WebSphere MQ for i5/OS

Quick Beginnings

Version 7.0

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This edition of the book applies to the following:

- IBM WebSphere MQ for i5/OS, Version 7.0

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

Contents

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Chapter 1. WebSphere MQ Server for i5/OS

This section describes installing, maintaining, and uninstalling, WebSphere® MQ for i5/OS®, V7.0.

In addition to reading the information here, refer to the readme files on the product and documentation CDs, and also to the latest information available on the WebSphere MQ Web site at:

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

Planning to install the WebSphere MQ server for i5/OS

License requirements

You must have sufficient licenses for your installation. At installation the license files are stored on the system for later reference. WebSphere MQ supports ITLM.

Ensure that you have purchased sufficient licenses for your installation.

License files

At installation the license files are copied into directories as described in "IFS root file system for MQ server" on page 4, for you to be able to read at any later time.

Use the WRKSFWAGR command to view the software licenses.

ITLM

If you are using ITLM (IBM® Tivoli® License Manager) there is no need to take any special action. You can install ITLM before or after WebSphere MQ. WebSphere MQ automatically detects ITLM and makes its checks with it each time a queue manager is started, with no user interaction required.

This applies to both the WebSphere MQ server, and WebSphere MQ Java, products.

Hardware requirements

Hardware and disk space requirements for WebSphere MQ for i5/OS

WebSphere MQ for i5/OS, V7.0 runs on any IBM System i™ computer, capable of running the required level of operating system. The machine must have sufficient storage to meet the combined requirements of the programming prerequisites, WebSphere MQ for i5/OS, the access methods, and the application programs, whether from IBM or other vendors.

The installation requirements depend on the components that 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 might also choose to reserve space for backup/archiving capacity on disk, tape, or other media.

Disk space required

For the WebSphere MQ for i5/OS product and samples, allow approximately 250MB of storage.

Software requirements

Operating system

Supported levels of the operating system for WebSphere MQ for i5/OS, Version 7.0

The operating systems supported by WebSphere MQ for i5/OS, Version 7.0 are:
- IBM i5/OS V5R3M0 (requires PTF SI21059)
- IBM i5/OS V5R4M0

For information about migration from old versions, see "Migrating from WebSphere MQ V5.3 or later" on page 13.

Network protocols
The network protocols supported by WebSphere MQ for i5/OS are:
- TCP/IP (provided by the operating system) including IPv6 support.
- SNA (provided by the operating system)

Compilers supported for WebSphere MQ for i5/OS applications
Compilers for various languages supported by WebSphere MQ for i5/OS.

WebSphere MQ for i5/OS, V7.0 supports the following compilers, which are all part of the IBM WebSphere Studio Development Suite for System i, part number 5722WDS:
- IBM Integrated Language Environment® C for iSeries®
- IBM Integrated Language Environment C++ for iSeries
- IBM Integrated Language Environment COBOL for iSeries
- IBM Integrated Language Environment RPG for iSeries

For Java™, WebSphere MQ for i5/OS, V7.0 supports the following SDKs, which are all part of the IBM Developer Kit for Java, part number 5722JV1:
- JDK V1.4.2 (IBM Developer Kit for Java option 6)
- JDK 1.5 (V5.0) (IBM Developer Kit for Java option 7)
- JDK 1.6 (V6.0) (IBM Developer Kit for Java option 8)

Transaction managers
TheWebSphere MQ for i5/OS, V7.0 server supports the following external transaction processing managers:
- IBM CICS® Transaction Server for i5/OS
- WebSphere Application Server V5.1
- WebSphere Application Server V6.0.2
- WebSphere Application Server V6.1

Databases
The WebSphere MQ for i5/OS, V7.0 server supports the IBM DB2 Universal Database™ as a resource manager under WebSphere MQ coordination. DB2® UDB is supplied as part of the operating system.

SSL (Secure Sockets Layer)
Software required to use SSL.

To use SSL (Secure Sockets Layer) on WebSphere MQ for i5/OS, V7.0 you need:
- Digital Certificate Manager (5722SS1 Option 34)
- Cryptographic Access Provider 128-bit (5722AC3 *BASE)
- The IBM HTTP server (5722DG1 *BASE)

If you want to install the 4758 PCI Cryptographic Coprocessor for System i to speed up the SSL handshake processing, you must also install i5/OS Cryptographic Service Provider (5722SS1 Option 35).

Clients
WebSphere MQ for i5/OS, V7.0 supports connection from any MQ V5.3 or later client. However, only WebSphere MQ classes for Java and WebSphere MQ classes for JMS client will run on i5/OS clients.

Language considerations
- Korean DBCS

  We recommend that you configure your terminal emulators to use sessions capable of displaying 132 columns, for example 27*132.

  Otherwise (in 24*80 sessions) you might find that EDTF incorrectly displays DBCS characters in MQ error log messages that extend beyond 80 columns.

i5/OS installation libraries and directories
WebSphere MQ for i5/OS installs into the i5/OS library structure and also uses directories in the IFS root file system.

MQ library structure
Installation of WebSphere MQ for i5/OS creates the following libraries.

QMQM
> The WebSphere MQ base product library.

QMQMSAMP
> The WebSphere MQ samples library (if you choose to install the samples). Further samples are put in the IFS root file system, see "IFS root file system for MQ server" on page 4.

QMxxxx library
> Each time that you create a queue manager, WebSphere MQ automatically creates an associated library, with a name like QM*xxxx* where *xxxx* is derived from the queue manager name. This library contains objects specific to the queue manager, including journals and associated receivers. By default the name of this library is derived from the name of the queue manager prefixed with the characters QM. For example, for a queue manager called TEST, the library would be called QMTEST.
>
> **Note:** When you create a queue manager, you can specify the name of its library if you want to. For example:
>
> ```
> CRTMQM MQMNAME(TEST) MQMLIB(TESTLIB)
> ```
>
> You can use the WRKLIB command to list all the libraries that WebSphere MQ for i5/OS has created. Against the queue manager libraries, you will see the text QMGR: *QMGRNAME*. The format of the command is:

```
WRKLIB LIB(QM*)
```

These queue manager-associated libraries are retained when the product is deleted.

IFS root file system for MQ server

A description of the IFS is given, and the WebSphere MQ IFS directory structure is described.

The integrated file system (IFS) is a part of i5/OS that supports stream input/output and storage management similar to personal computer and UNIX® operating systems, while providing an integrating structure over all information stored in the server. When you install WebSphere MQ for i5/OS, the directories listed below are created in the IFS *root* file system.

(Use of the IFS file structure is described in the WebSphere MQ System Administration Guide).

ProdData

Overview
```
- QIBM
   '-- ProdData
            '-- mqm
                    '-- doc
                    '-- inc
                    '-- lib
                    '-- samp
                    '-- licenses
            '-- LicenseDoc
                    '-- 5724H72_V7R0M0
```

/QIBM/ProdData/mqm
> Subdirectories below this contain all the product data, for example, C++ classes, trace format files, and license files. Data in this directory is deleted and replaced each time the product is installed.

/QIBM/ProdData/mqm/doc
> A Command Reference for the CL commands is provided in HTML format and installed here.

