

IBM MQSeries Workflow



# Installation Guide

*Version 3.3*



IBM MQSeries Workflow



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*Version 3.3*

**Note!**

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 339.

**Eighth Edition (March 2001)**

This edition applies to version 3, release 3, modification 0 of IBM MQSeries Workflow (product number 5697-FM3) and to all subsequent releases and modifications until otherwise indicated in new editions.

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## About this book

This book explains how to set up MQSeries Workflow components on workstations running UNIX, and Windows based operating platforms.

It is assumed that you are familiar with:

- IBM's MQSeries.
- IBM's DB2(R) relational database management system if you intend to use it for the Buildtime or Runtime databases.
- Oracle if you intend to use it for the Runtime database.
- Microsoft Access if you intend to use it for the Buildtime database.
- UNIX based operating systems, if you intend installing MQSeries Workflow components on AIX(R), HP-UX, or Sun Solaris.
- Windows based operating systems, if you intend installing MQSeries Workflow components on Windows Me, 98, 2000, or NT.

You should be familiar with the components of an MQSeries Workflow system and understand how an MQSeries Workflow system is structured. For an introduction to MQSeries Workflow, see the *IBM MQSeries Workflow: Concepts and Architecture* book.

Hereafter MQSeries Workflow is abbreviated to MQ Workflow.

References to OS/390(R) also apply to the new version of this operating system, called z/OS.

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## Who should read this book

This book is for system administrators who do the following:

- Install and configure MQ Workflow and its prerequisite and corequisite products.
- Install corrective service updates and new releases of MQ Workflow.

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## How this book is organized

This book consists of the following parts:

- "Part 1. About MQ Workflow" on page 1 describes which components can be installed on which platforms, explains what a configuration and profile are, and describes the steps required to set up MQ Workflow.

- “Part 2. Planning your MQ Workflow setup” on page 11 describes the choices that you must make before starting to install MQ Workflow, the prerequisite software, and the platform requirements.
- “Part 3. Installing and configuring MQ Workflow on UNIX” on page 53 describes how to install, configure, and verify MQ Workflow components on AIX, HP-UX, and Sun Solaris.
- “Part 4. Installing and configuring MQ Workflow on Windows” on page 125 describes how to install, configure, and verify MQ Workflow components on Microsoft Windows.
- The appendixes contain useful DB2 and MQSeries commands; information about MQ Workflow variables; details regarding language settings; information about files that are updated during installation; a full description on how to install and configure various setups on different platforms, and how to perform an unattended installation; instructions for migrating from a previous release; details about deleting MQ Workflow from a workstation; and installation messages.

At the back of this book is a glossary that defines terms as they are used in this book, a bibliography, and an index.

---

## Task road map

Use Table 1 to find the information you need to perform the most common MQ Workflow installation and configuration tasks.

*Table 1. MQ Workflow installation and configuration task road map*

If you want to...	Refer to...
View or print PDF or HTML versions of the MQ Workflow product documentation.	CD-ROM labeled ‘IBM MQSeries Workflow Version 3.3 - Documentation’
Understand the sequence of actions required to set up MQ Workflow.	“Steps in setting up MQ Workflow” on page 9
Understand which type of setup you require, and the prerequisites for installing MQ Workflow.	“Part 2. Planning your MQ Workflow setup” on page 11
Install DB2 and MQSeries.	“Chapter 6. Installing the prerequisite software” on page 47
Install and configure Oracle.	Oracle documentation
Migrate an existing MQ Workflow installation from a previous release.	“Appendix N. Migrating from a previous release” on page 307
Install and configure MQ Workflow.	<ul style="list-style-type: none"> <li>• “Part 3. Installing and configuring MQ Workflow on UNIX” on page 53</li> <li>• “Part 4. Installing and configuring MQ Workflow on Windows” on page 125</li> </ul>



Table 1. MQ Workflow installation and configuration task road map (continued)

If you want to...	Refer to...
Install and configure all MQ Workflow components on the same machine. This type of stand-alone setup is suitable for test, development, and demonstration purposes.	<ul style="list-style-type: none"> <li>• “Appendix E. Stand-alone client/server setup on Windows NT/2000” on page 231</li> <li>• “Appendix H. Quick server setup on AIX” on page 251</li> <li>• “Appendix I. Quick server setup on Sun Solaris” on page 257</li> <li>• “Appendix J. Quick server setup on HP-UX” on page 267</li> </ul>
Install and configure a standard MQ Workflow client on a Windows machine.	“Appendix F. Quick client setup on Windows” on page 241
Install and configure a client concentrator.	“Appendix G. Client concentrator setup” on page 245
Perform an unattended installation and configuration of MQ Workflow on Windows or UNIX.	“Appendix K. Unattended installation and configuration” on page 277
Remove an MQ Workflow installation.	“Appendix O. Uninstalling MQ Workflow” on page 319
Diagnose configuration problems.	“Appendix Q. Using the configuration checking utility fmczchk” on page 331
Share your comments or suggestions with us to improve this manual.	“How to send your comments”
Visit the MQ Workflow home page.	<a href="http://www.ibm.com/software/ts/mqseries/workflow">http://www.ibm.com/software/ts/mqseries/workflow</a>

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## How to get additional information

Visit the MQ Workflow home page at

<http://www.ibm.com/software/ts/mqseries/workflow>

For a list of additional MQ Workflow publications, refer to “MQSeries Workflow publications” on page 347.

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## How to send your comments

Your feedback is important in helping to provide the most accurate and high-quality information. If you have any comments about this book or any other MQ Workflow documentation, choose one of the following methods:

- Send your comments by e-mail to: [swsdid@de.ibm.com](mailto:swsdid@de.ibm.com)  
Be sure to include the name of the book, the part number of the book, the version of MQ Workflow, and, if applicable, the specific location of the text you are commenting on (for example, a page number or table number).
- Fill out one of the forms at the back of this book and return it by mail, by fax (+49-(0)7031-16-4892), or by giving it to an IBM representative.



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## Summary of changes

This section describes recent changes made to this manual.

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### Changes made for this edition

This manual contains information previously presented in Version 3.2.2 of the *MQSeries Workflow: Installation Guide*. It includes terminology, maintenance, restructuring, and editorial changes to support MQ Workflow Version 3 Release 3. The following summarizes the major changes in this edition:

- Windows 95 and OS/2(R) Warp are no longer supported by MQ Workflow.
- You can use Oracle for the Runtime database. In this edition, configuring MQ Workflow to use an Oracle database is only described for the UNIX platforms. If you want to use Oracle for the MQ Workflow Runtime database on a Windows installation, contact the MQSeries Workflow support team.
- “Setup scenario for a client concentrator” on page 17 gives a high-level description of an MQ Workflow client concentrator, its advantages, and software requirements.
- “Appendix G. Client concentrator setup” on page 245 describes how to set up a client concentrator on a Windows or UNIX machine.
- The new Web Client is a servlet and Java Server Pages based interface to MQ Workflow. It runs on the Web Server (Server Side Java). On the client side, only a browser with JavaScript support is required. For more information about the Web Client see “Setup scenarios for a Web Client” on page 19.
- “Chapter 10. Changing your configuration on UNIX” on page 101 includes more tasks.
- “MQ Workflow variables” on page 196 includes new variables. The variables have been grouped according to where they are stored; system environment, installation profile, general configuration profile, and configuration profile.
- “Appendix F. Quick client setup on Windows” on page 241 describes how to set up a standard MQ Workflow client.
- “Appendix M. Using the Java API and Java CORBA Agent” on page 293 explains the concepts and options when using Java with MQ Workflow.
- “Appendix N. Migrating from a previous release” on page 307 describes what you have to do to migrate an existing MQ Workflow installation from Version 3.1.2 or later to Version 3.3.0.

- “Appendix R. Tivoli inventory enablement” on page 337 describes the locations of the files which can be used by Tivoli.
- For this release, JDK 1.1 is no longer supported, your MQ Workflow Java applications must use JDK Version 1.2 or 1.3.
- Support has been added for the Java Naming and Directory Interface (JNDI) locator policy.

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## Changes made for edition 7

The following changes were made to this book for edition 7:

- The book was restructured to group the chapters for each platform. For more details, see “How this book is organized” on page xiii.
- “Chapter 3. Security planning” on page 23 describes which user IDs and groups are used for installing and configuring MQ Workflow.
- “Chapter 4. Planning your installation” on page 27 provides worksheets to help you to plan for configuring MQ Workflow components on a machine.
- “Chapter 8. Configuring on UNIX” on page 65 includes a description of how to configure a VisiBroker Java CORBA Agent, how to catalog a remote Runtime database, and changes made to the configuration utility `fmczt11`.
- “Chapter 9. Verifying an MQ Workflow server on UNIX” on page 95 now includes an extended verification test described in “Testing a client connection to a UNIX server” on page 98.
- “Chapter 10. Changing your configuration on UNIX” on page 101 describes how to perform some common tasks that require changes to the MQ Workflow configuration profile.
- Where to find log files, and how to perform a trace, is described in:
  - “Chapter 12. Problem determination on UNIX” on page 121
  - “Chapter 17. Problem determination on Windows” on page 181
- “Chapter 14. Configuring MQ Workflow on Windows” on page 131 includes a description of how to configure a VisiBroker Java CORBA Agent and how to catalog a remote Runtime database.
- “Appendix C. Language settings” on page 219 has been extended to cover all supported platforms.
- How to set up a complete MQ Workflow system on one machine suitable for testing or evaluation; using default values, and including installing DB2 and MQSeries, is described in:
  - “Appendix H. Quick server setup on AIX” on page 251
  - “Appendix I. Quick server setup on Sun Solaris” on page 257
  - “Appendix J. Quick server setup on HP-UX” on page 267

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# Part 1. About MQ Workflow

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## Chapter 1. Introduction

This chapter provides the following background information:

- “Which operating systems are supported?”
- “Which MQ Workflow components can be installed?”
- “What is an MQ Workflow configuration?” on page 6
- “What is an MQ Workflow profile?” on page 8
- “Steps in setting up MQ Workflow” on page 9

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### Which operating systems are supported?

MQ Workflow components can be installed on any of the following supported platforms:

- AIX
- HP-UX
- Sun Solaris
- Windows 2000
- Windows NT
- Windows 98
- Windows Me

All CD-ROMs used to set up MQ Workflow components on workstations are labeled ‘*IBM MQSeries Workflow Version 3.3.0: Program code for*’ followed by the name of the operating system it supports.

References to UNIX throughout this book are valid for any of the UNIX based operating systems: AIX, HP-UX, and Sun Solaris. Differences that occur when setting up MQ Workflow components on any of the UNIX based operating systems are indicated, where necessary.

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### Which MQ Workflow components can be installed?

Table 2 on page 4 lists all MQ Workflow components and indicates on which operating platform each component can be installed. Details and descriptions for each component can be found in the *IBM MQSeries Workflow: Concepts and Architecture* manual, however, for a quick reference, a brief description of each component is also given here.

Table 2. MQ Workflow components and the supported operating systems

MQ Workflow components		UNIX	Windows NT/2000	Windows Me/98
Server		●	●	
Runtime Database Utilities		●	●	●
Buildtime			●	●
Client components	Administration Utility	●	●	●
	Standard Client		●	●
	API Runtime Libraries	●	●	●
	Program Execution Agent	●	●	●
Java CORBA Agent		● <sup>2</sup>	●	●
Java API Beans		● <sup>2</sup>	●	●
Web Client		● <sup>2</sup>	●	●
API for Lotus Notes <sup>1</sup>			●	●
API Development Kit		●	●	●
Samples		● <sup>2</sup>	●	●

**Notes:**

1. The API for Lotus Notes component contains the API DLL and the LSS files.
2. These components are not available on HP-UX.

**Server** MQ Workflow servers control the execution of process models throughout your organization. The server category consists of one or more components, such as Execution server, Administration server, Scheduling server, and Cleanup server.

**Runtime Database Utilities**

The MQ Workflow Runtime Database Utilities are used to create and populate Runtime databases. There are two types of Runtime Database Utilities:

- **Import/Export utility**

With the MQ Workflow Import/Export utility you can import and export process models, organization models, and system resources, following the syntax of the FlowMark Definition Language (FDL).

- **Database Creation utility**

The MQ Workflow Database Creation utility is required to create an MQ Workflow Runtime database and to set up the database structure.



## **Buildtime**

With MQ Workflow Buildtime you can create process and organization models and define system resources.

## **Clients**

Several types of client components exist. These include:

- **Administration Utility**

The MQ Workflow Administration Utility is the administrator's user interface used to control the operation of MQ Workflow servers and administer an MQ Workflow system.

- **Standard Client**

The MQ Workflow Client provides a standard client GUI to manage processes and work items.

- **API Runtime Libraries**

The MQ Workflow Client API Runtime Libraries enable the execution of MQ Workflow client applications.

- **Program Execution Agent**

An MQ Workflow Program Execution Agent enables the execution of client programs as defined for process activities.

## **Java CORBA Agent**

The MQ Workflow Java CORBA Agent enables the execution of MQ Workflow Client applications built with the Java API.

## **Java API Beans**

The MQ Workflow Java API can be used to build MQ Workflow client applications written in the Java programming language.

## **Web Client**

The MQ Workflow Web Client allows you to provide a Web browser interface to MQ Workflow systems.

## **API for Lotus Notes**

The MQ Workflow API for Lotus Notes provides methods to access MQ Workflow from a Lotus Notes database.

## **API Development Kit**

The MQ Workflow Development Kit contains everything that application developers need to interface to MQ Workflow, using one or more of the programming languages supported for the various platforms such as C, C++, Java, Visual Basic, REXX and LotusScript. The MQ Workflow ActiveX Controls Development Kit contains interfaces to MQ Workflow client components implemented as ActiveX Controls, that can be used to build a custom MQ Workflow client.

## Samples

Several MQ Workflow Samples can be installed, for example, Java samples and a distributed process sample using XML.

---

## What is an MQ Workflow configuration?

Configuring MQ Workflow components is necessary to:

1. Bind installed MQ Workflow components and the associated resources required for client/server communication and storing data (for example, MQSeries(R) and DB2).
2. Provide important information and values about MQ Workflow components that are required to perform various setup and administration tasks.

Without configuring the MQ Workflow components you have installed, the database and communications resources required to implement an MQ Workflow system cannot be used, MQ Workflow components cannot communicate with the MQ Workflow system, and no database is available to store process models created with MQ Workflow Buildtime.

To use resources provided by the prerequisite software and perform basic setup tasks, you must configure each MQ Workflow component. To configure an MQ Workflow component, you must supply a group of configuration settings for the MQ Workflow component, you can either use the MQSeries Workflow **Configuration Utility**, or the MQSeries Workflow **Unattended Configuration Utility**.

Each time you use the MQSeries Workflow Configuration Utility to configure an MQ Workflow component, an *MQ Workflow configuration* is created for that component.

An MQ Workflow configuration contains the group of configuration settings you provide during the configuration process. This group of configuration settings defines how an MQ Workflow component is set up and used.

Figure 1 on page 7 shows an MQ Workflow system group containing two MQ Workflow systems that use the same Runtime database. Each system is made up primarily of an MQ Workflow server, a database client, and MQSeries components (an MQSeries queue manager and queues). You can either use Oracle or DB2 for your Runtime database.

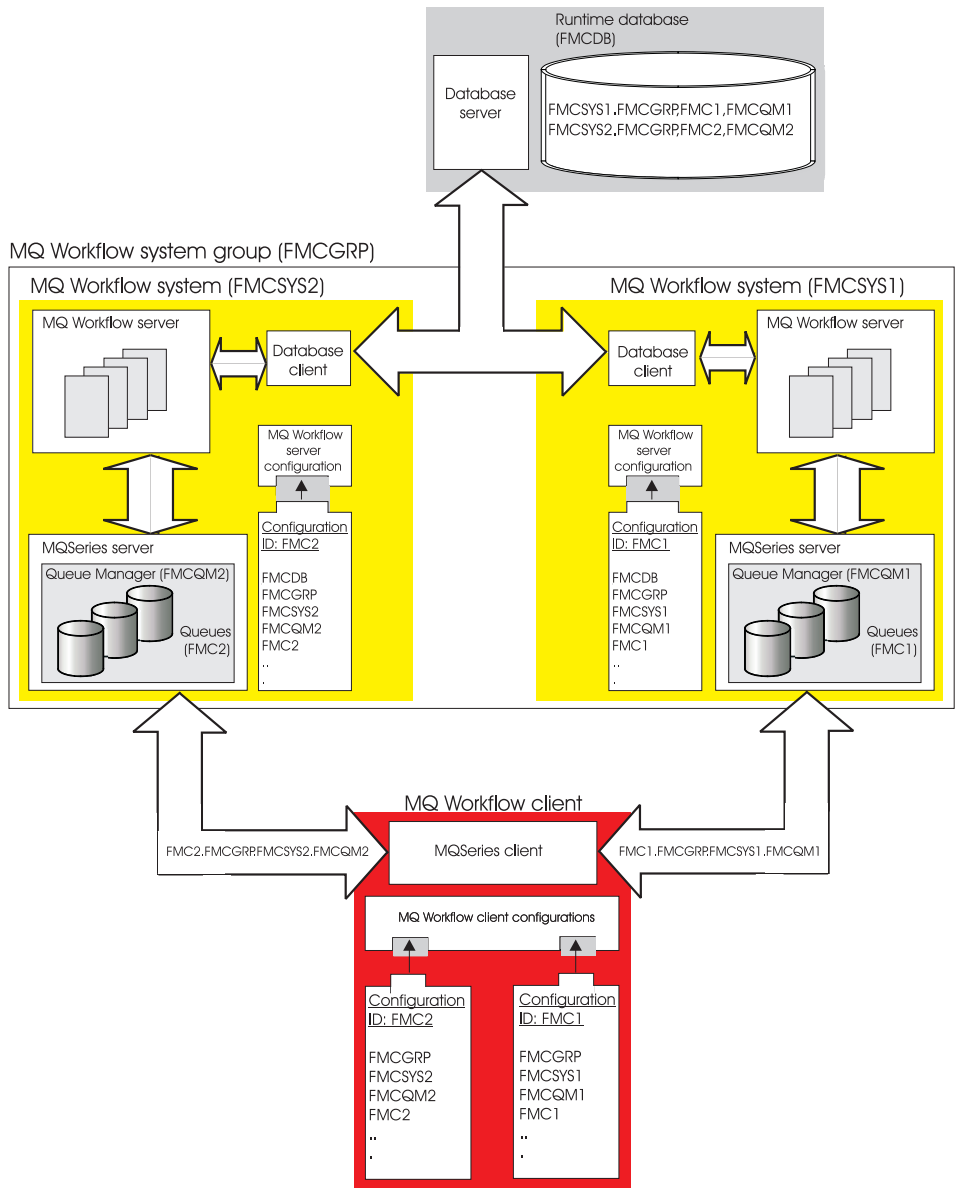


Figure 1. The MQ Workflow client can connect to either MQ Workflow servers.

Figure 1 also shows an MQ Workflow client. For this client to make a connection with a particular MQ Workflow system, the client needs to know about the MQ Workflow system to which it wants to connect. The client needs to know the name of the MQ Workflow system and the system group to which it belongs, the name of the system's queue manager used to manage communications, and the queue prefix used to identify queues from which all

messages are sent and received. You specify this information when you configure the MQ Workflow server, and provide it again when you configure the MQ Workflow client. By doing so, MQ Workflow server and client configurations are created.

It is possible to configure MQ Workflow components multiple times, each time providing a different group of configuration settings and thereby creating multiple MQ Workflow configurations.

For the MQ Workflow client in Figure 1 on page 7, you could make it possible for the client to connect to both systems by creating two MQ Workflow configurations. Each configuration would contain the group of settings required to connect to a specific MQ Workflow system. A *configuration identifier* is then used to identify each MQ Workflow configuration.

To use an MQ Workflow component with a particular MQ Workflow configuration, you must specify the configuration identifier for that configuration when you start the MQ Workflow component.

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## What is an MQ Workflow profile?

The configuration data you enter in the MQSeries Workflow Configuration Utility during the definition stage is recorded in one of several MQ Workflow specific profiles. The particular profile used depends on the type of configuration information you supply. Three profiles exist and are collectively referred to as the MQ Workflow profile:

### **Installation profile**

The installation profile contains data that is set during the MQ Workflow installation stage and is independent of the configuration stage. Data such as the MQ Workflow installation directory, language, version number, and MQ Workflow components installed are contained in the installation profile.

### **General configuration profile**

The general configuration profile contains configuration-independent data. Currently the general configuration profile is only used to contain the configuration identifier for the default configuration.

### **Configuration profile**

The configuration profile contains data that you specify during the configuration stage, such as the name of the MQ Workflow system, the Runtime database and queue manager. This data is used to configure database and communication resources and define settings for MQ Workflow. The configuration profile is created during the configuration stage and can be deleted.

“Appendix B. MQ Workflow variables” on page 193 describes each profile, specifies the location of each, and provides definitions, descriptions, and default values for information recorded in each of the different profiles.

---

## Steps in setting up MQ Workflow

Setting up MQ Workflow is a multistage process that should be performed in the following sequence:

### **Step 1: Choosing an MQ Workflow setup**

The first step you must take before doing anything is to decide on how you want to set up MQ Workflow. Several MQ Workflow setups are possible.

### **Step 2: Planning your installation**

You must plan which components you need on each machine and determine which identifiers, user IDs, resources, and configuration options will be used.

### **Step 3: Checking system requirements**

You must make sure that your resources meet the requirements for each MQ Workflow component in your setup.

### **Step 4: Installing prerequisite software**

Before going any further you must install prerequisite software. Knowing where and what to install is important and depends on the MQ Workflow setup you have chosen.

### **Step 5: Installing MQ Workflow**

Installing MQ Workflow simply copies the software from the MQ Workflow CD-ROM to your workstation and performs basic setup and registration functions.

### **Step 6: Configuring MQ Workflow**

You must enter configuration information, and create resources for the components that you have installed.

### **Step 7: Verifying MQ Workflow**

After configuring MQ Workflow, you should check that all components have been configured correctly, and run a simple check that verifies client/server communication and database connectivity.



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## Part 2. Planning your MQ Workflow setup

### Chapter 2. Choosing an MQ Workflow

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## Chapter 2. Choosing an MQ Workflow setup

The first step you must take to implement MQ Workflow is to decide what kind of MQ Workflow setup you want.

When choosing a setup, typical questions you should consider are:

- Should you experiment with a stand-alone setup first?
- How many MQ Workflow servers and client components are needed?
- Will the Runtime database run on a dedicated machine?
- Will you need client concentrators?
- How can the setup evolve to handle higher workloads?
- Will the Runtime database use Oracle or DB2?
- Where should MQ Workflow servers and client components be installed?
- Which other MQ Workflow components are needed?
- Which Windows workstation will be used to run Buildtime?
- Will the Buildtime database use Microsoft Jet Engine or DB2?
- Which prerequisite software does each machine need?
- What type of client will you provide to the end user? For example: the standard client, a custom client based on C++, OCX, or Java, or a browser interface using the Web Client.

Answers to these questions depend on your company's requirements and system resources.

---

### Types of MQ Workflow setups

MQ Workflow can be set up in many different ways, the following scenarios describe the essential elements of the most common setups:

- "Database options" on page 14
- "Performance options" on page 15
- "Setup scenario for stand-alone" on page 15
- "Setup scenario for standard client/server (two-tier)" on page 16
- "Setup scenario for client/servers with a dedicated database (three-tier)" on page 17
- "Setup scenario for a client concentrator" on page 17
- "Setup scenarios for a Web Client" on page 19

The following sections briefly describe each setup and give an example illustration for each. Finding the setup that is closest to your company's needs will give you a starting point for creating your own MQ Workflow setup.

## Database options

MQ Workflow uses two different databases to store all its information about topology, process model, and Runtime information.

### Buildtime database

Used to store topology and process model information created using the Buildtime tool. The Buildtime tool is used to model your business processes, and to define and change your MQ Workflow process model, topology, and staff definitions. These are exported as an FDL file that can be imported into the Runtime database.

Buildtime only runs on Windows. It can use either a DB2 or a Microsoft Jet Database Engine to store the Buildtime database. The database can either be local or on a remote UNIX system. The database type and location of the Buildtime database has no impact on Runtime performance.

### Runtime database

Used to store all Runtime information, including all ongoing work items that belong to one MQ Workflow system group. Every system in a system group (every server) requires access to the Runtime database. The Runtime database can be either DB2 or Oracle.

**Note:** In this release, MQ Workflow for HP-UX does not support using an Oracle database.

When you create the first MQ Workflow system (server), you must also create the Runtime database for the system group. It is the relationship between the client, server, and database, which distinguishes between the following setups:

**Stand-alone setup:** In a stand-alone setup, the client, server, and Runtime database are on the same machine. This setup is only suitable for testing, demonstrations, and evaluation. It is described in "Setup scenario for stand-alone" on page 15.

**Two-tier setup:** In a standard client/server (two-tier) setup, your server and Runtime database are on the same machine. This is suitable for pilot projects, where high performance is not required. This scenario is described in "Setup scenario for standard client/server (two-tier)" on page 16.

**Three-tier setup:** In a pure three-tier setup, the servers access the Runtime database which is hosted on a dedicated database machine. This setup is described in "Setup scenario for client/servers with a dedicated database (three-tier)" on page 17.

The distinction between two- and three-tier setup blurs when a second server is added to a two-tier setup. In this case, the first server is in a two-tier setup, but the second server has to be configured as part of a three-tier setup, because the Runtime database is not local to the second server.

## Performance options

Your current and anticipated performance requirements will influence the setup planning. In particular, for the highest performance, supporting a large number of clients, you should consider the following setups:

### three-tier

For high performance, you can host the Runtime database on a dedicated machine. This setup is described in “Setup scenario for client/servers with a dedicated database (three-tier)” on page 17.

### client concentrator

If you have a large number of clients, the main benefit of using client concentrators is that they distribute the workload evenly across all the servers in a system group (between the server input queues in the MQSeries cluster). This setup is described in “Setup scenario for a client concentrator” on page 17.

### use a mainframe

For the highest performance, availability, and workload capacity MQSeries Workflow for z/OS allows you to host MQ Workflow servers, and the Runtime database on your mainframe, and also interface Workflow processes to new and legacy mainframe applications. For more information about MQSeries Workflow for z/OS contact your IBM sales office or visit our homepage at <http://www.ibm.com/software/ts/mqseries/workflow>.

## Setup scenario for stand-alone

The stand-alone workstation scenario is often the first type of MQ Workflow setup implemented. It can be used to become familiar with MQ Workflow functions, for demonstration, evaluation, and development purposes.

Figure 2 illustrates a stand-alone MQ Workflow setup on Windows NT/2000.

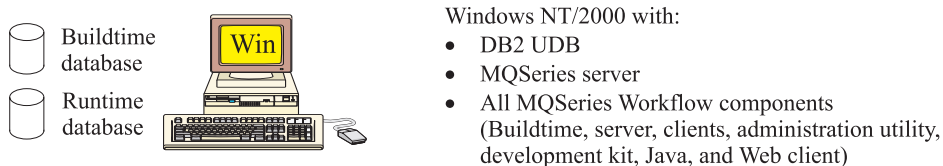


Figure 2. Example of a stand-alone setup

After installing the prerequisite software (for example, DB2 and MQSeries), all MQ Workflow components are installed together on the same Windows NT

workstation. After installation, you must configure MQ Workflow. During the MQ Workflow configuration phase, the Buildtime and Runtime databases are created and MQSeries is customized and configured to work with MQ Workflow.

“Appendix E. Stand-alone client/server setup on Windows NT/2000” on page 231 describes how to create a stand-alone system on Windows NT/2000.

### Setup scenario for standard client/server (two-tier)

In the standard client/server scenario, the MQ Workflow server and client components are all installed on different machines. The Runtime database is hosted on the same machine as the MQ Workflow server. You can add more MQ Workflow servers that will share the same Runtime database. Any suitable Windows workstation can be used to host the Buildtime tool.

**Note:** It is recommended to install the MQ Workflow Administration Utility on the machine that hosts the Runtime database and the MQ Workflow server in order to be able to locally administer the server, and to verify client connectivity.

Figure 3 illustrates a standard MQ Workflow client/server setup using just one server machine.

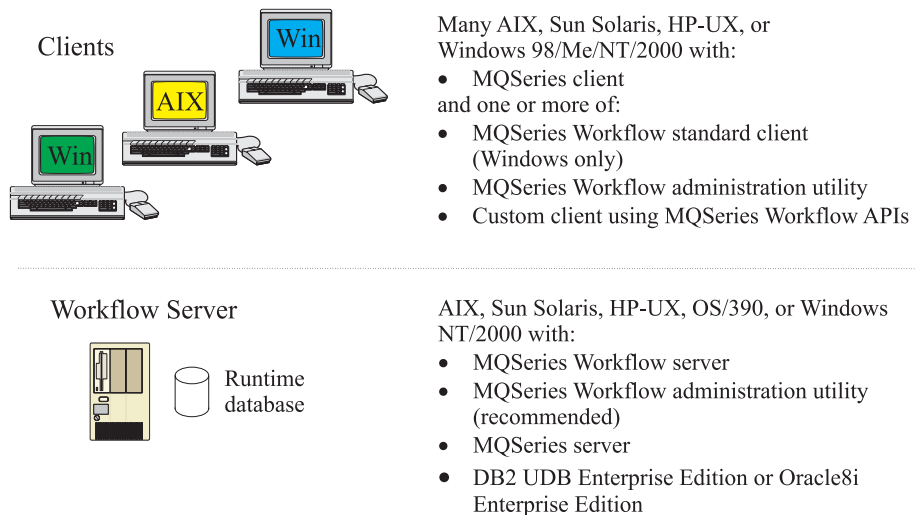


Figure 3. Example of a standard client/server setup (two-tier)

## Setup scenario for client/servers with a dedicated database (three-tier)

With this type of setup, the Runtime database is in a third-tier, separate from the MQ Workflow server tier. This simplifies the management of MQ Workflow data, and allows easy expansion as your business, workload, and database size grows.

Figure 4 illustrates a dedicated database setup. The MQ Workflow clients may connect to different MQ Workflow servers, but the requests from one client will always be handled by the same server. Without client concentrators, you can only balance the workload by making a static allocation of clients to servers. All MQ Workflow servers access the same database, and must be running the same operating system. Any suitable Windows workstation can be used to host the Buildtime tool.

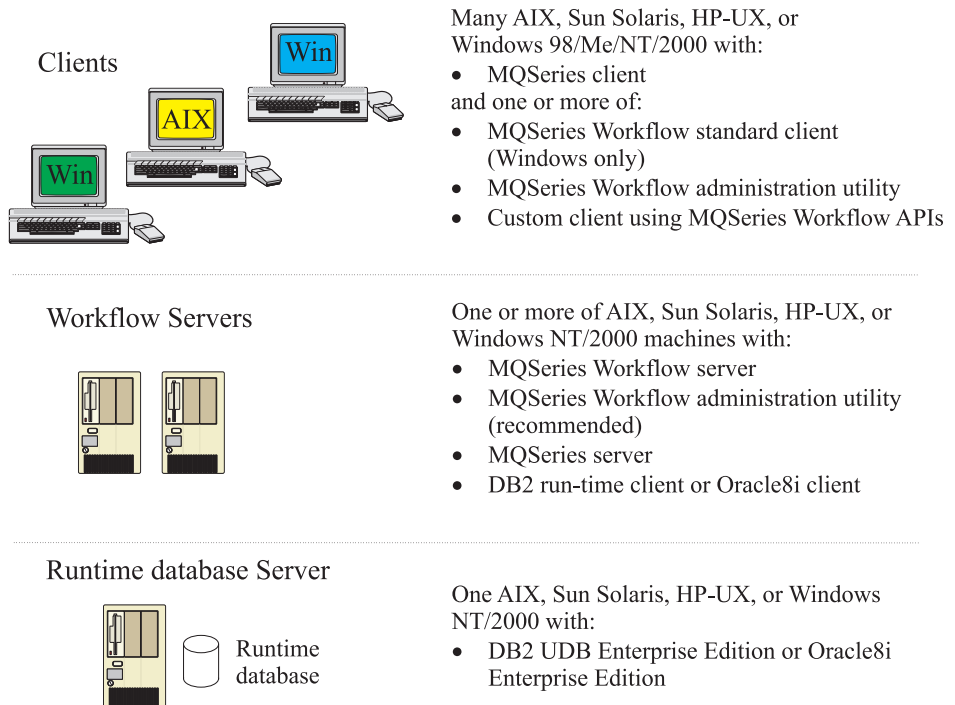


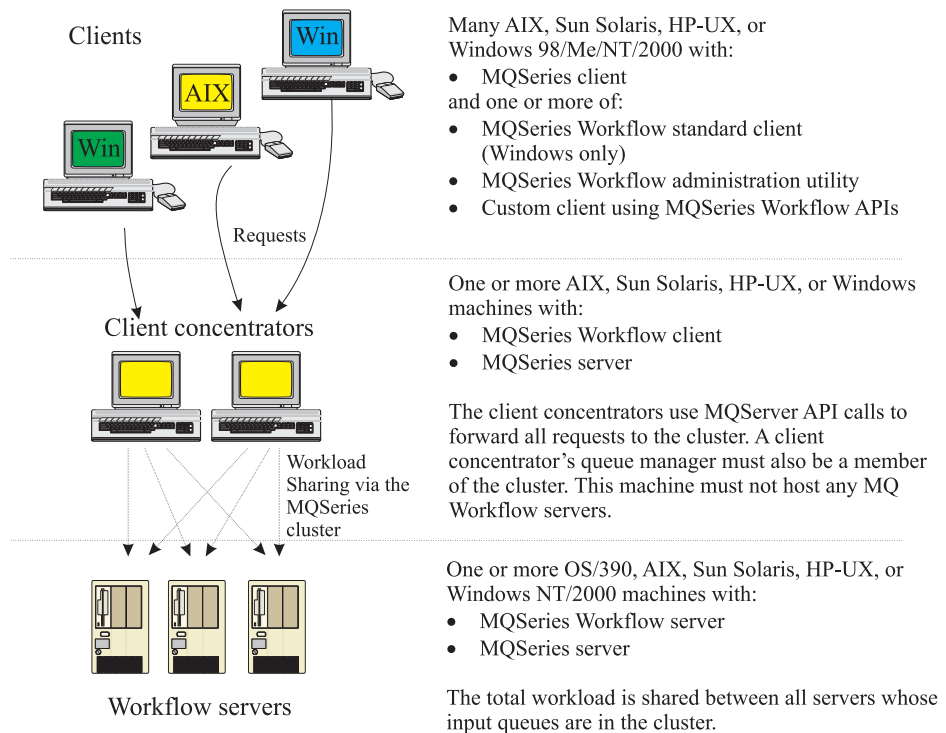
Figure 4. Example of a dedicated database setup (three-tier)

## Setup scenario for a client concentrator

Using one or more client concentrators is especially recommended if you have a large number of clients. The client concentrator receives requests from normal clients, and forwards them to an MQSeries cluster. This shares the whole workload between all servers whose input queues are in the cluster, which increases reliability.

With this setup, MQ Workflow client components connect to different MQ Workflow servers via one or more concentrators, and all MQ Workflow servers access and use the same Runtime database. The MQ Workflow servers and all MQ Workflow client concentrators must be in the same MQSeries cluster. All the normal clients that are using the same client concentrator use an identical client channel definition table. Without the client concentrator, each client has a fixed association to a particular server, which only achieves a limited sharing of workload.

There is no 'client concentrator' component, any of the following MQ Workflow clients that are configured to use the MQSeries server APIs on a local queue manager, will act as a client concentrator: Administration Utility, Client, or API Runtime Libraries. Of these, it is recommended to use the Administration Utility, because it is the smallest, and it can be used to verify the concentrator setup.



Note: The Runtime database is not shown. Client concentrators can be used in two and three-tier setups.

Figure 5. Example of a client concentrator setup

Figure 5 on page 18 illustrates how a client concentrator works. The client concentrator has its own queue manager, and uses the MQSeries server APIs to forward requests to the server input queues in the appropriate cluster.

The concentrator machine must not be running any MQ Workflow servers that (via their input queues) are members of the same cluster. In that case, MQSeries optimizations would route all the requests to the local queue and the other servers would not receive any of the workload.

For details about how to actually set up a client concentrator, see “Appendix G. Client concentrator setup” on page 245.

### **Setup scenarios for a Web Client**

The Web Client is a servlet and Java Server Pages based interface to MQ Workflow. It runs on the Web Server (Server Side Java). On the client side, only a browser with JavaScript support is required.

