level.

This information applies to both server and client installations of WebSphere MQ Version 6.0.

The latest information about service updates and downloads can be found on the Internet, at:

`http://www.ibm.com/software/integration/mqfamily/support/`

Applying service

Use the System Management Interface Tool (**smit**) to install maintenance.

The same process applies to WebSphere MQ client installations. Refer to the *WebSphere MQ Clients* book for more information about client installation.

To install service updates:

1. Before installing maintenance you must end all WebSphere MQ activity:
   a. Log in as root.
   b. Use the **endmqm** command to stop all running queue managers.
   c. Stop any listeners associated with the queue managers, using the command:
      `endmqlsr -m QMgrName`
   d. To check that you have stopped all of them, enter the following:
      `ps -ef | grep mq`

      Check that there are no processes listed that are running command lines beginnings `amq` or `runmq`. Ignore any that start with `amqi`.
2. Display the appropriate **smitty** panel using this sequence:

   ```
   Software Installation and Maintenance
    Install and Update Software
      Install and Update From ALL Available Software
   ```

   Alternatively, use a fastpath command (**smit[ty] install_update**).
3. Select a value for **INPUT device / directory for software**. Click the **List** button (or press the F4 key on **smitty**) to display a list of valid values.
4. Complete the **SOFTWARE to install** field. Enter **ALL** to install all applicable fileset updates to your installation.
5. If you think that at a later time you might want to reject the service updates and return to the backup level, you must ensure that:
   a. The **COMMIT software updates** value is set to **no**.
   b. The **SAVE replaced files** value is set to **yes**.

   By setting these values, you ensure that the updates are applied, and the old filesets are saved, not overwritten.

6. Press Enter to display a confirmation message before starting the update. While the command runs, it displays progress messages ending with an **installp Summary** table, confirming which components of WebSphere MQ for AIX have been updated. If the command does not complete successfully, a full error log is saved in the file **smit.log** in root's home directory.

Restoring the previous service level

You can backout service updates and restore your system to the previous service/install level, for any component of WebSphere MQ for AIX that is in the **APPLIED** state.

To back out a service update:

1. Before installing maintenance you must end all WebSphere MQ activity:
   a. Log in as root.
   b. Use the **endmqm** command to stop all running queue managers.
   c. Stop any listeners associated with the queue managers, using the command:
      ```
      endmqlsr -m QMgrName
      ```
   d. To check that you have stopped all of them, enter the following:
      ```
      ps -ef | grep mq
      ```
      Check that there are no processes listed that are running command lines beginnings `amq` or `runmq`. Ignore any that start with `amqi`.
2. Display the appropriate **smit** panel using this sequence:
   ```
   Software Installation and Maintenance
     Software Maintenance and Utilities
       Reject Applied Software Updates (Use Previous Version)
   ```
   Alternatively, use a fastpath command (smitty install_reject).
3. Complete the SOFTWARE name field. Enter **MQM** to restore all applicable fileset updates to your installation.

   Note: Although there is an option to restore only selected fileset updates for WebSphere MQ for AIX, this still results in all applicable fileset updates for the service update being restored.
4. Use the displayed default values for all other fields to reject the current service level and reinstate the previous service or install level.
5. Press Enter to display a confirmation message, before starting the reject process. While the command runs, it displays progress messages terminating with an **Installp Summary** table, confirming which components of WebSphere MQ for AIX have been rejected.

Chapter 6. Uninstalling WebSphere MQ

This topic describes how to uninstall WebSphere MQ for AIX using the System Management Interface Tool (smit).

1. Log in as root.
2. Use the endmqm command to stop any running queue managers.
3. Stop any listeners associated with the queue managers, using the command:
   ```
   endmqlsr -m QMgrName
   ```
4. To display the appropriate panel, use the following sequence:
   ```
   Software Installation and Maintenance
     Software Maintenance and Utilities
       Remove Installed Software
   ```
   Alternatively, use a fastpath command (smitty install_remove).
5. Press F4 to list the software in the **SOFTWARE name** field.
6. Select the filesets to uninstall from the list (those beginning with mqm), and pressEnter. There is an option at this stage to do a preview.
7. Press **Enter** on the **Remove Installed Software** panel, it will ask whether you are sure, press **Enter**.

Note: If for any reason the product was not properly installed, you will have to delete the files and directories contained in /usr/mqm.

Unless you are planning to reinstall, after uninstalling WebSphere MQ, delete the /var/mqm directory tree.

Chapter 7. WebSphere MQ Documentation

This chapter describes the documentation and sources of information about WebSphere MQ. It starts with a list of the publications, including their PDF filenames, and then discusses:

- Publications supplied with the product
- Hardcopy books
- Online information

If there is similar information in this book and any of the books in the following list, the information in this book should take precedence.

WebSphere MQ is described in the following books:

Table 9. WebSphere MQ family books

PDF file name	Order Number	Title
AMQTAC05	GC34-6476	*WebSphere MQ For Windows® Quick Beginnings*
AMQDAC08	GC34-6477	*WebSphere MQ For Solaris Quick Beginnings*
AMQAAC07	GC34-6478	*WebSphere MQ For AIX Quick Beginnings*
AMQCAC07	GC34-6479	*WebSphere MQ For HP-UX Quick Beginnings*
AMQ1AC05	GC34-6480	*WebSphere MQ For Linux Quick Beginnings*
AMQWAC03	GC34-6481	*WebSphere MQ For iSeries™ Quick Beginnings*
CSQZAE10	SC34-6587	*WebSphere MQ Intercommunication*
CSQZAH07	SC34-6589	*WebSphere MQ Queue Manager Clusters*
CSQZAF08	GC34-6590	*WebSphere MQ Clients*
AMQZAG06	SC34-6584	*WebSphere MQ System Administration Guide*
CSQZAJ10	SC34-6597	*WebSphere MQ Script (MQSC) Command Reference*
CSQZAX05	SC34-6593	*Monitoring WebSphere MQ*
CSQZAC04	SC34-6598	*WebSphere MQ Programmable Command Formats and Administration Interface*
AMQZAO05	GC34-6601	*WebSphere MQ Messages*
CSQZAL10	SC34-6595	*WebSphere MQ Application Programming Guide*
CSQZAK10	SC34-6596	*WebSphere MQ Application Programming Reference*
AMQZAN09	SC34-6592	*WebSphere MQ Using C++*
CSQZAW13	SC34-6591	*WebSphere MQ Using Java*
AMTYAK08	SC34-6065	*WebSphere MQ Application Messaging Interface*
CSQZAS03	SC34-6588	*WebSphere MQ Security*
CSQSAT03	GC34-6582	*WebSphere MQ for z/OS® Concepts and Planning Guide*
CSQSAV04	SC34-6583	*WebSphere MQ for z/OS System Setup Guide*
CSQSAW03	SC34-6585	*WebSphere MQ for z/OS System Administration*
AMQWAG02	SC34-6586	*WebSphere MQ for iSeries System Administration Guide*
AMQTAN03	SC34-659	*WebSphere MQ for Windows Using the Component Object Model Interface*

Table 9. WebSphere MQ family books (continued)

PDF file name	Order Number	Title
AMQWAK02	SC34-6599	*WebSphere MQ for iSeries Application Programming Reference (ILE RPG)*
CSQSAQ03	GC34-6600	*WebSphere MQ for z/OS Problem Determination Guide*
CSQSAO04	GC34-6602	*WebSphere MQ for z/OS Messages and Codes*
CSQZAO01	GC34-6604	*WebSphere MQ Migration Guide*
CSQZAV00	GC34-6605	*WebSphere MQ Using .Net*
CSQSAD03	GI10-2584	*Program Directory for WebSphere MQ for z/OS*
AMQNAR10	SC34-6606	*WebSphere MQ Publish/Subscribe User's Guide*
CSQZAQ00	SC34-6607	*WebSphere MQ Constants*
CSQZAY03	SC34-6603	*WebSphere MQ Bibliography and Glossary*

Publications supplied with the product

The WebSphere MQ documentation is supplied separately on a CD-ROM alongside the product. You can either view the documents directly from CD, or you can install them on your computer (either before or after installing the WebSphere MQ product).

The WebSphere MQ online documentation is delivered as on the documentation CD-ROM as PDFs on all platforms and as an Information Center on Linux (x86 platform) and Windows only.

PDF

A PDF (Portable Document Format), corresponding to each hardcopy book, is available on the documentation CD-ROM. You can read PDFs using Adobe Acrobat Reader. Additionally, you can download them to your own file system, or print them.

The PDFs are available in U.S. English in the *en_US* directory, and also in some or all of the following national languages. To find out which ones are available in your language, look for the appropriate directory on the CD-ROM. The PDFs are in a subdirectory called *ll_LL*, where *ll_LL* is one of the following:

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- it_IT (Italian)
- ja_JP (Japanese)
- ko_KR (Korean)
- pt_BR (Brazilian Portuguese)
- zh_CN (Simplified Chinese)
- zh_TW (Traditional Chinese)

Within these directories, you can find the complete set of PDFs that are available. "Hardcopy books" on page 51 shows the file names used for the PDF files.

Hardcopy books

This book, and all the books listed in Table 9 on page 49, are available for you to order or print.

You can order publications from the IBMLink™ Web site at:

```
http://www.ibm.com/ibmlink
```

In the United States, you can also order publications by dialing **1-800-879-2755**.

In Canada, you can order publications by dialing **1-800-IBM-4YOU (1-800-426-4968).**

For further information about ordering publications, contact your IBM authorized dealer or marketing representative.

For information about printing books, see "Publications supplied with the product" on page 50.

Online information

This section describes the sources of information available online about WebSphere MQ Version 6.0:

HTML and PDF books on the World Wide Web

The WebSphere MQ books are available on the World Wide Web as well as on the product CD-ROM. They are available in PDF and HTML format. The WebSphere MQ product family Web site is at:

```
http://www.ibm.com/software/integration/mqfamily
```

By following links from this Web site you can:

- Obtain latest information about the WebSphere MQ product family.
- Access the WebSphere MQ books in HTML and PDF formats.

Online help

Man pages are provided for all API calls, MQSC commands, and relevant control commands including **crtmqm**, **strmqm**, and **endmqm**.

SupportPacs

SupportPacs contain material that complements the WebSphere MQ family products, for example, there are a number of SupportPacs to help you with performance and capacity planning. Many SupportPacs are freely available for download, others can be purchased as a fee-based service. SupportPacs can be obtained from the following Web site:

```
http://www.ibm.com/software/integration/websphere/support
```

WebSphere MQ newsgroups

WebSphere MQ support provides a number of newsgroups where members share their knowledge and experience with others. A list of the newsgroups can be found at:

```
http://www.ibm.com/software/integration/mqfamily/support/newsgroups
```

Whitepapers and migration documents

IBM produces a number whitepapers that contain other useful information about WebSphere MQ. These can be found at:

```
http://www.ibm.com/software/integration/websphere/library
```

Service support summary (PTF readmes)

The service support summary gives a summary of the support information and end of service dates for in-service MQSeries products. This can be found at:

```
http://www.ibm.com/software/integration/mqfamily/support/summary
```

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