/QIBM/ProdData/mqm/inc
> The header files for compiling your C or C++ programs.

/QIBM/ProdData/mqm/lib
> Auxiliary files used by MQ.

/QIBM/ProdData/mqm/samp
> Further samples (for the others see "MQ library structure" on page 3).

/QIBM/ProdData/mqm/licenses
> License files. The two files for each language are named like LA_*xx* and LI_*xx* where *xx* is the 2 character language identifier for each language supplied.

Also the following directory stores license agreements files:

/QIBM/ProdData/LicenseDoc/5724H72_V7R0M0
> License files. The files are named like 5724H72_V7R0M0_*xx* where *xx* is the 2 or 5 character language identifier for each language supplied.

UserData

Overview

```
- QIBM
   '-- UserData
           '-- mqm
                  '-- errors
                  '-- trace
                  '-- qmgrs
                         '-- &system
                         '-- qmgrname1
                         '-- qmgrname2
                         '-- etc
```

/QIBM/UserData/mqm

Subdirectories below this contain all user data relating to queue managers.

When you install the product, an mqs.ini file is created in directory /QIBM/UserData/mqm/ (unless it is already there from a previous installation).

When you create a queue manager, a qm.ini file is created in the directory /QIBM/UserData/mqm/qmgrs/*QMGRNAME*/ (where *QMGRNAME* is the name of the queue manager).

Data in the above directories is retained when the product is deleted.

User profiles

Two important user profiles are described.

When you install WebSphere MQ for i5/OS, V7.0, two user profiles are created:
* QMQM
* QMQMADM

These two objects are central to the correct running of WebSphere MQ for i5/OS. Do **not** alter or delete them. If you do, IBM cannot guarantee correct behavior of your product.

These profiles are retained when the product is deleted.

Directory names

Directory names that on other WebSphere MQ platforms begin with character:

    @ (at)

on WebSphere MQ for i5/OS begin instead with character:

    & (ampersand)

For example:

    @SYSTEM

is on i5/OS:

    &SYSTEM

Delivery packaging

WebSphere MQ for i5/OS is supplied on a number of CDs.

Three CDs are supplied, as follows:

1. WebSphere MQ for i5/OS, V7.0 (server), and sample programs; WebSphere MQ Java for i5/OS, V7.0 (client).
2. WebSphere MQ clients that you can use with WebSphere MQ for i5/OS server.
3. WebSphere MQ documentation (you can view or install this CD on Windows® or Linux® only).

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

Delivered components

The components are as follows:

Server (Base)
> Support to enable you to create and support your own applications. This includes the runtime component that provides support for external applications. It also includes support for client connections from WebSphere MQ installations on other computers.

Command Reference
> Help for the CL commands is provided in HTML format and installed with the product in the /QIBM/ProdData/mqm/doc directory.

Samples (Option 1)
> Sample application programs. The source is supplied in the QMQMSAMP library and executables are supplied in the QMQM library.

Documentation
> The full product documentation in both PDF and Eclipse plugin formats is supplied on the WebSphere MQ Documentation CD. You can view or install this CD on Windows, or Linux x86 or x86-64.
>
> Each book is supplied in U.S. English and also in some or all of the following national languages:
> * Czech
> * Brazilian Portuguese
> * French
> * German
> * Hungarian
> * Italian
> * Japanese
> * Korean
> * Polish
> * Russian
> * Spanish
> * Simplified Chinese
> * Traditional Chinese

Readme file
> Latest information about the product that became available after publication of this book or the full documentation. You can find the readme file in the root of the product or documentation CD. Review it before starting to install WebSphere MQ for i5/OS.

Creating the system-default objects

The system-default objects are created automatically when you issue the CRTMQM command to create a queue manager. For example:

```
CRTMQM MQMNAME(QMGRNAME) ASP(*SYSTEM)
```

You can refresh them using the STRMQM command (Warning: this command will replace any existing default objects). For example:

```
STRMQM MQMNAME(QMGRNAME) RDEFSYS(*YES)
```

Refer to the onscreen help for information about using this command.

Note: on the command `STRMQM MQMNAME(QMGRNAME) RDEFSYS(*YES)`:

- The command does not recreate the objects, it performs a CRTxxxx REPLACE(*YES) for all of the SYSTEM.* objects.
- This means that it refreshes the parameters on the objects back to their defaults. So if, for example, on the SYSTEM.DEFAULT.LOCAL.QUEUE object, TRGENBL had previously been changed to *YES, then, when the command is run, it is changed back to TRGENBL(*NO).
- If any messages exist on a queue, they are left intact, because the queues are not physically deleted.
- The contents of the SYSTEM.AUTH.DATA.QUEUE are untouched when this command is run.
- So, if the contents of this (or any other significant queue) become corrupt, it must be physically deleted and recreated either from scratch, or from a backup.

Preparing the system

This section describes steps you must take before installing WebSphere MQ for i5/OS, V7.0.

Use the following procedure only if you have never installed WebSphere MQ or MQSeries® on your system before.

Read the Readme file on the product or documentation CDs.

To run WebSphere MQ for i5/OS, V7.0, you must have the OS/400® V5R3 or later operating system installed on your machine.

If you are migrating to V7.0 from an earlier version of Websphere MQ, refer instead to "Migrating from WebSphere MQ V5.3 or later" on page 13.

Setting system values

Before installing WebSphere MQ for i5/OS, use the DSPSYSVAL command to check that the following system values are set to the requirements of your enterprise:

- QCCSID
- QSYSLIBL
- QALWOBJRST
- QSHRMEMCTL
- QFRCCVNRST
- QMLTTHDACN

You can change these values, if necessary, using the CHGSYSVAL command.

1. QCCSID

   Every message has a coded-character set identifier (CCSID) in its header. The CCSID tag identifies the code page and character set of the source. For CCSIDs that are supported on the i5/OS machine, see the *i5/OS National Language Support* book.

   A queue manager obtains its CCSID from the job that created it. If the job CCSID is not a valid value in the range 1–65534, the queue manager uses the default CCSID value (65535) instead. You can change the CCSID used by the MQ queue manager by using the CL command CHGMQM.

   Note: The CCSID must be either single-byte character set (SBCS), or mixed, that is SBCS and DBCS. It must not be DBCS only.

2. QSYSLIBL

   Ensure that QSYS2 is included in the list of libraries that make up the system part of the library list. MQ uses programs in this library for data conversion and SNA LU 6.2 communication.

   Note: Do not have QMQM as part of the system or user portion of the library list.

3. QALWOBJRST

   Ensure that the QALWOBJRST system value is set to *ALL or *ALWPGMADP before you install MQ. If it is set to *NONE, the installation will fail.

   After installation, reset QALWOBJRST to its original value to maintain system security.

4. QSHRMEMCTL

   Ensure that the QSHRMEMCTL system value is set to 1 (Allowed).

   A value of 1 is used in environments where pointers can be shared amongst programs between different jobs.

   MQ requires this setting to use the shared memory APIs shmat and shmget and to share its pointers across jobs.

   If it is not set correctly initialization of WebSphere MQ will fail with system return code ″3401″ (Permission denied), and commands such as CRTMQM, STRMQM, ENDMQM, TRCMQM will fail.