The Web Client provides access to process template lists, process instance lists, worklists, user and list settings and also to object properties (input and output containers). It features full process, full worklist control, and process monitoring.

It has the following scalability features:

- Several Web servers attached to one MQ Workflow domain
- Several MQ Workflow systems within one MQ Workflow domain
- Load distribution through MQSeries queue manager clustering

The following Web Client setups are possible:

1. The setup recommended for best performance is described in “Web Client using the Java API and local bindings”.
2. Another setup is described in “Web Client using a Java CORBA Agent on another machine” on page 20.

#### **Web Client using the Java API and local bindings**

The setup shown in Figure 6 on page 20 provides better performance than using a Java CORBA Agent, and it is easier to configure.

During configuration, if you select the Web Client and Java Agent, they will share the same configuration, and the ‘Local bindings’ locator policy (LOC\_LOCATOR) is used.

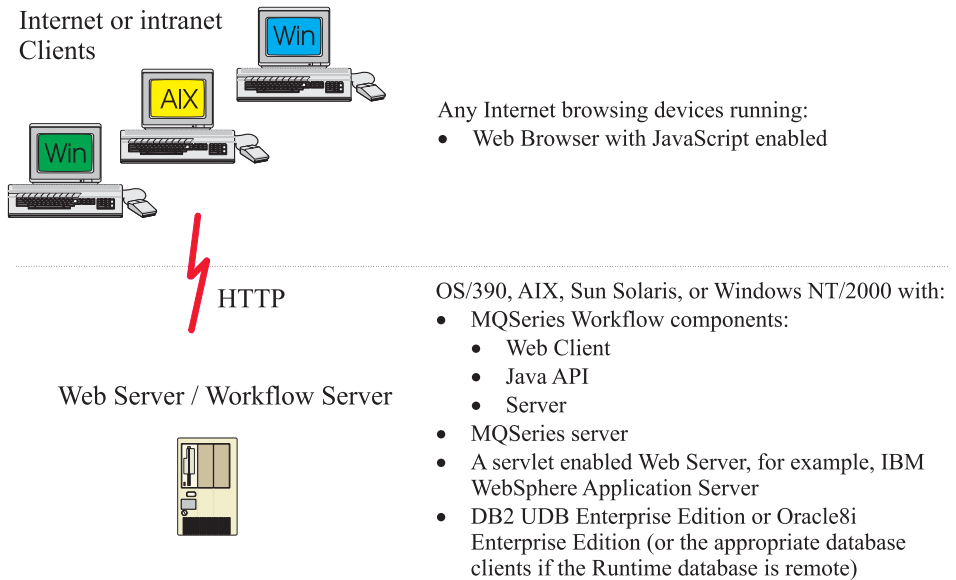


Figure 6. Web Client using the Java API and local bindings

For more information about using the MQ Workflow Java API, see “Appendix M. Using the Java API and Java CORBA Agent” on page 293.

**Note:** Further possible IBM WebSphere(R) Application Server configuration options are described in the IBM WebSphere Application Server documentation.

### Web Client using a Java CORBA Agent on another machine

Figure 7 on page 21 illustrates how the Web Client can be configured to use a Java CORBA Agent on another machine. It shows which software is required on each machine.

During configuration, if you select the Web Client and do not select the Java agent, it is assumed that the agent is on a different machine, and the locator policy Local bindings (LOC\_LOCATOR) will not be selectable. This case requires that MQ Workflow Java API Beans component is installed.



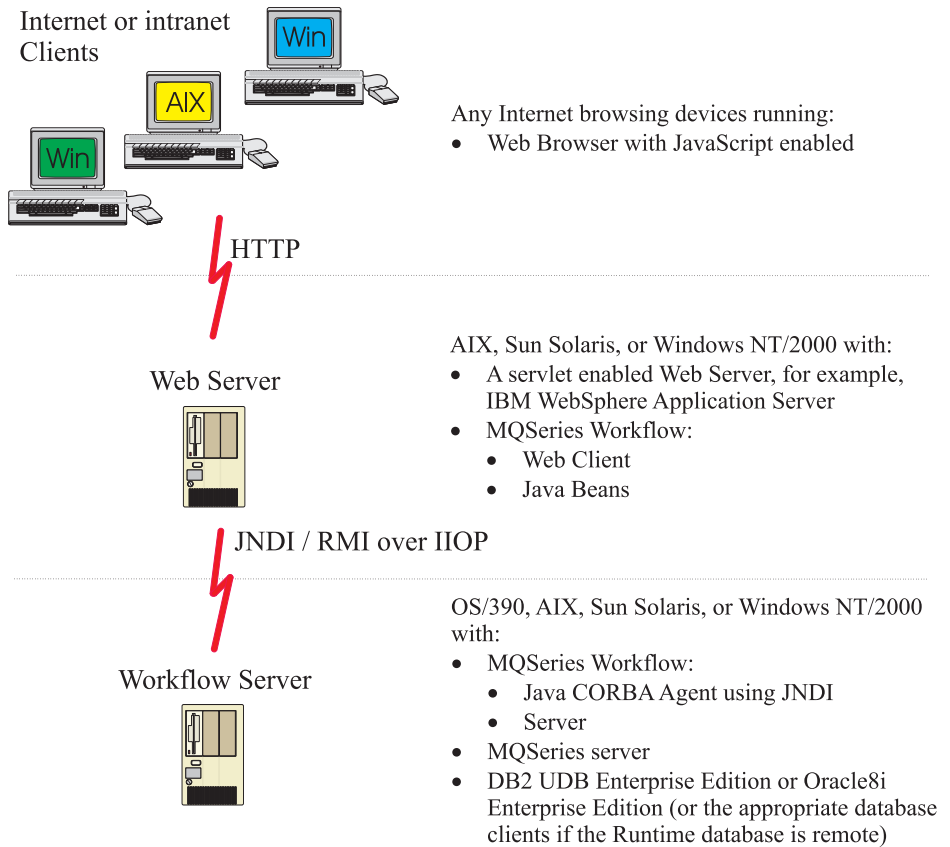


Figure 7. Web Client using a Java CORBA Agent on another machine

**Note:** Further possible IBM WebSphere Application Server configuration options are described in the IBM WebSphere Application Server documentation.



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## Chapter 3. Security planning

The security options available to you are dependent on the platform on which you are going to install MQ Workflow.

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### Security on Windows

The system administrator is assumed to be responsible for the installation and configuration of MQ Workflow, MQSeries, DB2, and any other co-requisite products.

---

### Security on UNIX

For a **stand-alone** installation, the system administrator is assumed to be responsible for the installation and configuration of MQ Workflow, MQSeries, DB2, and any other co-requisite products.

In a **complex** setup, the installation and configuration tasks may be shared between several administrators, requiring the following user IDs:

- **System administrator** (root) installs MQ Workflow, performs postinstallation steps, and defines configurations. Root authority is required for defining a new configuration because some system files are updated. For more information, see “Files updated on UNIX” on page 223.
- **MQ Workflow administrator** is the user ID that owns the MQ Workflow installation infrastructure.
- **Configuration administrator** is the user ID that owns the directories and files relating to an MQ Workflow configuration, it is the only user ID that can change the configuration profile, and is also used to start the MQ Workflow server and the Java CORBA Agent.
- **Runtime database creator** is an administrator user ID, used to attach to the database subsystem instance to create the Runtime database.
- **Runtime database user** user ID is used by all MQ Workflow servers.
- **MQSeries administrator** user ID is used to create and configure the queue manager.
- **Transaction coordinator** is the user ID with rights to connect to the Runtime database. This user ID is used by the MQSeries queue manager for two-phase commit.
- **Principal** user ID is associated with an MQSeries channel. This allows any client that accesses the channel to have the authority of the principal, such a user is known as an MCAUSER (MQ channel agent user). Without using a

principal, every client user would have to be known to the queue manager, and be authorized access to the necessary MQSeries objects (queue manager and queues).

- **MQ Workflow user who imports FDL** is the user who imports and exports FDL to and from the Runtime database, and migrates the Runtime database.

The granularity of your security requirements determines how many user IDs you require, and which groups they are members of. Use Table 3 to plan which user IDs will be used to perform which roles. If you use the defaults, the installation and configuration can be performed with the minimum number of user IDs. Where the table contains a **yes**, the corresponding user ID must be a member of the corresponding user group.

Table 3. Planning user IDs, and which ones must be in which groups

User / profile variable name	User IDs		Group IDs <sup>1</sup>		
			MQ Workflow group <MQWorkflowGroup>	MQSeries admin. group	Runtime database admin. group <DBAdminGroup>
	Defaults	Your value	fmcgrp	mqm	db2iadm1 or dba and oinstall <sup>2</sup>
System administrator	root	root			
MQ Workflow administrator <MQWorkflowAdministrator>	fmc		yes		
Configuration administrator <ConfigurationAdministrator>	<sup>3</sup>		yes	<sup>4</sup>	<sup>4</sup>
Runtime database creator <RTDatabaseCreator>	<sup>5</sup>				yes
Runtime database user <RTDatabaseUserID>	<sup>6</sup>				
MQSeries administrator	mqm	mqm		yes	
Transaction coordinator <MQTransactionCoordinator>	<sup>7</sup>	<sup>8</sup>			
Principal <MQPrincipal>	<sup>6</sup>	<sup>9</sup>			
MQ Workflow user who imports/exports FDL <RTDatabaseMQWorkflowUser>	ADMIN	<sup>10</sup>			

**Notes:**

1. It is recommended to use the default group IDs. For the MQSeries administration group you must use the group ID mqm.
2. The default database administrator group for DB2 is db2iadm1. For Oracle the database creator must be a member of both groups dba and oinstall.
3. The default value is the user ID for the MQ Workflow administrator.
4. If you want this user to also administer MQSeries and DB2, then this user ID must also be a member of these groups. To be able to administer MQSeries on HP-UX, the primary group of the user ID must be mqm.
5. If you are using Oracle for the Runtime database, the default is oracle, otherwise, the default value is the user ID for the configuration administrator.
6. The default value is the user ID for the configuration administrator.
7. The default value is the user ID for the Runtime database user.
8. This user ID requires authorization to connect to the database. If you are using Oracle for the Runtime database, the Transaction coordinator user ID must be the same as the Runtime database user ID.
9. This is the user ID that clients use when accessing a channel as an MCAUSER.
10. To import an FDL file, you must specify a Workflow user ID which must be stored in the MQ Workflow Runtime database. This is the user ID of the person who is allowed to import process models and topologies into the Runtime database. You do not need to create this user on any machine. This user ID and the initial password "password" are stored in the Workflow Runtime database.

These user IDs will be created during the steps described in "After installing MQ Workflow on UNIX" on page 63.



## Chapter 4. Planning your installation

The following installation worksheets summarize the installation options and the information that you will require to successfully install MQSeries Workflow. It is strongly recommended that you complete the worksheets for each machine before starting installation. For the easiest installation, you should use the default values whenever possible.

### Machine configuration

Complete Table 4 to plan which software will be installed on each machine.

Table 4. Machine configuration

Identifier/Parameter	Value/Option
TCP/IP address	<sup>1</sup>
Operating system	<input type="checkbox"/> AIX / <input type="checkbox"/> HP-UX / <input type="checkbox"/> Sun Solaris <input type="checkbox"/> Windows 2000 / <input type="checkbox"/> NT / <input type="checkbox"/> Me / <input type="checkbox"/> 98
Workstation memory	<sup>2</sup>
Workstation disk space	<sup>2</sup>
MQ Workflow components required	<sup>3</sup> <input type="checkbox"/> All components <input type="checkbox"/> Server <sup>4</sup> <input type="checkbox"/> Runtime database utilities <input type="checkbox"/> Buildtime <input type="checkbox"/> Administration utility <sup>5</sup> <input type="checkbox"/> Standard client <sup>6</sup> <input type="checkbox"/> API runtime libraries <input type="checkbox"/> Program execution agent <input type="checkbox"/> Java CORBA Agent <sup>6</sup> <input type="checkbox"/> Java API Beans <input type="checkbox"/> Web Client <sup>7</sup> <input type="checkbox"/> API for Lous Notes <input type="checkbox"/> API development kit <input type="checkbox"/> Samples
Required software	<input type="checkbox"/> MQSeries server <sup>6</sup> / <input type="checkbox"/> MQSeries client <sup>6</sup> <input type="checkbox"/> DB2 Enterprise Edition / <input type="checkbox"/> DB2 Run-Time Client <input type="checkbox"/> Oracle Enterprise Edition / <input type="checkbox"/> Oracle Client <input type="checkbox"/> WebSphere Application Server <sup>7</sup>
Programming environment	<sup>8</sup> <input type="checkbox"/> C / <input type="checkbox"/> C++ / <input type="checkbox"/> Java / <input type="checkbox"/> Visual Basic

**Notes:**

1. Normally, the host name can be used instead. Only in an HACMP node is the actual address mandatory.
2. These should meet the requirements described in “Chapter 5. Hardware and software requirements” on page 37.
3. To find out which components can be installed on each platform, see “Which MQ Workflow components can be installed?” on page 3.
4. For an MQ Workflow server you require at least an Oracle or DB2 Run-Time Client and an MQSeries server.
5. It is recommended to use the Administration Utility if you want to create a client concentrator.
6. You must not install both the MQSeries client and server on the same machine. For an MQ Workflow client you only require an MQSeries client if the machine does not have an MQSeries server. Any client that will act as a client concentrator requires an MQSeries server. If you are using the Java CORBA Agent, it is recommended to install an MQSeries server.
7. The MQ Workflow Web Client requires the IBM WebSphere Application Server V3.5, or an application server supporting Servlet API 2.1 (or later) specification, and JSP 1.0 (or later).
8. For a complete list of which programming languages can be used on each platform for developing applications using the MQSeries Workflow API, see “Chapter 5. Hardware and software requirements” on page 37. For more information about programming using the Workflow APIs, see *MQSeries Workflow: Programming Guide*.

---

## MQ Workflow installation information

Complete Table 5 to plan your installation.

*Table 5. MQ Workflow installation information*

Identifier/Parameter	Default value	Your value
MQ Workflow administrator	fmc	1
MQ Workflow group	fmcgrp	1
Installation root directory	On AIX: /usr/lpp/fmc On Sun Solaris and HP-UX: /opt/fmc On Windows: c:\Program Files\MQSeries Workflow	2
Configuration root directory	On UNIX: /var/fmc On Windows: <i>Installation root directory</i>	2



**Notes:**

1. This is only required on UNIX platforms. Use the values that you planned in Table 3 on page 24.
2. On UNIX, it is recommended to create a dedicated file system for MQ Workflow. For complex setups, it is best to have several file systems.

---

## MQ Workflow configuration information

Complete Table 6 to plan your configuration.

Table 6. MQ Workflow configuration information

Identifier/Parameter	Default value	Your value
Configuration identifier	FMC	1
Configuration administrator	MQ Workflow administrator	2

**Notes:**

1. If a configuration already exists with the standard default name FMC, the default name FMC $n$  is suggested, where  $n$  starts at 1 and is incremented until a configuration name is found that does not already exist.
2. This user ID is only required on UNIX platforms. Use the value you planned for *ConfigurationAdministrator* in Table 3 on page 24.

---

## Oracle Runtime database configuration information

If you intend to use Oracle for the Runtime database, complete Table 7.

Table 7. Oracle Runtime database configuration information

Identifier/Parameter	Default value	Your value
Database option	create new	<input type="checkbox"/> use existing / <input type="checkbox"/> create new
Database SID	FMCDB	1
Database alias	FMCDB	
Oracle administrator	oracle	
Administration directory	/var/fmc/rt_db/admin/FMCDB	
Container directory	/var/fmc/rt_db/oradata/FMCDB	
Log directory	/var/fmc/rt_db/oradata/FMCDB	
Oracle user ID to access Runtime database	fmc	

**Notes:**

1. The SID must not be longer than six characters.

## DB2 Runtime database configuration information

If you intend to use DB2 for the Runtime database, complete Table 8.

Table 8. DB2 Runtime database configuration information

Identifier/Parameter	Default value	Your value
Database option	create new	<input type="checkbox"/> use existing / <input type="checkbox"/> create new
Database locality	local	<input type="checkbox"/> local / <input type="checkbox"/> remote
DB2 instance name	On UNIX: db2inst1 On Windows: DB2	<sup>1</sup>
Local DB2 instance name		<sup>2</sup>
Workflow Runtime database name	FMCDDB	
User ID of database administrator	fmc	
Database layout file	fmcdblay.ini	<sup>3</sup>
Database location	On UNIX: /var/fmc/rt_db/ db2inst1/FMCDDB	<sup>4</sup>
Container location	On Windows: c:\ Program Files\MQSeries	
Location of log files	Workflow\rt_db\db2\FMCDDB	
Space management for database	System	<sup>5</sup> <input type="checkbox"/> System / <input type="checkbox"/> Database / <input type="checkbox"/> Raw <sup>6</sup>
DB2 user ID to access Runtime database	fmc	<sup>7</sup>

### Notes:

1. This instance must be dedicated to MQ Workflow.
2. Only required if the database is remote.
3. If the file does not exist it will be created.
4. An empty Runtime database requires between 100 MB and 430 MB, depending on the platform. For more detailed requirements, see “Chapter 5. Hardware and software requirements” on page 37.
5. The space management option applies to all UNIX platforms, and unattended configuration on Windows.
6. Management by the database using a raw device is only available on AIX.
7. This user ID will be used by the MQ Workflow server and the Import/Export utility (fmcibie) to connect to the database.

---

## MQ Workflow system identifiers

All MQ Workflow components require the system identifiers listed in Table 9.

Table 9. MQ Workflow system identifiers

Identifier/Parameter	Default value	Your value
System group name	FMCGRP	
System name	FMCSYS	

---

## MQSeries queue manager configuration information

If you are installing a server, client concentrator, or Java CORBA Agent (the machine has an MQSeries server installed), complete Table 10 to plan your MQSeries queue manager.

Table 10. MQSeries queue manager configuration information

Identifier/Parameter	Default value	Your value
Queue manager name	FMCQM	1
Queue prefix	FMC	2
Type of logging	Circular	3 <input type="checkbox"/> Circular / <input type="checkbox"/> Linear
Log files location	<input type="checkbox"/> MQSeries default	4
Channel definition table	5	
TCP/IP address	<i>hostname</i>	6
TCP/IP port	5010 / 14000...	7
Principal name	fmc	8
Cluster name	FMCGRP	9
Repository type	First	10 <input type="checkbox"/> First / <input type="checkbox"/> Additional <sup>11</sup>
First queue manager name	—	11
First queue manager's TCP/IP address	—	11
First queue manager's TCP/IP port	—	11
Transaction coordinator	fmc	12
User ID to be used to start the queue manager	Other	13 <input type="checkbox"/> Transaction coordinator <input type="checkbox"/> Other mqm group member

## Notes:

1. The name of the queue manager used by MQ Workflow must be unique.
2. This prefix will be used for all Workflow queues on the machine. To be able to exploit Fastnet capabilities in the future, it is recommended that you use the same queue prefix for all systems in the same system group.
3. The log files record all actions performed by the queue manager. They can be used for error recovery and backups. **Circular** logging keeps all restart data in a ring of log files. It starts by filling the first file in the ring, then moving on to the next, and so on, until all the files are filled. It then goes back to the first file in the ring and starts again. **Linear** logging keeps the log data in a continuous sequence of files. Space is not reused, so you can always retrieve any record logged from the time that the queue manager was created. This type of logging is normally used for audit trails and archiving. Linear logging is suitable for a production system. Circular logging uses less disk space.
4. This is the location of the MQSeries logging file(s) and is used whenever you create a queue manager. If no location is specified, the MQSeries default location will be used.
5. On UNIX the default value is `/var/fmc/chl1tabs/MQWFCHL.TAB`. On Windows the default value is `c:\Program Files\MQSeries Workflow\chl1tabs\MQWFCHL.TAB`
6. Copy your value from Table 4 on page 27. This item is duplicated here to reflect the order that you will need information during configuration.
7. If port 5010 is already used, the next free port at or above 14000 is recommended as the default port to be used by the Workflow queue manager. It is recommended that you use unique port numbers for each queue manager so that you will be able to use fail-over techniques like HACMP on AIX (even if they are running on separate workstations).
8. This is only required on UNIX platforms. The authority of the principal user ID is given to clients that access MQSeries channels as an MCAUSER (MQ channel agent user).
9. *Clustering* is a technique used to group logically associated queue managers together. For MQ Workflow, this logical association exists between queue managers if they belong to MQ Workflow systems that are members of the same MQ Workflow system group. This group of associated queue managers is called a *cluster*.
10. Select additional if this is not the first queue manager in the cluster. The first queue manager configured in the cluster is used to hold a repository of information about all other queue managers. The repository contains channel and queue definitions for every queue manager in the cluster. All other queue managers need only know the name and location of the first queue manager that holds this repository in order to read definitions for any other queue manager in the cluster. This reduces the overhead

involved in explicitly defining channels and queues for every queue manager in the MQ Workflow system group. For more information about clustering, refer to the MQSeries online documentation.

11. If you select the repository type 'additional', then you need information about the first queue manager in the cluster.
12. Only required if you are installing a server.
13. Only required if you are installing a server, and the database is remote, or if the queue manager will not be started by the transaction coordinator, then MQSeries needs to store information about the user ID that will be used to connect to the database.

---

## Java CORBA Agent configuration information

Complete Table 11 with your values for the Java agent. For more information about using the Java CORBA Agent, refer to the *IBM MQSeries Workflow: Programming Guide*.

Table 11. Java CORBA Agent configuration information

Identifier/Parameter	Default value	Your value
Locator policy	—	<input type="checkbox"/> Local bindings <input type="checkbox"/> VisiBroker Smart Agent <sup>1</sup> <input type="checkbox"/> CORBA Naming Service <sup>1</sup> <input type="checkbox"/> Java RMI <sup>1,2</sup> <input type="checkbox"/> Interoperable Object Reference <sup>1</sup> <input type="checkbox"/> Java Naming and Directory Interface <sup>3</sup>
Agent name	MQWFAGENT	<sup>4</sup>
JDK/JRE install directory	—	<sup>4</sup>
Code version	3300	<sup>4</sup>
VisiBroker installation directory	—	<sup>5</sup>
Root name context used to register the CORBA naming service	—	<sup>6</sup>
Java Interoperable Object Reference path	—	<sup>7</sup>
JNDI naming context factory	Java Runtime	<sup>8</sup> <input type="checkbox"/> IBM WebSphere Application Server 3.5: com.ibm.ejs.ns.jndi.CNInitialContextFactory <input type="checkbox"/> Java 2 Runtime Environment: com.sun.jndi.cosnaming.CNctxFactory <input type="checkbox"/> Other: _____

Table 11. Java CORBA Agent configuration information (continued)

Identifier/Parameter	Default value	Your value
JNDI name server TCP/IP address	<i>hostname</i>	8
JNDI name server TCP/IP port number	900	8
Agent cycle time	300 seconds	9
Client threshold	1000 objects	10
Client cycle	90% of the agent cycle	11

**Notes:**

1. These locator policies are deprecated. Deprecated means, it is recommended to no longer use these locator policies, they are currently still implemented, they may be removed in future releases, and it is recommended to use other locator policies. These locator policies (except Java RMI) require the Inprise VisiBroker Smart agent V3.4 (Version 4.0 is not supported). For more information about Inprise VisiBroker see <http://www.inprise.com>.
2. Java RMI agents should only be used for prototyping. They are not suitable for production purposes.
3. A Java Version 2 compliant Object Request Broker (ORB) is required, for example, the ORB which comes with JDK 1.2/1.3, IBM WebSphere Application Server Advanced Edition.
4. This is not required if you use the 'Local Bindings' locator policy. It is not possible to connect back-level Java API applets or applications to a Java CORBA Agent using the most recent code level. The code level of the Java CORBA Agent and the Java API applets or applications must exactly match, otherwise you will receive an error message indicating that the Java CORBA Agent for the domain could not be located. In order to allow a smooth migration of the back-level (old) clients, a Java CORBA Agent running with the old code level should be in place until the last back level client has been upgraded. A new Java CORBA Agent configuration should be created which uses the most recent code level. The name of the new Java CORBA Agent must be different to the old one.
5. This is only required if you use the 'VisiBroker Smart Agent' locator policy.
6. This is only required if you use the 'CORBA naming service' locator policy.
7. This is only required if you use the 'Interoperable Object Reference' locator policy. This is the location where the agent publishes its IOR file. On Windows this must end with a trailing slash (/).

8. This is only required if you use the 'Java Naming and Directory Interface' locator policy.
9. The number of seconds between periodic garbage collection. Valid values are between 30 and 86400.
10. The number of unreferenced objects tolerated by each client before non-periodic garbage collection is performed. Valid values are between 0 and 500000.
11. The ratio between the client-side keep-alive message cycle and the agent-side liveliness check. Valid values are between 10 and 90%.

---

## Web Client configuration information

If you intend to use the Web Client with an IBM WebSphere Application Server, complete Table 12 with your values.

Table 12. Web Client configuration information

Identifier/Parameter	Default value	Your value
WebSphere Application Server installation directory	—	
TCP/IP address of WebSphere Application Server administration node	<i>localhostname</i>	
XML configuration skeleton file name	fmcoh35.skel	





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## Chapter 5. Hardware and software requirements

The recommended hardware and software requirements for each platform are described in:

- “Windows requirements” on page 38
- “AIX requirements” on page 42
- “Sun Solaris requirements” on page 44
- “HP-UX requirements” on page 45

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### Servers

The number and size of process models and process instances residing in the Runtime database, as well as the number of clients concurrently attached to the server, heavily influence the demand for main memory and hard disk space. For systems not used for production (for example development, test, or demonstration systems) less main memory may be sufficient. When setting up your servers, for performance and safety reasons, keep your database files on separate disks.

The following recommended values are for a two-tier configuration, where the server and Runtime database reside on the same system:

- “Servers for Windows 2000 or NT” on page 38
- “Servers for AIX” on page 43
- “Servers for Sun Solaris” on page 44
- “Servers for HP-UX” on page 45

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### Clients

There are several types of clients. They provide MQ Workflow administration, Runtime database utilities, the standard client application, Web Client, and programming APIs (for creating your own clients). Table 2 on page 4 shows which clients are available on which operating systems. The following sections describe the operating and programming environments required.

- “Clients for Windows 2000” on page 38
- “Clients for Windows NT” on page 40
- “Clients for Windows Me or 98” on page 41
- “Buildtime requirements” on page 42
- “Clients for AIX” on page 43
- “Clients for Sun Solaris” on page 45

- “Clients for HP-UX” on page 46

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## Windows requirements

The following sections describe the hardware and software requirements for servers, clients, and Buildtime on Windows platforms.

### Servers for Windows 2000 or NT

For a two-tier configuration, where the server and Runtime database reside on the same system, you require the following hardware and software:

#### Hardware

- A personal computer with Intel-based processor architecture, for example 200 MHz Pentium is required. For test or demo purposes, an IBM ThinkPad or portable personal computer is acceptable.
- Screen resolution 800x600 or larger.

*Table 13. Windows server hardware requirements*

Operating environment	Main memory	Hard disk space		
		Code and samples	Empty DB2 database	Total recommended
Windows 2000	256 MB	150 MB	280 MB	2 GB
Windows NT	256 MB	150 MB	280 MB	2 GB

#### Software

- Windows 2000, Windows NT Workstation V4.0 or Windows NT Server V4.0 with service pack 4, 5, or 6a.
- IBM MQSeries for Windows NT and Windows 2000 Version 5.1 with CSD level 5, or higher (Version 5.2 is included in the MQ Workflow package).

**Note:** MQSeries for Windows NT Version 5.2 requires NT service pack 6a.

- IBM DB2 Universal Database(R) for Windows NT Version 6.1 or higher (Version 7.1 is included in the MQ Workflow package).
- To use the MQ Workflow Web Client you require the following:
  - MQSeries Workflow Java API
  - A Web server or application server supporting Servlet API 2.1 (or later) specification and JSP 1.0 (or later), for example, IBM WebSphere Application Server Version 3.5.

### Clients for Windows 2000

Clients on Windows 2000 require the following operating and programming environments:

- A personal computer with Intel-based processor architecture capable of running the operating system and 64 MB of main memory are recommended.
- Screen resolution 800x600 or larger.
- Microsoft Windows 2000.
- IBM MQSeries for Windows NT and Windows 2000 Version 5.1 with CSD level 5 or higher (Version 5.2 is included in the MQ Workflow package).

**Notes:**

1. If the MQSeries server will be installed on the same machine, the MQSeries client must not be installed.
  2. If you install the Java CORBA Agent, it is strongly recommended to install MQSeries server.
- For the development of programs using the MQSeries Workflow APIs, one of:
    - Microsoft Visual C++ Version 6.0 (MQSeries Workflow client APIs for C and C++, FlowMark(R) 2.3 compatibility Workflow client API for C++, FlowMark 2.3 compatibility C language API).
    - IBM VisualAge(R) C++ for Windows NT Version 4.0 or 5.0 (MQSeries Workflow client APIs for C and C++, FlowMark 2.3 compatibility C language API).
    - Microsoft Visual Basic for Windows Version 6.0 (FlowMark 2.3 compatibility Visual Basic language API).
    - JDK 1.2 or 1.3 (MQSeries Workflow client APIs for Java).
    - Inprise VisiBroker Smart Agent Version 3.4 (version 4.0 is not supported) for the Java CORBA Agent when using any of the following locator policies: CORBA Naming Service, Interoperable Object Reference, or VisiBroker Smart Agent.
  - For the development of programs using the MQSeries Workflow ActiveX Controls:
    - Microsoft Visual Basic for Windows Version 6.0.
  - For the MQSeries Workflow API for Lotus Notes:
    - Lotus Notes Release 5.
  - To use the MQ Workflow Web Client you require the following:
    - Internet or intranet devices require a Web browser that supports JavaScript, for example:
      - Netscape V4.6 or later
      - MS Internet Explorer V5.0 or later
  - For an MQSeries Workflow standard client, no additional prerequisites are required.

## Clients for Windows NT

Clients on Windows NT require the following operating and programming environments:

- A personal computer with Intel-based processor architecture capable of running the operating system and 64 MB of main memory are recommended.
- Screen resolution 800x600 or larger.
- Microsoft Windows NT Workstation V4.0; Service Pack 4, 5, or 6a is required.
- IBM MQSeries for Windows NT Version 5.1 with CSD level 5 or higher (Version 5.2 is included in the MQ Workflow package).

### Notes:

1. MQSeries for Windows NT Version 5.2 requires NT service pack 6a.
  2. If the MQSeries server will be installed on the same machine, the MQSeries client must not be installed.
  3. If you install the Java CORBA Agent, it is strongly recommended to install the MQSeries server.
- For the development of programs using the MQSeries Workflow APIs, one of:
    - Microsoft Visual C++ Version 5.0 or 6.0 (MQSeries Workflow client APIs for C and C++, FlowMark 2.3 compatibility Workflow client API for C++, FlowMark 2.3 compatibility C language API).
    - IBM VisualAge C++ for Windows NT Version 3.5, 4.0, or 5.0 (MQSeries Workflow client APIs for C and C++, FlowMark 2.3 compatibility C language API).
    - Microsoft Visual Basic for Windows Version 5.0 or 6.0 (FlowMark 2.3 compatibility Visual Basic language API).
    - JDK 1.2 or 1.3 (MQSeries Workflow client APIs for Java)
    - Inprise VisiBroker Smart Agent Version 3.4 (version 4.0 is not supported) for the Java CORBA Agent when using any of the following locator policies: CORBA Naming Service, Interoperable Object Reference, or VisiBroker Smart Agent.
  - For the development of programs using the MQSeries Workflow ActiveX Controls:
    - Microsoft Visual Basic for Windows Version 6.0.
  - For the MQSeries Workflow API for Lotus Notes:
    - Lotus Notes Release 5.
  - To use the MQ Workflow Web Client you require the following:
    - MQSeries Workflow Java API

- Internet or intranet devices require a Web browser that supports JavaScript for example:
  - Netscape V4.6 or later
  - MS Internet Explorer V5.0 or later
- For an MQSeries Workflow standard client, no additional prerequisites are required.

## Clients for Windows Me or 98

Clients on Windows Me or 98 require the following operating and programming environments:

- A personal computer capable of running the operating system and 48 MB of main memory are recommended.
- Screen resolution 800x600 or larger.
- Microsoft Windows Me or 98.
- IBM MQSeries for Windows 98 or Windows Me Version 5.1 client with CSD level 5 or higher (Version 5.2 is included in the MQ Workflow package).

**Note:** If the MQSeries server will be installed on the same machine, the MQSeries client must not be installed.

- For the development of programs using the MQSeries Workflow APIs, one of:
  - Microsoft Visual C++ Version 6.0 (MQSeries Workflow client APIs for C and C++, FlowMark 2.3 compatibility Workflow client API for C++, FlowMark 2.3 compatibility C language API).
  - IBM VisualAge C++ for Windows NT Version 3.5, 4.0, or 5.0 (MQSeries Workflow client APIs for C and C++, FlowMark 2.3 compatibility C language API).
  - Microsoft Visual Basic for Windows Version 6.0 (FlowMark 2.3 compatibility Visual Basic language API).
  - JDK 1.2 or 1.3 (MQSeries Workflow client APIs for Java).
  - Inprise VisiBroker Smart Agent Version 3.4 (version 4.0 is not supported) for the Java CORBA Agent when using any of the following locator policies: CORBA Naming Service, Interoperable Object Reference, or VisiBroker Smart Agent.
- For the development of programs using the MQSeries Workflow ActiveX Controls:
  - Microsoft Visual Basic for Windows Version 6.0.
- For the MQSeries Workflow API for Lotus Notes:
  - Lotus Notes Release 5.
- To use the MQ Workflow Web Client you require the following:
  - MQSeries Workflow Java API.

- Internet or intranet devices require a Web browser that supports JavaScript, for example:
  - Netscape V4.6 or later
  - MS Internet Explorer V5.0 or later
- For an MQSeries Workflow standard client, no additional prerequisites are required.

## Buildtime requirements

To use the Buildtime you require the following:

- A personal computer with Intel-based processor architecture (for example, Pentium 300 MHz or higher).
- Screen: Resolution 800x600 (minimum), 432 mm (17 inches), measured diagonally, or larger.
- One of these operating environments:
  - Windows 2000, and for Buildtime database: IBM DB2 Enterprise Edition Version 6.1 or higher; or Microsoft Jet Database Engine.
  - Windows NT Workstation V4.0 (Service Pack 4, 5, or 6a is required), and for Buildtime database: IBM DB2 Enterprise Edition Version 6.1 or higher; or Microsoft Jet Database Engine.
  - Windows 98 or Me, and for Buildtime database (stand-alone or as client): IBM DB2 Personal Edition Version 6.1 or higher; or Microsoft Jet Database Engine.

**Note:** IBM DB2 UDB Version 7.1 is included in the MQ Workflow package.

Operating environment	IBM DB2 UDB		MS Jet Engine	
	Main memory <sup>1</sup>	Hard disk <sup>2</sup>	Main memory <sup>1</sup>	Hard disk <sup>2</sup>
Windows 2000	96 MB	1 GB	64 MB	700 MB
Windows NT	96 MB	1 GB	64 MB	700 MB
Windows 98/Me	64 MB	1 GB	64 MB	700 MB

### Notes:

1. Make sure you have sufficient swap space.
2. These recommended values assume that your Buildtime and Buildtime database are on the same machine. The exact space required depends on the complexity of your processes and topology.

---

## AIX requirements

The following sections describe the hardware and software requirements for servers and clients on AIX.

## Servers for AIX

For a two-tier configuration, where the server and Runtime database reside on the same system, you require the following hardware and software:

### Hardware

- An RS/6000(R) uni-processor, SMP, or SP machine as supported by AIX.
- A dedicated graphical display is not necessary. The system console is sufficient.

Table 14. AIX server hardware requirements

Operating environment	Main memory	Hard disk space		
		Code and samples	Empty database	Total recommended
RS/6000	512 MB	310 MB	115 MB	2 GB

### Software

- AIX Version 4.3 or higher.
- IBM MQSeries for AIX Version 5.1 with CSD level 5 or higher (Version 5.2 is included in the MQ Workflow package). If you want to use Oracle, and IBM MQSeries for AIX Version 5.1, you need CSD level 6.
- IBM DB2 Universal Database for AIX Version 6.1 or higher (Version 7.1 is included in the MQ Workflow package), or Oracle Version 8.1.7.
- In a high availability environment:
  - AIX V4.3.1 with HACMP V4.2.2, or
  - AIX V4.3.2 or V4.3.3 with HACMP V4.3.1
- To use the MQ Workflow Web Client you require the following:
  - MQSeries Workflow Java API
  - A Web server or application server supporting Servlet API 2.1 (or later) specification and JSP 1.0 (or later), for example, IBM WebSphere Application Server Version 3.5.