5. QFRCCVNRST

   Ensure that the QFRCCVNRST system value is set to zero (Restore all objects without conversion), or 1 (Objects with validation errors are converted), before you install MQ. If it is set otherwise the installation will fail.

6. QMLTTHDACN

   Optionally set this to control the generation of messages into joblogs. Set QMLTTHDACN to 2 to get messages generated in a joblog; set it to 1 to avoid the messages. For example, the message CPD000D is an informational message that is generated when a command that is not thread-safe is issued from a multi-threaded application. Setting QMLTTHDACN to 1 avoids the message.

Installing WebSphere MQ Server for i5/OS

The first two stages of installing WebSphere MQ for i5/OS are installing the base MQ server and the samples.

There are three stages to an install:

- Install the level (the base MQ server) including the primary language
- Install the samples
- Install any additional languages required

This topic describes the first two stages, see the next topic for the third.

Note: You can install only one instance of WebSphere MQ for i5/OS in each partition of your server.

1. Sign on to the system with a user profile that has *ALLOBJ special authority, for example QSECOFR.
2. To install the WebSphere MQ for i5/OS, V7.0 base product and primary language, issue the command:

   ```
   RSTLICPGM LICPGM(5724H72) DEV(install device) OPTION(*BASE) OUTPUT(*PRINT)
   ```

   where:

   - 5724H72 is the product identifier for WebSphere MQ for i5/OS, V7.0
   - *install device* is the device from which the product is to be loaded, typically an optical drive, for example, OPT01.
   - unspecified parameters revert to defaults, which will include RSTOBJ(* ALL) - this means that the command will install both MQ and the language files for the primary language of your computer. For installing additional languages see "Installing translated versions" on page 10.

   During the installation, the license agreement is displayed for you to accept. (See "License requirements" on page 1).

3. To install the sample applications issue the command:

   ```
   RSTLICPGM LICPGM(5724H72) DEV(install device) OPTION(1) OUTPUT(*PRINT)
   ```

If installation of WebSphere MQ fails, remove MQ before attempting to reinstall. To do this:

- To delete installed options, use `DLTLICPGM LICPGM(5724H72)OPTION(*ALL)`
- To delete partially-installed options, delete the QMQM library (and the QMQMSAMP libraries if necessary)
- Delete the IFS directory /QIBM/ProdData/mqm and its subdirectories. To delete the IFS directories, use the EDTF command, for example:

   ```
   EDTF STMF('/QIBM/ProdData')
   ```

   and select option 9 for the mqm directory.

If you want to see how the install went in more detail, use the following commands:-

- View the log:

   ```
   DSPJOBLOG
   ```

- Review the spoolfile generated from the RSTLICPGM command

Installing translated versions

These instructions provide a list of the available national-language versions of Websphere MQ for i5/OS, and tell you how to install them.

The following language versions are available for WebSphere MQ for i5/OS:

Table 1. National-language versions of WebSphere MQ for i5/OS

Language ID	Language
2909	Belgian English
2966	Belgian French MNCS (Multi-National Character Set)
2981	Canadian French MNCS
2975	Czech
2950	English Uppercase
2924	English Uppercase and Lowercase
2984	English US DBCS
2938	English US Uppercase DBCS
2928	French
2940	French MNCS
2976	Hungarian
2932	Italian
2942	Italian MNCS
2962	Japanese
2986	Korean
2978	Polish
2979	Russian
2989	Simplified Chinese
2931	Spanish

WebSphere MQ for i5/OS is installed in the language that is the primary language on your system.

You can install additional versions of the product in any of the languages shown in Table 1. To do so:

1. Sign on to the system with a user profile that has *ALLOBJ special authority
2. Issue the following command specifying the appropriate language ID:

   ```
   RSTLICPGM LICPGM(5724H72) DEV(install device) RSTOBJ(*LNG) LNG(language ID)
   ```

   This will install the commands, message file, and panel groups into the relevant QSYS library for the language. For example, library QSYS2928 is used for French. If this QSYS29nn library does not exist, it will be created by the RSTLICPGM command.

Note:

1. To run the Japanese language version of WebSphere MQ for i5/OS, the CCSID of the job must be 939 (5035) rather than 930 (5026) because WebSphere MQ uses lowercase English characters.

2. If you are installing WebSphere MQ for i5/OS onto a machine for which the primary language is not on the CD, the install program will prompt you to load a CD containing the product in that language; if, however, you have only one product CD, this means that the WebSphere MQ product has not been translated into your language. To get around this, proceed as follows:

- Install the product in one of the supplied languages, and then add the corresponding QSYS29nn library into the *system library* list (for example using command CHGSYSLIBL). At the same time, check that there are no MQ *CMD, *MENU, or *MSGF objects in libraries higher up the library list. If some exist, then either delete these objects (because they refer to an earlier version of MQ) or reorder the System Library list (because the product has been installed in more than one of the supplied languages).

Verifying the installation

How to check that your installation has been successful.

1. To ensure that the product has loaded correctly, issue the Display Software Resources (DSPSFWRSC) command and check that the licensed program 5724H72 is listed. If you have installed the base and the optional samples, you should see:

```
          Resource
          ID      Option  Feature  Description
          5724H72  *BASE    5050    WebSphere MQ for i5/OS
          5724H72  *BASE    2924    WebSphere MQ for i5/OS
          5724H72   1       5050    WebSphere MQ for i5/OS - Samples
```

2. Press F11, while viewing the Display Software Resources screen, and you will see the library and version number of the products installed:

```
          Resource                        Feature
          ID      Option  Feature  Type    Library   Release
          5724H72  *BASE    5050    *CODE   QMQM      V7R0M0
          5724H72  *BASE    2924    *LNG    QMQM      V7R0M0
          5724H72   1       5050    *CODE   QMQMSAMP  V7R0M0
```

3. If you have installed additional language versions, you will also see entries for these. For example, if you have installed the French version, for which the language ID is 2928, you will see:

   a.

   ```
             Resource
             ID      Option  Feature  Description
             5724H72  *BASE    2928    WebSphere MQ for i5/OS
   ```

   b. and when you press F11:

   ```
             Resource                        Feature
             ID      Option  Feature  Type    Library    Release
             5724H72  *BASE    2928    *LNG    QSYS2928   V7R0M0
   ```

4. Use the command DSPMQMVER to check exactly what version you have installed. For V7R0 it will report:

```
          Version: 7.0.0.0
```

After installation

Tasks to perform after you have installed WebSphere MQ for i5/OS, and before using it.

When you have correctly installed WebSphere MQ for i5/OS on your system:

1. Refer to the WebSphere MQ family Web site at:

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

   for the latest product information, and to install and apply all fix packs that are recommended. See also:

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

2. Some WebSphere MQ commands, for example `CRTMQM` (create queue manager) and `DLTMQM` (delete queue manager), rely on using i5/OS system commands for creating and managing objects, files, and libraries. Similarly some WebSphere MQ program code, for example a queue manager, relies on using i5/OS system programs.

   To enable this, the commands and programs listed below must either have `*PUBLIC *USE` authority, or explicit `*USE` authority to the WebSphere MQ user profiles QMQM and QMQMADM.