## Clients for AIX

Clients on AIX require the following operating and programming environments:

- A workstation capable of running the operating system.
- AIX Version 4.3, or higher.
- IBM MQSeries for AIX Version 5.1 with CSD level 5 or higher (Version 5.2 is included in the MQ Workflow package).

**Note:** If the MQSeries server will be installed on the same machine, the MQSeries client must not be installed. If you install the Java CORBA Agent, it is strongly recommended to install an MQSeries server.

- For the development of programs using the MQSeries Workflow APIs, one of:
  - IBM CSet++ for AIX Version 5.0 (MQSeries Workflow client APIs for C and C++, FlowMark 2.3 compatibility Workflow client API for C and C++).
  - IBM VisualAge C++ Professional for AIX V4.0 or 5.0
  - JDK 1.2 or 1.3 (MQSeries Workflow client APIs for Java)
- Inprise VisiBroker Smart Agent Version 3.4 (version 4.0 is not supported) for the Java CORBA Agent when using any of the following locator policies: CORBA Naming Service, Interoperable Object Reference, or VisiBroker Smart Agent.

## Sun Solaris requirements

The following sections describe the hardware and software requirements for servers and clients on Sun Solaris.

### Servers for Sun Solaris

For a two-tier configuration, where the server and Runtime database reside on the same system, you require the following hardware and software:

#### Hardware

- A Sun workstation with SPARC processor architecture is required.
- A dedicated graphical display is not necessary. The system console is sufficient.

*Table 15. Sun Solaris server hardware requirements*

Operating environment	Main memory	Hard disk space		
		Code and samples	Empty database	Total recommended
Sun SPARC	512 MB	140 MB	120 MB	2 GB

#### Software

- Sun Solaris Version 7 or higher.
- IBM MQSeries for Sun Solaris Version 5.1 with CSD level 5 or higher (Version 5.2 is included in the MQ Workflow package).
- IBM DB2 Universal Database for Sun Solaris Version 6.1 or higher (Version 7.1 is included in the MQ Workflow package), or Oracle Version 8.1.7.
- To use the MQ Workflow Web Client you require the following:



- MQSeries Workflow Java API
- A Web server or application server supporting Servlet API 2.1 (or later) specification and JSP 1.0 (or later), for example, IBM WebSphere Application Server Version 3.5.

## Clients for Sun Solaris

Clients on Sun Solaris require the following operating and programming environments:

- A workstation capable of running the operating system.
- Sun Solaris Version 7 or higher.
- IBM MQSeries for Sun Solaris Version 5.1 with CSD level 5 or higher (Version 5.2 is included in the MQ Workflow package).

**Note:** If you install the Java CORBA Agent, it is strongly recommended to install an MQSeries server.

- For the development of programs using the MQSeries Workflow APIs, one of:
  - Sun WorkShop Compiler, Versions 4.2 and 5.0
  - For C++ only, Kuck&Associates Inc. KAI C++ Version 3.3
  - JDK 1.2 or 1.3 (MQSeries Workflow client APIs for Java).
- Inprise VisiBroker Smart Agent Version 3.4 (version 4.0 is not supported) for the Java CORBA Agent when using any of the following locator policies: CORBA Naming Service, Interoperable Object Reference, or VisiBroker Smart Agent.

---

## HP-UX requirements

The following sections describe the hardware and software requirements for servers and clients on HP-UX.

### Servers for HP-UX

For a two-tier configuration, where the server and Runtime database reside on the same system, you require the following hardware and software:

#### Hardware

- An HP 9000 workstation is required.
- A dedicated graphical display is not necessary. The system console is sufficient.

Table 16. HP-UX server hardware requirements

Operating environment	Main memory	Hard disk space		
		Code and samples	Empty database	Total recommended
HP 9000	512 MB	150 MB	120 MB	2 GB

### Software

- HP-UX Version 10.20.
- IBM MQSeries for HP-UX 5.1 with CSD level 5 or higher (Version 5.2 is included in the MQ Workflow package).
- IBM DB2 Universal Database for HP-UX Version 6.1 (Version 6.1 is included in the MQ Workflow package).

### Clients for HP-UX

Clients on HP-UX require the following operating and programming environments:

- A workstation capable of running the operating system.
- HP-UX Version 10.20.
- IBM MQSeries for HP-UX 5.1 with CSD level 5 or higher (Version 5.2 is included in the MQ Workflow package).
- For the development of programs using the MQSeries Workflow APIs, one of:
  - HP C/ANSI C Developer's Bundle for HP-UX V10.20 (S700).
  - HP C++ for HP-UX V10.20 (S700).

---

## Chapter 6. Installing the prerequisite software

Depending on your chosen setup, one or more of the following are prerequisites for MQ Workflow:

- IBM DB2 Universal Database Version 6.1, or higher (the MQ Workflow package includes Version 6.1 for HP-UX, and Version 7.1 for the other supported platforms).
- IBM MQSeries Version 5.1 with CSD level 5 or higher (Version 5.2 is included in the MQ Workflow package).

The following sections describe where and which database and MQSeries components you must install.

---

### Database

MQ Workflow requires two databases, one for the Runtime database, and one for the Buildtime database:

#### Runtime database

You can either use IBM DB2 Universal Database or Oracle as the database management system to store, retrieve, manipulate, and manage Runtime data within your MQ Workflow system. You must install the database management system before you install MQ Workflow.

#### Buildtime database

You can either use IBM DB2 Universal Database or Microsoft Jet Database Engine (Microsoft Access) as the database management system for Buildtime data. If you decided to use Microsoft Jet Database Engine instead of DB2, no prerequisite software needs to be installed for the Buildtime database. All necessary software drivers are installed automatically during the MQ Workflow configuration stage.

Table 17 summarizes which database components you must install on different types of MQ Workflow machines.

*Table 17. Which database components are required on each MQ Workflow machine*

Machine	Database components to install
Runtime database	One of: <ul style="list-style-type: none"><li>• DB2 Universal Database Enterprise Edition Version 6.1 or higher<sup>1</sup></li><li>• Oracle Enterprise Edition Version 8.1.7</li></ul>

Table 17. Which database components are required on each MQ Workflow machine (continued)

Machine	Database components to install
Server	<p>If the Runtime database is located on a different workstation, one of:</p> <ul style="list-style-type: none"> <li>• DB2 Run-Time Client<sup>2</sup></li> <li>• Oracle client</li> </ul> <p>(depending on the database management system used for the Runtime database).</p>
Buildtime database	<p>One of:</p> <ul style="list-style-type: none"> <li>• DB2 Universal Database Enterprise Edition Version 6.1 or higher. <b>Note:</b> If you use Version 6.1, do not use fix pack 3.</li> <li>• Microsoft Access.</li> </ul>
MQ Workflow Buildtime	<p>If the MQ Workflow Buildtime database is located on a different workstation, and uses DB2, the Buildtime workstation requires:</p> <ul style="list-style-type: none"> <li>• DB2 Run-Time Client</li> </ul>
Client	<p>MQ Workflow client machines require no database components.</p>

**Notes:**

1. The MQ Workflow package includes DB2 Universal Database Enterprise Edition Version 6 for HP-UX, and Version 7.1 for all other supported platforms.
2. The DB2 Run-Time Client was previously known as the DB2 Client Application Enabler.

## IBM DB2 Universal Database

The products and components provided on the IBM DB2 Universal Database CD-ROMs include: *DB2 Universal Database Enterprise Edition*, *DB2 Universal Database Workgroup Edition*, and *DB2 Run-Time Client*. For MQ Workflow, the DB2 products that you need to install are:

### DB2 Universal Database Enterprise Edition

The *DB2 Universal Database Enterprise Edition* allows Buildtime and Runtime databases to be created for holding MQ Workflow data and process models. It also provides a DB2 Universal Database server that enables MQ Workflow Buildtime and MQ Workflow servers installed with the DB2 Run-Time Client on local and remote workstations to update, control, and manage the Buildtime and Runtime databases, respectively.

DB2 Universal Database Enterprise Edition must be installed on the Runtime database workstation.

## DB2 Universal Database Workgroup Edition

On the Buildtime client machine, you can either use the DB2 Run-Time Client to access a remote Buildtime DB2 database, or install the Universal Database Workgroup Edition.

## DB2 Run-Time Client

The *DB2 Run-Time Client* allows MQ Workflow Buildtime and MQ Workflow servers installed on remote workstations to access local Buildtime and Runtime databases, respectively. The *DB2 Run-Time Client* must be installed on all **remote** MQ Workflow Buildtime and MQ Workflow server workstations in order to access local Buildtime and Runtime databases created with the DB2 Universal Database Enterprise Edition.

**Note:** The *DB2 Run-Time Client* replaces what was previously known as the DB2 Client Application Enabler.

## Installing DB2

Brief descriptions how to install DB2 are given in:

- “Installing DB2 on Windows” on page 233
- “Install DB2 Universal Database on AIX” on page 251
- “Install DB2 Universal Database on Sun Solaris” on page 258
- “Install DB2 Universal Database on HP-UX” on page 268

For further information about DB2, see the *DB2 Enterprise - Extended Edition for Windows NT Quick Beginnings* online manual, located as HTML files on the *DB2 Universal Database Enterprise Edition Version 7.1 for Windows Operating Environments* CD-ROM, in the directory doc\ as well as in PDF format file on the *DB2 Version 7.1 Manuals in PDF format* CD-ROM.

When installing DB2, note the following points:



If any of your DB2 client workstations, databases managed by this workstation, or host databases are configured in Japanese, Korean, Simplified Chinese or Traditional Chinese, the component **East Asian Conversion Support** must be installed, too.



During the DB2 installation on Windows NT, the check box **Install Components required to administer remote servers** must be checked.

## Oracle

If you want to use an Oracle database to store the MQ Workflow Runtime database, Oracle must be installed on the Runtime database machine before installing MQ Workflow. For information about installing Oracle, refer to the Oracle documentation. The database used for Runtime data must be dedicated to MQ Workflow.

The MQ Workflow Runtime database will be created during customization.

### Notes:

1. In this release, MQ Workflow for HP-UX does not support using an Oracle database.
2. If you want to use Oracle for the MQ Workflow Runtime database on a Windows installation, contact the MQSeries Workflow support team.

## MS Access

If you want to use a Microsoft Jet database engine for the Buildtime database, you must install it before installing MQ Workflow Buildtime.

---

## IBM MQSeries

IBM MQSeries must be installed prior to installing MQ Workflow.

IBM MQSeries is IBM's messaging product that enables MQ Workflow components to communicate across similar or different operating-system platforms by sending and receiving data as messages.

Within an MQ Workflow system, the following MQSeries components are used to coordinate and manage communications:

### MQSeries server

An MQSeries server is used to manage messages sent and received by an MQ Workflow server. For a client concentrator, an MQSeries server is also used to route messages from MQ Workflow client workstations to MQ Workflow servers located on other workstations. An MQSeries server must be installed on all workstations where you intend installing:

- MQ Workflow servers
- Client concentrators
- Java CORBA Agent (recommended)

### MQSeries client

An MQSeries client provides a remote interface to an MQSeries server. MQ Workflow client components (such as the MQ Workflow administration utility, standard client, or API Runtime Libraries) use MQSeries clients to send messages to and receive messages from an

MQSeries server. An MQSeries client must be installed on all workstations where you intend installing MQ Workflow client components.

**Note:** If you install an MQSeries server, an MQSeries client must not be installed on the same machine.

Table 18. Which MQ Workflow components require an MQSeries server or client

MQ Workflow components	MQSeries components to install
Server	One of: <ul style="list-style-type: none"> <li>• MQSeries V5.2<sup>1</sup> <b>server</b></li> <li>• MQSeries V5.1 <b>server</b> with CSD level 5<sup>3</sup></li> </ul>
Any component that is to be configured to act as a client concentrator machine.	
Java CORBA Agent <sup>2</sup>	
Administration utility	One of: <ul style="list-style-type: none"> <li>• MQSeries V5.2<sup>1</sup> <b>client</b><sup>2</sup></li> <li>• MQSeries V5.1 <b>client</b><sup>2</sup> with CSD level 5</li> </ul>
Standard client	
API for Lotus Notes	
API Runtime libraries	
Program Execution Agent	
Web Client <sup>4</sup>	

**Notes:**

1. MQSeries V5.2 is included in the MQ Workflow package.
2. If an MQSeries server is installed instead of an MQSeries client, all MQ Workflow components on that machine will use the MQSeries server API on a local queue manager. Using an MQSeries server is required to create a client concentrator, and to improve Java CORBA Agent reliability.
3. On AIX, if you want to use Oracle, and IBM MQSeries for AIX Version 5.1, you need CSD level 6.
4. The Web Client can use Java API instead of an MQSeries client.

**Installing MQSeries**

Brief descriptions on how to install MQSeries are given in:

- “Installing MQSeries on Windows” on page 234
- “Install MQSeries on AIX” on page 253
- “Install MQSeries on Sun Solaris” on page 259
- “Install MQSeries on HP-UX” on page 269

For more details about how to install MQSeries, see the *Quick Beginnings* online manual, **START.HTM**, contained on the MQSeries CD-ROM. This manual is also available as a printed book from IBM.





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## Part 3. Installing and configuring MQ Workflow on UNIX

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## Chapter 7. Installing on UNIX

This chapter describes how to install MQ Workflow components on UNIX machines:

1. If you have an older version of MQ Workflow installed, and you want to use data from it with the new release of MQ Workflow, you must migrate your existing installation as explained in “Appendix N. Migrating from a previous release” on page 307.
2. “Creating user ID and groups”
3. Perform one of:
  - a. “Installing MQ Workflow on AIX” on page 57
  - b. “Installing MQ Workflow on HP-UX” on page 60
  - c. “Installing MQ Workflow on Sun Solaris” on page 61

**Note:** During the installation procedure, the language version for MQ Workflow is set. The language environment variable, `$LANG` or `$LC_ALL`, on your UNIX workstation must be set to the same language. For details about this see “Appendix C. Language settings” on page 219.

4. “After installing MQ Workflow on UNIX” on page 63
5. Then continue with “Chapter 8. Configuring on UNIX” on page 65

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### Creating user ID and groups

You must create user IDs that will be used to install and configure the database, MQSeries, and MQSeries Workflow.

Table 19. Creating user IDs and groups

Step	Description	Action
1	Check your user IDs	Look up the actual IDs you planned in Table 3 on page 24 for the following: <ol style="list-style-type: none"><li>1. <i>MQWorkflowGroup</i></li><li>2. <i>DBAdminGroup</i></li><li>3. <i>MQWorkflowAdministrator</i></li></ol>
2	Log on as root	Log on as <b>root</b> .

Table 19. Creating user IDs and groups (continued)

Step	Description	Action
3	Create the Workflow group	Enter the command: <b>On AIX:</b> <code>mkgroup MQWorkflowGroup</code> <b>On HP-UX and Sun Solaris:</b> <code>groupadd MQWorkflowGroup</code>
4	Verify that group mqm exists	Verify that the MQSeries administrator group <b>mqm</b> exists (this is the mandatory group that is created when you install MQSeries). If it does not exist, check that you have installed MQSeries correctly.
5	Verify that the database administration group exists	Check that the Runtime database administration group exists. For DB2, the default is <code>db2iadm1</code> . For Oracle, the default is <code>dba</code> .
6	Create an MQ Workflow administration user	Check your security planning in Table 3 on page 24. The number of user IDs that you plan to use during configuration will affect which groups the <i>MQ Workflow Administrator</i> user ID will be made a member of: <ol style="list-style-type: none"> <li>If the configuration is to be performed by the <i>MQ Workflow Administrator</i> user ID which will have MQSeries and database administration rights (use this for standard and stand-alone setups), enter the command:  <b>On AIX:</b>  <code>mkuser pgrp=MQWorkflowGroup  groups=mqm,DBAdminGroup MQWorkflowAdministrator</code>  <b>On Sun Solaris:</b>  <code>useradd -g MQWorkflowGroup -G mqm,DBAdminGroup  -d /export/home/fmc -s /usr/bin/ksh  -m MQWorkflowAdministrator</code>  <b>On HP-UX:</b>  <code>useradd -g mqm -G MQWorkflowGroup,DBAdminGroup  -d /export/home/fmc -s /usr/bin/ksh  -m MQWorkflowAdministrator</code> </li> <li>If the <i>MQ Workflow Administrator</i> user ID is not going to have MQSeries and DB2 administration rights (use this for higher security), enter the command:  <b>On AIX:</b>  <code>mkuser pgrp=MQWorkflowGroup MQWorkflowAdministrator</code>  <b>On HP-UX and Sun Solaris:</b>  <code>useradd -g MQWorkflowGroup -d /export/home/fmc  -s /usr/bin/ksh -m MQWorkflowAdministrator</code> </li> </ol>
7	Set the password for the MQ Workflow Administrator user ID	Enter the command: <code>passwd MQWorkflowAdministrator</code>

## Installing MQ Workflow on AIX

These instructions describe how to install MQ Workflow on an AIX workstation using the AIXwindows version of the System Management Interface Tool (smit). If you install an MQ Workflow Server on a workstation that does not have AIXwindows, use the character-based version of the System Management Interface Tool (smitty). The sequence of panels is the same as for smit.

### Automatic default configuration on AIX

On AIX, there is a default configuration option, `fmcdefault`, which installs and configures a local, two-tier MQ Workflow system, where the server and DB2 database are on the same machine. This option automatically runs the configuration utility after MQ Workflow has been installed. If you are migrating your installation, you must not use the automatic default configuration option.

If you intend to use the default configuration option, you must first check the following:

1. An MQSeries Server must be already installed and configured.
2. The TCP/IP port number 5010 must not be used by any other application.
3. You must have previously installed and configured DB2 with the user ID `db2inst1`.
4. The DB2 administration group must be `db2iadm1`.
5. The user ID `fmc` must exist, and be a member of the groups `db2iadm1` and `mqm`, as described in “Creating user ID and groups” on page 55.

To install MQ Workflow on AIX, you must perform the following:

1. Log on to the workstation as `root`.
2. Insert the CD-ROM labeled ‘*IBM MQSeries Workflow Version 3.3 - Program Code for UNIX platforms*’ into the CD-ROM drive.
3. Mount the CD-ROM by entering the command:
 

```
mount -oro -v cdrfs /dev/cd0 /cdrom
```
4. Read the `readme.xxx`, where `xxx` is your language code, for example `enu` for US English.
5. If you intend to use the automatic default configuration option:
  - a. If you are **not** using `csh`, edit the file `/home/fmc/.profile`, and add the following line:
 

```
. /home/db2inst1/sqllib/db2profile
```

**Note:** Make sure that there is a space between the period '.' and the slash '/'.

- b. If you are using csh, edit the file /home/fmc/.cshrc, and add the following line:
 

```
source /home/db2inst1/sqllib/db2cshrc
```
- 6. Start the System Management Interface Tool by entering one of the following commands: smit or smitty
- 7. Step through the installation windows by selecting the appropriate options until the **MULTI-SELECT LIST** window appears. The options displayed may vary depending on your version:
  - a. Select **Software Installation and Maintenance**
  - b. Select **Install and Update Software**
  - c. Select **Install and Update Software from LATEST Available Software**
  - d. Enter the **INPUT device / directory** where the program code CD-ROM is mounted.
- 8. In the **MULTI-SELECT LIST** window, the following list of components appears. Select the MQ Workflow components you want to install.

fmc	ALL	fmc_all_filesets
MQSeries Workflow API Development Kit		fmc.api.adt
MQSeries Workflow API Runtime		fmc.api.rte
MQSeries Workflow Administration Utility		fmc.autil
MQSeries Workflow Base Common Files		fmc.base
MQSeries Workflow Client Common Files		fmc.client
MQSeries Workflow Java API Beans		fmc.java.api
MQSeries Workflow Java CORBA Agent		fmc.java.agent
MQSeries Workflow Message Catalog Files		fmc.msg
MQSeries Workflow Other Common Files		fmc.baseext
MQSeries Workflow Program Execution Agent		fmc.pea
MQSeries Workflow Common Files		fmc.basertdb
MQSeries Workflow Common Files for DB2		fmc.basertdb.db2
MQSeries Workflow Common Files for Oracle		fmc.basertdb.oracle
MQSeries Workflow Rtdb Utilities Common Files		fmc.rtdbutil
MQSeries Workflow Rtdb Utilities for DB2		fmc.rtdbutil.db2
MQSeries Workflow Rtdb Utilities for Oracle		fmc.rtdbutil.oracle
MQSeries Workflow Samples		fmc.samples
MQSeries Workflow Server Common Files		fmc.server
MQSeries Workflow Server for DB2		fmc.server.db2
MQSeries Workflow Server for Oracle		fmc.server.oracle
MQSeries Workflow WebClient		fmc.webclient
fmcdefault	ALL	fmcdefault
		_all_filesets
MQSeries Workflow Default Configuration		fmcdefault.config

Selecting the fmc package installs all AIX-based MQ Workflow components.

Selecting the fmcdefault package is used to install AIX-based MQ Workflow components and configure them automatically with default

configuration values. This means that you do not have to configure MQ Workflow components as explained in “Chapter 8. Configuring on UNIX” on page 65.

Selecting both `fmc` and `fmcdefault` is useful for installing a UNIX-based two-tier MQ Workflow setup with preset configuration values.

9. After selecting the MQ Workflow components you want to install, select the appropriate options to start the installation. After starting the installation, program files are copied to the newly created MQ Workflow installation directory, `/usr/lpp/fmc`. This may take several minutes to complete.
10. When the installation is complete, leave `smit` from the **Exit** menu.
11. If you selected the **default configuration**, the configuration tool will be run automatically to create a configuration based on the default values. After it has completed creating the configuration, you should perform the steps described in “Chapter 9. Verifying an MQ Workflow server on UNIX” on page 95.
12. If you are **installing a new installation**, you must perform the actions described in “After installing MQ Workflow on UNIX” on page 63.
13. If you are **migrating an existing installation**, you should continue performing the migration steps from “Change directory and file permissions on UNIX” on page 314.

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## Installing MQ Workflow on HP-UX

These instructions describe how to install MQ Workflow on an HP-UX system using the HP-UX software install program `swinstall`.

1. Log on to your system as `root`.
2. Insert the CD-ROM labeled '*IBM MQSeries Workflow Version 3.3 - Program Code for UNIX platforms*' into the CD-ROM drive.
3. Mount this CD-ROM with a mount point `/cdrom`. For details on how to mount a CD-ROM, refer to the HP 9000 Series 700 or 800 Owner's Guide.
4. Read the `readme.xxx` where `xxx` is your language code, for example `enu` for US English.
5. Invoke the HP-UX software install program by entering at a shell prompt:  
`swinstall`

If the environment variable `DISPLAY` is set correctly, the XWindows version of `swinstall` is displayed, otherwise the terminal version is displayed.

6. In the panel **Source Depot Type:** select **Network Directory/CDROM**.
7. In the panel **Source Home Name...** enter your host name.
8. On the MQ Workflow CD-ROM, find the file **hpux/FMC-330.PKG**.
9. In the panel **Source Depot Path...** enter the fully qualified name of the file **FMC-330.PKG**.
10. Select **OK**. A panel appears displaying **MQSeries Workflow**.
11. Highlight **MQSeries Workflow** and select **Action**, then **Mark For Install** from the menu options.
12. After all MQ Workflow components have been selected, select **Action**, then **Install (analysis)** from the menu options.
13. When **Ready** is displayed in the **Status** field, select **OK**.
14. A panel appears. Select **Yes**.
15. The installation starts and program files are copied to the newly created MQ Workflow installation directory `/opt/fmc`. This may take several minutes to complete.
16. When the installation is complete, select **Done**, and exit `swinstall`.
17. If you are **installing a new installation**, you must perform the actions described in "After installing MQ Workflow on UNIX" on page 63.
18. If you are **migrating an existing installation**, you should continue performing the migration steps from "Change directory and file permissions on UNIX" on page 314.



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## Installing MQ Workflow on Sun Solaris

These instructions describe how to install MQ Workflow on a machine running Sun Solaris.

1. Log on to your system as root.
2. Insert the CD-ROM labeled 'IBM MQSeries Workflow Version 3.3 - Program Code for UNIX platforms' into the CD-ROM drive. The CD-ROM is mounted automatically.
3. Read the `readme.xxx` where `xxx` is your language code, for example `enu` for US English.
4. Enter the command:  

```
pkgadd -d <fully-qualified-name-of-CDROM-image>
```

For example, `pkgadd -d /mount-point/solaris/fmc-3.3.0.pkg`

### Notes:

- a. You cannot use `admintool` to install MQ Workflow for Solaris.
  - b. By default, MQ Workflow for Solaris will be installed into `/opt/fmc`. If you want to install MQ Workflow for Solaris into a different base directory than `/opt`, you can specify another installation administration file using the `-a` option of `pkgadd` (for more information about `pkgadd`, see the `pkgadd` manual pages). The new installation administration file (located in `/var/sadm/install/admin`) must define the new base directory with a fully qualified path name, for example, `basedir=/usr`.
  - c. During installation a subdirectory `fmc` will be created for MQ Workflow in the base directory.
5. When you are prompted, select the MQSeries Workflow package.
  6. The program files are copied to your machine. This may take several minutes.
  7. If you get the command prompt without any error messages, the installation is complete.
  8. If you installed MQ Workflow into a different base directory than `/opt`, make sure that the environment variable, `FMC_INSTALLATION_DIRECTORY`, is set to the base directory. For example, `FMC_INSTALLATION_DIRECTORY=/usr`
  9. Check that your 'maxusers' setting is high enough, as described in "Kernel configuration parameters" on page 62.
  10. If you are **installing a new installation**, you must perform the actions described in "After installing MQ Workflow on UNIX" on page 63.
  11. If you are **migrating an existing installation**, you should continue performing the migration steps from "Change directory and file permissions on UNIX" on page 314.

## Kernel configuration parameters

There are recommended values for the Sun Solaris kernel configuration parameters. This summarizes the requirements from the *IBM DB2 Connect: Quick Beginnings*, and *MQSeries for Sun Solaris: Quick Beginnings* manuals:

```

set msgsys:msginfo_msgmax = 65535
set msgsys:msginfo_msgmnb = 65535
set msgsys:msginfo_msgmap = 1026
set msgsys:msginfo_msgmni = 256
set msgsys:msginfo_msgssz = 16
set msgsys:msginfo_msgtql = 1024
set msgsys:msginfo_msgseg = 32767
set shmsys:shminfo_shmmax = 483183820 (90% of your physical memory)
set shmsys:shminfo_shmseg = 1024
set shmsys:shminfo_shmmni = 1024
set shmsys:shminfo_shmmin = 1
set semsys:seminfo_semaem = 16384
set semsys:seminfo_sevmx = 32767
set semsys:seminfo_semmni = 1024 (semmni < semmns)
set semsys:seminfo_semmap = 1026 (semmni + 2)
set semsys:seminfo_semmns = 16384
set semsys:seminfo_semmsl = 100
set semsys:seminfo_semopm = 100
set semsys:seminfo_semmnu = 2048
set semsys:seminfo_semume = 256

set maxusers = 32 (This is the minimum, best to set it higher)

```

**Note:** The default for `maxusers` is the size of main memory in MB minus 2. For example, if you have 512 MB memory, `maxusers` defaults to 510. You can omit the `set maxusers` command from the `/etc/system` file.

## After installing MQ Workflow on UNIX

Before you can configure MQ Workflow, you must perform a number of preliminary steps that prepare your system for configuring MQ Workflow.

Table 20. After installing MQ Workflow on UNIX

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	Create the MQ Workflow installation profile	<p>If you want to use the default values for configuration root directory, administration user ID, and MQ Workflow group, enter the command:</p> <pre><b>fmczinsx -o env</b></pre> <p>otherwise enter:</p> <pre><b>fmczinsx -o env -c &lt;ConfigRootDir&gt; -U &lt;MQWFAdmin&gt; -G &lt;MQWFGroup&gt;</b></pre> <p><b>Note:</b> If you are using HP-UX, the option <code>-G &lt;MQWFGroup&gt;</code> is required.</p>
3	Select the Runtime database type	<ol style="list-style-type: none"> <li>If you want to use DB2 for the Runtime database, you must enter the command: <pre><b>fmczinsx -o db2</b></pre> </li> <li>If you want to use Oracle for the Runtime database, you must enter the command: <pre><b>fmczinsx -o oracle</b></pre> </li> </ol> <p><b>Note:</b> This command has system-wide effect.</p>
4	If you are using Oracle for the Runtime database	<p>If you are using Oracle for the Runtime database, make sure that the shared libraries used by Oracle applications are available via a standard library search path. These libraries are necessary for the Transaction Coordinator (XA) switch file "ora8swit" located in <code>&lt;InstDir&gt;/oraswit</code> and an environment variable (LIBPATH, LD_LIBRARY_PATH) will not suffice. This program will search through the following directories for the required shared libraries:</p> <ol style="list-style-type: none"> <li><code>&lt;InstDir&gt;/lib/workflow</code></li> <li><code>/usr/lib</code></li> <li><code>/opt/oracle/product/8.1.7/lib</code></li> </ol> <p>Either of these subdirectories needs to contain a link to the following shared libraries within <code>\$ORACLE_HOME/lib</code>:</p> <p><b>For AIX:</b> <code>libc1ntsh.a</code></p> <p><b>For Solaris:</b> <code>libc1ntsh.so.8.0</code>, <code>libwtc8.so</code></p>
5	Prepare infrastructure resources	<p>To prepare various directories, MQSeries, database and MQ Workflow files, enter the command:</p> <pre><b>fmczinsx -o inf</b></pre>

## UNIX

Table 20. After installing MQ Workflow on UNIX (continued)

Step	Description	Action
6	Select the connection type for the machine	<ol style="list-style-type: none"><li>1. If you intend to configure an MQ Workflow server, client concentrator, or Java CORBA Agent, you must have already installed an MQSeries server on the machine, and should enter the command: <b>fmczinsx -o mqserver</b>  Since this is a system-wide setting, <b>all</b> MQ Workflow client components configured on this machine will use a local queue manager for communication.</li><li>2. If you want all your MQ Workflow clients on this machine to use the MQSeries Client API for communication (even if a local queue manager is available) enter the command: <b>fmczinsx -o mqclient</b>  Since this is a system-wide setting, <b>none</b> of the MQ Workflow client components configured on this machine will use a local queue manager for communication.</li></ol>
7	Start configuring	Now you are ready to perform the actions described in “Chapter 8. Configuring on UNIX” on page 65.

## Chapter 8. Configuring on UNIX

This chapter describes how to configure MQ Workflow on any of the supported UNIX platforms, and how to create the necessary resources.

### Before creating an MQ Workflow configuration on UNIX

If you are about to configure a server, Runtime Database Utilities, a client using MQSeries Server API (for example a client concentrator), or a Java CORBA Agent, you must prepare the environment before you create an MQ Workflow configuration. If you are not configuring any of these components, skip to “Creating an MQ Workflow configuration” on page 74.

Table 21. Actions required before creating an MQ Workflow configuration on UNIX

Actions	Server			Runtime Database Utilities	Client using MQ Series Server API	Java CORBA Agent
	First system in system group. With a Runtime database:		Additional system in system group			
	Local	Remote				
“Verify user IDs” on page 66	●	●	●	●	●	●
“Prepare a multiple server setup” on page 67	●	●	●			
“Update the configuration administrator’s profile” on page 67	●	●	●			
“Prepare the DB2 environment” on page 68	● <sup>1</sup>	● <sup>1</sup>				
“Catalog the existing remote DB2 instance” on page 69		● <sup>1</sup>	● <sup>1</sup>	● <sup>1</sup>		
“Catalog the existing remote database” on page 69			●	●		
“Prepare the Oracle environment” on page 70	● <sup>2</sup>					
“Copy the channel definition table” on page 71			●		●	
“Changing the MQ Workflow client connection type” on page 71					●	
“Prepare the Java CORBA Agent and Java API classes” on page 72						●

Table 21. Actions required before creating an MQ Workflow configuration on UNIX (continued)

Actions	Server		Runtime Database Utilities	Client using MQ Series Server API	Java CORBA Agent	
	First system in system group. With a Runtime database:					Additional system in system group
	Local	Remote				
"Security authorizations for Java CORBA Agent using JNDI" on page 73					● <sup>3</sup>	

**Notes:**

1. Only required if you are using DB2 for the Runtime database.
2. Only required if you are using Oracle for the Runtime database.
3. Only required if you are using Java security.

**Verify user IDs**

If required, each MQ Workflow configuration can use different user IDs. Depending on your security planning, you may need to create new user IDs for this configuration

Table 22. Verify user IDs

Step	Description	Action
1	Check your security plans	Before you can verify whether all the necessary user IDs exist, you should check your copy of Table 3 on page 24.
2	Verify Configuration Administrator user ID	If your <i>Configuration Administrator</i> user ID is not the same as the <i>MQ Workflow Administrator</i> user ID, you should create the <i>Configuration Administrator</i> user ID and make it a member of the necessary groups according to your security planning.
3	Verify Runtime database user ID	If you plan not to use the <i>Configuration Administrator</i> user ID to access the DB2 runtime database, verify that the user ID you plan to use exists. <b>Note:</b> If the database is remote, the Runtime database user ID must exist only on the database machine.
4	Verify Principal user ID	If you plan not to use the <i>Configuration Administrator</i> user ID as the <i>Principal</i> user ID for clients to access MQSeries channels, verify that the user ID you plan to use exists.
5	Verify Transaction Coordinator user ID	If you plan not to use the <i>Runtime database user ID</i> as the <i>Transaction Coordinator</i> user ID between the MQSeries queue manager and the Runtime database, verify that the user ID you plan to use exists. <b>Note:</b> If the database is remote, the transaction coordinator user ID must exist only on the database machine.

## Prepare a multiple server setup

If you want to configure more than one Workflow system in your system group, you should make sure that you have completed “Chapter 4. Planning your installation” on page 27 for each Workflow system.

You must ensure the following:

- All queue manager names must be unique.
- Only one queue manager is configured as being the first queue manager in the cluster.
- All configurations of servers or Runtime Database Utilities, that use the same Runtime database must use the same code level of MQ Workflow.
- The first queue manager in the cluster and the command server for that queue manager must be started, as described in “Basic MQSeries commands” on page 190.

All additional systems should use the values from the first system for the following:

- System group name
- Queue Prefix
- Cluster name
- For the cluster’s first queue manager:
  - Name of the queue manager
  - TCP/IP address
  - TCP/IP port number

## Update the configuration administrator’s profile

If you are creating a new system, Table 23 describes the changes you must make to the configuration administrator’s profile.

Table 23. Update the configuration administrator’s profile

Step	Description	Action
1	Add the language to the configuration administrator’s profile	<p>For the MQ Workflow configuration administrator user ID (see your value for ConfigurationAdministrator in Table 3 on page 24):</p> <ul style="list-style-type: none"> <li>• If you are <b>not</b> using csh, edit the .profile file, and add the line: export LANG=xxxxx</li> <li>• If you are using csh, edit the .cshrc file, and add the line: setenv LANG xxxxx</li> </ul> <p>Where xxxxx is your language code, for example, for U.S. English on AIX, use <b>en_US</b>. For a list of language codes, see “Appendix C. Language settings” on page 219.</p>

## Prepare the DB2 environment

If you are using DB2 for the Runtime database, Table 24 describes how you must prepare the DB2 environment.