   Such authority is applied automatically as part of the install process, and you should not need to apply it yourself.

   However, if you encounter problems, here is how to do it manually:

   a. **Commands**

      Set the authorities for commands using GRTOBJAUT with an OBJTYPE(*CMD) parameter, for example:

      `GRTOBJAUT OBJ(QSYS/ADDLIBLE) OBJTYPE(*CMD) USER(QMQMADM) AUT(*USE)`
      - QSYS/ADDLIBLE
      - QSYS/ADDPFM
      - QSYS/CALL
      - QSYS/CHGCURLIB
      - QSYS/CHGJOB
      - QSYS/CRTJRN
      - QSYS/CRTJRNRCV
      - QSYS/CRTJOBQ
      - QSYS/CRTJOBD
      - QSYS/CRTLIB
      - QSYS/CRTMSGQ
      - QSYS/CRTPF
      - QSYS/CRTPGM
      - QSYS/CRTSRCPF
      - QSYS/DLTJRN
      - QSYS/DLTJRNRCV
      - QSYS/DLTLIB
      - QSYS/DLTMSGQ
      - QSYS/OVRPRTF
      - QSYS/RCLACTGRP
      - QSYS/RTVJRNE
      - QSYS/RCVJRNE
      - QSYS/SBMJOB

   b. **Programs**

      Set the authorities for programs using GRTOBJAUT with an OBJTYPE(*PGM) parameter, for example:

      `GRTOBJAUT OBJ(QSYS/QWTSETP) OBJTYPE(*PGM) USER(QMQMADM) AUT(*USE)`

- QSYS/QWTSETP(*PGM)
- QSYS/QSYRLSPH(*PGM)
- QSYS/QSYGETPH(*PGM)

3. Where you have more than one computer and a mixture of releases of OS/400 or i5/OS, and WebSphere MQ, you must compile CL programs either on the computer they will run on, or on one with an identical combination of releases of OS/400 or i5/OS, and WebSphere MQ. When you install later versions of WebSphere MQ, delete all WebSphere MQ commands from previous releases in any QSYSVvRrMm libraries using the QSYS/DLTCMD command.

4. If you have never installed WebSphere MQ on your system before (that is, you are not doing a migration), perform the following tasks:

   a. Make all user profiles that will be used for creating and administering queue managers members of the group profile QMQMADM, using the command CHGUSRPRF.

   b. The default TCP channel listener in WebSphere MQ for i5/OS, V7.0 is a threaded listener, which starts threaded channels. If you want to run non-threaded TCP channel listeners in WebSphere MQ for i5/OS, V7.0, you must add an attribute to the CHANNELS stanza of each queue manager's qm.ini file. The attribute is ThreadedListener=No. Information about qm.ini files is in the WebSphere MQ System Administration Guide.

5.

   a. Start the WebSphere MQ subsystem, by issuing the command:

      STRSBS SBSD(QMQM/QMQM)

      Note: The subsystem must be started after each IPL of the system, so you might choose to start it as part of your system startup process.

You are now ready to start using WebSphere MQ for i5/OS.

Migrating from WebSphere MQ V5.3 or later

There are two major types of upgrade:

- The upgrade takes place on the same machine, optionally accompanied by a hardware upgrade. This is referred to as a *slip install*.
- The upgrade takes place on a different machine. This is referred to as a *side-by-side install*.

Whichever type of install you perform, you must first:

1. Prepare your system
2. Quiesce your queue managers

Preparing for migration

Before performing a slip install or side-by-side install, carry out the following procedure:

1. Sign on to the system with a user profile that has *ALLOBJ special authority, for example QSECOFR.

2. Stop all applications that are using the existing version of WebSphere MQ. (On WebSphere MQ verion 5.3 and later, use the command WRKMQM, option 22 "Work with queue manager jobs", to help find them).

3. End all channels for all queue managers on the system. To do this, use the WRKMQMCHL command and select option 15.

4. On each queue manager, end the command server. To do this, enter the command:

```
ENDMQMCSVR MQMNAME(QMGRNAME) OPTION(*IMMED)
```

   where *QMGRNAME* is the name of the queue manager.

5. Remove any unwanted messages from your queues.

6. Resolve any in-doubt messages that are held by sender or server channels. To do this, use the WRKMQMCHST command and select option 17.

7. On each queue manager, save the latest media recovery checkpoint. To do this enter the following command:

```
RCDMQMIMG OBJ(*ALL) OBJTYPE(*ALL) MQMNAME(QMGRNAME) DSPJRNDTA(*YES)
```

8. Quiesce the product. To do this, see "Quiescing WebSphere MQ" on page 15.

9. End the QMQM subsystem by entering the command:

```
ENDSBS SBS(QMQM)
```

10. Save your WebSphere MQ data:

   a. Create a save file for every queue manager library on your system. To do this, issue the command:

```
CRTSAVF FILE(QGPL/queue-manager-library)
```

   where the *queue-manager-library* name consists of the name of the queue manager preceded by QM.

   b. Save your queue manager libraries into the save files. To do this, issue the commands:

```
SAVLIB LIB(queue-manager-library) DEV(*SAVF)
SAVF(QGPL/queue-manager-library)
```

   c.

   Remove all unwanted FDC data from directory:

```
QIBM/UserData/mqm/errors
```

   Remove old FDC files with the command:

```
RMVLNK OBJLNK('/QIBM/UserData/mqm/errors/*.FDC')
```

   This cleans up all files with an extension of 'FDC' in the IFS.

   Remove old JOB files with the command:

```
RMVLNK OBJLNK('/QIBM/UserData/mqm/errors/*.JOB')
```

   This cleans up all files with an extension of 'JOB' in the IFS.

   d.

   Remove all unwanted trace data from directory:

```
QIBM/UserData/mqm/trace
```

   (or remove the whole directory).

   Remove all trace files with the command:

```
RMVLNK OBJLNK('/qibm/userdata/mqm/trace/*')
```

   e. Create a save file for MQ IFS data. To do this, issue the command:

```
CRTSAVF FILE(QGPL/QMUSERDATA)
```

   f. Save your MQ IFS data, using the command:

```
SAV DEV('/QSYS.LIB/QGPL.LIB/QMUSERDATA.FILE') OBJ('/QIBM/UserData/mqm')
```

11. If you are moving from running WebSphere MQ on any machine to WebSphere MQ on a new machine, transfer the save files to the new machine.

Quiescing WebSphere MQ

The orderly shutdown of WebSphere MQ is called *quiescing*. You need to quiesce WebSphere MQ to upgrade to a newer version.

To quiesce one or more queue managers:
1. Sign on to a new interactive i5/OS session, ensuring that you are not accessing any WebSphere MQ objects.
2. Ensure that you have:
   a. *ALLOBJ authority, or object management authority for the QMQM library.
   b. Sufficient authority to use the ENDSBS command.
3. Warn all users that you are going to stop WebSphere MQ.
4. Quiesce all queue managers:-
   a. On Version 5.3, use the ENDMQM command:

      `ENDMQM MQMNAME(*ALL) OPTION(*CNTRLD) ENDCCTJOB(*YES) TIMEOUT(15)`

      Where *15* is a timeout value in seconds.

      If the ENDMQM command has not completed within a reasonable period (at least 10 minutes), use the WRKMQM command to identify the queue managers that are still ending, and force each one in turn to stop by issuing:

      `ENDMQM MQMNAME(QMGRNAME) OPTION(*IMMED)`

      Where *QMGRNAME* is the name of the queue manager.

      Complete the tidying up of shared memory by issuing the command:

      `ENDMQM MQMNAME(*ALL) OPTION(*IMMED) ENDCCTJOB(*YES) TIMEOUT(15)`
   b. On Version 6.0 or later, use the ENDMQM command:

      `ENDMQM MQMNAME(*ALL) OPTION(*CNTRLD) ENDCCTJOB(*YES) RCDMQMIMG(*YES)`
      `  TIMEOUT(15)`

      Where *15* is a timeout value in seconds.

      If the ENDMQM command has not completed within a reasonable period (at least 10 minutes), use the WRKMQM command to identify the queue managers that are still ending, and force each one in turn to stop by issuing:

      `ENDMQM MQMNAME(QMGRNAME) OPTION(*IMMED)`

      Where *QMGRNAME* is the name of the queue manager.

      Complete the tidying up of shared memory by issuing the command:

      `ENDMQM MQMNAME(*ALL) OPTION(*IMMED) ENDCCTJOB(*YES) RCDMQMIMG(*NO)`
      `  TIMEOUT(15)`
5. If the command in the previous step does not complete, end the subsystem immediately by issuing:

   `ENDSBS SBS(QMQM) OPTION(*IMMED)`
6. If this also fails, use the operating system command ENDJOB to end all jobs in the subsystem QMQM, as described below.

   Note: Do not use ENDJOBABN unless you intend to IPL the machine before starting WebSphere MQ. Ending WebSphere MQ jobs using ENDJOBABN can lead to damaged semaphores, which in turn can prevent your queue manager from starting.

a. If a QMGR(s) must be shut down manually, the recommended order of ending jobs (ENDJOB) is shown below (if the job exists) - wait a few minutes for AMQA* or AMQZ* jobs to tidy up.
   1) RUNMQLSR - TCP listener (multi-threaded)
   2) AMQCLMAA - TCP listener (single-threaded)
   3) AMQRMPPA - Channel process pooling job
   4) RUNMQCHI - channel initiator
   5) AMQCRSTA - receiving MCA jobs
   6) RUNMQCHL - sending MCA jobs
   7) AMQCRS6B - LU62 receiver channel
   8) AMQPCSEA - command server
   9) RUNMQTRM - Application trigger monitor
   10) RUNMQDLQ - Dead letter queue handler
   11) AMQFCXBA - Broker Worker Job
   12) AMQFQPUB - Queued Publish/Subscribe Daemon
   13) AMQZMUC0 ('0' is a zero) - Utility Manager
   14) AMQZMUR0 ('0' is a zero) - Utility Manager
   15) AMQZMGR0 ('0' is a zero) - Process Controller
   16) AMQRRMFA - cluster repository manager
   17) AMQZDMAA - deferred message manager
   18) AMQALMPX - Log Manager
   19) AMQZFUMA - Object Authority Manager
   20) AMQZLAS0 ('0' is a zero) - LQM agents
   21) AMQZLAA0 ('0' is a zero) - LQM agents
   22) AMQZXMA0 ('0' is a zero) - Execution Controller

b. Issue the following command:

   ENDMQM MQMNAME(*QMGRNAME*) OPTION(*IMMED)

c. Issue the following command:

   ENDMQM MQMNAME(*ALL) OPTION(*CNTRLD) ENDCCTJOB(*YES) RCDMQMIMG(*NO)
   TIMEOUT(*05*)

   Where *05* is a timeout value in seconds.

d. Manually clean up shared memory. Issue the following command:

   EDTF '/QIBM/UserData/mqm/qmgrs'

   then:
   1) Take option 5 for &SYSTEM and check that the following sub-dirs are empty: isem esem, msem, ssem, and shmem.
   2) Take option 5 for QMGRNAME and check that the following sub-dirs are empty :- isem esem, msem, ssem, and shmem.
   3) Take option 5 for &ipcc in the QMGRNAME directory and check that the following sub-dirs are empty :- isem esem, msem, ssem, and shmem.
   4) Take option 5 for &qmpersist in the QMGRNAME directory and check that the following sub-dirs are empty :- isem esem, msem, ssem, and shmem.

Performing a slip install

To perform a slip install, carry out the following tasks:

1. "Preparing for migration" on page 13
2. "Installing WebSphere MQ Server for i5/OS" on page 9
3. "Verifying the installation" on page 11
4. "Verifying the migration" on page 18

5. "After installation" on page 12

Performing a side-by-side install

To perform a side-by-side install, carry out the following tasks:

1. "Preparing for migration" on page 13
2. "Installing WebSphere MQ Server for i5/OS" on page 9
3. "Verifying the installation" on page 11
4. "Verifying the migration" on page 18
5. "After installation" on page 12
6. Restore the queue-manager libraries for every queue manager, using the command:

   ```
   RSTLIB SAVLIB(queue-manager-library) DEV(*SAVF) (*PRINT)
   SAVF(QGPL/queue-manager-library)
   ```

   where the *queue-manager-library* name consists of the name of the queue manager preceded by QM.
7. Restore the WebSphere MQ IFS data, using the command:

   ```
   RST DEV('/QSYS.LIB/QGPL.LIB/QMUSERDATA.FILE') OBJ('/QIBM/UserData/mqm') (*PRINT)
   ```
8. To associate the journal receivers, issue the command WRKJRN on the journal AMQAJRN in each queue manager library, by pressing *PF4* and selecting option 9.
9. If you want to set up your work management environment, job descriptions, and pools, see the WebSphere MQ System Administration Guide for guidance. Otherwise, use the default setup.

Migrating translated versions

Follow these instructions to migrate a translated version.

Previous editions of this book recommended installing translated versions that are not on the CD by: installing a language that is on the CD, and then copying the QSYS29xx files into QSYS. This is no longer recommended because those objects will not be removed at a subsequent upgrade or reinstall. The new recommended procedure is described in Installing translated versions.

If you are upgrading now, and, when you installed your existing translated version, you followed the previous advice and copied objects into QSYS, then follow the steps below to ensure that all the old objects are removed at an upgrade or reinstall of MQ. This is a one-time resolution.

To remove old objects from QSYS:

1. To uninstall the previous version of MQ, issue the command:

   ```
   DLTLICPGM 5724B41
   ```

   where 5724B41 is the component id of the previous version of MQ.
2. Create a temporary user profile:

   ```
   CRTUSRPRF QMQMx
   ```

   where QMQMx is any new temporary usrprf.
3. Delete the previous QMQM profile, and change the ownership of its objects to the temporary profile:

   ```
   DLTUSRPRF USRPRF(QMQM) OWNOBJOPT(*CHGOWN QMQMx)
   ```

4. Install the new version of WebSphere MQ for i5/OS, V7.0 base product and language:

```
RSTLICPGM LICPGM(5724H72) DEV(install device) RSTOBJ(*LNG) LNG(language ID)
```

See Installing translated versions for full details on this command, and what to do if your required language is not on the CD.