Table 24. Prepare the DB2 environment

Step	Description	Action
1	Log on	Log on as the MQ Workflow administrator on the machine where you want to install the server.
2	Add the DB2 profile to the user profiles	<p>Edit the <code>.profile</code> file (or the <code>.cshrc</code> file if <code>csh</code> is used) for each of the following users:</p> <ul style="list-style-type: none"> <li>• Each MQ Workflow configuration administrator user.</li> <li>• The MQSeries administrator if the MQ Workflow configuration administrator is not in the DB2 administration group (the default group is <code>db2iadml</code>).</li> <li>• The Runtime database user if it is different from the MQ Workflow configuration administrator.</li> <li>• The transaction coordinator if it is different from the MQ Workflow configuration administrator.</li> </ul> <ol style="list-style-type: none"> <li>1. If you are <b>not</b> using <code>csh</code>: <ol style="list-style-type: none"> <li>a. On AIX, add the command: <pre>./home/db2inst1/sqllib/db2profile</pre> </li> <li>b. On Sun Solaris and HP-UX, add the command: <pre>./export/home/db2inst1/sqllib/db2profile</pre> </li> </ol> <p><b>Note:</b> Make sure that there is a space between the period <code>'</code> and the slash <code>'/'</code>. Replace <code>db2inst1</code> with your DB2 instance name.</p> </li> <li>2. If you are using <code>csh</code>: <ol style="list-style-type: none"> <li>a. On AIX, add the command: <pre>source /home/db2inst1/sqllib/db2cshrc</pre> </li> <li>b. On Sun Solaris and HP-UX, add the command: <pre>source /export/home/db2inst1/sqllib/db2cshrc</pre> </li> </ol> <p><b>Note:</b> Replace <code>db2inst1</code> with your DB2 instance name.</p> </li> </ol>
3	Start the DB2 instances	<ol style="list-style-type: none"> <li>1. On the machine that will host the server, start the DB2 instance by entering the command: <pre>db2start</pre> </li> <li>2. If the Runtime database is not on the same machine as the server, ensure that the DB2 instance hosting the Runtime database is also started.</li> </ol>
4	Set the DB2 isolation level to 'read stability'	<p>Log on to the machine that will host the Runtime database with a user ID that has DB2 administration rights and enter the command:</p> <pre>db2set -i DB2_RR_TO_RS=YES</pre>



## Catalog the existing remote DB2 instance

If you are using DB2 for the Runtime database, and are creating a three-tier setup using a new system group and a new database, or adding a new system to an existing system group, you must perform the actions in Table 25 to redirect all database requests to the remote machine.

Table 25. Catalog the existing remote DB2 instance

Step	Description	Action
1	Note information about the workstation hosting the Runtime database	On the machine that will host the Runtime database and note the following information: <ol style="list-style-type: none"> <li>1. Host name or TCP/IP address of the machine, <i>computer-name</i>.</li> <li>2. The name of the DB2 instance on this machine, <i>instance-name</i>.</li> <li>3. The service name (port) used by the DB2 instance, <i>servicename</i>.</li> <li>4. If you are adding a new system to an existing system group, note the name of the Runtime database, <i>database-name</i> (for configurations that use the default values, this should be <b>FMCDB</b>).</li> </ol>
2	Catalog the existing remote DB2 instance	On the workstation where you want to install the server: <ol style="list-style-type: none"> <li>1. Log on with a user ID that has DB2 administration rights (the default is <b>fmc</b>).</li> <li>2. Enter the commands:               <pre>db2 CATALOG TCPIP NODE <i>node-name</i> REMOTE <i>computer-name</i>           SERVER <i>servicename</i> REMOTE_INSTANCE <i>instance-name</i> db2 ATTACH TO <i>node-name</i> db2 UPDATE DBM CFG USING TP_MON_NAME mqmax db2 TERMINATE</pre>               where <i>node-name</i> is a local alias where the database instance resides.  <b>Note:</b> For more information about cataloging a database, see “Accessing a remote DB2 instance” on page 188.             </li> </ol>
3	Verify that the Runtime database user can attach to the remote instance	On the workstation where you want to install the server, enter the commands: <pre>db2 ATTACH TO <i>node-name</i> USER <i>RTDatabaseUser</i>           USING <i>RTDatabasePassword</i> db2 DETACH</pre> where the <i>RTDatabaseUser</i> and <i>RTDatabasePassword</i> are valid for the remote machine.

## Catalog the existing remote database

If you are creating an additional new system to an existing system group, the Runtime database must already exist on another machine, and you must perform the actions in Table 26 on page 70 to redirect all database requests to the remote machine.

Table 26. Catalog the existing remote database

Step	Description	Action
1	If you are using DB2 for the Runtime database, catalog the remote DB2 database	<p>On the workstation where you want to install the server:</p> <ol style="list-style-type: none"> <li>1. Catalog the database by entering the command:  <code>db2 CATALOG DATABASE <i>database-name</i> AT NODE <i>node-name</i></code>                       where <i>database-name</i> is the name of the database on the remote machine that you gave the local alias <i>node-name</i>.</li> <li>2. Verify that the Runtime database user ID can access the Runtime database, by entering the commands:  <code>db2 CONNECT TO <i>database-name</i> USER <i>RTDatabaseUser</i>                                        USING <i>RTDatabasePassword</i></code>  <code>db2 CONNECT RESET</code></li> </ol> <p><b>Note:</b> For more information about cataloging a database, see “Accessing a remote DB2 instance” on page 188.</p>

### Prepare the Oracle environment

If you intend to use Oracle8i for the Runtime database you must perform the following steps. See the appropriate Oracle8i documentation for details:

1. Install Oracle8i. See the Oracle installation documentation for your operating system.
2. Create a UNIX user ID, as member of the dba and oinstall groups (with OSDBA role); this can be the same UNIX user used to install Oracle8i (for example: oracle). This user ID must be supplied later when prompted for "RT Database Creator".
3. ksh  
`export ORACLE_BASE=<oracle_base_path>`  
`export ORACLE_HOME=<oracle_home_path>`  
`export PATH=$PATH:$ORACLE_HOME/bin`
4. On AIX, also enter:  
`export LIBPATH=$LIBPATH:$ORACLE_HOME/lib`
5. On Sun Solaris, also enter:  
`export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$ORACLE_HOME/lib`
6. If you are creating a three-tier setup, you must use the Oracle tool **Net8 Assistant** to add a new **local service naming** entry in the tnsnames.ora file. On UNIX, this is normally located in \$ORACLE\_HOME/network/admin.
7. Make sure that the Oracle listener process is started on the machine that will host the Runtime database. To start the listener on that workstation log on with a user ID in the group oinstall and issue the command:  
`lsnrctl start`

## Copy the channel definition table

If you are creating an additional server, or a client using the MQSeries Server API (for example a client concentrator), MQ Workflow will create a new queue manager for you.

Each time that MQ Workflow creates a new queue manager, a new channel definition will be added to the channel definition table file specified during configuration. If the file does not exist on the machine, it will be created, and the file will only contain the channel definition for the queue manager just created.

It is recommended that you use just one channel definition table to contain all queue managers used in the system group. This channel definition table can then be distributed to all the MQ Workflow clients, so that all clients will be able to send messages to any server, or client concentrator.

If you do not follow the recommended procedure, you can either provide a dedicated channel definition table for each queue manager manually, or locate the channel definition table on a network disk that all servers and client concentrators have write access to.

In the recommended procedure, you must copy the latest channel definition table from the machine where you last created an MQ Workflow configuration with a new queue manager, this is described in Table 27.

Table 27. Copy the channel definition table

Step	Description	Action
1	Copy the latest channel definition table	<ol style="list-style-type: none"> <li>Use ftp to copy the client channel definition table (in binary mode): <ul style="list-style-type: none"> <li><b>from</b> &lt;ConfigurationRootDir&gt;/chltabs/MQWFCHL.TAB on the machine where you last configured an MQ Workflow server or client concentrator</li> <li><b>to</b> &lt;ConfigurationRootDir&gt;/chltabs/MQWFCHL.TAB on the machine where you are configuring an additional MQ Workflow server or new client concentrator.</li> </ul> </li> <li>Assign permissions <code>mqm:mqm 660</code> to the local copy of MQWFCHL.TAB.</li> </ol>

## Changing the MQ Workflow client connection type

If you have a machine with an MQSeries server installed, the MQ Workflow clients on this machine can either use the MQSeries Server APIs or the Client APIs. If you are creating a client concentrator, or using a Java CORBA Agent, you should use the Server API. There may also be occasions when you want to switch an MQ Workflow client from using the MQSeries Server API to using the MQSeries Client API.

Table 28. Changing the MQ Workflow client connection type

Step	Description	Action
1	Log on	Log on as root.
2	Decide client setup	<ol style="list-style-type: none"> <li>1. Check whether you want your MQ Workflow clients on this machine to use the MQSeries Server API or the MQSeries Client API.</li> <li>2. Perform one of the actions 3a or 3b.</li> </ol>
3a	Select MQSeries Server API	<p>If you want all MQ Workflow clients on this machine to use the MQSeries Server API, enter the command:</p> <pre>fmczinsx -o mqserver</pre> <p><b>Note:</b> This option is required for a client concentrator machine. This can cause existing clients on this machine to stop working, if they were configured to use an MQSeries Client.</p>
3b	Select MQSeries Client API	<p>If you want all MQ Workflow clients on this machine to use the MQSeries Client API, enter the command:</p> <pre>fmczinsx -o mqclient</pre> <p><b>Note:</b> This can cause existing clients on this machine to stop working, if they were configured to use an MQSeries Server.</p>

### Prepare the Java CORBA Agent and Java API classes

If you intend to use the Inprise VisiBroker Object Request Broker (ORB), you must configure it as described in Table 29. This preparation has also to be performed on every client that will use the Java API classes in conjunction with the Inprise VisiBroker ORB.

For more information about using the Java CORBA Agent, refer to the *IBM MQSeries Workflow: Programming Guide*.

**Note:** The Java CORBA Agent is not supported on HP-UX.

Table 29. Prepare the Java CORBA Agent

Step	Description	Action
1	Install VisiBroker	<ol style="list-style-type: none"> <li>1. Install the Inprise VisiBroker V3.4 as described in the VisiBroker documentation. For more information about Inprise VisiBroker see <a href="http://www.inprise.com">http://www.inprise.com</a>.</li> <li>2. Write down the name of the directory where VisiBroker is installed. You will need this information later.</li> </ol>
2	Copy ORB file	Copy the file <code>orb.properties</code> from your <i>&lt;VisiBroker Installation Directory&gt;/docs</i> directory to your <i>&lt;Java Installation Directory&gt;/jre/lib</i> directory.

Table 29. Prepare the Java CORBA Agent (continued)

Step	Description	Action
3	Edit the ORB file	<p>Edit your copy of the orb.properties file in the &lt;Java Installation Directory&gt;/jre/lib directory:</p> <ol style="list-style-type: none"> <li>1. Set the <b>ORBClass</b> variable to point to the VisiBroker: org.omg.CORBA.ORBClass = com.visigenic.vbroker.orb.ORB</li> <li>2. Set the <b>ORBSingletonClass</b> variable to point to the VisiBroker: org.omg.CORBA.ORBSingletonClass = com.visigenic.vbroker.orb.ORB</li> </ol>

## Security authorizations for Java CORBA Agent using JNDI

If you are customizing a client that will be using the JNDI locator policy with Java security enabled, you should perform the security authorizations described in Table 30.

Table 30. Security authorizations for Java CORBA Agent using JNDI

Step	Description	Action
1	Security authorizations for Java Agent using RMI or JNDI	<p>If you want to use an MQ Workflow Java CORBA Agent using JNDI locator policy with security enabled, the following authorizations must be added to the file &lt;JavaHome&gt;/jre/lib/security/java.policy on every client that is using JNDI locator policy with Java security enabled:</p> <pre>grant codeBase "file:~/Workflow InstallDir/bin/-" {     permission java.util.PropertyPermission "*", "read, write";     permission java.net.SocketPermission "*:&lt;JNDINameServerPort&gt;",         "accept, connect, listen, resolve";     permission java.net.SocketPermission "*:1024-",         "accept, connect, listen, resolve";     permission java.lang.RuntimePermission "accessClassInPackage.sun.misc"; };</pre> <p><b>Note:</b> Be sure to use the correct path for your MQ Workflow installation directory in the codeBase attribute, and replace &lt;JNDINameServerPort&gt; with your value for the actual name server TCP/IP port number from Table 11 on page 33.</p>
2	Security authorizations for WebSphere Application Server with JNDI	<p>If WebSphere Application Server is used as JNDI Naming Service, the following authorizations also have to be added to the &lt;JavaHome&gt;/jre/lib/security/java.policy file on every client:</p> <pre>grant codeBase "file:~/WebSphereInstDir/lib/*" {     permission java.util.PropertyPermission "*", "read, write";     permission java.net.SocketPermission "*:*",         "accept, connect, listen, resolve"; };</pre> <p><b>Note:</b> Be sure to substitute the path for your WebSphere Application Server installation directory in the codeBase attribute for <i>WebSphereInstDir</i>.</p>

## Creating an MQ Workflow configuration

The following sections describe how to define a new configuration, select which components you want to configure, and enter the information required for the selected components.

### Enter the configuration identifier and select components

To create a new configuration, you must start the configuration utility as root, and select which components you want to configure. This is described in Table 31.

Table 31. Enter the configuration identifier and select components

Step	Description	Action
1	Log on as root	Log on as <b>root</b>
2	If you are about to create an Oracle database or use an existing one	<p>If you are about to create an Oracle database or use an existing one, enter the following commands:</p> <ol style="list-style-type: none"> <li>1. ksh  <code>export ORACLE_BASE=&lt;oracle_base_path&gt;</code>  <code>export ORACLE_HOME=&lt;oracle_home_path&gt;</code>  <code>export PATH=\$PATH:\$ORACLE_HOME/bin</code></li> <li>2. On AIX, also enter:  <code>export LIBPATH=\$LIBPATH:\$ORACLE_HOME/lib</code></li> <li>3. On Sun Solaris, also enter:  <code>export LD_LIBRARY_PATH=\$LD_LIBRARY_PATH:\$ORACLE_HOME/lib</code></li> </ol>
3	Start the MQSeries Workflow configuration utility	<p>Enter the command: <b>fmczutil</b></p> <p><b>Note:</b> If you want to use the input that was previously saved to a file, enter the command:</p> <pre>fmczutil -f&lt;filename&gt;</pre> <p>The input values contained in the file will appear in <code>fmczutil</code> as the default values which you can accept or modify. If you do not specify a file name, the help information is displayed.</p>

Table 31. Enter the configuration identifier and select components (continued)

Step	Description	Action
4	Create a new configuration	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px;"> <pre>FMC332011 Configuration Commands Menu: l ... List s ... Select c ... Create d ... Change default configuration x ... Exit Configuration Commands Menu</pre> </div> <p>For a new configuration, select <b>c</b>.</p> <p><b>Note:</b> If you are not creating a new configuration, you can use the following options: Option <b>l</b> lists configuration identifiers for all MQ Workflow configurations that have already been defined. Option <b>s</b> allows you to select an already defined MQ Workflow configuration to work on; this option is only displayed if a configuration already exists. Option <b>d</b> allows you to change the default configuration; this option is only displayed if more than one configuration exists.</p>
5	Enter configuration identifier	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px;"> <pre>Configuration identifier : [FMC]</pre> </div> <p>Press enter to accept the default configuration identifier, or enter your own value.</p>
6	Enter the configuration administrator	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px;"> <pre>Configuration administrator : [fmc]</pre> </div> <p>Press Enter to accept the default value for the user that will be allowed to update the configuration-related data, or enter your own value.</p>

Table 31. Enter the configuration identifier and select components (continued)

Step	Description	Action
7	Select the components to configure	<p>When you see:</p> <pre style="border: 1px solid black; border-radius: 10px; padding: 10px;"> FMC33210I Select Category Menu: s ... ( ) Server<sup>1</sup> i ... ( ) Runtime Database Utilities c ... ( ) Client<sup>2,3</sup> j ... ( ) Java Agent<sup>4,5</sup> w ... ( ) Web Client<sup>5</sup> a ... all n ... none x ... Exit Select Category Menu </pre> <p><b>Note:</b> Only the components that have been installed will appear in the menu. For an explanation of the options, see the notes following this table.</p> <p>Select one or more components:</p> <ol style="list-style-type: none"> <li>1. To select the components that you want to configure, enter the letter for the option you wish to select. Each time that you make a selection, the menu is displayed again, with an '(X)' indicating which components have been selected. Selected components can be deselected by reentering the option.</li> <li>2. When you have selected all components that you want to configure, enter <b>x</b> to exit the selection menu. The configuration utility will then start prompting you for the configuration information needed to configure the components that you have selected.</li> </ol>

**Notes:**

1. Selecting the server will also select the Runtime database utilities, and the Administration Utility part of the Client component (if it is installed). The Runtime database utilities component is a subset of the server. The Administration Utility is not required by the server, but it is recommended for verifying functionality.
2. Select client if you want to use any of the following MQ Workflow clients: administration utility, API Runtime libraries, or Program Execution Agent.
3. If MQSeries server APIs are to be used, option c is displayed as "Client with queue manager". This allows you to configure a client concentrator, or to make a normal client use MQSeries Server APIs.
4. Selecting the Java Agent will also select the API Runtime libraries part of the Client component, since this component is required by the Java Agent.
5. If you select the Web Client and Java agent, they will share the same configuration, and Local bindings (LOC\_LOCATOR) is used as the locator policy. If you select the Web Client and do not select the Java agent, it is



assumed that the agent is on a different machine, and Java Naming and Directory Interface (JNDI\_LOCATOR) is used as the locator policy. In this case, the Java API will be used.

- If you are using MQSeries 5.1 on AIX from within Java 2, you need to export the following setting in the invoking shell and in the Java agent script files:

```
export LDR_CNTRL=MAXDATA=0x30000000
```

Use this setting with caution: From this shell you cannot invoke MQSeries commands like `strmqm`. For further information, see the MQSeries Java Support Pack readme at <http://www.ibm.com/software/ts/mqseries/support/summary/jvreadme.html>

## Entering further information

The information that you now have to enter depends on the components that you selected in the previous stage. Table 32 describes what further configuration information you will have to enter.

Table 32. Configuration information required for each selected component

Selected components	Configuration information required				
	Runtime database: see table 33 or 34	Queue manager: see table 35	Client: see table 36	Java CORBA Agent: see table 37	Web Client: see table 38
Server	Yes	Yes			
Runtime Database Utilities	Yes				
Client <sup>1</sup>			Yes		
Client with queue manager <sup>1</sup>		Yes			
Java Agent <sup>2</sup>			Yes	Yes	
Web Client <sup>2</sup>					Yes
all	Yes	Yes	Yes	Yes	Yes

### Notes:

- If MQSeries server APIs are to be used, the 'Client' component is described as 'Client with queue manager'. This is required when the client is on a machine that has an MQSeries server installed, for example, when creating a client concentrator.
- These components are not available on HP-UX.

## Enter information for a DB2 Runtime database

If you are not configuring a server or Runtime database utilities, you can skip to “Entering queue manager information” on page 83.

If you want to use DB2 for the Runtime database, you must perform the actions described in Table 33. If you want to use Oracle for the Runtime database, you must perform the actions described in Table 34 on page 81.

Table 33. Entering information for a DB2 Runtime database

Step	Description	Action
1	Select new database	<p>When you see:</p> <pre> - Configuration of Runtime database ...   u ... ( ) Use an existing Runtime database   n ... (X) Create a new Runtime database                     </pre> <ol style="list-style-type: none"> <li>If you are configuring the first system in a system group, press Enter to select the default option <b>n</b> for a new database.</li> <li>If you are creating an additional system in an existing system group, enter <b>u</b> to use an existing database.</li> </ol>
2	Select local or remote database	<p>When you see:</p> <pre> l ... (X) Local database r ... ( ) Remote database                     </pre> <p>enter <b>r</b> if the database will be on a remote machine, or press Enter to accept the default for a database on the local machine.</p>
3	If you selected <b>local database</b> , enter instance name	<p>If you selected <b>local database</b>, and you see:</p> <pre> DB2 instance           : [db2inst1] DB2 database           : [FMADB]                     </pre> <ol style="list-style-type: none"> <li>Enter the DB2 instance that will contain the new Runtime database. <b>Note:</b> The DB2 instance name is case-sensitive on UNIX.</li> <li>Enter the database name.</li> </ol>

Table 33. Entering information for a DB2 Runtime database (continued)

Step	Description	Action
4	If you selected <b>remote database</b> , enter information for remote database	<p>If you selected <b>remote database</b>, and you see:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <pre>Local DB2 instance where the remote DB2 instance is cataloged :[db2inst1] DB2 remote instance           : [] DB2 database                   : [FMCDB]</pre> </div> <ol style="list-style-type: none"> <li>1. Enter the local DB2 instance where the remote DB2 instance is cataloged.</li> <li>2. Enter the remote DB2 instance. <b>Note:</b> This is the name of the DB2 instance on the machine that will host the Runtime database. This is the value for <i>instance-name</i> that you used during “Catalog the existing remote DB2 instance” on page 69.</li> <li>3. Enter the database name.</li> </ol> <p><b>Note:</b> DB2 instance names are case-sensitive on UNIX.</p>
5	Enter database administrator’s user ID	<p>When you see:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <pre>DB2 user ID of database administrator : [fmc]</pre> </div> <p>Enter the database administrator’s user ID.</p>
6	If you are creating a <b>new database</b> , enter database locations	<p>If you are creating a <b>new database</b>, you will see:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <pre>DB2 database layout file : [/var/fmc/cfgs/FMC/fmcdblay.ini] DB2 database location    : [/var/fmc/rt_db/db2inst1/FMCDB] DB2 container location   : [/var/fmc/rt_db/db2inst1/FMCDB] DB2 Log files location   : [/var/fmc/rt_db/db2inst1/FMCDB]</pre> </div> <ol style="list-style-type: none"> <li>1. Enter the path to the file that defines the database layout. <b>Note:</b> If the file does not exist, it will be created by the configuration utility.</li> <li>2. Enter the path for the Runtime database.</li> <li>3. Enter the path for its containers.</li> <li>4. Enter the path for the log files for backup and error recovery.</li> </ol> <p><b>Note:</b> For a three-tier setup, or if you do not want to use the default directories, these directories must exist on the machine hosting the Runtime database, and the DB2 instance on the machine hosting the Runtime database must be authorized to access these directories. For more information, see the <i>IBM DB2 Administration Getting Started</i> online manual.</p>

Table 33. Entering information for a DB2 Runtime database (continued)

Step	Description	Action
7	If you are creating a <b>new database</b> , select the space management	<p>If you are creating a <b>new database</b>, you will see:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <pre>FMC33526I Select space management ...: s ... (X) Managed by system d ... ( ) Managed by database r ... ( ) Managed by database (using raw device)</pre> </div> <p>Select one of the space management options.  <b>Note:</b> The option Raw device is only available on AIX. For more information about space management, see the <i>IBM DB2 Administration Guide</i> online manual.</p>
8	Enter Runtime database user ID	<p>When you see:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <pre>DB2 user ID to access Runtime database : [fmc]</pre> </div> <p>Enter the DB2 user ID that is to be used to access the Runtime database.  <b>Note:</b> The default value is the configuration administrator user ID that you specified earlier. During creation of the database this user ID will be granted the required access rights. If the database already exists, you can perform “Granting the right to start and stop the MQSeries Workflow system” on page 116 later.</p>
9	Enter data to populate the Runtime database	<p>When you see:</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <pre>System group name      : [FMCGRP] System name           : [FMCSYS] Queue manager name    : [FMCQM] Queue prefix          : [FMC]</pre> </div> <ol style="list-style-type: none"> <li>1. Enter the name of the system group that the Runtime database will serve.</li> <li>2. Enter the name of a system in the system group.</li> <li>3. Enter the name of the queue manager.</li> <li>4. Enter a queue prefix. This is used to set a high-level qualifier for queue names in your MQ Workflow system. For details, refer to the MQSeries online documentation.</li> </ol> <p><b>Note:</b> This information will be used to populate the Runtime database when it is created. A Runtime database that does not contain this information is not valid, and cannot be used by MQ Workflow. If you are using an existing database, this information is used to generate an FDL file <code>&lt;ConfigurationRootDirectory&gt;/cfigs/&lt;ConfigID&gt;/fd1/fmcnews.fdl</code>, which you can import into the Runtime database as described in “Importing topology FDL” on page 104.</p>

## Enter information for an Oracle Runtime database

If you want to use Oracle for the Runtime database, you must perform the actions described in Table 34.

Table 34. Entering information for an Oracle Runtime database

Step	Description	Action
1	Select new database	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre>- Configuration of a Runtime database ...  u ... ( ) Use an existing Runtime database n ... (X) Create a new Runtime database</pre> </div> <ol style="list-style-type: none"> <li>1. If you are configuring the first system in a system group, press Enter to select the default option <b>n</b> for a new database.</li> <li>2. If you are creating an additional system in an existing system group, enter <b>u</b> to use an existing database.</li> </ol>
2	Enter database SID	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre>Oracle database SID           : [FMCDDB]</pre> </div> <p>Enter the Oracle database SID, or press Enter to accept the default value.  <b>Note:</b> The maximum SID length is only six characters.</p>
3	Enter database alias	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre>Database alias                : [FMCDDB]</pre> </div> <p>Enter the database alias used to connect to the database.</p>
4	Enter the Oracle administrator user ID	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre>Oracle administrator         : [oracle]</pre> </div> <p>Enter the Oracle database creator user ID.</p>
5	If you are creating a new database, enter database directories	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre>Database administration directory : [/var/fmc/rt_db/admin/FMCDDB] Database container directory      : [/var/fmc/rt_db/oradata/FMCDDB] Database log directory            : [/var/fmc/rt_db/oradata/FMCDDB]</pre> </div> <p>Enter the directories to be used for administration, data, and log files.  <b>Note:</b> If you specify directories other than the suggested defaults, they must already exist and be owned by the Oracle database administrator user ID (for example, the default user oracle).</p>

Table 34. Entering information for an Oracle Runtime database (continued)

Step	Description	Action
6	Enter Runtime database user ID	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <p style="text-align: center;">Oracle user ID to access Runtime database : [fmc]</p> </div> <p>Enter the user ID that is to be used to access the Oracle Runtime database.</p> <p><b>Note:</b> This user ID will be granted the required access rights. If the database already exists, you must specify the user ID you selected when creating the database.</p>
7	Enter data to populate the Runtime database	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <p>System group name : [FMCGRP]  System name : [FMCSYS]  Queue manager name : [FMCQM]  Queue prefix : [FMC]</p> </div> <ol style="list-style-type: none"> <li>1. Enter the name of the system group that the Runtime database will serve.</li> <li>2. Enter the name of a system in the system group.</li> <li>3. Enter the name of the queue manager.</li> <li>4. Enter a queue prefix. This is used to set a high-level qualifier for queue names in your MQ Workflow system. For details, refer to the MQSeries online documentation.</li> </ol> <p><b>Note:</b> This information will be used to populate the Runtime database when it is created. A Runtime database that does not contain this information is not valid, and cannot be used by MQ Workflow. If you are using an existing database, this information is used to generate an FDL file <code>&lt;ConfigurationRootDirectory&gt;/cfigs/&lt;ConfigID&gt;/fd1/fmcznews.fdl</code>, which you can import into the database as described in “Importing topology FDL” on page 104.</p>

## Entering queue manager information

If you are not configuring a server or a client with queue manager, skip to “Entering connection information for a client (or Java agent)” on page 86.

Table 35. Entering queue manager information

Step	Description	Action
1	If you are <b>not configuring a server or Runtime database utilities</b> , enter client connection information	<p>If you see:</p> <pre> System group name      : [FMCGRP] System name           : [FMCSYS] Queue manager name    : [FMCQM] Queue prefix          : [FMC] </pre> <ol style="list-style-type: none"> <li>1. Enter the name of the system group containing the system.</li> <li>2. Enter the name of the system that the client is to connect to.</li> <li>3. Enter the name of the queue manager to create.</li> <li>4. Enter the queue prefix used by the queue manager.</li> </ol>
2	Select log type	<p>When you see:</p> <pre> - Configuration of queue manager ... FMC33513I Select log type ...: c ... (X) Circular log l ... ( ) Linear log (prerequisite for backup) </pre> <p>Select the logging type that you require by entering <b>c</b> for circular logging, or <b>l</b> for linear logging.</p>
3	Enter log location	<p>When you see:</p> <pre> Queue Manager log files location : [] </pre> <p>Enter a location where the log files are to be created, or to use the default MQSeries log file location press Enter without specifying a location.</p>
4	Enter channel table	<p>When you see:</p> <pre> Channel definition table file: [/var/fmc/chl1tabs/MQWFCHL.TAB] </pre> <p>Enter the name of the channel definition table.  <b>Note:</b> Make a note of this file path. This file will be required by any MQSeries client that wants to connect to the queue manager you are currently configuring. If the file does not exist, it will be created.</p>

Table 35. Entering queue manager information (continued)

Step	Description	Action
5	Enter TCP/IP information	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <pre>TCP/IP address      : [hostname] TCP/IP port number  : [5010]</pre> </div> <ol style="list-style-type: none"> <li>1. Enter the TCP/IP address or hostname of your machine.</li> <li>2. Enter an unused TCP/IP port number.</li> </ol>
6	Enter principal name	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <pre>Principal name      : [fmc]</pre> </div> <p>Enter the Principal user ID.</p> <p><b>Note:</b> The default value for the principal name is the value you specified as the configuration administrator. During creation of the queue manager and definition of the channels and queues this user ID will be granted the required access rights.</p>
7	Enter the cluster name	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <pre>Cluster name       : [FMCGRP]</pre> </div> <p>Enter the name of the cluster that the queue manager will be a member of. The default value is the name of the MQ Workflow system group.</p>
8	If you are configuring a server, select the repository type	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <pre>FMC33537I Select repository type ...: f ... ( ) 'FMCQM' is the first queue manager in cluster 'FMCGRP' a ... ( ) 'FMCQM' is an additional queue manager in cluster 'FMCGRP'</pre> </div> <ol style="list-style-type: none"> <li>1. If you selected to create a new database, enter <b>f</b>.</li> <li>2. If you selected to use an existing database, or are configuring a client with queue manager, enter <b>a</b>.</li> </ol> <p><b>Note:</b> The default value, which will be marked with an (X), depends on the information that you have already entered.</p>



Table 35. Entering queue manager information (continued)

Step	Description	Action
9	If you selected <b>additional queue manager</b> or if you are <b>not configuring a server</b> , enter information about the first queue manager	<p>If you selected <b>additional queue manager</b> or if you are <b>not configuring a server</b>, when you see:</p> <pre>FMC33536I: Specify information about the first queue manager in cluster 'FMCGRP' ...: Queue manager name      : [] TCP/IP address          : [] TCP/IP port number      : [5010] Principal name          : [fmc]</pre> <ol style="list-style-type: none"> <li>1. Enter the name of the first queue manager in the cluster.</li> <li>2. Enter the TCP/IP address or host name of the machine where the first queue manager is located.</li> <li>3. Enter the TCP/IP port number that the first queue manager is using.</li> <li>4. Enter the user ID of the Principal that was defined for the first queue manager.</li> </ol>
10	If you are using <b>DB2</b> for the Runtime database, and selected <b>server</b> , enter a transaction coordinator user ID	<p>If you are using <b>DB2</b> for the Runtime database, and you are configuring a <b>server</b>, when you see:</p> <pre>DB2 user ID of transaction coordinator : [fmc]</pre> <p>Enter the user ID that the queue manager should use to access the Runtime database.</p> <p><b>Note:</b> This is required because the MQSeries queue manager is used to coordinate transactions for two-phase commit. The default value for the user ID of the transaction coordinator is the value you specified when prompted for the user ID to access the Runtime database.</p>
11	If you are configuring a <b>server with local DB2 database</b>	<p>If you are configuring a <b>server with local DB2 database</b>, when you see:</p> <pre>FMC33220I Which user ID will regularly start the queue manager 'FMCQM' ?: t ... ( ) the transaction coordinator user ID 'fmc' o ... (X) another user ID within the group 'mqm'</pre> <p>Press Enter to accept the default option <b>o</b> that you will start the queue manager with another mqm group member user ID. Otherwise, if you enter <b>t</b> you must start the queue manager with the transaction coordinator user ID.</p>

## Entering connection information for a client (or Java agent)

If you are configuring any client components or the Java CORBA Agent, you must provide the information described in Table 36. If you have already entered information to configure a server, Runtime database utilities, or entered queue manager information, you have already entered some or all of this information, and the questions will not appear.

Table 36. Entering connection information for a client (or Java agent)

Step	Description	Action
1	Enter client connection information for first system	<p>A client component (or Java agent) requires certain information to be able to establish a connection to a particular MQ Workflow system.</p> <p>If you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre>- Configuration of client ...   System group name      : [FMCGRP]   System name            : [FMCSYS]   Queue manager name     : [FMCQM]   Queue prefix           : [FMC]</pre> </div> <ol style="list-style-type: none"> <li>1. Enter the name of the system group containing the system.</li> <li>2. Enter the name of the system that the client is to connect to.</li> <li>3. Enter the name of the queue manager that is on the system to connect to.</li> <li>4. Enter the queue prefix used by the queue manager.</li> </ol>
2	Enter channel table	<p>If you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre>Channel definition table file: [/var/fmc/chltabs/MQWFCHL.TAB]</pre> </div> <p>Enter the path to the queue manager's channel definition table.  <b>Note:</b> This is the value you noted during step 4 of Table 35 on page 83. Be sure that the client is authorized to access this file.</p>

## Entering information for the Java CORBA Agent

If you are configuring a Java agent, you must provide the information described in Table 37, otherwise skip to “After entering the configuration information” on page 92.

Table 37. Entering information for the Java CORBA Agent

Step	Description	Action
1	If you chose <b>Web Client</b> , enter garbage collection parameters	<p>If you chose <b>Web Client</b>, skip to step 8.  <b>Note:</b> When using a Java CORBA Agent and a Web Client, the local bindings (LOC_LOCATOR) will be used as locator policy.</p>

Table 37. Entering information for the Java CORBA Agent (continued)

Step	Description	Action
2	Choose a locator policy and enter additional information for the service	<p>When you see:</p> <pre> - Configuration of Java Agent ... FMC33509I Select locator policy ...: l ... (X) Local bindings v ... ( ) Visibroker Smart Agent (deprecated) c ... ( ) CORBA Naming Service (deprecated) r ... ( ) JAVA RMI (deprecated) i ... ( ) Interoperable Object Reference (deprecated) j ... ( ) Java Naming and Directory Interface                     </pre> <p>Enter the letter to select a locator policy, or press Enter to accept the default (local bindings), which is marked with an '(X)'.</p> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1. Java RMI Agents should only be used for prototyping. They are currently not suited for production purposes.</li> <li>2. The following locator policies are deprecated: VisiBroker Smart Agent (OSA_LOCATOR), CORBA Naming Service (COS_LOCATOR), Java Remote Method Invocation (RMI_LOCATOR) and Interoperable Object Reference (IOR_LOCATOR). Deprecated means, it is recommended to no longer use these locator policies, they are currently still implemented, they may be removed in future releases, and it is recommended to use other locator policies.</li> </ol>
3	If you did <b>not</b> choose <b>Local bindings</b> , enter agent information	<p>If you did <b>not</b> select <b>Local bindings</b>, when you see:</p> <pre> Agent name                : [MQWFAGENT] JDK/JRE Installation Directory : [/usr/java] Code Version               : [3300]                     </pre> <ol style="list-style-type: none"> <li>1. Enter the name for the Java CORBA Agent.</li> <li>2. Enter the directory on your workstation where the Java Development Kit or Java Runtime Environment has been installed. <b>Note:</b> The lib subdirectory must contain the file rt.jar and the bin subdirectory must contain the executable java</li> <li>3. Enter the code version for the JAR file used by the Java CORBA Agent.</li> </ol>
4	If you chose <b>VisiBroker Smart Agent, CORBA naming service, or Interoperable Object Reference</b> , enter the installation directory	<p>If you chose <b>VisiBroker Smart Agent, CORBA naming service, or Interoperable Object Reference</b>, when you see:</p> <pre> VisiBroker Installation Directory : []                     </pre> <p>Enter the path where VisiBroker is installed. <b>Note:</b> You wrote this down during Prepare the Java CORBA Agent and Java API classes in 2 on page 72.</p>

Table 37. Entering information for the Java CORBA Agent (continued)

Step	Description	Action
5	If you chose the <b>CORBA Naming Service</b> , enter the root name	<p>If you chose the <b>CORBA Naming Service</b>, when you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 5px; margin: 5px 0;">                     Root name context : []                 </div> <p>Enter a name to be used to register the agent.</p>
6	If you chose the option <b>Interoperable Object Reference</b> , enter the IOR path	<p>If you chose the <b>Interoperable Object Reference</b>, when you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 5px; margin: 5px 0;">                     Java IOR Path : []                 </div> <p>Enter the location where the agent publishes its Interoperable Object Reference file.</p>
7	If you chose the option <b>Java Naming and Directory Interface</b>	<p>If you chose <b>Java Naming and Directory Interface</b>, when you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 5px; margin: 5px 0;">                     FMC33508I Select naming context factory ...:                      w ... (X) com.ibm.ejs.ns.jndi.CNInitialContextFactory (IBM WebSphere V3.5)                      j ... ( ) com.sun.jndi.cosnaming.CNCtxFactory (Java 2 Runtime Environment)                      o ... ( ) (Other)                 </div> <ol style="list-style-type: none"> <li>1. Select the naming context factory, or enter <b>o</b> and enter the full name (including package names) of a JNDI naming context factory class.  <b>Note:</b> If the WebSphere Application Server is not installed, the default is <b>j</b>.</li> <li>2. If you selected <b>w</b> or <b>o</b>, when you see:                     <div style="border: 1px solid black; border-radius: 15px; padding: 5px; margin: 5px 0;">                         JAR file containing naming factory : [/usr/WebSphere/AppServer/lib/ujc.jar]                     </div> <p>Enter the filename of the .jar file that contains the naming factory class.</p> </li> <li>3. When you see:                     <div style="border: 1px solid black; border-radius: 15px; padding: 5px; margin: 5px 0;">                         FMC33538I Specify information about the JNDI name server ...:                          TCP/IP address : [hostname]                          TCP/IP port number : [900]                     </div> <p>Enter the TCP/IP address or host name of the machine where the JNDI name server is located and enter the TCP/IP port that the JNDI name server is using.</p> </li> </ol>

Table 37. Entering information for the Java CORBA Agent (continued)

Step	Description	Action
8	Enter garbage collection parameters	<p>When you see:</p> <pre>FMC33606I Specify information about garbage collection (reaper) ...: Agent cycle (in seconds)      : [300] Client threshold (number of objects) : [1000] Client cycle (in % of agent cycle) : [90]</pre> <ol style="list-style-type: none"> <li>1. Enter the length of time between periodic garbage collection. Any value between 30 and 86400 seconds is valid.</li> <li>2. Enter the maximum number of unreferenced objects that will be tolerated by each client before a non-periodic garbage collection is triggered. Any value between 0 and 500000 is valid.</li> <li>3. Enter the ratio between the client-side keep-alive message cycle and the agent-side liveliness check. Any value between 10% and 90% is valid.</li> </ol>

### Entering information for the Web Client

If you are configuring a Web Client, you must provide the information described in Table 38, otherwise skip to “After entering the configuration information” on page 92.

Table 38. Entering information for the Web Client

Step	Description	Action
1	Choose an application server	<p>When you see:</p> <pre>FMC33183I Select application server...: w ... (X) WebSphere o ... ( ) Other</pre> <ol style="list-style-type: none"> <li>1. If you want to use the IBM WebSphere Application Server, press Enter to accept the default <b>w</b>.</li> <li>2. If you do not want to use the WebSphere Application Server, enter <b>o</b>.</li> </ol>

Table 38. Entering information for the Web Client (continued)

Step	Description	Action
2	If you selected <b>other</b> application server	<p>If you selected <b>other</b> application server, configure your Web Server:</p> <ol style="list-style-type: none"> <li>1. Ensure that your Web Server is Servlet 2.1/JSP 1.0 compliant servlet enabled.</li> <li>2. In your Web Server, create an alias <code>/MQWFClient</code> for the MQ Workflow directory: <code>ConfigurationRootDirectory/cfgs/ConfigurationID/webpages</code></li> <li>3. To register the servlet with the servlet container:               <ol style="list-style-type: none"> <li>a. Add <code>InstallationDirectory/bin/javaVRMS/fmcojagt.jar</code> and <code>InstallationDirectory/WebClient/fmcohcli.jar</code> to the servlet container's CLASSPATH. <b>Note:</b> Where <code>InstallationDirectory</code> is the Workflow installation directory. Do not extract the <code>.class</code> files to the servlet container's servlet directory.</li> <li>b. For servlet API version 2.1: Register <code>com.ibm.workflow.servlet.client.Main</code> as <code>/MQWFClient/servlet/Main</code> with the servlet container.</li> <li>c. For servlet API 2.2 and later: In your servlet container, create a Web Application with root URI <code>/MQWFClient</code> and document root <code>ConfigurationRootDirectory/cfgs/ConfigurationID/webpages</code>.</li> <li>d. If you are using the Local bindings (LOC_LOCATOR) locator policy (this is the default, see <code>WebClient.properties</code>), make sure that the JNI libraries <code>fmcojprf</code> and <code>fmcojloc</code> are in the shared library path for the servlet container and that the servlet container's JVM is running under an account that is authorized to access MQSeries.</li> </ol> </li> </ol>
3	Specify the Java Code Level	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 5px; width: fit-content; margin: 10px auto;"> <span style="margin-right: 20px;">Code Version</span> <span style="border-bottom: 1px solid black; display: inline-block; width: 100px;"></span> <span style="margin-left: 20px;">: [3300]</span> </div> <p>Press Enter to accept the MQ Workflow code level of Java that will be used for the Web Client, or enter a different code version number.</p>

Table 38. Entering information for the Web Client (continued)

Step	Description	Action
4	If you are <b>not</b> configuring a <b>Java Agent</b> , enter information about the Java Agent	<p>In this case, your Java Agent should already be configured (typically on another machine), and you must enter information about it. When you see:</p> <pre> Agent name           : [MQWFAGENT] Code Version         : [3300] </pre> <ol style="list-style-type: none"> <li>1. Enter the name for the Java Agent.</li> <li>2. Enter the code version for the JAR file used by the Java Agent.</li> <li>3. When you see: <pre> FMC33508I Select naming context factory ...: w ... (X) com.ibm.ejs.ns.jndi.CNInitialContextFactory (IBM WebSphere V3.5) j ... ( ) com.sun.jndi.cosnaming.CNCTXFactory (Java 2 Runtime Environment) o ... ( ) (Other) </pre> <p>Select the naming context factory, or enter <b>o</b> and enter the full name (including package names) of a JNDI naming context factory class.</p> </li> <li>4. When you see: <pre> FMC33538I Specify information about the JNDI name server ...: TCP/IP address       : [hostname] TCP/IP port number   : [900] </pre> <ol style="list-style-type: none"> <li>a. Enter the TCP/IP address or host name of the machine where the JNDI name server is located.</li> <li>b. Enter the TCP/IP port that the JNDI name server is using.</li> </ol> </li> </ol>
5	If you selected <b>WebSphere</b> , enter path, IP address, and configuration file	<p>If you selected <b>WebSphere</b>, when you see:</p> <pre> FMC33186I Specify information about the WebSphere Application Server...: Installation directory       : [/usr/WebSphere/AppServer] TCP/IP address of administration node : [hostname] XML configuration skeleton file name : [fmc35.skel] </pre> <ol style="list-style-type: none"> <li>1. Enter the path where the IBM WebSphere Application Server is installed.</li> <li>2. Enter the TCP/IP address or host name of the machine where the IBM WebSphere Application Server administration node is located.</li> <li>3. Enter the file name of the skeleton file to be used for XML configuration within WebSphere.</li> </ol>

**Note:** Do not use the directory *ConfigurationRootDirectory/cfgs/ConfigurationID/webpages* for development. If the corresponding configuration is deleted, the webpages subdirectory will also be deleted. Use another directory for development and copy the necessary files to the webpages subdirectory.

## After entering the configuration information

Only after you have entered all the necessary configuration information does the configuration tool perform any actions.

Table 39. After entering the configuration information

Step	Description	Action
1	Create the configuration profile	<p>When you see:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <pre>c ... Create configuration profile for 'FMC' now s ... Save input to file r ... Review/change input x ... Exit (input for configuration 'FMC' will be lost)</pre> </div> <ol style="list-style-type: none"> <li>1. If you want to proceed, enter <b>c</b>, then various directories and files will be created. For more details about what is created, see “Changes made by the configuration utility fmczutil” on page 225.</li> <li>2. If you want to save the input you have entered into a file, enter <b>s</b>. You will be prompted for a file name, the default is fmczcfg.dat.</li> <li>3. If you want to review the input you have entered, enter <b>r</b>. The values that you have entered will appear as the defaults which you can change if you wish.</li> <li>4. If you want to exit, enter <b>x</b>. Your input will be lost, and you will be returned to the Configuration Commands menu.</li> </ol>
2	If you want to create a <b>new</b> Runtime database	<p>If you have defined a new Runtime database, you will see:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <pre>Do you want to create the Runtime database 'FMCDB' now? y ... Yes n ... No</pre> </div> <ol style="list-style-type: none"> <li>1. If you want to create the database later, enter <b>n</b>. How to create the database at a later stage is described in “Creating a Runtime database” on page 103.</li> <li>2. It is recommended that you enter <b>y</b> to create the database now. When you see: <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <pre>Enter password for user ID 'fmc'      : [] Confirm password for user ID 'fmc'   : []</pre> </div> <ol style="list-style-type: none"> <li>a. Enter the password for the user ID.</li> <li>b. Enter the password again.</li> </ol> </li> </ol>



Table 39. After entering the configuration information (continued)

Step	Description	Action
3	If you are using an <b>existing</b> Runtime database, you can load the FDL into the Runtime database	<p>If you are using an existing Runtime database, you will see:</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <pre>Do you want to load FDL for system 'FMCSYS' into the Runtime database 'FMCDB' now? y ... Yes n ... No</pre> </div> <ol style="list-style-type: none"> <li>1. If you do not want to load the new configuration for the system into the Runtime database, enter <b>n</b>. How to do it later is described in “Importing topology FDL” on page 104.</li> <li>2. It is recommended that you enter <b>y</b> to load the new configuration for the system into the Runtime database. When you see: <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <pre>MQ Workflow user ID to import FDL      : [ADMIN] MQ Workflow password for user 'ADMIN'  : [] Enter password for user ID 'fmc'      : [] Confirm password for user ID 'fmc'    : []</pre> </div> <ol style="list-style-type: none"> <li>a. Enter the MQ Workflow user ID that is to be used to import the FDL. <p><b>Note:</b> The default user is ADMIN. This user ID is an internal Workflow user ID that is defined in the Runtime database. It is not necessary for this user ID to exist at the operating system level.</p> </li> <li>b. Enter the password for the user ID. <p><b>Note:</b> The default password for the default user ADMIN is ‘password’.</p> </li> <li>c. Enter the password for the user ID to access the Runtime database.</li> <li>d. Enter the password again.</li> </ol> </li> </ol>
4	If you are configuring a server or a client that will use MQSeries server APIs (for example a client concentrator), you can create the queue manager	<p>If you see:</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <pre>Do you want to create the queue manager 'FMCQM' now? y ... Yes n ... No</pre> </div> <ol style="list-style-type: none"> <li>1. If you do not want to create the queue manager now, enter <b>n</b>. You can create it later as described in “Creating a queue manager” on page 106.</li> <li>2. It is recommended that you enter <b>y</b> to create the queue manager now. If you are configuring a server, when you see: <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <pre>Enter password for user ID 'fmc'      : [] Confirm password for user ID 'fmc'    : []</pre> </div> <ol style="list-style-type: none"> <li>a. Enter the password for the Transaction Coordinator user ID that the queue manager will use for two-phase commits on the Runtime database.</li> <li>b. Enter the password again.</li> </ol> <p>Now the queue manager will be created on behalf of the user mqm.</p> </li> </ol>

Table 39. After entering the configuration information (continued)

Step	Description	Action
5	If you are configuring a <b>Web Client</b> and selected <b>WebSphere</b> as application server, you can configure the Web Client within WebSphere	<p>If you are configuring a Web Client and selected IBM WebSphere as application server, when you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <p>- Do you want to configure the Web Client within the WebSphere Application Server now?</p> <p>y ... Yes</p> <p>n ... No</p> </div> <ol style="list-style-type: none"> <li>1. If you want to configure the Web Client within WebSphere Application Server later, enter <b>n</b>. How to configure the Web Client within WebSphere at a later stage is described in “Configuring the Web Client within WebSphere Application Server” on page 107.</li> <li>2. If you want to configure the Web Client within WebSphere now:               <ol style="list-style-type: none"> <li>a. Make sure that the WebSphere Application Server is running.</li> <li>b. Enter <b>y</b>.</li> <li>c. Output from the WebSphere XMLConfig program will fill the screen.</li> <li>d. Success is indicated by the final message:                   <ul style="list-style-type: none"> <li>- FMC33659I The configuration within the WebSphere Application Server was successful.</li> </ul> </li> </ol> </li> </ol>
6	Exit the configuration utility	Enter <b>x</b> to exit the utility.
7	If you are configuring a <b>Web Client</b> , authorize the root as a valid principal	<p>If you are configuring a <b>Web Client</b>, authorize the root as a valid principal by entering the command:</p> <pre>fmczdmqa -y ConfigurationID -p root</pre>
8	Verify your server	Now you have created an MQ Workflow configuration, it should be ready to use. However, it is recommended that you perform the steps described in “Chapter 9. Verifying an MQ Workflow server on UNIX” on page 95.

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## Chapter 9. Verifying an MQ Workflow server on UNIX

The verification process is identical for AIX, HP-UX, and Sun Solaris. After configuration you should verify that the components are working by performing the verification described in Table 40.

This simple verification involves running the configuration checker, starting the MQ Workflow system and administration utility, and shutting the system down again.

Table 40. Verifying MQ Workflow server on UNIX

Step	Description	Action
1	Check identifiers	You need to know your values for the following identifiers: <b>ConfigID</b> The identifier of the server configuration as specified by the root user as described in "Creating an MQ Workflow configuration" on page 74. <b>MQQueueManager</b> Your MQ Workflow system's MQSeries queue manager.
2	Log on	Log on with a user ID that has administration rights for the configuration that is to be verified.
3	Check the server configuration	1. Enter the command <code>fmczchk -y &lt;ConfigID&gt;</code>  <b>Note:</b> You should always check the configuration after creating or changing an MQ Workflow configuration. For information about other options, see "Appendix Q. Using the configuration checking utility fmczchk" on page 331. 2. If there were any errors or warnings, check the log file <code>fmczchk.log</code> in the current directory.
4	Start the Runtime database subsystem	Start your DB2 or Oracle Runtime database subsystem. To start DB2: 1. Log on as owner of the DB2 instance ( <b>db2inst1</b> is the default) or a user ID in the DB2 administration group ( <b>db2iadm1</b> is the default). 2. Enter the command: <code>db2start</code> 3. Log off as owner of the DB2 instance. To start Oracle, refer to the Oracle product documentation.

Table 40. Verifying MQ Workflow server on UNIX (continued)

Step	Description	Action
5	Load process data into the Runtime database (optional)	<p>If you already have a process model:</p> <ol style="list-style-type: none"> <li>1. Transfer your process model data <i>yourprocess.fdl</i> to your machine.</li> <li>2. Enter the command:  <pre>fmcibie -i=yourprocess.fdl -u=ADMIN -p=password -o -t -l</pre> <p>where option <b>-o</b> overrides existing definitions in the database, <b>-t</b> translates the process so that an instance can be created, and <b>-l</b> creates a log file with the same name as the FDL file name with the extension of <i>.log</i>.</p> <p><b>Note:</b> You can create process models using the MQSeries Workflow Buildtime component on a Windows 2000 or NT workstation. Your process model and staff definitions are exported as an FDL file.</p> </li> </ol>
6	Start the MQSeries resources	<ol style="list-style-type: none"> <li>1. Log on using a user ID that is in the group <b>mqm</b>.</li> <li>2. Start the queue manager by entering the command:  <pre>strmqm &lt;MQQueueManager&gt;</pre> </li> <li>3. Start the trigger monitor by entering the command:  <pre>runmqtrm -m&lt;MQQueueManager&gt; -q FMCTRIGGER &amp;</pre> </li> </ol>
7	Start the administration server (and the system)	<ol style="list-style-type: none"> <li>1. Log on as theMQ Workflow configuration administrator.</li> <li>2. Enter the command:  <pre>fmcmain -y &lt;ConfigID&gt; &amp;</pre> </li> <li>3. You will see messages reporting which servers have started.</li> </ol>

Table 40. Verifying MQ Workflow server on UNIX (continued)

Step	Description	Action
8	Start the administration utility	<ol style="list-style-type: none"> <li>1. Log on as the MQ Workflow configuration administrator.</li> <li>2. Enter the command:  <code>fmcautil -y &lt;ConfigID&gt; -uADMIN -ppassword</code> <p><b>Note:</b> Initially, the user ID is set to 'ADMIN', and the password is set to 'password'. No '&amp;' is required after this command since <code>fmcautil</code> cannot run in the background.</p> </li> <li>3. The verification is successful if you see the administration utility's main menu:</li></ol>
9	Perform other testing (optional)	<p>While the system is running, you can perform other tests.</p> <ul style="list-style-type: none"> <li>• For more information about using the MQ Workflow administration utility to start and stop MQ Workflow server components, see <i>IBM MQSeries Workflow: Administration Guide</i>.</li> <li>• To test a client connection perform "Testing a client connection to a UNIX server" on page 98.</li> </ul>
10	Stop the system	<p>From the administration utility's main menu:</p> <ol style="list-style-type: none"> <li>1. Enter <b>s</b> for system commands.</li> <li>2. Enter <b>d</b> (shutdown system).</li> <li>3. You will see messages reporting which components have stopped.</li> <li>4. Finally, a message will report that the system has stopped.</li> </ol>
11	Stop the administration utility	Select option <b>x</b> twice to exit the administration utility.
12	Shut down other subsystems	<p>If required:</p> <ul style="list-style-type: none"> <li>• To stop the MQSeries queue manager and trigger monitor, you must be logged on with a user ID in the group <code>mqm</code>, and enter the command:  <code>endmqm -i &lt;MQQueueManager&gt;</code></li> <li>• To stop DB2, you must be logged on with a user ID that is in the DB2 administration group, and enter the command:  <code>db2stop</code></li> </ul>
13	Log off	Log off.

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## Testing a client connection to a UNIX server

Since the standard client is not available for UNIX, it is recommended that you verify that a Windows client can connect to your UNIX server. This client connection test assumes that you have installed, configured, and verified an MQ Workflow server. For this test you will install and configure an MQ Workflow client on a Windows workstation, and then verify that it can connect to a server.

Table 41. Testing a client connection to a UNIX server

Step	Description	Action
1	Copy the server's channel table to the client machine	Copy the Workflow server's channel table to the client machine in binary mode. <b>Note:</b> If you used the installation defaults, this file is in <code>/var/fmc/chltabs/MQWFCHL.TAB</code> . For a Runtime client on Windows 2000 and NT the file should be copied to the directory <code>C:\Program Files\MQSeries Workflow\chltabs</code>
2	Prepare a Workflow Runtime client	Install and configure an MQ Workflow Runtime client on NT, as described in "Appendix F. Quick client setup on Windows" on page 241.
3	Check the client configuration	On the client machine: <ol style="list-style-type: none"><li>1. Enter the command: <code>fmczchk -y &lt;ConfigID&gt;</code>  where <code>&lt;ConfigID&gt;</code> is the configuration identifier for the client configuration. <b>Note:</b> For information about other options, see "Appendix Q. Using the configuration checking utility <code>fmczchk</code>" on page 331.</li><li>2. If there were any errors or warnings, check the log file <code>fmczchk.log</code> in the current directory.</li></ol>

Table 41. Testing a client connection to a UNIX server (continued)

Step	Description	Action
4	Start the MQ Workflow system	<p>On the server machine: Make sure that the MQ Workflow system and prerequisites are running. Here is a summary of the sequence of commands that must be issued:</p> <ol style="list-style-type: none"> <li>1. If you are using DB2 for the Runtime database, start DB2 with the command: db2start</li> <li>2. If you are using Oracle for the Runtime database, start Oracle.</li> <li>3. Start the MQSeries queue manager with the command: strmqm &lt;MQQueueManager&gt;</li> <li>4. Start the MQSeries trigger monitor with the command: runmqtrm -m&lt;MQQueueManager&gt; -q FMCTRIGGER &amp;</li> <li>5. Start the MQ Workflow administration server with the command: fmcain -y &lt;ConfigID&gt; &amp;</li> </ol>
5	Load a process model into the Runtime database (optional)	<p>If you want to load a process model into the Runtime database:</p> <ol style="list-style-type: none"> <li>1. Change to a directory where you keep your process data.</li> <li>2. Transfer the process data (.fdl file) to a working directory on your MQ Workflow server machine.</li> <li>3. Issue the import command: fmcibie -i=<i>yourprocess.fdl</i> -u=ADMIN -p=password -o -t -l</li> </ol> <p><b>Note:</b> If the FDL file is not in your current directory, you must specify the full path to it. The initial password for the default user "ADMIN" is "password". Option -o overrides existing definitions in the database. Option -t translates the process so that an instance can be created. Option -l creates a log file with the name <i>yourprocess.log</i></p> <ol style="list-style-type: none"> <li>4. Check the log file <i>yourprocess.log</i> for any errors.</li> </ol> <p><b>Note:</b> Be aware that FDL files can also contain topological information, which might overwrite values in the database. This can cause conflicts with configuration data and the server might refuse to start. For information about using the MQ Workflow graphical tool for creating process models, see <i>IBM MQSeries Workflow: Getting Started with Buildtime</i>.</p>

Table 41. Testing a client connection to a UNIX server (continued)

Step	Description	Action
6	Start the Windows client	<p>On the Windows task bar:</p> <ol style="list-style-type: none"> <li>1. Click on the <b>Start</b> button.</li> <li>2. Select <b>Programs</b>.</li> <li>3. Select <b>IBM MQSeries Workflow</b>.</li> <li>4. Select <b>MQSeries Workflow Client - ConfigID</b>.</li> <li>5. If the client establishes a connection to the server without producing any error messages, this test has been a success.</li> </ol>
7	Solving problems if the client does not establish a connection	<p>If the client does not establish a connection successfully, check the following:</p> <ol style="list-style-type: none"> <li>1. Are the prerequisite products started?</li> <li>2. Is the MQ Workflow server started?</li> <li>3. Is the correct channel table accessible to the client?</li> <li>4. The channel table must contain data that was configured on the server that you intend to connect to.</li> <li>5. Has the channel table become corrupted?</li> <li>6. Have you checked both the client and server configurations? For details on how to do this, see "Appendix Q. Using the configuration checking utility fmczchk" on page 331.</li> <li>7. Were any deviations from the default customization values applied consistently to both the client and the server? For example, check that the system group name, system name, queue manager name, and queue prefix entered for the client configuration match those given during the server configuration.</li> </ol>



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## Chapter 10. Changing your configuration on UNIX

After a configuration has been defined and created, there are occasions when you will want to change your configuration. These changes must be performed using the configuration utility. This chapter describes how to perform the following tasks:

- “Starting the configuration utility”
- “Creating a Runtime database” on page 103
- “Importing topology FDL” on page 104
- “Creating a queue manager” on page 106
- “Configuring the Web Client within WebSphere Application Server” on page 107
- “Changing the default configuration identifier” on page 109
- “Adding, modifying, or removing connect names” on page 109
- “Changing the password for the Runtime database user ID” on page 111
- “Changing the password for the transaction coordinator user ID” on page 112
- “Binding packages” on page 113
- “Changing the settings for the Java CORBA Agent” on page 114
- “Granting the right to start and stop the MQSeries Workflow system” on page 116
- “Importing FDL” on page 117

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### Starting the configuration utility

Table 42 describes how to start the configuration utility and select a configuration. This action is required for many of the tasks that change your configuration.

*Table 42. Starting the configuration utility*

Step	Description	Action
1	Log on	Log on as the <b>MQ Workflow configuration administrator user</b> . <b>Note:</b> You must only log on as root if you want to change the default configuration ID.

Table 42. Starting the configuration utility (continued)

Step	Description	Action
2	If you are configuring on <b>HP-UX</b> , change to the appropriate administration group	<p>If you are configuring on <b>HP-UX</b>:</p> <ol style="list-style-type: none"> <li>1. If you are about to create or delete a DB2 Runtime database on HP-UX, you must change to the DB2 administration group by entering the command:  <code>newgrp db2iadm1</code>                      where <code>db2iadm1</code> is your DB2 administration group.</li> <li>2. If you are about to create a new queue manager on HP-UX, you must change to the MQSeries administration group by entering the command:  <code>newgrp mqm</code></li> </ol>
3	Start the configuration utility	<p>Enter the command:  <code>fmczutil</code></p>
4	Select the configuration	<p>When you see:</p> <pre style="border: 1px solid black; border-radius: 10px; padding: 10px;"> FMC33201I Configuration Commands Menu: 1 ... List s ... Select x ... Exit Configuration Commands Menu                     </pre> <ol style="list-style-type: none"> <li>1. Enter <b>1</b> to list all the configurations that have been defined, that you can change.</li> <li>2. Enter <b>s</b> to select one of the configurations that was listed.</li> <li>3. When you see:</li> </ol> <pre style="border: 1px solid black; border-radius: 10px; padding: 10px;"> Configuration identifier : [FMC]                     </pre> <p>Enter the configuration identifier for the MQ Workflow configuration for which you want to modify.</p>
5	Select the Configuration Settings Menu	<p>When you see:</p> <pre style="border: 1px solid black; border-radius: 10px; padding: 10px;"> FMC33202I Selected Configuration Commands Menu: Selected configuration : FMC c ... Configuration Settings Menu r ... Runtime Database Commands Menu q ... Queue Manager Commands Menu w ... Web Client Commands Menu x ... Exit Selected Configuration Commands Menu                     </pre> <p>Select the option required by the task you wish to perform.  <b>Note:</b> Options that are not available will not be displayed. For example: <b>r</b> is only available if a server or Runtime Database Utilities are configured. <b>q</b> is only available if a server (or client using MQSeries Server APIs) is configured, and the starting user ID is member of group 'mqm'. <b>w</b> is only available if a Web Client is configured.</p>

## Creating a Runtime database

If you have defined a Runtime database as described in “Creating an MQ Workflow configuration” on page 74, but have not created it, you must create the database as described in Table 43.

Table 43. Creating a Runtime database

Step	Description	Action
1	Start the configuration utility	Start the MQSeries Workflow configuration utility and select a configuration as described in Table 42 on page 101. <b>Note:</b> If you are using HP-UX, take particular attention of Step 2, Action 1 on page 102.
2	Select the Runtime database commands menu	When you see: <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre>FMC33202I Selected Configuration Commands Menu:   Selected configuration : FMC   c ... Configuration Settings Menu   r ... Runtime Database Commands Menu   q ... Queue Manager Commands Menu   w ... Web Client Commands Menu   x ... Exit Selected Configuration Commands Menu</pre> </div> Enter <b>r</b> for the Runtime Database Commands Menu.

Table 43. Creating a Runtime database (continued)

Step	Description	Action
3	Create a new Runtime database	<p>When you see:</p> <pre style="border: 1px solid black; border-radius: 10px; padding: 10px;"> FMC33206I Selected Runtime Database Commands Menu: Selected Runtime database : FMCDB c ... Create p ... Change password x ... Exit Selected Runtime Database Commands Menu                     </pre> <ol style="list-style-type: none"> <li>1. If you want to create the database now, enter <b>c</b>.  <b>Note:</b> Option 'c' is only available if the database does not exist. If the database already exists, you will also see options for 'Drop', 'Bind packages', and 'Import topology FDL'. Option p allows you to set the password used to access the Runtime database.</li> <li>2. When you see: <pre style="border: 1px solid black; border-radius: 10px; padding: 10px;"> Enter password for user ID 'fmc' : [] Confirm password for user ID 'fmc' : []                     </pre> <ol style="list-style-type: none"> <li>a. Enter the password for the database administrator user ID.</li> <li>b. Enter the password again.</li> </ol> </li> <li>3. The Runtime database is being created. This can take a few minutes, during which several messages appear.  <b>Note:</b> Warning messages during binding can be ignored.</li> <li>4. When you see the message: <pre style="border: 1px solid black; border-radius: 10px; padding: 10px;"> - FMC33911I The new Runtime database FMCDB was created successfully.                     </pre> <p>The Runtime database has been created successfully.</p> </li> </ol>
4	Exit the menu	Enter <b>x</b> three times.

## Importing topology FDL

The procedure described in Table 44 on page 105 can only be used to load FDL containing topology into the Runtime database. The general procedure to import any FDL is described in "Importing FDL" on page 117.

**Note:** This will not replace existing objects.

Table 44. Importing topology FDL

Step	Description	Action
1	Start the configuration utility	Log on as a user with a DB2 or Oracle environment (depending on your Runtime database type), then start the MQSeries Workflow configuration utility and select a configuration as described in Table 42 on page 101.
2	Go to the Runtime Database Commands menu	<p>When you see:</p> <pre> FMC33202I Selected Configuration Commands Menu:       Selected configuration : FMC c ... Configuration Settings Menu r ... Runtime Database Commands Menu q ... Queue Manager Commands Menu w ... Web Client Commands Menu x ... Exit Selected Configuration Commands Menu           </pre> <p>Enter <b>r</b> to display the Runtime Database Commands menu.</p>
3	Import a topology FDL	<p>When you see:</p> <pre> FMC33206I Selected Runtime Database Commands Menu:       Selected Runtime database : FMCDB d ... Drop b ... Bind packages f ... Import topology FDL p ... Change password x ... Exit Selected Runtime Database Commands Menu           </pre> <ol style="list-style-type: none"> <li>1. Enter <b>i</b> to import a topology FDL.</li> <li>2. When you see <pre> FDL file : [/var/fmc/cfgs/FMC/fmcznews.fdl] MQ Workflow user ID to import FDL : [ADMIN] MQ Workflow password for user 'ADMIN' : []           </pre> <ol style="list-style-type: none"> <li>a. Enter the name of the topology FDL file to be imported.</li> <li>b. Enter the MQ Workflow user ID that is to be used to import the FDL. <p><b>Note:</b> The default user is 'ADMIN'. This user ID is an internal Workflow user ID that is defined in the Runtime database. It is not necessary for this user ID to exist at the operating system level.</p> </li> <li>c. Enter the password for the user ID. <p><b>Note:</b> The default password for the default user 'ADMIN' is 'password'.</p> </li> </ol> </li> </ol>
4	Enter the password for the Runtime database user ID	<p>If you see:</p> <pre> Enter password for user ID 'fmc' : [] Confirm password for user ID 'fmc' : []           </pre> <ol style="list-style-type: none"> <li>1. Enter the password for the user ID to access the Runtime database.</li> <li>2. Enter the password again.</li> </ol>

Table 44. Importing topology FDL (continued)

Step	Description	Action
5	Exit the configuration utility	Enter <b>x</b> three times.

## Creating a queue manager

If you have defined a server, or a client that will use MQSeries server APIs (for example a client concentrator), as described in “Creating an MQ Workflow configuration” on page 74, but have not created the queue manager, you must create it by performing the steps in Table 45.

Table 45. Creating a queue manager

Step	Description	Action
1	Start the configuration utility	Start the MQSeries Workflow configuration utility and select a configuration as described in Table 42 on page 101. <b>Note:</b> If you are using HP-UX, take particular attention of Step 2, Action 2 on page 102.
2	Select the queue manager commands menu	When you see: <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <pre>FMC33202I Selected Configuration Commands Menu:   Selected configuration : FMC   c ... Configuration Settings Menu   r ... Runtime Database Commands Menu   q ... Queue Manager Commands Menu   w ... Web Client Commands Menu   x ... Exit Selected Configuration Commands Menu</pre> </div> Enter <b>q</b> for the Queue Manager Commands Menu.
3	Select create a new queue manager	When you see: <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <pre>FMC33208I Selected Queue Manager Commands Menu:   Selected queue manager : FMCQM   c ... Create   d ... Delete   p ... Change password   x ... Exit Selected Queue Manager Commands Menu</pre> </div> Select <b>c</b> to create a previously defined queue manager.

Table 45. Creating a queue manager (continued)

Step	Description	Action
4	If you are configuring a server, enter the transaction coordinator password	<p>If you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <p>Enter password for user ID 'fmc' : <input type="password"/></p> <p>Confirm password for user ID 'fmc' : <input type="password"/></p> </div> <ol style="list-style-type: none"> <li>1. Enter the password for the transaction coordinator user ID.</li> <li>2. Enter the password again.</li> </ol> <p><b>Note:</b> This is required because the MQSeries queue manager is used as a transaction coordinator for two-phase commit.</p>
5	Wait for the queue manager to be created	<p>The queue manager will be created. This may take a few minutes. Several messages will be displayed. The queue manager creation process has finished and the queue manager has been created successfully when the following message appears:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <p>- FMC33736I The queue manager FMCQM has been updated successfully.</p> </div>
6	Exit the configuration utility	Enter <b>x</b> two times.

## Configuring the Web Client within WebSphere Application Server

Table 46 describes the actions you must perform to configure the Web Client within IBM WebSphere Application Server.

Table 46. Configuring the Web Client within WebSphere Application Server

Step	Description	Action
1	Make sure WebSphere is running	Make sure that the WebSphere Application Server is running.
2	Start the configuration utility	Start the MQSeries Workflow configuration utility and select a configuration as described in Table 42 on page 101.

Table 46. Configuring the Web Client within WebSphere Application Server (continued)

Step	Description	Action
3	Select the Web Client commands menu	<p>When you see:</p> <pre> FMC33202I Selected Configuration Commands Menu:       Selected configuration : FMC       c ... Configuration Settings Menu       r ... Runtime Database Commands Menu       q ... Queue Manager Commands Menu       w ... Web Client Commands Menu       x ... Exit Selected Configuration Commands Menu           </pre> <p>Enter <b>w</b> to display the Web Client Commands menu.</p>
4	Select the Configure within WebSphere option	<p>When you see:</p> <pre> FMC33199I Web Client Commands Menu:       c ... Configure within WebSphere       x ... Exit Web Client Commands Menu           </pre> <p>Enter <b>c</b> to configure the Web Client within WebSphere.  <b>Note:</b> If the Web Client was not yet configured within WebSphere Application Server, configuration within the WebSphere will be done right away.</p>
5	If Web Client configuration files already exist	<p>If the Web Client was already configured within WebSphere and the Web Client configuration files already exist, when you see:</p> <pre> FMC33666W The Web Client configuration files already exist.       Do you want to replace them?       y ... Yes       n ... No           </pre> <p>If you want the WebClient to be configured immediately within WebSphere using the existing Web Client configuration files, enter <b>n</b>. If you want to enter new information for the Web Client, enter <b>y</b>, then enter the information as described in Table 38 on page 89.</p>
6	Exit the configuration utility	Enter <b>x</b> three times.
7	Authorize the root as a valid principal	Authorize the root as a valid principal by entering the command: <code>fmczdmqa -y ConfigurationID -p root</code>

If you have problems getting the Web Client working, refer to the WebSphere Application Server documentation, and “Web Client problem determination” on page 124.



## Changing the default configuration identifier

If you have defined more than one configuration, you can change which one is the default configuration as described in Table 47. This changes the value of the `DefaultConfigurationID` variable in the General Configuration Profile. The value of this variable is used by tools such as `fmcautil`, if you do not use the `-y` option to specify a particular configuration identifier.

If you want to delete the default configuration, and it is not the only configuration, you must change the default configuration identifier first.

Table 47. Changing the default configuration

Step	Description	Action
1	Log on	Log on as <b>root</b> .
2	Start the configuration utility	Enter the command: <code>fmczutil</code>
3	Change the default configuration	<p>If more than one configuration is defined, you will see:</p> <pre> FMC33201I Configuration Commands Menu:  1 ... List  s ... Select  c ... Create  d ... Change default configuration  x ... Exit Configuration Commands Menu           </pre> <p>1. Enter <b>d</b> to change the default configuration. 2. When you see:</p> <pre> Enter new default configuration identifier : [FMC]           </pre> <p>Enter the new default configuration identifier.</p>
4	Exit the configuration utility	Enter <b>x</b> .

## Adding, modifying, or removing connect names

A connect name allows a connection to be established with a particular system. Table 48 on page 110 describes how to add or modify a connect name.