5. To preserve the required objects, change the ownership of the IFS /QIBM/UserData/mqm and its subdirs back to QMQM using the command:

```
CHGOWN OBJ('/QIBM/UserData/mqm') NEWOWN(QMQM)
```

6. To preserve the required objects in the queue manager libraries, change their ownership back to QMQM using commands such as:

```
CHGOBJOWN OBJ(qmgr_lib/qmgr_object) OBJTYPE(*object_type) NEWOWN(QMQM)
```

where:
- *qmgr_lib* is the queue manager library,
- *qmgr_object* is one of the objects there,
- *object_type* is the type of the object.

Repeat the command for every object, and every queue manager.

7. Delete the temporary user profile QMQMx (and all its owned objects):

```
DLTUSRPRF USRPRF(QMQMx) OWNOBJ(*DLT)
```

8. Follow the steps in Verifying the installation

Verifying the migration

After you have verified the installation, perform these steps.

Before you start, make sure you have performed the steps in *Verifying the installation* in *WebSphere MQ Intercommunications*.

To verify that you have migrated to WebSphere MQ for i5/OS, V7.0 successfully:

1. Make QMQMADM either the primary or a secondary group profile for your user profile. To do this, issue one of the following commands:

```
CHGUSRPRF USRPRF(YOUR PROFILE) GRPPRF(QMQMADM)
CHGUSRPRF USRPRF(YOUR PROFILE) SUPGRPPRF(QMQMADM)
```

2. Start the WebSphere MQ subsystem with the command:

```
STRSBS SBSD(QMQM/QMQM)
```

(If it is already running, you will get error message CPF1010 which you can safely ignore).

3. Check that your queue managers are accessible by issuing the command:

```
WRKMQM
```

Use option 14 against each queue manager to start it.

Use option 5 against each queue manager to check its attributes.

4. You can use the other options to check your queue manager objects, for example check your queues using option 18, check your channels using option 20, and so on.

5. Take a fresh media recovery checkpoint, using the following command:

```
RCDMQMIMG OBJ(*ALL) OBJTYPE(*ALL) MQMNAME(QMGRNAME) DSPJRNDTA(*YES)
```

Where *QMGRNAME* is the name of the queue manager.

Refer to the documentation for more information about these commands and how to use them. See either *Command Reference* or *Documentation* in *Delivered components* in *WebSphere MQ Intercommunications*.

After migration

1. When you are satisfied that the migration has completed successfully, you can delete the saved data in the save files in QGPL. (This data was saved in Preparing for migration.)
2. See the tasks in After installation.

Applying maintenance to WebSphere MQ for i5/OS

To find out what version you have currently installed, use the following commands:-

Table 2. MQ commands to display the installed versions

WebSphere MQ Product	Version command
WebSphere MQ Server	`DSPMQMVER`

WebSphere MQ Java	WebSphere MQ Classes for Java:
	
	`    java com.ibm.mq.MQJavaLevel`
	
	WebSphere MQ Classes for Java Message Service:
	
	`    java com.ibm.mq.jms.MQJMSLevel`
	
	Note: For those commands to work you might need to set your environment classpath to:
	• `/QIBM/ProdData/mqm/java/lib/com.ibm.mq.jar`
	or:
	• `/QIBM/ProdData/mqm/java/lib/com.ibm.mqjms.jar`
	respectively.
	
	See Environment variables relevant to WebSphere MQ classes for Java and Environment variables used by WebSphere MQ classes for JMS.

Service updates for WebSphere MQ for i5/OS are supplied as PTFs (Program Temporary Fixes). They are available for download from the web as save files, which are normally stored in the QGPL library. For details of how to load and apply PTFs and read their cover letters, see the i5/OS Information Center here: http://publib.boulder.ibm.com/iseries/.

Find updates here:

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

Before loading and applying a PTF:
- Read the cover letter carefully to see if you need to take any special actions.
- Quiesce all queue managers, as described in "Quiescing WebSphere MQ" on page 15.

i5/OS

To check for PTFs for i5/OS itself, check here:

```
http://www.ibm.com/servers/eserver/support/iseries
```

and click on "Fix Central".

Uninstalling WebSphere MQ for i5/OS, V7.0

There are two ways of uninstalling WebSphere MQ for i5/OS, V7.0

To uninstall WebSphere MQ for i5/OS, perform one of the following tasks:

- A *standard* deletion removes WebSphere MQ product code but preserves user data.
- An *entire* deletion removes both WebSphere MQ product code and user data.

Both types of deletion require you to be signed on to the system with a user profile that has *ALLOBJ special authority, for example QSECOFR.

Uninstalling WebSphere MQ

Perform a standard deletion of the WebSphere MQ for i5/OS product if you want to retain your user data, for example, because you intend to reinstall the product at a later date.

To perform this deletion:

1. Quiesce WebSphere MQ for i5/OS. (See "Quiescing WebSphere MQ" on page 15.)
2. End the WebSphere MQ subsystem, by issuing the command:
   ```
   ENDSBS SBS(QMQM)
   ```
3. Ensure that no locks are held on the library QMQM, by issuing the command:
   ```
   WRKOBJLCK OBJ(QMQM) OBJTYPE(*LIB)
   ```
4. Use the Delete Licensed Program (DLTLICPGM) command to delete the base product (and also the samples if you chose to install them). To delete the base product and the samples, issue the command:
   ```
   DLTLICPGM LICPGM(5724H72) OPTION(*ALL)
   ```
   To delete only the samples, issue the command:
   ```
   DLTLICPGM LICPGM(5724H72) OPTION(1)
   ```
   To delete any extra language versions installed, issue the command:
   ```
   DLTLICPGM LICPGM(5724H72) LNG(nnnn)
   ```

   where nnnn is the language number, as in the list here: "Installing translated versions" on page 10.

Deleting WebSphere MQ for i5/OS in this way deletes only the objects that belong to WebSphere MQ: the QMQM library, and the subdirectories that belong to WebSphere MQ server below the /QIBM/ProdData/mqm directory.

If that leaves no other subdirectories (for example if WebSphere MQ Java is installed it uses subdirectories there) then the /QIBM/ProdData/mqm directory itself is deleted.

None of the queue manager journal libraries, or IFS directories based upon /QIBM/UserData are removed.

Uninstalling WebSphere MQ and data

You can delete WebSphere MQ entirely, including all user data. If you do this, save your user data first. It will not be recoverable.

To perform this deletion:
1. Quiesce WebSphere MQ for i5/OS. (See "Quiescing WebSphere MQ" on page 15.)
2. Delete each queue manager in turn by using the command WRKMQM and selecting option 4.
3. End the WebSphere MQ subsystem, by issuing the command:

    `ENDSBS SBS(QMQM)`
4. Delete the directory /QIBM/UserData/mqm and its subdirectories. Do this using the EDTF command and selecting option 9 (recursive delete) for the mqm directory, as follows,

    > **Note:** If you do this, you will no longer have any information regarding your installation. Use this command with extreme caution.