Table 48. Adding, modifying, or removing connect names

Step	Description	Action
1	Start the configuration utility	Start the MQSeries Workflow configuration utility and select a configuration as described in Table 42 on page 101.
2	Go to Connect Name Commands menu	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre>FMC33202I Selected Configuration Commands Menu:       Selected configuration : FMC c ... Configuration Settings Menu r ... Runtime Database Commands Menu q ... Queue Manager Commands Menu w ... Web Client Commands Menu x ... Exit Selected Configuration Commands Menu</pre> </div> <ol style="list-style-type: none"> <li>1. Enter <b>c</b> to display the Configuration Settings menu.</li> <li>2. Enter <b>c</b> to display the Client Settings menu.</li> <li>3. Enter <b>c</b> to display the Connect Name Commands menu.</li> </ol>

Table 48. Adding, modifying, or removing connect names (continued)

Step	Description	Action
3	Specify additional connections	<p>When you see:</p> <pre> FMC33229I Connect Name Commands Menu:       Selected configuration : FMC 1 ... List s ... Select a ... Add x ... Exit Connect Name Commands Menu </pre> <ol style="list-style-type: none"> <li>1. If you want to list the connections defined so far, enter <b>1</b>. The connections will be listed, and the Connect Name Commands Menu will be displayed again.</li> <li>2. If you want to modify or remove a connect name, enter <b>s</b>. <ol style="list-style-type: none"> <li>a. If you want to remove the selected connect name, enter <b>r</b>.</li> <li>b. If you want to modify the queue manager name or queue prefix, enter <b>m</b>, and then enter the new queue manager name and queue prefix.</li> </ol> </li> <li>3. If you want to add information so that the client can connect to another system, enter <b>a</b>. When you see: <pre> System group name      : [FMCGRP] System name            : [FMCSYS2] Queue manager name    : [FMCQM2] Queue prefix          : [FMC] </pre> <ol style="list-style-type: none"> <li>a. Enter the name of the system group containing the additional system.</li> <li>b. Enter the name of the additional system that the client is to connect to.</li> <li>c. Enter the name of the queue manager to connect to on the additional system.</li> <li>d. Enter the queue prefix used by the queue manager.</li> </ol> <p>The Connect Name Commands Menu will be displayed again.</p> </li> <li>4. If you do not want to define more connections, or if you want to define them later, enter <b>x</b>. Otherwise, repeat this step as many times as necessary to define all the connections you require.</li> </ol>
4	Exit the configuration utility	Enter <b>x</b> five times.

## Changing the password for the Runtime database user ID

Table 49 on page 112 describes how to change passwords for the user ID that accesses the Runtime database. If the password of the user ID is changed on the system, you also need to change it within MQSeries Workflow.

Table 49. Changing the password for the Runtime database user ID

Step	Description	Action
1	Start the configuration utility	Start the MQSeries Workflow configuration utility and select a configuration as described in Table 42 on page 101.
2	Select the Runtime database commands menu	<p>When you see:</p> <pre style="border: 1px solid black; padding: 10px;"> FMC33202I Selected Configuration Commands Menu:   Selected configuration : FMC   c ... Configuration Settings Menu   r ... Runtime Database Commands Menu   q ... Queue Manager Commands Menu   w ... Web Client Commands Menu   x ... Exit Selected Configuration Commands Menu                     </pre> <p>Enter <b>r</b>.</p>
3	Select the change password option	<p>When you see:</p> <pre style="border: 1px solid black; padding: 10px;"> FMC33206I Selected Runtime Database Commands Menu:   Selected Runtime database : FMCDB   d ... Delete   b ... Bind packages   f ... Import topology FDL   p ... Change password   x ... Exit Selected Runtime Database Commands Menu                     </pre> <ol style="list-style-type: none"> <li>1. Enter <b>p</b>.</li> <li>2. Enter the password.</li> <li>3. Enter the password again.</li> </ol>
4	Exit the configuration utility	Enter <b>x</b> three times.

## Changing the password for the transaction coordinator user ID

Table 50 describes how to change passwords for the user ID that is used for coordinating transactions. If the password of the user ID is changed on the system, you also need to change it within MQSeries Workflow.

Table 50. Changing the password for the transaction coordinator user ID

Step	Description	Action
1	Start the configuration utility	<p>Start the MQSeries Workflow configuration utility and select a configuration as described in Table 42 on page 101.</p> <p><b>Note:</b> If the MQ Workflow configuration administrator user is not in the group <b>mqm</b>, you must start the configuration utility with another user ID that is in the group <b>mqm</b>.</p>

Table 50. Changing the password for the transaction coordinator user ID (continued)

Step	Description	Action
2	Select the queue manager commands menu	<p>When you see:</p> <pre>FMC33202I Selected Configuration Commands Menu:       Selected configuration : FMC       c ... Configuration Settings Menu       r ... Runtime Database Commands Menu       q ... Queue Manager Commands Menu       w ... Web Client Commands Menu       x ... Exit Selected Configuration Commands Menu</pre> <p>Enter <b>q</b> to display the queue manager commands menu.</p>
3	Change the password	<p>When you see:</p> <pre>FMC33208I Selected Queue Manager Commands Menu:       Selected Queue Manager: FMCQM       c ... Create       d ... Delete       p ... Change password       x ... Exit Selected Queue Manager Commands Menu</pre> <ol style="list-style-type: none"> <li>Enter <b>p</b> to change the password.</li> <li>If the transaction coordinator user ID is identical to the Runtime database user ID, this user ID and password will be promoted to the queue manager. Otherwise you will be prompted to enter the new password twice.</li> <li>You will see various messages reporting that: <ol style="list-style-type: none"> <li>The queue manager has been stopped.</li> <li>The password has been changed.</li> <li>The queue manager has been restarted.</li> </ol> </li> </ol>
4	Exit the configuration utility	Enter <b>x</b> three times.

## Binding packages

After installing a Service Pack, you might have to rebind your DB2 database (see the Service Pack's readme file to find out if it is required). Rebinding is not required if you are using Oracle for the Runtime database. Table 51 describes how to bind the Runtime database packages.

Table 51. Binding packages

Step	Description	Action
1	Start the configuration utility	Start the MQSeries Workflow configuration utility and select a configuration as described in Table 42 on page 101.

Table 51. Binding packages (continued)

Step	Description	Action
2	Select the Runtime database commands menu	<p>When you see:</p> <pre> FMC33202I Selected Configuration Commands Menu:   Selected configuration : FMC   c ... Configuration Settings Menu   r ... Runtime Database Commands Menu   q ... Queue Manager Commands Menu   w ... Web Client Commands Menu   x ... Exit Selected Configuration Commands Menu           </pre> <p>Enter <b>r</b>.</p>
3	Select the bind option	<p>When you see:</p> <pre> FMC33206I Selected Runtime Database Commands Menu:   Selected Runtime database : FMCDB   c ... Create   d ... Delete   b ... Bind packages   f ... Import topology FDL   p ... Change password   x ... Exit Selected Runtime Database Commands Menu           </pre> <p>Enter <b>b</b>.</p>
4	Exit the configuration utility	Enter <b>x</b> three times.

## Changing the settings for the Java CORBA Agent

If you have configured a Java Agent, you can modify its properties as described in Table 52. This may be necessary if you want to upgrade your Java Agent, or use a different JDK installation directory.

**Note:** Programs that rely on an existing agent will probably stop working if you change the locator policy, the agent name, or the code level.

Table 52. Changing the settings for the Java Agent

Step	Description	Action
1	Start the configuration utility	Start the MQSeries Workflow configuration utility and select a configuration as described in Table 42 on page 101.

Table 52. Changing the settings for the Java Agent (continued)

Step	Description	Action
2	Go to the Java Agent Settings menu	<p>When you see:</p> <pre> FMC33202I Selected Configuration Commands Menu:   Selected configuration : FMC   c ... Configuration Settings Menu   r ... Runtime Database Commands Menu   q ... Queue Manager Commands Menu   w ... Web Client Commands Menu   x ... Exit Selected Configuration Commands Menu </pre> <ol style="list-style-type: none"> <li>1. Enter <b>c</b> to display the Configuration Settings menu.</li> <li>2. Enter <b>j</b> to display the Java Agent Settings menu.</li> </ol>
3	Go to the Java Agent Settings Change menu	<p>When you see:</p> <pre> FMC33217I Java Agent Settings Menu:   Selected configuration : FMC   d ... Display   c ... Change   x ... Exit Java Agent Settings Menu </pre> <p>Enter <b>c</b> to display the Java Agent Settings Change menu.  <b>Note:</b> Entering <b>d</b> will display the current settings for the Java Agent.</p>
4	Change Java Agent settings	<p>When you see:</p> <pre> FMC33228I Java Agent Settings Change Menu:   Selected configuration : FMC   p ... Locator Policy   n ... Agent name   i ... JDK / JRE installation directory   v ... VisiBroker Installation Directory   l ... Code level   a ... Agent cycle   t ... Client threshold   c ... Client cycle   x ... Exit Java Agent Settings Change Menu </pre> <p><b>Note:</b> If the Java Agent uses the 'Local bindings' locator policy, options 'n', 'i', and 'l' are not displayed. If the Java Agent and Web Client are configured, option 'p' is not displayed.</p> <ol style="list-style-type: none"> <li>1. If you want to change the locator policy or values that are specific to the locator policy, enter <b>p</b>, then enter the information as described in steps 1 to 5 in Table 37 on page 86.</li> <li>2. If you want to make other changes, repeatedly select the appropriate option and enter the new value.</li> <li>3. When you have finished making changes, enter <b>x</b> to exit the menu.</li> </ol>

Table 52. Changing the settings for the Java Agent (continued)

Step	Description	Action
5	If you changed the locator policy	<p>If you changed the locator policy, you may see the following warning:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <ul style="list-style-type: none"> <li>- FMC33692W Changing the value for 'Locator Policy' will cause malfunction of programs using this Java CORBA Agent.</li> <li>- FMC33718I Do you want to change the settings for the Java CORBA Agent?                y ... Yes                n ... No</li> </ul> </div> <p>If you enter <b>y</b> (or if this warning is not displayed) the changes will be written to the configuration profile, and a batch file will be created in the configuration directory which can be used to start the agent. If you enter <b>n</b> the changes will not be written to the configuration profile.</p>
6	Exit the configuration utility	Enter <b>x</b> four times.

## Granting the right to start and stop the MQSeries Workflow system

Table 53 describes how to grant the right to start and stop the MQSeries Workflow system. To revoke this right, you must run the same utilities, but using different options. MQ Workflow clients do not require these permissions.

Table 53. Granting the right to start and stop the MQSeries Workflow system

Step	Description	Action
1	Grant the user access to the Runtime database	<ol style="list-style-type: none"> <li>1. Log on with the user ID of the Runtime database creator, or another user ID in the DB2 administration group.</li> <li>2. Enter the command:  <code>fmczddba -d database -x xauserID userID</code></li> </ol> <p>Where <i>xauserID</i> is the transaction coordinator user ID, and <i>userID</i> is the Runtime database user ID. If you do not use option <i>-x</i>, <i>userID</i> will also be used for the <i>xauserID</i>.</p> <p><b>Note:</b> Entering <code>fmczddba</code> without any parameters displays the command's syntax and options. You can use the <code>-r</code> option in the future, to revoke access.</p> <ol style="list-style-type: none"> <li>3. Log off.</li> </ol>



Table 53. Granting the right to start and stop the MQSeries Workflow system (continued)

Step	Description	Action
2	Grant user access to MQSeries queues	<ol style="list-style-type: none"> <li>1. Log on with the user ID mqm, or another user ID in the mqm group.</li> <li>2. Enter the command:  <code>fmczdmqa -y ConfigurationID -p userID</code> <p><b>Note:</b> Use the <code>-r</code> option to revoke access, and the <code>-g</code> option to grant access to a group of IDs. Entering <code>fmczdmqa</code> without any parameters displays the command's syntax and options.</p> </li> <li>3. Log off.</li> </ol>
3	Add user to group	Add the user ID to the MQ Workflow group (the default is <code>fmcgrp</code> ). When revoking rights, remove the user ID from the group.

## Importing FDL

If you want to import FDL into the Runtime database, perform the actions described in Table 54. You can create process models using the MQSeries Workflow Buildtime component on a Windows 2000 or NT workstation. Your process model and staff definitions are exported as an FDL file.

Table 54. Importing FDL

Step	Description	Action
1	Ensure that the Runtime database subsystem is running	<p>If you are using DB2, you can start it by performing the following steps:</p> <ol style="list-style-type: none"> <li>1. Log on as owner of the DB2 instance (<code>db2inst1</code> is the default) or a user ID in the DB2 administration group (<code>db2inst1</code> is the default).</li> <li>2. Enter the command:  <code>db2start</code></li> <li>3. Log off as owner of the DB2 instance.</li> </ol> <p>If you are using Oracle, refer to the Oracle documentation.</p>
2	Log on	Log on using a user ID that is authorized to import FDL.
3	Load process data into the Runtime database	<ol style="list-style-type: none"> <li>1. Transfer your process model data <code>yourprocess.fdl</code> to your machine.</li> <li>2. Enter the command:  <code>fmcibie -i=yourprocess.fdl -u=ADMIN -p=password -o -t -l</code> <p>where option <code>-o</code> overrides existing definitions in the database, <code>-t</code> translates the process so that an instance can be created, and <code>-l</code> creates a log file with the same name as the FDL file name with the extension of <code>.log</code>.</p> </li> </ol>



## Chapter 11. Deleting a configuration on UNIX

Only the root user can delete a configuration. When you delete a configuration, you can also delete the Runtime database, queue manager, queues, and channels associated with the configuration.

If you want to delete the default configuration, and it is not the only configuration, you must change the default configuration identifier first as described in “Changing the default configuration identifier” on page 109.

Table 55. Deleting a configuration

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	If you are about to remove a configuration containing an Oracle database	<p>If you are about to remove a configuration containing an Oracle database, enter the following commands:</p> <ol style="list-style-type: none"> <li>1. ksh  <code>export ORACLE_BASE=&lt;oracle_base_path&gt;</code>  <code>export ORACLE_HOME=&lt;oracle_home_path&gt;</code>  <code>export PATH=\$PATH:\$ORACLE_HOME/bin</code></li> <li>2. On AIX, also enter:  <code>export LIBPATH=\$LIBPATH:\$ORACLE_HOME/lib</code></li> <li>3. On Sun Solaris, also enter:  <code>export LD_LIBRARY_PATH=\$LD_LIBRARY_PATH:\$ORACLE_HOME/lib</code></li> </ol>
3	Start the MQSeries Workflow configuration utility	Enter the command: <b>fmcutil</b>
4	Select a configuration	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre>FMC33201I Configuration Commands Menu:  1 ... List   s ... Select   c ... Create   d ... Change default configuration   x ... Exit Configuration Commands Menu</pre> </div> <p>Enter <b>s</b> to select a configuration.  <b>Note:</b> Option <b>1</b> lists configuration identifiers for all MQ Workflow configurations that have already been defined.</p>

Table 55. Deleting a configuration (continued)

Step	Description	Action
5	Enter configuration identifier	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <p>Configuration identifier : [FMC]</p> </div> <p>Enter the name of the configuration that you want to delete, or press Enter to accept the default configuration identifier.  <b>Note:</b> You can only delete the default configuration if it is the only configuration.</p>
6	Remove the Runtime database	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <p>- FMC33711I Do you want to remove the Runtime database FMCDB ?  y ... Yes  n ... No</p> </div> <p>Enter <b>y</b> to delete the entire Runtime database and its contents, or enter <b>n</b> if you want to keep it.</p>
7	Remove the queue manager	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <p>- FMC33712I Do you want to remove the queue manager FMCQM ?  y ... Yes  n ... No</p> </div> <p>Enter <b>y</b> to delete the queue manager, or enter <b>n</b> if you want to keep it.</p>
8	If you selected <b>not</b> to remove the queue manager, remove the Workflow queues and channels	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <p>- FMC33714I Do you want to remove the MQSeries Workflow queues and channels from the queue manager FMCQM ?  y ... Yes  n ... No</p> </div> <p>Enter <b>y</b> to delete the MQSeries Workflow queues and channels, or enter <b>n</b> if you want to keep them.</p>
9	Exit the configuration utility	Enter <b>x</b> to exit the utility.

---

## Chapter 12. Problem determination on UNIX

If you are having problems running MQ Workflow servers or clients, you can try using the following sources of information to solve your problem:

- “Where to find MQ Workflow log files on UNIX”
- “Running an MQ Workflow trace on UNIX” on page 122
- “Java API Classes and Java CORBA Agent problem determination” on page 123
- “Web Client problem determination” on page 124
- “Appendix Q. Using the configuration checking utility `fmczchk`” on page 331
- The latest MQ Workflow support information is available at <http://www.ibm.com/software/ts/mqseries/workflow>

---

### Where to find MQ Workflow log files on UNIX

You can find MQ Workflow log files in the following locations:

- MQ Workflow:
  1. For general log files, see  
`/var/fmc/log/*.log`
  2. For a configuration `<ConfigID>`, see  
`/var/fmc/cfgs/<ConfigID>/log/*.log`
- DB2:
  1. For example, with an instance name `<db2inst>`, on AIX see:  
`/home/<db2inst>/sql1lib/db2dump/db2diag.log`  
  
On Sun Solaris and HP-UX see:  
`/export/home/<db2inst1>/sql1lib/db2dump/db2diag.log`
- MQSeries:
  1. For general log files, see `/var/mqm/errors/AMQERR0<n>.LOG`
  2. For system log files, see `/var/mqm/qmgrs/@SYSTEM/errors/AMQERR<n>.LOG`
  3. For a particular queue manager, see  
`/var/mqm/qmgrs/<QueueManagerName>/errors/AMQERR0<n>.LOG`

where `<n>` can be 1, 2, or 3

Also, look for any `*.0.FDC` files associated with processes mentioned in `AMQERR01.LOG`.

## Running an MQ Workflow trace on UNIX

It may be necessary to run an MQSeries Workflow product trace in order to find the cause of a problem.

Table 56. Running an MQ Workflow trace on UNIX

Step	Description	Action
1	Set the trace level	<p>Enter the command:</p> <pre>fmczchk -c trc:level,filename -y ConfigID</pre> <p>where:</p> <p><b>level</b> Has the value 0 for high-level information, 1, 2, or 3 for increasing levels of detail.</p> <p><b>filename</b> Is the path and file name of the trace file. The extension .log will be added to the file name you specify.</p> <p><b>ConfigID</b> Is the configuration identifier for the system you wish to trace. If you do not specify the -y option, the trace will be performed on the system identified by the <i>DefaultConfigurationID</i> variable that is set in the general configuration profile.</p> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>If there is a problem reading the Workflow profile, you can define the trace by entering the following commands: <pre>export FMC_TRACE_CRITERIA=&lt;level&gt;,FFFF,FFFFFFFF export FMC_TRACE_FILE=&lt;filename&gt;</pre> </li> <li>In some cases, it may be necessary to make each MQ Workflow module write its own trace file. To activate this, enter the command: <pre>export FMC_SPLIT_TRACES=1</pre> </li> </ol>
2	Recreate the problem situation	<ol style="list-style-type: none"> <li>Restart the MQ Workflow server or component that you wish to trace.</li> <li>Run through your scenario that is causing the problem.</li> </ol>
3	Stop the tracing	<ol style="list-style-type: none"> <li>Stop the MQ Workflow server or component that you have been tracing.</li> <li>Disable tracing by entering the command: <pre>fmczchk -c trc:0 -y ConfigID</pre> </li> </ol>
4	Check the trace file	Check the file <i>filename.log</i>

Table 56. Running an MQ Workflow trace on UNIX (continued)

Step	Description	Action
5	Contact IBM MQSeries Workflow support team (optional)	You can contact the support team via the MQ Workflow support page at <a href="http://www.ibm.com/software/ts/mqseries/workflow">http://www.ibm.com/software/ts/mqseries/workflow</a>

## Java API Classes and Java CORBA Agent problem determination

If you have problems running the Java CORBA Agent or an application that uses the Java API classes, check the following:

1. Make sure you have the most recent level of the JDK.
2. Check that the Java Native Interface (JNI) works properly by issuing the command:

```
java com.ibm.workflow.catalog.Properties -yConfigurationID
```

This lists the Java system properties and Java Agent properties for the given configuration (or for the default configuration if the `-y` option is not specified). This requires that `fmcojagt.jar` is in the CLASSPATH. Your output may look similar to:

```
-- listing properties --
java.runtime.name=Java(TM) 2 Runtime Environment, Stand...
java.vm.version=1.3.0
java.vm.vendor=IBM Corporation
java.vendor.url=http://www.ibm.com/
path.separator=;
java.vm.name=Classic VM
```

....

```
-- listing properties --
Agent.CosNaming.Root=
Agent.Naming.Factory=
Agent.Reaper.Threshold=1000
Agent.IorPath=./
Agent.Naming.URL=
Agent.Reaper.Cycle=300000
Agent.Reaper.Ratio=90
```

3. To verify that your CLASSPATH is set correctly, that the Java Native Interface works properly, and that your MQSeries authorizations are set up correctly, run the `HelloApplication` by issuing the command:

```
java HelloApplication AgentName LOC ADMIN password
```

### Notes:

- a. This requires `fmcojagt.jar` in the CLASSPATH.

- b. If the MQ Workflow API returns `ERROR_COMMUNICATION` on AIX and you are using MQSeries 5.1 from within Java 2, then a possible reason is that you need to export the following setting in the invoking shell and in the Java agent script files:

```
export LDR_CNTRL=MAXDATA=0x30000000
```

Use this setting with caution: From this shell you cannot invoke MQSeries commands like `strmqm`. For further information, see the MQSeries Java Support Pack readme at <http://www.ibm.com/software/ts/mqseries/support/summary/jvreadme.html>

Your output may look similar to:

```
Logon successful
available worklists:
    WL
    Workitems for worklist WL
available process templates:
    CreditRequest
Logoff successful
```

This is especially useful when you have a complex security setup.

---

### Web Client problem determination

If you have problems running the Web Client, check the following:

1. Verify that your basic Java CORBA Agent/Java API classes setup works correctly, as described in “Java API Classes and Java CORBA Agent problem determination” on page 123.
2. Verify that your Web Server installation is able to serve static content (HTML files). For details on how to do this, see the documentation for your Web Server.
3. Verify that your Application Server (Servlet Container) installation works correctly. Consult your Application Server (Servlet Container) documentation for details. For example, for the WebSphere Application Server, try `http://localhost/servlet/snoop`.
4. Make sure that the root user is authorized as a valid principal. This can be set by the root user, by entering the command:

```
fmczdmqa -y ConfigurationID -p root
```

for the configuration ID that includes the Web Client.



---

## Part 4. Installing and configuring MQ Workflow on Windows

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## Chapter 13. Installing MQ Workflow on Windows

This chapter describes how to install any or all of the MQ Workflow components on a machine running Windows Me, 98, 2000, or NT.

- If you only want to install a standard MQ Workflow client, see “Appendix F. Quick client setup on Windows” on page 241.
- If you only want a stand-alone client and server on the same machine, see “Appendix E. Stand-alone client/server setup on Windows NT/2000” on page 231.
- If you have an older version of MQ Workflow installed and you want to use data from this version with the new release of MQ Workflow, you must migrate your existing installation as explained in “Appendix N. Migrating from a previous release” on page 307.
- If you want to use Oracle for the MQ Workflow Runtime database on a Windows installation, contact the MQSeries Workflow support team.

Before installing, you should decide which MQ Workflow components you need. When installing on Windows NT or 2000, you can only select one setup type. Table 57 shows which MQ Workflow components are available, and which are installed for each setup type. If you wish, you can install all components, and only configure the components that you actually need.

Table 57. Which MQ Workflow components are installed for each setup type

MQ Workflow Components	Windows 2000/NT setup type						
	All components	Administrative components	Buildtime	Clients	Development kit	Java	Server
Administration Utility	●	●					●
API for Lotus Notes	●			●			
API Runtime Library	●			●			
Buildtime	●		●				
Client	●			●			
Development Kit	●				●		
Java API	●					●	
Java CORBA Agent	●					●	
Program Execution Agent	●			●			●

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Table 57. Which MQ Workflow components are installed for each setup type (continued)

MQ Workflow Components	Windows 2000/NT setup type						
	All components	Administrative components	Buildtime	Clients	Development kit	Java	Server
Runtime Database Utilities	●	●	●				
Samples	●	●	●	●	●	●	●
Server	●						●
Web Client	●					●	

To install MQ Workflow components on a workstation running Windows:

1. If you are installing on **Windows 2000 and NT**, make sure that you are logged on with a user ID that has administration rights.
2. Insert the CD-ROM labeled '*IBM MQSeries Workflow Version 3.3 - Program Code for Windows platforms*' into the CD-ROM drive. The installation program should start automatically. If it does not start automatically, you can start it by opening a command prompt window and entering:

```
x:\WINDOWS\SETUP
```

where *x* is the drive letter for the CD-ROM drive.

3. A window appears containing a list of languages. Select the language that you want to use.

**Note:** After installing MQ Workflow, this language cannot be changed.

4. The **Software License Agreement** window is displayed. Read the license agreement and select **Accept** to accept the license or **Decline** to decline the license.

**Note:** The language of the Software License Agreement dialog depends on the Regional Settings specified in the Windows Control Panel, not on the language you selected in the previous dialog.

5. The **Welcome** window is displayed. Click **Next**.
6. The **Choose destination location** window is displayed with the default destination location for installation: **C:\Program Files\MQSeries Workflow**. If necessary, enter a new destination location. Select **Next**.
7. On **Windows 2000 and NT**: The **Setup-type** window is displayed. Highlight the category that contains the components you want to install, see Table 57 on page 127. You can only select one category. If you want to install components from more than one category, select the **All Components** option. Click **Next**.

8. The **Select Components** window is displayed containing a list of components. Choose the MQ Workflow components you want to install. Click **Next**.

**Notes:**

- a. On Windows 2000 and NT, the list depends on the category you previously selected. On Windows Me and 98, all components are listed.
  - b. If you select the Web Client, make sure that you also select at least one of the Java CORBA Agent or the Java API components.
9. The **Select Program Folder** window is displayed. Select or create a name for the Program folder you want to use for MQ Workflow. When created, this folder appears on the Windows Start menu under Programs with the name you entered. Click **Next**.
  10. The **Start Copying Files** window is displayed containing the current settings. If the settings are correct, click **Next**, otherwise click **Back** to correct the settings.
  11. The setup program now copies program files to the MQ Workflow installation directory, updates the registry, and creates a list of installed files. This may take several minutes to complete.
  12. The **Setup Complete** window is displayed. Click **Finish** to restart your workstation to activate the changes made by the installation program.
  13. After the reboot, a registration program is executed, and the installation is complete.
  14. The MQ Workflow configuration utility starts automatically. See "Chapter 14. Configuring MQ Workflow on Windows" on page 131.

**Note:** If you install the **API for Lotus Notes**, make sure you read "Appendix L. Installing the API for Lotus Notes" on page 291.

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## Chapter 14. Configuring MQ Workflow on Windows

This chapter describes how to configure MQ Workflow components that have been installed on Windows.

### Before configuring MQ Workflow on Windows

Before you create an MQ Workflow configuration, you must prepare the environment. These actions are only required if you are about to configure a server, Runtime Database Utilities, a client using MQSeries Server API on a local queue manager (for example a client concentrator), or a Java CORBA Agent. Otherwise skip to “How to configure MQ Workflow on Windows” on page 139.



For Windows 2000 and Windows NT make sure that you have **administration rights** before configuring MQ Workflow components.

Table 58. Actions required before creating an MQ Workflow configuration on Windows

Actions	Server			Runtime Database Utilities	Client using MQSeries Server API	Java CORBA Agent	Build-time
	First system in system group. With Runtime database:		Additional system in system group				
	Local	Remote					
“Prepare a multiple server setup” on page 132	●	●	●				
“Catalog the existing remote DB2 instance” on page 133		● <sup>1</sup>	● <sup>1</sup>	● <sup>1</sup>			●
“Catalog the existing remote DB2 database” on page 133			● <sup>1</sup>	● <sup>1</sup>			●
“Create a new system in the Runtime database” on page 134			●	●			
“Copy the channel definition table” on page 135			●		●		
“Selecting the MQSeries client connection type” on page 136					●		
“Prepare the Java CORBA Agent and Java API classes” on page 137						●	

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Table 58. Actions required before creating an MQ Workflow configuration on Windows (continued)

Actions	Server		Runtime Database Utilities	Client using MQ Series Server API	Java CORBA Agent	Build-time	
	First system in system group. With Runtime database:						Additional system in system group
	Local	Remote					
"Security authorizations for Java CORBA Agent using JNDI" on page 137					● <sup>2</sup>		

### Notes:

1. Only required if you are using DB2 for the Runtime database.
2. Only required if you are using Java security.

After performing these actions, follow the description in "How to configure MQ Workflow on Windows" on page 139

### Prepare a multiple server setup

If you want to configure more than one Workflow system in your system group, you should make sure that you have completed "Chapter 4. Planning your installation" on page 27 for each Workflow system.

You must ensure the following:

- All queue manager names must be unique.
- Only one queue manager is configured as being the first queue manager in the cluster.
- All configurations of servers or Runtime Database Utilities, that use the same Runtime database must use the same code level of MQ Workflow.
- Ensure that the first queue manager in the cluster is running.

All additional systems should use the values from the first system for the following:

- System group name
- Queue Prefix
- Cluster name
- For the cluster's first queue manager:
  - Name of the queue manager
  - TCP/IP address
  - TCP/IP port number



## Catalog the existing remote DB2 instance

If you are creating a server in a three-tier setup, adding a new system to an existing system group, or configuring Buildtime to use a remote database, the database must already exist on another machine.

You must perform the following actions to redirect all database requests to the remote machine:

1. On the machine that will host the database:
  - a. Set the DB2 isolation level to 'read stability' by entering the command:  
`db2set -i DB2_RR_TO_RS=YES`
  - b. Note the host name or TCP/IP address, *computer-name*.
  - c. Note the DB2 instance name, *instance-name*.
  - d. Note the service name (port number) used by the DB2 instance, *servicename*.
2. On the workstation where you want to install the server (or where you are configuring Buildtime to use a remote database):
  - a. Start the DB2 Command Window by clicking on the **Start** button, **Programs, IBM DB2**, then **Command Window**.
  - b. Enter the commands:

```
db2 catalog tcpip node node-name remote computer-name
      server servicename remote_instance instance-name
db2 attach to node-name user userid using password
db2 update dbm cfg using TP_MON_NAME mqmax
db2 terminate
```

where:

**node-name**

is a local alias for the remote instance.

**servicename**

is the port number for the service, for example 50000.

**userid, password**

is a valid user ID and password to connect to your remote instance.

**computer-name, instance-name**

are the values that you noted during step 1.

**Note:** For more information about cataloging a DB2 instance, see "Accessing a remote DB2 instance" on page 188.

## Catalog the existing remote DB2 database

If you are creating a server in a three-tier setup, adding a new system to an existing system group, or configuring Buildtime to use a remote DB2

## Windows

database, the Runtime/Buildtime database must already exist on another machine, and you must perform the following actions to redirect all database requests to the remote machine:

1. On the workstation where you want to install the server, start the DB2 Command Window by clicking on the **Start** button, **Programs, IBM DB2,** then **Command Window**.
2. Catalog the database by enter the command:  
db2 catalog database *database-name* at node *node-name*

where:

**node-name** is a local alias for the remote instance.

**database-name** is the name of the database on the remote workstation.

**Note:** For more information about cataloging a database, see “Accessing a remote DB2 instance” on page 188.

3. If you are cataloging the Runtime database, verify that the Rruntime database user ID can access the Runtime database by entering the commands:

```
db2 CONNECT TO database-name USER RTDatabaseUser
                               USING RTDatabasePassword
db2 CONNECT RESET
```

**RTDatabaseUser, RTDatabasePassword**  
are a valid user ID and password to connect to your remote Runtime database.

### Create a new system in the Runtime database

When you configure the component ‘Server’ or ‘Runtime Database Utilities’ using an existing Runtime database, you have to define the new system in that Runtime database. If you are using DB2 for the Runtime database, and it is on a remote workstation, you must have already cataloged the existing instance and the existing database. Finally, you must generate and import an FDL file (*yoursystem.fdl*) that contains the definitions for the additional system.

#### Notes:

1. Systems in the same Runtime database must use the same system group.
2. Systems cannot share queue managers (the queue manger names for different systems **must** be different).

To create and import *yoursystem.fdl*:

1. To create *yoursystem.fdl* using Buildtime:
  - a. Create a new queue manager.

- b. Create a new system within the system group using the new queue manager.
  - c. Create an execution server for the new system.
  - d. Create a program execution server for the new system.
  - e. Export the new topology objects to `yoursystem.fdl`.
2. To create `yoursystem.fdl` manually:
    - a. Copy the file `InstallationDirectory\FDL\fmcinews.fdl` to `yoursystem.fdl` and edit that file.

**Note:** Do not modify the shipped file.

- b. Replace '`<codepage>`' by your codepage value, for example 1252.
- c. Replace all occurrences of `<SystemGroupName>` by the name of the system group defined in the Runtime database.
- d. Replace all occurrences of `<SystemName>` by the name of the new system to be configured.

**Note:** This system must not yet exist in the database.

- e. Replace all occurrences of `<QueueManager>` by the name of the queue manager associated to the system.

**Note:** The queue manager must not yet exist in the database, and it must not yet exist on your workstation.

3. To import the FDL file, enter the command:

```
fmcibie -i=yoursystem.fdl -u=ADMIN -p=password -l
```

where '`-l`' creates a log file with the same name as the FDL file name with the extension of `.log`.

### Copy the channel definition table

If you are creating an additional server, or a client using the MQSeries Server API (for example a client concentrator), MQ Workflow will create a new queue manager for you.

Each time that MQ Workflow creates a new queue manager, a new channel definition will be added to the channel definition table file specified during configuration. If the file does not exist on the machine, it will be created, and the file will only contain the channel definition for the queue manager just created.

It is recommended that you use just one channel definition table to contain all queue managers used in the system group. This channel definition table can then be distributed to all the MQ Workflow clients, so that all clients will be able to send messages to any server, or client concentrator.

## Windows

If you do not follow the recommended procedure, you can either provide a dedicated channel definition table for each queue manager manually, or locate the channel definition table on a network disk that all servers and client concentrators have write access to.

In the recommended procedure, you must copy the latest channel definition table from the machine where you last created an MQ Workflow configuration with a new queue manager, as follows:

1. Use ftp to copy the latest client channel definition table (in binary mode):
  - from** <ConfigurationRootDir>\chl\tabs\MQWFCHL.TAB on the machine where you last configured an MQ Workflow server or client concentrator
  - to** <ConfigurationRootDir>\chl\tabs\MQWFCHL.TAB on the machine where you are configuring an additional MQ Workflow server or new client concentrator.

### Selecting the MQSeries client connection type

Normally, an MQ Workflow client uses an MQSeries client connection. However, if you are configuring a client concentrator or using a Java CORBA Agent, you must use MQSeries server APIs.

If you have an MQ Workflow client on a machine where there is an MQSeries server (queue manager), you have the choice whether it will use the client API, or the server API. The setting for this has a system-wide effect, so changing it for one client will affect all other clients on that machine, and may stop them from working.

If the MQSeries Server is installed, and MQ Workflow is being installed for the first time on the machine, the installation program automatically sets the path so that the server API will be used. If you are updating an existing installation, the path setting will not be changed. If the existing client connection type is correct, you do not need to change it.

If you want to change the client connection type, you must edit the system search path:

1. On Windows NT: Click on the Windows **Start** button, then **Settings**, **Control Panel**, **System** icon, **Environment** tab, and select **Path** in the **System Variables** field.
2. On Windows 2000: Click on the Windows **Start** button, then **Settings**, **Control Panel**, **System** icon, **Advanced** tab, **Environment** button, and select **Path** in the **System Variables** field.
3. To make all MQ Workflow clients on this machine use the MQSeries server APIs, the system environment variable **Path** should contain the entry:  
`...;InstDir\bin\mqserver;...`

where *InstDir* is the MQ Workflow installation directory. If you use the default values, the path would include one of these entries:

```
...;C:\Program Files\MQSeries Workflow\bin\mqserver;...
...;C:\progra~1\mqseri~1\bin\mqserver;...
```

- To make all MQ Workflow clients on this machine use the MQSeries client APIs, the system environment variable **Path** should contain the entry:

```
...;InstDir\bin\mqclient;...
```

where *InstDir* is the MQ Workflow installation directory. If you use the default values, the path would include one of these entries:

```
...;C:\Program Files\MQSeries Workflow\bin\mqclient;...
...;C:\progra~1\mqseri~1\bin\mqclient;...
```

**Note:** If you want to change an existing selection, you should edit the entry in the search path. Remember that if there are two entries in the search path, only the first one will have an effect.

### Prepare the Java CORBA Agent and Java API classes

If you want to use the VisiBroker 3.4 Object Request Broker (ORB), you must customize it as described below:

- Install the Inprise VisiBroker Version 3.4 as described in the VisiBroker documentation.
- Copy the file `orb.properties` from the `inprise\vbroker\docs` directory to your Java `\jre\lib` (for example, `x:\Java1.2\jre\lib`).
- Edit your copy of the `orb.properties` file in your Java `\jre\lib` directory:
  - Set the **ORBClass** variable to point to the VisiBroker, for example:
 

```
org.omg.CORBA.ORBClass = com.visigenic.vbroker.orb.ORB
```
  - Set the **ORBSingletonClass** variable to point to the VisiBroker, for example:
 

```
org.omg.CORBA.ORBSingletonClass = com.visigenic.vbroker.orb.ORB
```

### Security authorizations for Java CORBA Agent using JNDI

If you are customizing a client that will be using the JNDI locator policy with Java security enabled, you should perform the following security authorizations:

- If you want to use an MQ Workflow Java CORBA Agent using JNDI locator policy, with security enabled, the following authorizations must be added to the file `<JavaHome>/jre/lib/security/java.policy` on every client that is using JNDI locator policy with Java security enabled:

```
grant codeBase "file:/<Workflow InstallDir>/bin/-"
{
    permission java.util.PropertyPermission "*", "read, write";
    permission java.net.SocketPermission "*:<JNDINameServerPort>",
```

## Windows

```
                "accept, connect, listen, resolve";
    permission java.net.SocketPermission "*:1024-",
                "accept, connect, listen, resolve";
};
```

**Note:** Be sure to use the correct path for your MQ Workflow installation directory in the codeBase attribute, and replace `<JNDINameServerPort>` with your value for the actual name server TCP/IP port number from Table 11 on page 33.

2. If WebSphere Application Server is used as JNDI Naming Service, the following authorizations also have to be added to the `<JavaHome>/jre/lib/security/java.policy` file on every client:

```
grant codeBase "file:/*<WebSphereInstallDir>/lib/*"
{
    permission java.util.PropertyPermission "*", "read, write";
    permission java.net.SocketPermission "/*:*", "accept, connect, listen, resolve";
};
```

**Note:** Be sure to substitute the path for your WebSphere Application Server installation directory in the codeBase attribute for *WebSphere InstallDir*.

## How to configure MQ Workflow on Windows

The **MQSeries Workflow Configuration Utility** is used to configure installed MQ Workflow components.

After installing MQ Workflow components on a workstation for the first time and rebooting the system, the MQSeries Workflow Configuration Utility should start automatically. If it does not, you can start it manually by selecting the **MQSeries Workflow Configuration Utility** icon found in the **IBM MQSeries Workflow** folder.

The first time the MQSeries Workflow Configuration Utility starts on your workstation, it appears containing an empty **General** page with only the **New...** button enabled.

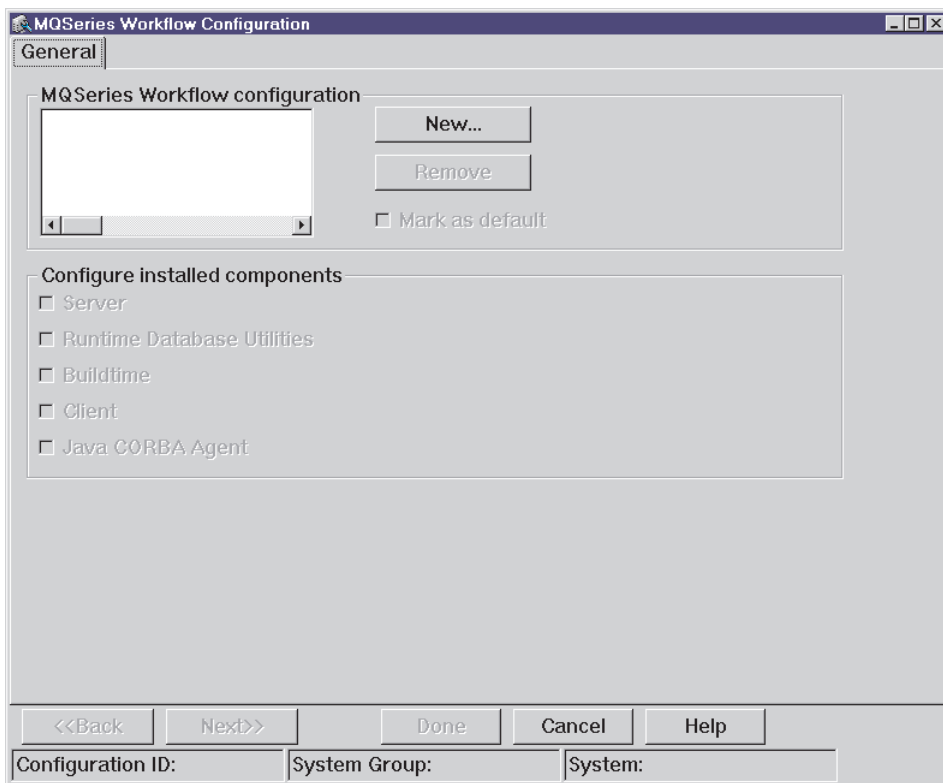


Figure 8. Configuration utility: General page (empty)

The **General** page is used to:

- Specify a configuration ID that is used to identify an MQ Workflow configuration.

## Windows

- Select the MQ Workflow components that you want to configure.

### Specifying a configuration identifier

By clicking on the **New...** button in the **General** page, the **MQSeries Workflow Configuration ID** dialog box appears.

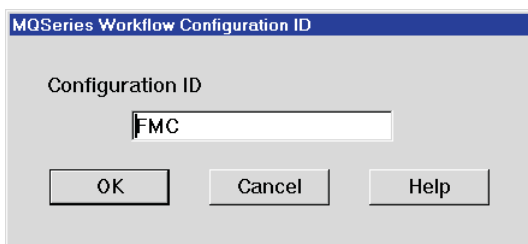


Figure 9. Configuration utility: Configuration ID dialog box

This dialog box allows you to specify a configuration identifier that is used to identify the new configuration you are about to create. A default value is provided. You can use this value or enter a new one.

After specifying a configuration identifier and clicking the **OK** button, the value you specified is displayed in the list box at the top of the **General** page.

The **Remove** button allows the MQ Workflow configuration identified by the selected configuration ID to be removed. It can delete any databases or queue managers defined in the MQ Workflow configuration.

The **Mark as default** check box sets the MQ Workflow configuration identified by the selected configuration ID to be the default.



If you open an existing configuration that was created or modified outside the MQ Workflow configuration utility, you can only browse or delete it using the configuration utility.

### Selecting MQ Workflow components

On the **General** page, after you have selected a configuration ID, the check boxes are enabled next to all components that have been installed. Any components that have not been installed cannot be selected and are indicated with a **not installed** message.

The check boxes allow you to select the MQ Workflow components you want to configure. As you select components, pages are added to the MQSeries Workflow Configuration Utility.



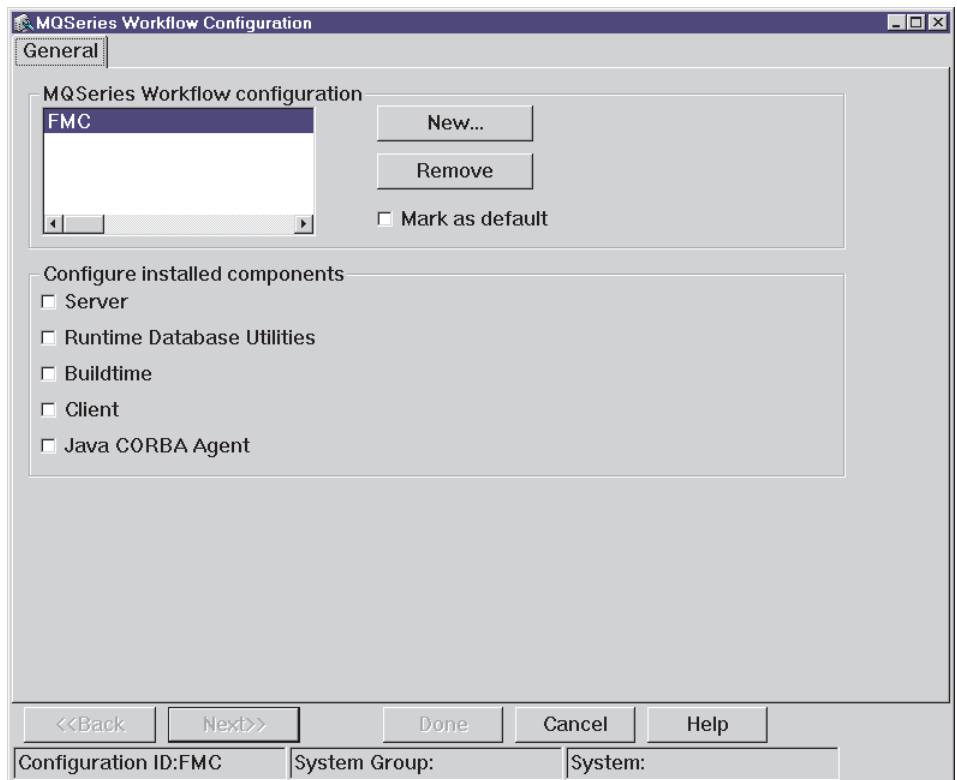


Figure 10. Configuration utility: General page

Selecting the **Client** component will add the pages required by any of the following MQ Workflow client components that are installed on your workstation:

- Administration utility
- Standard Client
- API for Lotus Notes
- API Runtime Libraries
- Program Execution Agent

## Configuring MQ Workflow components

After specifying a configuration ID and selecting the MQ Workflow components you want to configure in the **General** page, you must enter configuration data within the pages that are added to the MQSeries Workflow Configuration Utility.

## Windows

Table 59 lists the pages that are added for each MQ Workflow component selected on the **General** page.

Table 59. Configuration pages added when an MQ Workflow component is selected from the General page

MQ Workflow components selected	Configuration pages added / for more details see							
	"Runtime database page"	"Queue manager page" on page 146	"Cluster page" on page 148	"Client connections page" on page 150	"Buildtime page" on page 152	"Buildtime database page" on page 153	"Client page" on page 158	"Java CORBA Agent page" on page 159
Server	●	●	●					
Runtime Database Utilities	●							
Buildtime					●	●		
Client		1	1	●			●	
Java CORBA Agent		1	1	●				●

### Notes:

1. The queue manager and cluster pages are also added if the clients are going to use the MQSeries server APIs of a local queue manager, for example, to create a client concentrator.

### Runtime database page

The **Runtime Database** page is added when you select either **Server** or **Runtime Database Utilities** from the **General** page and is used to configure a Runtime database.

**Note:** In this release, you cannot configure an Oracle database here. If you want to use Oracle for the MQ Workflow Runtime database on a Windows installation, contact the MQSeries Workflow support team.

To configure a Runtime database, from the topmost list box, select the DB2 instance where your Runtime database is located. The default DB2 instance, **DB2**, should at least be listed.

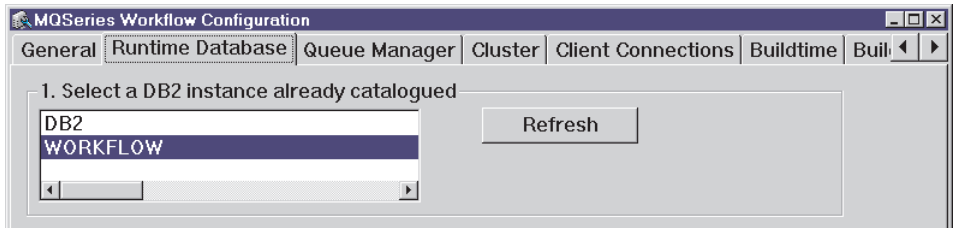


Figure 11. Configuration utility: Runtime Database page (top)

If no other DB2 instance is listed, select the default instance **DB2**. If you do not want to use the default instance, you can use the DB2 control center to add a new one. To add a new DB2 instance, refer to the *DB2 Enterprise - Extended Edition for Windows NT Quick Beginnings* online manual.

The **Refresh** button clears the **Runtime Database** page and allows only available DB2 instances to be displayed.

If the DB2 instance you selected does not contain a valid Runtime database, you must create a new Runtime database as explained in “Creating a Runtime database”.

### Selecting a Runtime database

Selecting a DB2 instance lists all the databases located in that instance within the list box located in the middle of the **Runtime Database** page. From the list of databases displayed, select the Runtime database you want to use.



Figure 12. Configuration utility: Runtime Database page (middle)

If the database you select is not a valid Runtime database, a message appears telling you. If you do not want to use any of the Runtime databases listed, or no valid Runtime databases exist, you must create a new one.

### Creating a Runtime database

To create a new Runtime database, select the **New...** button. The **New DB2 Database** window appears containing default settings. You can use these default settings to create a new Runtime database or enter your own.

## Windows

The top half of the **New DB2 Database** window is used to specify DB2 specific settings.

The screenshot shows the 'New DB2 Database' configuration window. The fields are filled with the following values:

Field	Value
Database name	FMCDB
Database location	C:
Containers location	c:\program files\mqseries wor
Log files location	c:\program files\mqseries wor
System Group	FMCGRP
System	FMCSYS
Queue Prefix	FMC
Queue Manager	FMCQM

Figure 13. Configuration utility: New DB2 Database window

To create a new Runtime database, you must specify a database name and location, and where its containers are to be located. For error recovery and backup, you can specify a location where log files used to restore lost data are created. The *IBM DB2 Administration Getting Started* online manual describes these settings.

In the lower half of the **New DB2 Database** window, you must specify settings that are used to populate the Runtime database. A database that does not contain these settings is not a valid Runtime database and cannot be used.

In the **System Group** and **System** fields, you must enter names (up to 8 characters) that are used to identify your MQ Workflow system group and system.

In the **Queue Prefix**, and **Queue Manager** fields you must enter names (up to 8 characters) that uniquely identify's MQSeries specific components used by your MQ Workflow system. The queue prefix is used to set a high-level qualifier for queue names in your MQ Workflow system.

When you have finished entering values in the **New DB2 Database** window, click the **OK** button. The name you provided for the new Runtime database is displayed in the list box located in the middle of the **Runtime Database** page.

### Setting connect parameters for a Runtime database

To set connection parameters for a Runtime database, select the desired Runtime database and press the **DB2 Connect parameters...** button. A **Connect Parameters** window appears:

Figure 14. Configuration utility: Runtime Database Connect Parameters window

In this window, you must specify user ID (up to 8 characters) and password values that give you administration rights for your workstation.

### Selecting a system

After selecting a valid Runtime database, values for the MQ Workflow system group and system, queue prefix, and queue manager are read from the selected database and displayed in the list box located at the bottom of the **Runtime Database** page.

Figure 15. Configuration utility: Runtime Database page (bottom)

The values are displayed in a concatenated string that has the form:

## Windows

<system>.<system group>.<queue prefix>,<queue manager>

If the Runtime database is used by more than one MQ Workflow system, entries for each system that use it are displayed.

Select the string that identifies your MQ Workflow system.

### Queue manager page

The **Queue Manager** page is added when you select **Server** from the **General** page, or if you select **Client** or **Java CORBA Agent**, and they are going to use MQSeries server APIs on a local queue manager.

The screenshot shows the 'MQSeries Workflow Configuration' dialog box with the 'Queue Manager' tab selected. The 'Queue Manager name' field contains 'FMCQM' and the 'Queue Prefix' field contains 'FMC'. Under 'Log type', 'Circular log' is selected. Under 'Communication protocol', 'TCP/IP port configuration' is selected, with 'hostname' in the adjacent field and '14000' in the port field. The 'Client Channel Definition Table to be updated' field contains 'c:\program files\mqseries workflow\chltabs\mqwfchl.tab' and a 'Select...' button is to its right. At the bottom, there are buttons for '<<Back', 'Next>>', 'Done', 'Cancel', and 'Help'. A status bar at the very bottom shows 'Configuration ID:FMC', 'System Group:FMCGRP', and 'System:FMCSYS'.

Figure 16. Configuration utility: Queue Manager page

This page is used to configure an MQSeries queue manager for use by MQ Workflow components.

If you are configuring a server, the default values for the **Queue Manager name** and **Queue Prefix** fields are taken from the Runtime database you selected on the **Runtime Database** page and will be disabled. If you are using

an existing database, the settings cannot be changed. If you are creating a new database, the settings can be changed on the **Runtime Database** page.

### **Queue manager: Log type**

For error recovery and backup, MQSeries provides a logging facility that uses log files to record all actions performed by the queue manager. How these actions are recorded depends on the log type you select. Two types of logging are possible: *Circular logging* and *Linear logging*. Use the radio buttons to select a log type.

Circular logging keeps all restart data in a ring of log files. It starts by filling the first file in the ring, then moving on to the next, and so on, until all the files are filled. It then goes back to the first file in the ring and starts again.

Linear logging keeps the log data in a continuous sequence of files. Space is not reused, so you can always retrieve any record logged from the time that the queue manager was created. As disk space is finite, you may have to think about some form of archiving.

Details about error logging are contained in the MQSeries online documentation.

### **Queue manager: Communication protocol**

To specify the communication protocol set up on your workstation, you must select the appropriate radio button and specify the address information in the field(s) opposite:

**For TCP/IP:** Specify the IP address or machine name of your workstation, and an unused port number.

**For NetBIOS:** Specify the Local NetBios name of your workstation.

**For APPC:** Specify the fully-qualified CP name of your workstation.

### **Queue manager: Client channel definition table**

The client channel definition table is a file that contains address information for MQ Workflow components that use MQSeries, and is used by MQSeries as a lookup table for locating such components.

If you are configuring the queue manager for an MQ Workflow client or MQ Workflow server, the client channel definition table is created and updated with the MQ Workflow server's address information.

You can specify where you want the table to be created. A default location is provided. If you do not want to use the default, the **Select...** button allows you to specify an alternative location.

## Windows

When specifying a location, keep in mind that MQ Workflow client components and the Java CORBA Agent must have access to the client channel definition table in order to locate other MQ Workflow components that have added their address information to the table. It is a good idea to make a note of its location.

### Cluster page

The **Cluster** page is added when you select **Server** from the **General** page, or if you select **Client** or **Java CORBA Agent**, and they are going to use MQSeries server APIs on a local queue manager.

The screenshot shows the 'MQSeries Workflow Configuration' dialog box with the 'Cluster' tab selected. The 'Cluster name' field contains 'FMCGRP'. Below this, the text reads 'The Queue Manager in this configuration is'. There are two radio button options: 'the first Queue Manager in the Cluster' (unselected) and 'an additional Queue Manager in this Cluster' (selected). A section titled 'First Queue Manager' contains the instruction 'Specify the name and the network address of the existing first Queue Manager in this Cluster'. It includes a 'Queue Manager name' field with 'FMCQM', a 'TCP/IP port configuration' section with a 'hostname' field and a port field containing '14000', and unselected options for 'NetBios configuration' and 'APPC configuration'. At the bottom, there are navigation buttons: '<<Back', 'Next>>', 'Done', 'Cancel', and 'Help'. A status bar at the very bottom shows 'Configuration ID:FMC', 'System Group:FMCGRP', and 'System:FMCSYS'.

Figure 17. Configuration utility: Cluster page

This page is used to specify values required to implement an MQSeries technique known as *clustering*.

Briefly, clustering is a technique used to group logically associated queue managers together. For MQ Workflow, this logical association exists between queue managers if they belong to MQ Workflow systems that are members of the same MQ Workflow system group. This group of associated queue managers is called a *cluster*.



The first queue manager configured in the cluster is used to hold a repository of information about all other queue managers. The repository contains channel and queue definitions for every queue manager in the cluster. Queue managers need only know the name and location of the first queue manager that holds this repository to get definitions for any other queue manager in the cluster. This reduces the overhead involved in explicitly defining channels and queues for every queue manager in the MQ Workflow system group. For further details about clustering, refer to the MQSeries online documentation.

To associate a queue manager with a particular cluster, enter a name in the **Cluster name** field. Make sure that you use the same cluster name for all queue managers that are members of the same cluster. The default value is the name of the MQ Workflow system group. You can use this value or specify a different one.

The first queue manager configured in the cluster must hold the information repository for all other queue managers. To indicate whether the queue manager is the first or an additional queue manager to be configured in the cluster, select the appropriate radio button.

**Note:** Make sure that you only configure one queue manager as the first queue manager of the cluster.

If you are configuring an additional queue manager in the cluster, you must specify the name of the first queue manager configured in the cluster in the **Queue Manager name** field.

You must also use the radio buttons and the field(s) opposite to specify the communication protocol and the address of the workstation where the first queue manager is located:

**For TCP/IP:** Specify the IP address or machine name and the port number used.

**For NetBIOS:** Specify the Local NetBios name.

**For APPC:** Specify the fully-qualified CP name.

### Client connections page

The **Client Connections** page is added when you select either **Client** or **Java CORBA Agent** from the **General** page.

On this page you specify settings that MQ Workflow client components and the Java CORBA Agent need in order to connect to an MQ Workflow system.

If you are configuring a client using the MQSeries Server API and a queue manager already configured for MQ Workflow exists locally on your machine, you have the choice to use the existing queue manager or create a new one. If you decide to reuse an existing queue manager, the pages 'Queue Manager' and 'Cluster' will not be shown. Nevertheless, the configured client will use the MQSeries server API.

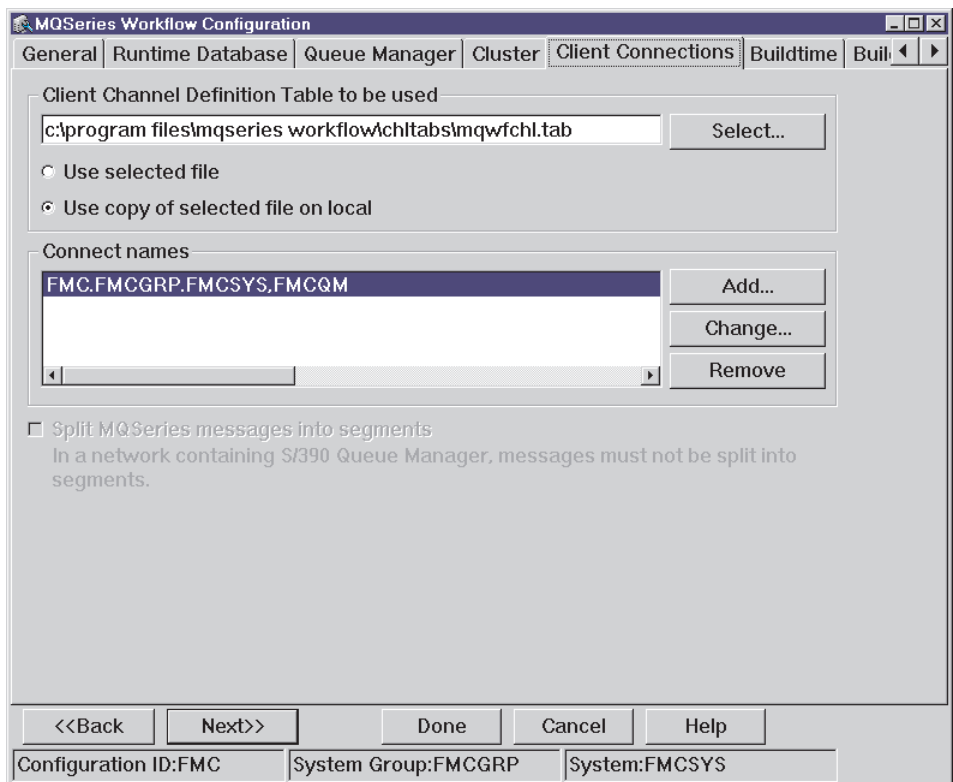


Figure 18. Configuration utility: Client Connections page

In the field at the top of the **Client Connections** page you must enter the location of the client channel definition table. The location of this table is specified on the **Queue Manager** page as explained in "Queue manager:

Client channel definition table” on page 147. To locate the client channel definition table you can use the **Select...** button.

**Note:** If you are configuring a client that will use the MQSeries API on a local queue manager, for example, a client concentrator, the field for the channel definition table is disabled, if you want to change this value you should go to the 'queue manager' page.

MQ Workflow client components and the Java CORBA Agent can read definitions contained in the client channel definition table directly, or copy the table to a local directory and use the local copy. Using a local copy improves system performance. Use the radio buttons to specify whether to read directly from the client channel definition table or to use a local copy. If you use a local copy, the file will be copied to *InstallationRootDirectory\cfgs\ConfigurationID*.

The list box in the middle of the **Client Connections** page is used to list *connect names*. A connect name is a mapping algorithm used to map MQ Workflow client components and the Java CORBA Agent to a specific MQ Workflow system.

A connect name has the following format:

<queue prefix>.<system group>.<system>,<queue manager>

To specify a connect name, click the **Add...** button. The following window appears:

Field	Value
System Group	FMCGRP
System	FMCSYS
Queue Prefix	FMC
Queue Manager	FMCQM

Figure 19. Configuration utility: Add Connection window

In the **MQSeries Workflow Connection** window, enter the names for the MQ Workflow system group and system, and MQSeries queue manager and queue prefix that specify a connection to a particular MQ Workflow system.

## Windows

After clicking the **Add** button, the connect name is displayed in the list box in the middle of the **Client Connections** page shown in Figure 18 on page 150.

**Note:** If you have chosen to create a new queue manager in a setup using MQSeries server API as the client connection type, you will only be allowed to add connections to the queue manager specified on the **Queue Manager** page.

Select the connect name that contains the settings for the queue manager of the MQ Workflow system to which you want to connect.

The **Change...** button is used to update a selected connect name.

The **Remove** button is used to remove a selected connect name.

### Buildtime page

The **Buildtime** page is added when you select **Buildtime** from the **General** page.

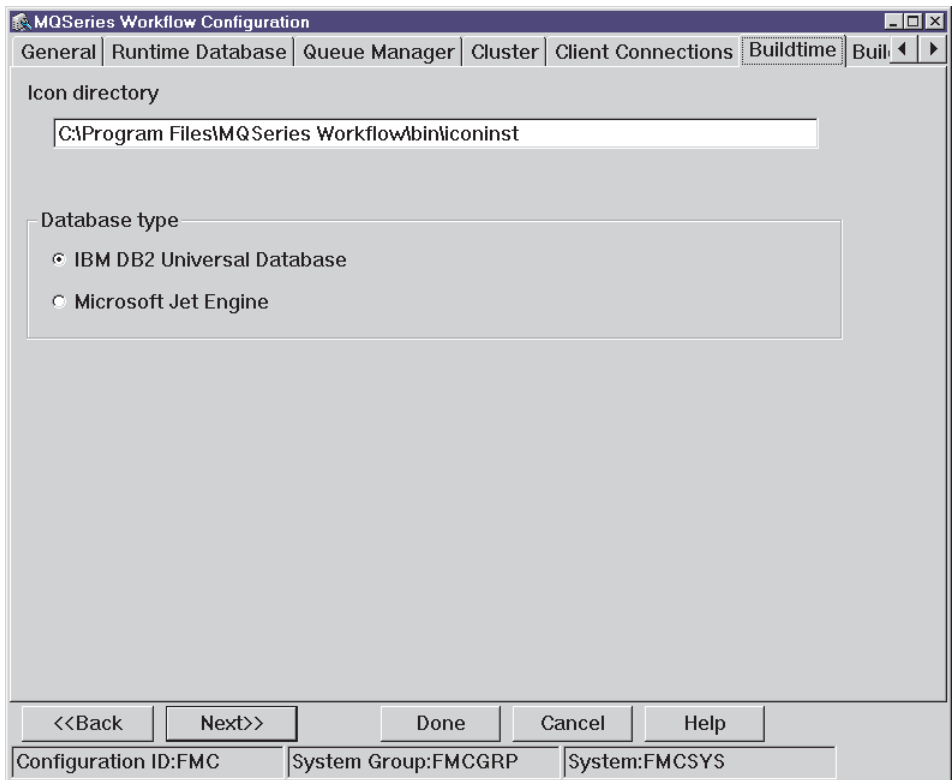


Figure 20. Configuration utility: Buildtime page

The **Icon directory** field is used to specify a directory for holding sample icons for Buildtime.

In the **Database type** field, select the radio button for the Buildtime database type.

- To use IBM DB2 Universal Enterprise Edition, select the radio button labeled **IBM DB2 Universal Database**. If DB2 is not installed, this radio button is disabled and cannot be selected.
- To use Microsoft Access, select the radio button labeled **Microsoft Jet Engine**.

### Buildtime database page

The **Buildtime Database** page is added when you select **Buildtime** from the **General** page. Depending on whether you have selected DB2 or Microsoft Jet Engine for the Buildtime database, you will see one of the following versions:

- “Buildtime database page (for DB2)”
- “Buildtime database page (for Microsoft Jet Engine)” on page 154

### Buildtime database page (for DB2)

The **Buildtime Database** page is added when you select **Buildtime** from the **General** page.

Figure 21 on page 154 shows how the **Buildtime Database** page looks if you selected DB2 as the Buildtime database type on the **Buildtime** page. This page is used to select an existing Buildtime database or create a new one using IBM DB2 Universal Enterprise Edition. The procedure to do this is the same as that used to select or create a Runtime database:

1. If you want to create or use an existing remote Buildtime database, you must catalog the database instance, as described in “Catalog the existing remote DB2 instance” on page 133.
2. If you already have a Buildtime database created on a remote instance, you must catalog the database itself, as described in “Catalog the existing remote DB2 database” on page 133.
3. Click on **Refresh**, to see the newly cataloged instance.
4. Select the Buildtime database instance.
5. If you want to create a new Buildtime database on the remote system, you can now follow the steps as described in “Creating a Runtime database” on page 143.
6. Set the connect parameters for the instance as described in “Setting connect parameters for a Buildtime database” on page 157.

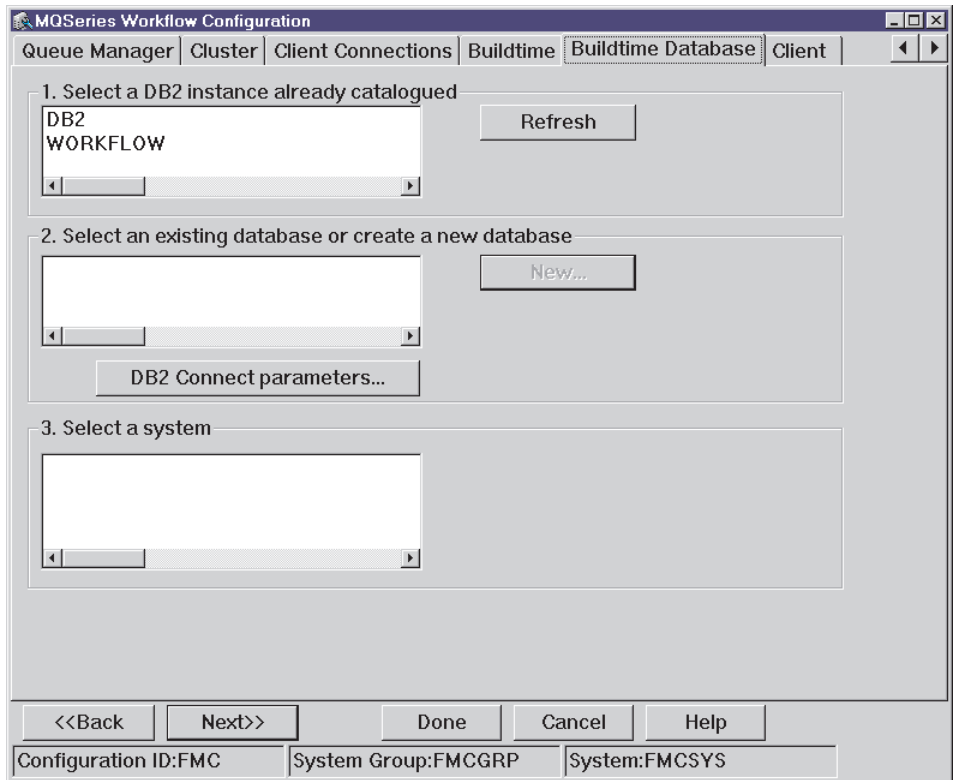


Figure 21. Configuration utility: Buildtime Database page (for DB2)

## Buildtime database page (for Microsoft Jet Engine)

The **Buildtime Database** page is added when you select **Buildtime** from the **General** page.

Figure 22 on page 155 shows how the **Buildtime Database** page looks if you selected **Microsoft Jet Engine** as the Buildtime database type in the **Buildtime** page. This page is used to select an existing Buildtime database or create a new one using Microsoft Jet database engine.

In the **ODBC data source name** field, provide a name for the ODBC data source used to connect MQ Workflow to the Microsoft Jet database engine.

In the **ODBC description** field you can enter a description used to describe the ODBC data source.

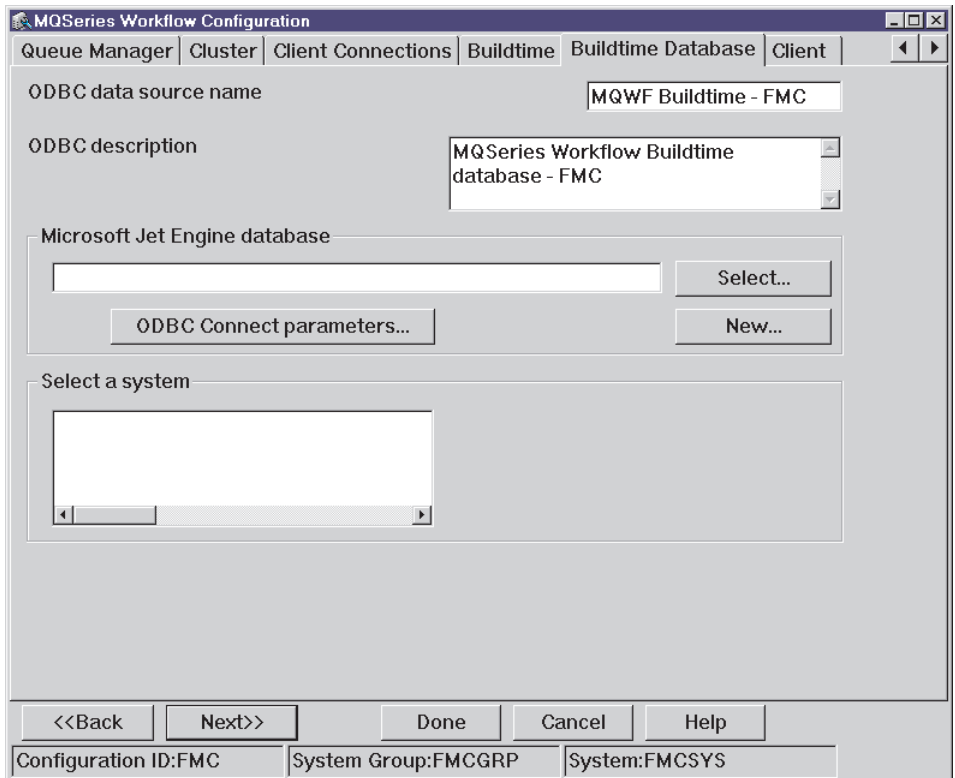


Figure 22. Configuration utility: Buildtime Database page (for Microsoft Jet Engine)

### Selecting a Buildtime database

To use an existing Buildtime database, enter its fully qualified path in the field located in the middle of the page. You can use the **Select...** button to locate it.

If you select a non-valid Buildtime database, a message appears telling you. In this case, you must either select a valid Buildtime database or create a new one as explained in “Creating a Buildtime database”.