    The format of the command is:

    `EDTF STMF('/QIBM/UserData')`

    Alternatively, you can delete the /QIBM/UserData/mqm directory and its subdirectories by repeated use of the RMVLNK and RMVDIR commands.
5. Ensure that no locks are held on the library QMQM, by issuing the command:

    `WRKOBJLCK OBJ(QMQM) OBJTYPE(*LIB)`
6. Optional: At this point, if you want to also uninstall WebSphere MQ Java, you could do it now, using the command:

    `DLTLICPGM LICPGM(5724L26) OPTION(*ALL)`

    This will also uninstall the Java Samples, if they were installed.
7. Use the Delete Licensed Program (DLTLICPGM) command to delete the base product (and also the samples if you chose to install them). To delete the base product and the samples issue the command:

    `DLTLICPGM LICPGM(5724H72) OPTION(*ALL)`
8. Identify all the users who belong to the QMQMADM group. Use the DSPUSRPRF command to display a list of them. You need to remove the QMQMADM group profile from their user profiles before you can delete the QMQMADM user profile. The format of the command is:

    `DSPUSRPRF USRPRF(QMQMADM) TYPE(*GRPMBR)`
9. For each of the user profiles QMQM and QMQMADM, use the WRKOBJOWN command to list all the objects owned by the profile. The format of the command is:

    `WRKOBJOWN USRPRF(PROFILE)`

    You need to alter the ownership or delete the objects. Then you must delete the two user profiles.

Reinstalling WebSphere MQ for i5/OS

You can reinstall WebSphere MQ for i5/OS, V7.0 without losing any of your data.

When you reinstall WebSphere MQ for i5/OS, the system checks whether the WebSphere MQ configuration file (mqs.ini) exists. If the file exists, it is kept and used with the newly installed system. If the file does not exist, an empty mqs.ini file is placed in the directory /QIBM/UserData/mqm.

All data that you have in the UserData directory is referenced by the newly installed system. In addition, all the queue manager-associated libraries containing journal and receiver information are referenced by the new system.

Chapter 2. WebSphere MQ Java for i5/OS

This collection of topics describes installing, maintaining, and uninstalling, the WebSphere MQ classes for Java and WebSphere MQ classes for Java Message Service (JMS) on i5/OS.

The WebSphere MQ classes for Java and WebSphere MQ classes for JMS are together known as *WebSphere MQ Java* in this section of the documentation.

In addition to reading the information here, refer to the readme files on the product and documentation CDs, and also to the latest information available on the WebSphere MQ Web site at:

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

Further information about WebSphere MQ Java can be found in the WebSphere MQ Using Java book.

Disk space required

For the WebSphere MQ Java base code and samples, allow approximately 15 MB of storage.

Installation library and directories

You can install WebSphere MQ Java for i5/OS with or without the WebSphere MQ server.

You can install WebSphere MQ Java for i5/OS, V7.0 in 2 ways:
- In addition to WebSphere MQ for i5/OS, V7.0 server (it doesn't matter which product is installed first)
- Standalone

In both cases, the installation procedure is the same.

WebSphere MQ Java on i5/OS library structure

Installation of WebSphere MQ Java V7.0 creates the WebSphere MQ Java product library QMQMJAVA.

IFS root file system for WebSphere MQ Java

When you install WebSphere MQ Java on i5/OS, additional IFS directories are created.

For general IFS information see "IFS root file system for MQ server" on page 4.

When you install WebSphere MQ Java on i5/OS, the following directories are created in the IFS root file system:

ProdData

Overview

```
- QIBM
   '-- ProdData
            '-- mqm
                    '-- java
                            '-- samples
                            '-- bin
                            '-- lib
```

/QIBM/ProdData/mqm/java
> Subdirectories below this contain all the product data, including Java classes. Data in this directory is deleted and replaced each time the product is replaced.

/QIBM/ProdData/mqm/java/samples
> Subdirectories below this contain all the sample Java classes and data.

Also the following directory stores licenses:

/QIBM/ProdData/LicenseDoc/5724L26_V7R0M0
> License files. The files are named like 5724L26_V7R0M0_*xx* where *xx* is the 2 or 5 character language identifier for each language supplied.

Installing WebSphere MQ Java for i5/OS

Install WebSphere MQ Java for i5/OS from either product CD, using the RSTLICPGM command.

You can install WebSphere MQ Java for i5/OS from either the Client CD or the Server CD.

1. Sign on to the system with a user profile that has *ALLOBJ special authority, for example QSECOFR.
2. To install WebSphere MQ Java, issue the command:

   `RSTLICPGM LICPGM(5724L26) DEV(install device) OPTION(*BASE)`

   where:
   - 5724L26 is the product identifier for WebSphere MQ Java for i5/OS.
   - *install device* is the device from which the product is to be loaded, typically a CD, for example, OPT01.

   During the installation, the license agreement is displayed for you to accept. (See "License requirements" on page 1).
3. To install the sample applications, issue the command:

   `RSTLICPGM LICPGM(5724L26) DEV(install device) OPTION(1) OUTPUT(*PRINT)`

Note: You can install only one instance of WebSphere MQ Java for i5/OS in each partition of your server.

If installation of WebSphere MQ Java fails, remove the partly-installed objects before attempting reinstallation. To do this, delete the QMQMJAVA library, then delete the IFS directory /QIBM/ProdData/mqm/java and its subdirectories using the EDTF command, for example:

`EDTF STMF('/QIBM/ProdData/mqm')`

and select option 9 against the Java directory.

Migrating WebSphere MQ classes for JMS and WebSphere MQ classes for Java on i5/OS

If you have WebSphere MQ Java SupportPac™ MA88 installed, you must uninstall it first.

If you have WebSphere MQ Java V5.3, or WebSphere MQ Java V6.0 installed, and want to install the WebSphere MQ Java V7.0 product on i5/OS, you can install the new version without uninstalling the old one.

If you do have MA88 installed, and try to install WebSphere MQ Java V7.0 anyway, the installation fails with a warning requesting you to uninstall the old client.

To uninstall the previous Java client:

1. Delete the QMQMJAVA library and the /QIBM/ProdData/mqm/java directory, by issuing the command:

   ```
   DLTLICPGM LICPGM(5648C60) OPTION(*ALL)
   ```

2. If the step above failed to delete the IFS directory /QIBM/ProdData/mqm/java and its subdirectories, use the EDTF command, for example:

   ```
   EDTF STMF('/QIBM/ProdData/mqm')
   ```

   and select option 9 against the java directory.

Verifying the installation of WebSphere MQ Java

To verify that you have successfully installed WebSphere MQ Java, follow these instructions.

1. To ensure that the product has loaded correctly, issue the Display Software Resources (DSPSFWRSC) command and check that the licensed program 5724L26 is listed. If you have installed the base and the optional samples, you should see:

   ```
           Resource
           ID        Option  Feature  Description
           5724L26   *BASE   5050     WebSphere MQ Classes for Java
           5724L26   1       5050     WebSphere MQ Classes for Java - Samples
   ```

2. Press F11, while viewing the Display Software Resources screen, and you will see the library and version number of the products installed:

   ```
           Resource                    Feature
           ID        Option  Feature   Type   Library   Release
           5724L26   *BASE   5050      *CODE   QMQMJAVA  V7R0M0
           5724L26   1       5050      *CODE   QMQMJAVA  V7R0M0
   ```

3. Check what versions you have installed by using the following commands:

   WebSphere MQ Classes for Java:

   ```
   java com.ibm.mq.MQJavaLevel
   ```

   WebSphere MQ Classes for Java Message Service:

   ```
   java com.ibm.mq.jms.MQJMSLevel
   ```

   Note: For those commands to work you might need to set your environment classpath to:

- `/QIBM/ProdData/mqm/java/lib/com.ibm.mq.jar`

or:

- `/QIBM/ProdData/mqm/java/lib/com.ibm.mqjms.jar`

respectively.

See Environment variables relevant to WebSphere MQ classes for Java and Environment variables used by WebSphere MQ classes for JMS.

For V7.0 both will report:

```
Version: 7.0.0.0
```

Note: The command uses the Java classes, and hence as well as reporting the version, it also performs some verification that the classes are installed and working.

4. Refer to *WebSphere MQ Using Java* for full details of verification of both:
   - WebSphere MQ classes for Java
   - WebSphere MQ classes for Java Message Service.

Applying maintenance to WebSphere MQ Java for i5/OS

See "Applying maintenance to WebSphere MQ for i5/OS" on page 19.

Uninstalling WebSphere MQ Java

Follow these instructions to uninstall Websphere MQ Java.

To uninstall the WebSphere MQ Java, V7.0 product:

1. Make sure you are signed on to the system with a user profile that has *ALLOBJ special authority, for example QSECOFR.
2. Issue the command:
   ```
   DLTLICPGM LICPGM(5724L26) OPTION(*ALL)
   ```

Deleting WebSphere MQ Java for i5/OS deletes the objects that belong to it: the QMQMJAVA library, and the subdirectories that belong to WebSphere MQ Java below the /QIBM/ProdData/mqm directory.

If that leaves no other subdirectories (for example if the WebSphere MQ Server is installed it uses subdirectories there) then the /QIBM/ProdData/mqm directory itself is deleted.

Chapter 3. WebSphere MQ documentation

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 3. WebSphere MQ Quick Beginnings books

PDF file name	Order Number	Title
AMQAAC10	GC34-6922	WebSphere MQ for AIX Quick Beginnings
AMQCAC09	GC34-6923	WebSphere MQ for HP-UX Quick Beginnings
AMQWAC04	GC34-6925	WebSphere MQ for i5/OS Quick Beginnings
AMQ1AC07	GC34-6924	WebSphere MQ for Linux Quick Beginnings
AMQTAC07	GC34-6920	WebSphere MQ for Windows Quick Beginnings
AMQDAC10	GC34-6921	WebSphere MQ for Solaris Quick Beginnings

Table 4. WebSphere MQ family books

PDF file name	Order Number	Title
CSQZAL12	SC34-6939	WebSphere MQ Application Programming Guide
CSQZAK11	SC34-6940	WebSphere MQ Application Programming Reference
CSQZAY04	SC34-6947	WebSphere MQ Glossary
CSQZAF10	GC34-6934	WebSphere MQ Clients
CSQZAQ01	SC34-6951	WebSphere MQ Constants
CSQZAE10	SC34-6931	WebSphere MQ Intercommunication
AMQZAO06	GC34-6945	WebSphere MQ Messages
CSQZA001	GC34-6948	WebSphere MQ Migration Information
CSQZAX06	SC34-6937	Monitoring WebSphere MQ
CSQZAC06	SC34-6942	WebSphere MQ Programmable Command Formats and Administration Interface
AMQNAR11	SC34-6950	WebSphere MQ Publish/Subscribe User's Guide
CSQZAH08	SC34-6933	WebSphere MQ Queue Manager Clusters
CSQZAS04	SC34-6932	WebSphere MQ Security
CSQZAJ11	SC34-6941	WebSphere MQ Script (MQSC) Command Reference
AMQZAG10	SC34-6928	WebSphere MQ System Administration Guide
AMQZAN10	SC34-6936	WebSphere MQ Using C++
CSQZAW16	SC34-6935	WebSphere MQ Using Java
CSQZAV06	GC34-6949	WebSphere MQ Using .NET
CSQSAT04	GC34-6926	WebSphere MQ for z/OS Concepts and Planning Guide
CSQSAV05	SC34-6927	WebSphere MQ for z/OS System Setup Guide
CSQSAW04	SC34-6929	WebSphere MQ for z/OS System Administration Guide
CSQSAQ04	GC34-6944	WebSphere MQ for z/OS Problem Determination Guide
CSQSA006	GC34-6946	WebSphere MQ for z/OS Messages and Codes

Table 4. WebSphere MQ family books (continued)

PDF file name	Order Number	Title
CSQSAD05	GI10-2584	*Program Directory for WebSphere MQ for z/OS®*

Table 5. Additional WebSphere MQ books for i5/OS

PDF file name	Order Number	Title
AMQWAK02	SC34-6943	WebSphere MQ for i5/OS Application Programming Reference (ILE/RPG)
AMQWAG04	SC34-6930	WebSphere MQ for i5/OS System Administration Guide

Table 6. Additional WebSphere MQ books for Windows

PDF file name	Order Number	Title
AMQTAN04	SC34-6938	*WebSphere MQ for Windows, Using the Component Object Model Interface*

Documentation 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 on the documentation CD-ROM as PDFs on all platforms and as an Information Center on Linux and Windows only.

Information Center

For information on how to view and install the Information Center, see Information Center in *WebSphere MQ for Windows Quick Beginnings*.

PDF

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

The PDFs are available in U.S. English in the \docs\pdf*en_US* directory on the Documentation CD, and also in some or all of the following national languages. After you have installed the PDFs, you can find the files in the directory in which you installed the Information Center. To find out which ones are available in your language, look for the appropriate directory on the CD in the form \docs\pdf*ll_LL*, where *ll_LL* is one of the following:

- cs_CZ (Czech)
- de_DE (German)
- es_ES (Spanish)
- fr_FR (French)
- hu_HU (Hungarian)
- it_IT (Italian)

- ja_JP (Japanese)
- ko_KR (Korean)
- pl_PL (Polish)
- pt_BR (Brazilian Portuguese)
- ru_RU (Russian)
- zh_CN (Simplified Chinese)
- zh_TW (Traditional Chinese)

Within these directories, you can find the complete set of PDFs that are available. Table 3 on page 27 shows the file names used for the PDF files.

Hardcopy books

This book, and all the books listed in Chapter 3, "WebSphere MQ documentation," on page 27, are available for you to order or print.

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

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http://www.ibm.com/ibmlink
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In the United States, you can also order publications by dialing **1-800-879-2755**.

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

For information about printing books, see iq10700_.dita.

Online Information

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. 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 WebSphere MQ products. This can be found at:

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

Softcopy help

WebSphere MQ for i5/OS provides context-sensitive help.

When you enter a command and press F4 = Prompt, then when you place your cursor on a panel field and press F1, you are presented with relevant help information.

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