### Creating a Buildtime database

To create a new Buildtime database, click on the **New...** button. The following window appears:

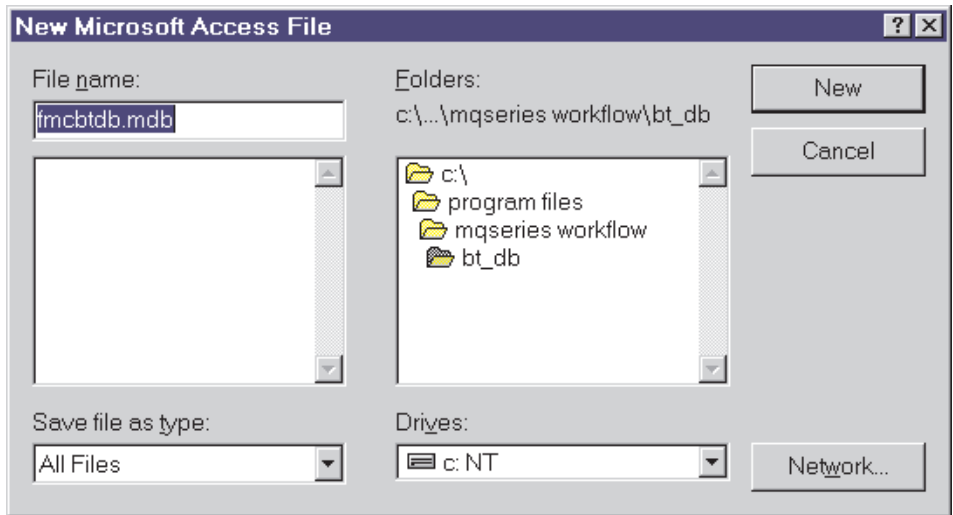


Figure 23. Configuration utility: Create New Buildtime Database window

Use this window to specify a name and location for the new Buildtime database and then click the **New** button. The path to the new Buildtime database appears in the field located in the middle of the **Buildtime Database** page and the following window appears:

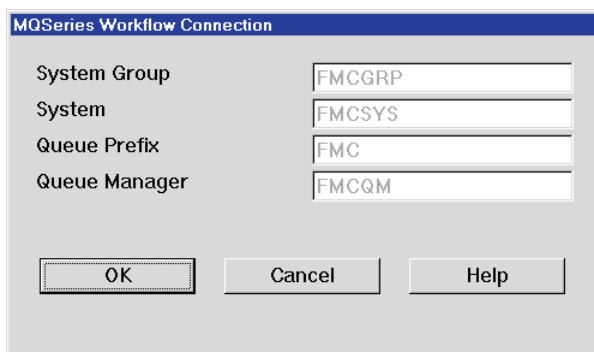


Figure 24. Configuration utility: Connection window

In this window, you must specify settings that are used to populate the Buildtime database. A database that does not contain these settings is not a valid Buildtime database and cannot be used.

In the **System Group** and **System** fields, you must enter names that are used to identify the MQ Workflow system group and system for which Buildtime builds process models.



In the **Queue Prefix**, and **Queue Manager** fields you must enter names that are used to identify MQSeries specific components for the MQ Workflow system for which Buildtime builds process models. The queue manager is responsible for managing communications within the MQ Workflow system. The queue prefix is used to set a high-level qualifier for queue names in the MQ Workflow system. For further details, refer to the MQSeries online documentation.

When you have finished entering values in the **MQSeries Workflow Connection** window, click the **OK** button. Values you provided appear as a concatenated string in the list box at the bottom of the **Buildtime Database** page.

### Setting connect parameters for a Buildtime database

To set connection parameters for a Buildtime database, select the desired Buildtime database and press the **ODBC Connect parameters...** button. A **Connect Parameters** window appears.

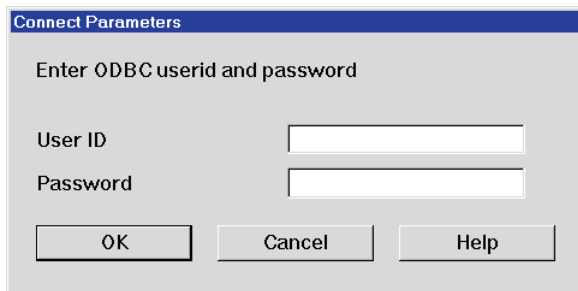


Figure 25. Configuration utility: Connect Parameters window (for ODBC)

In this window, you must specify user ID and password values that give you administration rights for Microsoft Access/Jet Engine.

### Selecting a system

After selecting a valid Buildtime database, values for the MQ Workflow system group and system, queue prefix, and queue manager are read from the database and displayed in the list box located at the bottom of the **Buildtime Database** page. The values are displayed in a concatenated string that has the form:

```
<system>.<system group>.<queue prefix>,<queue manager>
```

If the Buildtime database contains settings for more than one MQ Workflow system, entries for each system are displayed.

## Windows

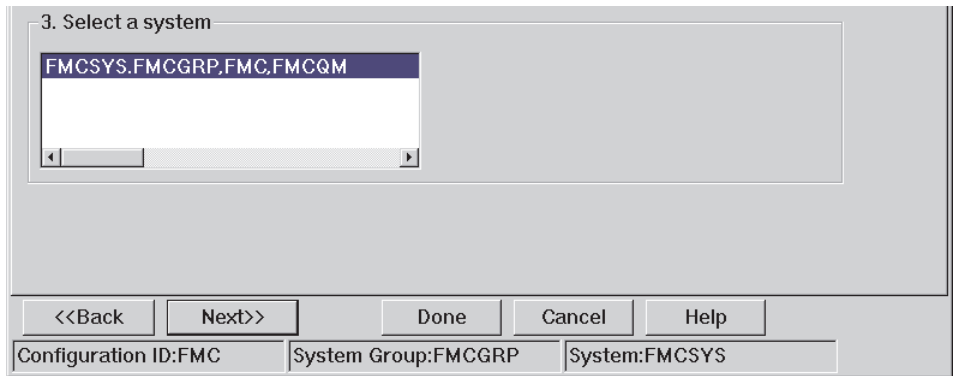


Figure 26. Configuration utility: Buildtime Database page (select a system)

Select the string that identifies the MQ Workflow system for which Buildtime is to be used.

### Client page

The **Client** page is added when you select **Client** from the **General** page.

The **Client** page is simply used to specify a directory for holding sample icons for MQ Workflow client components.

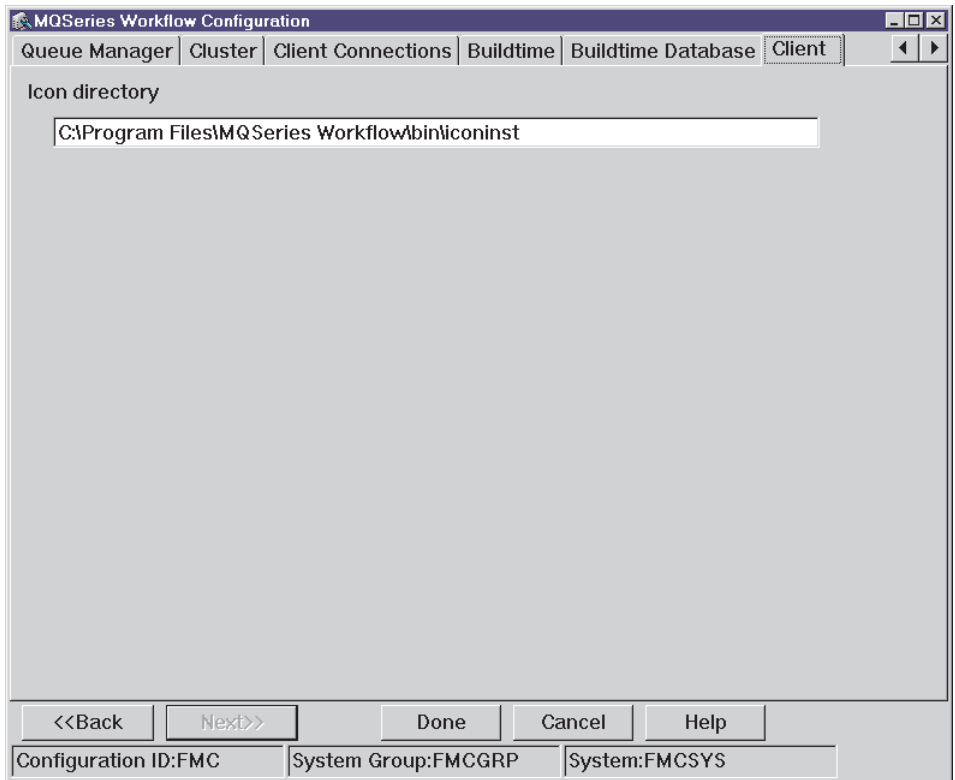


Figure 27. Configuration utility: Client page

Use the **Icon directory** field to specify a directory for holding the sample icons.

### Java CORBA Agent page

The **Java CORBA Agent** page is added when you select **Java CORBA Agent** from the **General** page.

This page is used to specify the naming service used by the Java CORBA Agent, and parameters for garbage collection. Where possible, values for these settings are read from your workstation and displayed in the appropriate fields.

The top half of the page contains radio buttons that allow you to choose a locator policy.

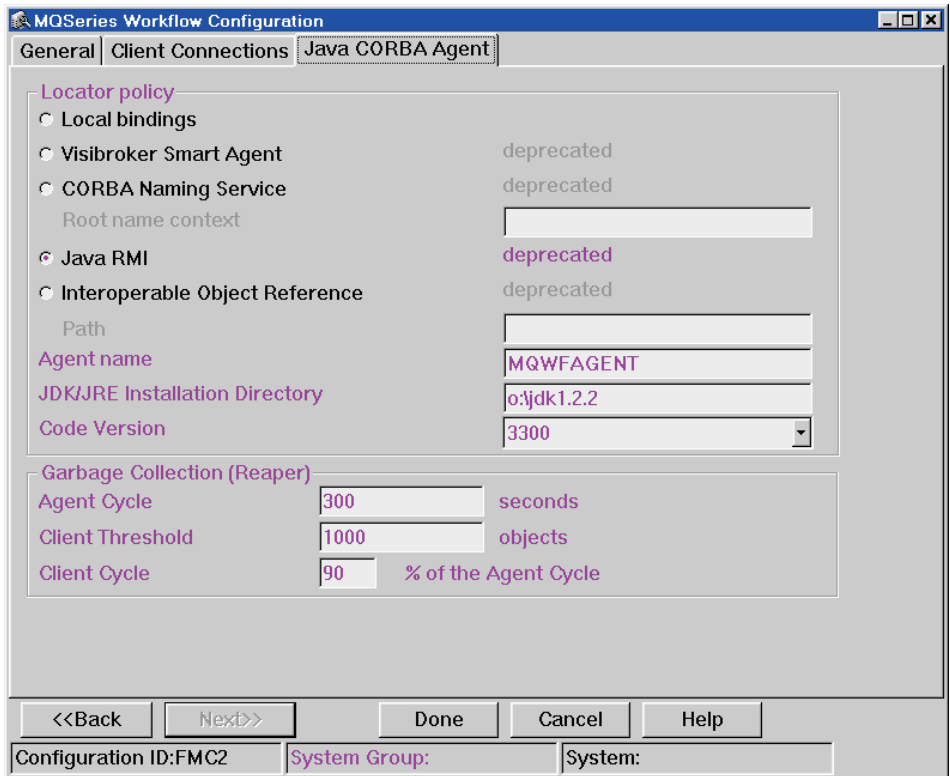


Figure 28. Configuration utility: Java CORBA Agent page



The following locator policies are deprecated: VisiBroker Smart Agent (OSA\_LOCATOR), CORBA Naming Service (COS\_LOCATOR), Java Remote Method Invocation (RMI\_LOCATOR), and Interoperable Object Reference (IOR\_LOCATOR). Deprecated means, it is recommended to no longer use these locator policies, they are currently still implemented, they may be removed in future releases, and it is recommended to use other locator policies.

Java RMI Agents should only be used for prototyping. They are currently not suited for production purposes.



If you want to use the Java Naming and Directory Interface (JNDI) locator policy, it cannot be selected at this stage. Select Local bindings, and complete all the enabled fields on this page. You can change the locator policy to JNDI later, as described in “Configuring JNDI on Windows” on page 176.

If you select a locator policy other than **Local bindings**, you must also specify:

- A name for the Java CORBA Agent in the **Agent name** field.
- The directory where the Java Development Kit and Java Runtime Environment has been installed in the **JDK/JRE Installation Directory** field.
- The code version for the JAR file used by the Java CORBA Agent in the **Code Version** field. The code version is used to specify the version, release, modification, and CSD level of the JAR file to be used for this configuration.

If you select **CORBA Naming Service**, in the **Root name context** field, you must also specify the root name context the Java CORBA Agent will use to register the agent name.

If you select **Interoperable Object Reference**, you must also specify where the agent will publish its Interoperable Object Reference file. You must specify a valid existing directory path with a trailing slash. Only a slash (/) character is accepted as a valid directory separator, for example, E:/InetPub/WWWroot/MQWFJAVA/Agent/. During run time the platform-specific directory separator is used.

The bottom of the **Java CORBA Agent** page is used to specify values for garbage collection.

In the **Agent Cycle** field, specify the length of time between periodic garbage collection. Enter a value anywhere between 30 seconds and 86400 seconds. 300 seconds is the default.

In the **Client Threshold** field, specify the maximum number of unreferenced objects tolerated by each client before non-periodic garbage collection is triggered. Enter a value anywhere between 0 and 500000. 1000 is the default.

In the **Client Cycle** field, specify the ratio between the client-side keep-alive message cycle and the agent-side liveness check. Enter a value between 10% and 90%. 90% is the default.

### Starting the MQ Workflow configuration process

When you have finished entering configuration data, use the **Done** button at the bottom of the MQSeries Workflow Configuration Utility to start the configuration process.



In this release, if you find that the **Done** button is disabled, you are browsing a configuration that was created or modified outside the MQ Workflow configuration utility. Such configurations can only be browsed or deleted using the configuration utility.

After clicking the **Done** button, the **Running configuration...** window appears.

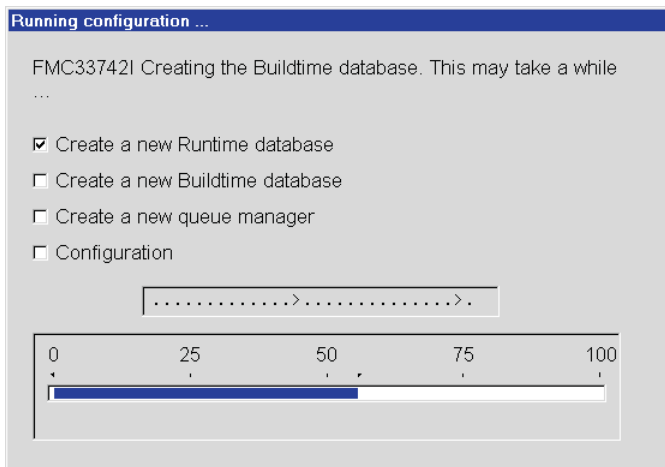
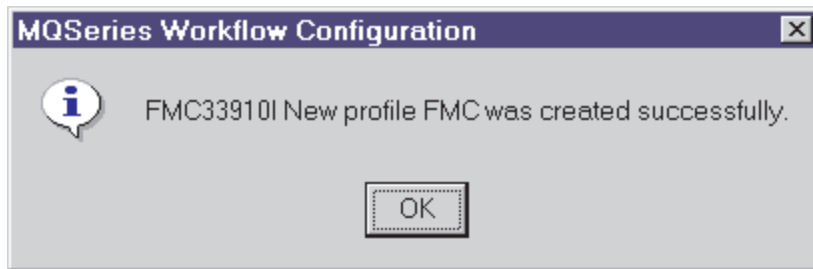


Figure 29. Configuration utility: Running Configuration window

A progress indicator shows how much progress has been made. Check boxes are crossed as each stage in the configuration is completed and a message at the top of the window indicates which step in the configuration process is currently being performed.

When the configuration process is finished the following window appears indicating success:



*Figure 30. Configuration utility: Profile Created Successfully message box*

If you want to use the Java Naming and Directory Interface (JNDI) locator policy, you must configure it as described in “Configuring JNDI on Windows” on page 176.

If you want to use the Web Client, you must configure it as described in “Configuring a Web Client on Windows” on page 178.

MQ Workflow is now ready to be used, however, first you should check that MQ Workflow has been configured correctly as explained in “Appendix Q. Using the configuration checking utility fmczchk” on page 331.





---

## Chapter 15. Verifying MQ Workflow on Windows

The MQ Workflow servers and clients have been installed and configured correctly if they can be started without any error messages appearing. This chapter describes how to start and stop MQ Workflow components on workstations running on Window Me, 98, 2000 or NT.

---

### Starting components in the right order

An MQ Workflow server consists of the following server components:

- Administration server
- Scheduling server
- Cleanup server
- Execution server

**With the exception of MQ Workflow Buildtime, the Administration server must be started before you start any other MQ Workflow components.**

Values in the Runtime database are used to specify whether other MQ Workflow server components are set to start with the Administration server or not. If not, you must use the MQ Workflow administration utility to start them before any other MQ Workflow components are started.

The MQ Workflow Buildtime can be started at any time.

---

### Starting the Administration server

Since an MQ Workflow server cannot be installed on either Windows 98 or Windows Me, the following only applies to Windows 2000 and NT.

The Administration server is always the first MQ Workflow component started in an MQ Workflow system. By default, it is automatically started as a Windows service.



Before you can start an Administration server, DB2 and MQSeries services and their sub-services must be started. After configuring an MQ Workflow server, these services are set to start automatically after reboot.

You can start the Administration server by using any of the following methods:

## Windows

- **Method 1:** Manually as a Windows service.
- **Method 2:** Automatically as a Windows service.
- **Method 3:** From a command line.

It is recommended to start the Administration server as a Windows service.

### Method 1: Manually as a Windows service

To start the Administration server manually as a Windows service, do the following:

1. To select **services**:
  - On Windows NT:
    - a. On the task bar, click on the Windows **Start** menu and select **Settings**.
    - b. Select **Control Panel**.
    - c. Select the **Services** icon. A dialog box appears.
  - On Windows 2000:
    - a. On the task bar, click on the Windows **Start** menu and select **Settings**.
    - b. Select **Control Panel**.
    - c. Select **Administrative Tools**.
    - d. Select the **Services** icon. A dialog box appears.
2. Within the service window of the dialog box, locate the line that reads **MQSeries Workflow 3.3 – <ConfigID>**  
Where <ConfigID> is replaced by the configuration identifier that identifies the MQ Workflow configuration for your MQ Workflow server. Highlight this line.
3. To start the Administration server:
  - On Windows NT: Click on the **Start** button to the right of the window.
  - On Windows 2000: In the **Action** menu, select **Start**.

### Method 2: Automatically as a Windows service

By default, the administration server is normally started as a Windows service. If you have disabled this option, you can set up Windows to start the Administration server automatically as a Windows service, do the following:

1. To select **services**:
  - On Windows NT:
    - a. On the task bar, click on the Windows **Start** menu and select **Settings**.
    - b. Select **Control Panel**.
    - c. Select the **Services** icon. A dialog box appears.
  - On Windows 2000:
    - a. On the task bar, click on the Windows **Start** menu and select **Settings**.
    - b. Select **Control Panel**.

- c. Select **Administrative Tools**.
- d. Select the **Services** icon. A dialog box appears.
2. Within the service window of the dialog box, locate the line that reads **MQSeries Workflow 3.3 – <ConfigID>**  
Where <ConfigID> is replaced by the configuration identifier that identifies the MQ Workflow configuration for your MQ Workflow server. Highlight this line.
3. Click on the **Startup** button to the right of the window to modify startup parameters for the Administration server. A dialog window appears titled **Service**.
4. Within the **Service** dialog, under **Startup Type** click on **Automatic** and select **OK**. The Administration server is now set to start automatically during the next system startup. You must reboot your system to start the Administration server.
5. The user ID and password for the Windows **IBM MQSeries** service are saved in the queue manager registry. This is necessary to allow the two-phase commit. If, for security reasons, you do not want to leave the user ID and password in the registry, delete them from the registry and modify the Windows **IBM MQSeries** and **MQSeries Workflow 3.3 – <ConfigID>** services as follows:
  - a. To select **services**:  
On Windows NT:
    - 1) On the task bar, click on the Windows **Start** menu and select **Settings**.
    - 2) Select **Control Panel**.
    - 3) Select the **Services** icon. A dialog box appears.  
On Windows 2000:
    - 1) On the task bar, click on the Windows **Start** menu and select **Settings**.
    - 2) Select **Control Panel**.
    - 3) Select **Administrative Tools**.
    - 4) Select the **Services** icon. A dialog box appears.
  - b. Within the service window of the dialog box, locate the line that contains the service name (either **IBM MQSeries** or **MQSeries Workflow 3.3 – <ConfigID>**). Highlight this line.
  - c. Click on the **Startup** button to the right of the window to modify startup parameters for the service. A dialog window appears titled **Service**.
  - d. Within the **Service** dialog, under **Log On As**: click on the radio button labeled **This account** and enter your user ID and password.
  - e. Select **OK**.

## Windows

### Method 3: From a command line

To start the MQ Workflow Server from a command line:

1. Open a command prompt window.
2. Enter the command:

```
fmcmain -c -y <ConfigID>
```

Where <ConfigID> is replaced by the configuration identifier that identifies the MQ Workflow configuration for your MQ Workflow server.

After the Administration server starts, a message appears telling you that it has started. If other MQ Workflow server components have been set to start with the Administration server, messages telling you that these servers have started also appear.

---

### Starting the administration utility

Before starting the administration utility you must start the Administration server as explained in “Starting the Administration server” on page 165. To start the administration utility perform the following:

1. On the Windows task bar, click on the **Start** menu.
2. Select **Programs**.
3. Select the **IBM MQSeries Workflow** program folder.
4. Select the **MQSeries Workflow Administration Utility - ConfigurationID**, where *ConfigurationID* is the configuration identifier that identifies the MQ Workflow configuration for the Administration Utility.
5. A command prompt will be opened and display the following:

```
- FMC16006I Administration Utility started.  
System group name : [FMCGRP] FMCGRP  
System name       : [FMCSYS] FMCSYS  
Userid           : [ADMIN] ADMIN  
Password         : []
```

6. Enter the password for the MQ Workflow user ID 'ADMIN'. The password is initially set to 'password'.

For more details about the administration utility, refer to the *IBM MQSeries Workflow: Administration Guide*.

---

### Starting and stopping other MQ Workflow servers

If MQ Workflow server components are not started together with the Administration server, you must use the MQ Workflow administration utility to start each server component individually.

To check whether MQ Workflow server components have been started or not, use the **Query** command provided by the administration utility.

The administration utility can also be used to stop MQ Workflow server components. Refer to the *IBM MQSeries Workflow: Administration Guide* to find out how to use the MQ Workflow administration utility to start and stop each MQ Workflow server component.

For more information about using Buildtime, see *IBM MQSeries Workflow: Getting Started with Buildtime*.

---

## Starting the standard Client

Before starting the standard MQ Workflow Client, the Administration server and all other MQ Workflow server components must already be running.

To start a standard MQ Workflow Client:

1. On the Windows task bar, click on the **Start** menu and select **Programs**.
2. Select the **IBM MQSeries Workflow** program folder.
3. Select the **MQSeries Workflow Client - <ConfigID>** icon, where <ConfigID> is replaced by the configuration identifier that identifies the MQ Workflow configuration for the standard MQ Workflow Client.
4. The following window appears.

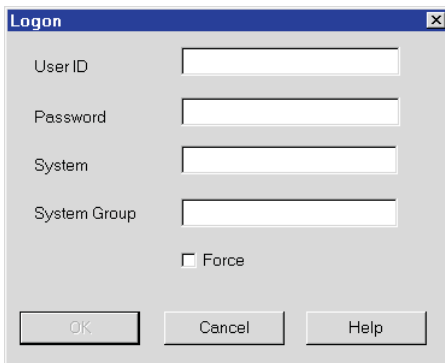


Figure 31. MQ Workflow Client logon window

In this window, enter the Client's user ID and password, and the name of the MQ Workflow system and system group to which the Client should connect.

The user ID and password are initially set to **ADMIN** and **password**, respectively, during the configuration stage.

## Windows

If *unified logon* has been set in the Runtime database, you are automatically logged on to the MQ Workflow system without the need to specify the Client's user ID and password. Unified logon means that when users have logged on to Windows 2000 or NT with their password, there is no need to further log on to individual applications. MQ Workflow supports unified logon when it is specified in the system properties table during MQ Workflow Buildtime. Refer to the *IBM MQSeries Workflow: Getting Started with Buildtime* book for details about setting unified logon.

---

### Starting Buildtime

To start Buildtime installed on any of the supported Windows based operating platforms:

1. On the Windows task bar, click on the **Start** menu and select **Programs**.
2. Select the **IBM MQSeries Workflow** program folder.
3. Select the **MQSeries Workflow Buildtime - <ConfigID>** icon, where <ConfigID> is replaced by the configuration identifier that identifies the MQ Workflow configuration for MQ Workflow Buildtime.
4. The following window appears.

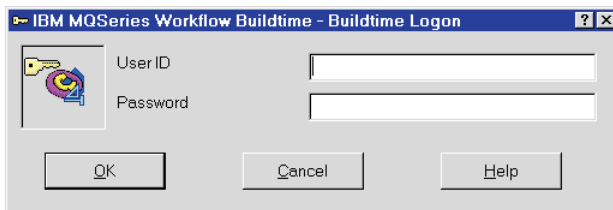


Figure 32. Buildtime logon window

In this window, enter the Buildtime's user ID and password. The user ID and password are initially set to **ADMIN** and **password**, respectively, during the configuration stage.

If *unified logon* has been set in the Buildtime database, you are automatically logged on without the need to specify the Buildtime's user ID and password. Unified logon means that when users have logged on to Windows 2000 or NT with their password, there is no need to further log on to individual applications. MQ Workflow supports unified logon when it is specified in the system properties table during MQ Workflow Buildtime. Refer to the *IBM MQSeries Workflow: Getting Started with Buildtime* book for details about setting unified logon.

---

## Starting and stopping a Java CORBA Agent

To start a Java CORBA Agent:

1. Ensure that the Administration server and all other MQ Workflow server components are already running.
2. If you are using a local queue manager for client communication, make sure that this queue manager is running.
3. On the Windows task bar, click on the **Start** button and select **Programs**.
4. Select the **IBM MQSeries Workflow** program folder.
5. Select the **MQSeries Workflow Java Agent** icon, with the configuration identifier for the MQ Workflow configuration for this Java CORBA Agent. A new MS-DOS command prompt window opens.
6. When the message "FMC38004I MQSeries Workflow CORBA Agent started." appears, the Java CORBA Agent has been successfully started. Additional runtime information about this Java CORBA Agent is also displayed.

To stop a Java CORBA Agent:

1. Make sure that all Java API clients have logged off from the Java CORBA Agent.
2. Select the MS-DOS command prompt window for the Java CORBA Agent that you want to stop.
3. Press and hold the **Control** key and press the 'C' key (Ctrl-C).

---

## Stopping the Administration server

Since an MQ Workflow server cannot be installed on either Windows 98 or Windows Me, the following only applies to Windows 2000 and NT.

You should note that stopping the Administration server also stops all other MQ Workflow server components.

There are two methods used to stop the Administration server:

1. Via the administration utility.
2. Via the service panel.



The methods described here for stopping an MQ Workflow Administration server are the only valid methods. You may find by using methods other than these, MQ Workflow resources are not cleaned up and DB2 and MQSeries are not deregistered.

## Windows

### Using the administration utility to stop the Administration server

To stop an MQ Workflow Administration server via the administration utility:

1. Start the administration utility.
2. From the main menu, select **s**. The system commands menu is displayed.
3. From the system commands menu, select the shutdown system option **d**.  
A message appears to tell you that a system shutdown has been requested.  
As each MQ Workflow Server component is stopped, a message is displayed informing you about the component's change in state.

### Using the service panel to stop the Administration server

To stop an MQ Workflow Administration server via the service panel:

1. To select **services**:  
On Windows NT:
  - a. On the task bar, click on the Windows **Start** menu and select **Settings**.
  - b. Select **Control Panel**.
  - c. Select the **Services** icon. A dialog box appears.  
On Windows 2000:
  - a. On the task bar, click on the Windows **Start** menu and select **Settings**.
  - b. Select **Control Panel**.
  - c. Select **Administrative Tools**.
  - d. Select the **Services** icon. A dialog box appears.
2. Within the service window of the dialog box, locate the line that reads **MQSeries Workflow 3.3 – <ConfigID>**.  
Where <ConfigID> is replaced by the configuration identifier that identifies the MQ Workflow configuration for your MQ Workflow server.  
Highlight this line.
3. Click on the **Stop** button to the right of the window.

---

### Stopping the administration utility

To stop the administration utility, select **x** from the menu screen until you exit from the administration utility. When control passes to a command prompt, the administration utility has stopped.

For more details about the administration utility refer to the *IBM MQSeries Workflow: Administration Guide*.



---

## Chapter 16. Changing your configuration on Windows

After a configuration has been defined and created, there are occasions when you will want to change your configuration. This chapter describes how to perform the following tasks:

- “Changing the settings for the Java CORBA Agent on Windows”
- “Configuring JNDI on Windows” on page 176
- “Configuring a Web Client on Windows” on page 178
- “Changing passwords on Windows” on page 179

---

### Changing the settings for the Java CORBA Agent on Windows

In this release, if you want to change the settings for the Java CORBA Agent, you must change it as you would on a UNIX platform; using the command line configuration utility `fmczutil`. This may be necessary if you want to upgrade your Java Agent, use a different JDK installation directory, or use the locator policy “Java Naming and Directory Interface”.

**Note:** Programs that rely on an existing agent will probably stop working if you change the locator policy, the agent name, or the code level.

1. Log on as an administrator.
2. Open a command prompt window.
3. Enter the command:  
`fmczutil`
4. You should see the Configuration Commands menu:

```
FMC33201I Configuration Commands Menu:
l ... List
s ... Select
c ... Create
d ... Change default configuration
x ... Exit Configuration Commands Menu
```

5. Enter **s** to select a configuration.
6. Enter the configuration ID of the configuration that you want to change, or press Enter to accept the default shown in square brackets.
7. You should see:

```
FMC33202I Selected Configuration Commands Menu:
  Selected configuration : FMC
c ... Configuration Settings Menu
r ... Runtime Database Commands Menu
q ... Queue Manager Commands Menu
w ... Web Client Commands Menu
x ... Exit Selected Configuration Commands Menu
```

8. Enter **c** to display the Configuration Settings menu.
9. Enter **j** to display the Java Agent Settings menu.
10. When you see:

```
FMC33217I Java Agent Settings Menu:
  Selected configuration : FMC
d ... Display
c ... Change
x ... Exit Java Agent Settings Menu
```

Enter **c** to display the Java Agent Settings Change menu.

**Note:** Entering **d** will display the current settings for the Java Agent.

11. You should see:

```
FMC33228I Java Agent Settings Change Menu:
  Selected configuration : FMC
p ... Locator Policy
n ... Agent name
i ... JDK / JRE installation directory
l ... Code level
a ... Agent cycle
t ... Client threshold
c ... Client cycle
x ... Exit Java Agent Settings Change Menu
```

**Note:** If the Java Agent uses the 'Local bindings' locator policy, options 'n', 'i', and 'l' are not displayed.

12. If you want to change the locator policy or values that are specific to the locator policy, enter **p**, then, when you see:

```
- Configuration of Java Agent ...
FMC33509I Select locator policy ...:
l ... (X) Local bindings
v ... ( ) Visibroker Smart Agent (deprecated)
c ... ( ) CORBA Naming Service (deprecated)
r ... ( ) JAVA RMI (deprecated)
i ... ( ) Interoperable Object Reference (deprecated)
j ... ( ) Java Naming and Directory Interface
```

- a. Enter the letter to select a locator policy, or press Enter to accept the default (local bindings) which is marked with an '(X)'.

**Note:** Java RMI Agents should only be used for prototyping. They are currently not suited for production purposes. The following locator policies are deprecated: VisiBroker Smart Agent (OSA\_LOCATOR), CORBA Naming Service (COS\_LOCATOR), Java Remote Method Invocation (RMI\_LOCATOR), and Interoperable Object Reference (IOR\_LOCATOR). Deprecated means, it is recommended to no longer use these locator policies, they are currently still implemented, they may be removed in future releases, and it is recommended to use other locator policies.

b. If you see:

```
Agent name           : [MQWFAGENT]
JDK/JRE Installation Directory : [c:\java]
Code Version         : [3300]
```

- 1) Enter the name for the Java CORBA Agent.
- 2) Enter directory on your workstation where the Java Development Kit or Java Runtime Environment has been installed.

**Note:** The lib subdirectory must contain the file rt.jar and the bin subdirectory must contain the executable java.exe.

- 3) Enter the code version for the JAR file used by the Java CORBA Agent.

c. If you see:

```
VisiBroker Installation Directory : []
```

Enter the path where VisiBroker is installed.

d. If you see:

```
Root name context : []
```

Enter a name to be used to register the agent.

e. If you see:

```
Java IOR Path : []
```

Enter the location where the agent publishes its Interoperable Object Reference file.

f. If you see:

```
FMC33606I Specify information about garbage collection (reaper) ...:  
Agent cycle (in seconds)      : [300]  
Client threshold (number of objects) : [1000]  
Client cycle (in % of agent cycle) : [90]
```

- 1) Enter the length of time between periodic garbage collection. Any value between 30 and 86400 seconds is valid.
  - 2) Enter the maximum number of unreferenced objects that will be tolerated by each client before a non-periodic garbage collection is triggered. Any value between 0 and 500000 is valid.
  - 3) Enter the ratio between the client-side keep-alive message cycle and the agent-side liveness check. Any value between 10% and 90% is valid.
13. If you want to make other changes, repeatedly select the appropriate option and enter the new value.
  14. When you have finished making changes, enter **x** to exit the menu.
  15. If you changed the locator policy, you may see the following warning:

```
- FMC33692W Changing the value for 'Locator Policy' will cause  
             malfunction of programs using this Java CORBA Agent.  
- FMC33718I Do you want to change the settings for the Java CORBA Agent?  
  y ... Yes  
  n ... No
```

If you enter **y** (or if this warning is not displayed), the changes will be written to the configuration profile, if you enter **n**, the changes will not be written to the configuration profile.

16. Enter **x** four times to exit the configuration utility.

---

## Configuring JNDI on Windows

In this release, if you want to use the Java Naming and Directory Interface (JNDI) on a Windows platform, you must first create a configuration with a Java Agent using the locator policy 'Local bindings', and then configure it as for JNDI, as you would on a UNIX platform; using the command line configuration utility `fmczutil`:

1. Create a configuration with a Java Agent using the locator policy 'Local bindings', as described in "Chapter 14. Configuring MQ Workflow on Windows" on page 131.
2. Log on as an administrator.
3. Open a command prompt window.
4. Enter the command:  
`fmczutil`
5. You should see the Configuration Commands menu:

```
FMC33201I Configuration Commands Menu:
l ... List
s ... Select
c ... Create
d ... Change default configuration
x ... Exit Configuration Commands Menu
```

6. Enter **s** to select a configuration.
7. Enter the configuration ID of the configuration that you want to use JNDI, or press Enter to accept the default shown in square brackets.
8. Enter **c** to display the Configuration Settings menu.
9. Enter **j** to display the Java Agent Settings menu.
10. Enter **d** to display the Java Agent settings for this configuration.
11. Enter **c** to change the Java Agent settings.
12. Enter **p** to change the locator policy.
13. Enter **j** to select the JNDI policy.
14. Enter the agent name.
15. Enter the JDK/JRE installation directory.
16. Enter the code version, or press Enter to accept the default code version.
17. When you see:

```
w ... (X) com.ibm.ejs.ns.jndi.CNInitialContextFactory (IBM WebSphere V3.5)
j ... ( ) com.sun.jndi.cosnaming.CNCtxFactory (Java 2 Runtime Environment)
o ... ( ) (Other)
```

Select the naming context factory by entering **w** or **j**, or enter **o** and then the full name (including package names) of a JNDI naming context factory class.

18. If you see:

```
JAR file containing naming factory : [/usr/WebSphere/AppServer/lib/ujc.jar]
```

- Enter the filename of the .jar file that contains the naming factory class.
19. Enter the TCP/IP address or host name of the machine where the JNDI name server is located, or press Enter to accept the default value.
  20. Enter the TCP/IP port number that the JNDI name server is using, or press Enter to accept the default.
  21. Enter **x** to exit the Java Agent Settings Change menu.
  22. Now the changes are written to the configuration profile and a batch file will be created in the configuration directory.
  23. If warning message FMC33692W is displayed, enter **y** to confirm that you want to change the locator policy settings.

## Windows

24. Enter **x** four times to exit the configuration utility.
25. Close the command prompt window.

The batch file created in step 22 on page 177 can be used to start the agent. You can also start the agent by selecting the Windows **Start** button, then **Programs, IBM MQSeries Workflow, and MQSeries Workflow Java Agent - ConfigID**.

---

### Configuring a Web Client on Windows

In this release, if you want to use the Web Client on a Windows platform, you must configure it as you would on a UNIX platform; using the command line configuration utility `fmczutil`:

1. Log on as an administrator.
2. Open a command prompt window.
3. Enter the command:  
`fmczutil`
4. You should see the Configuration Commands menu:

```
FMC33201I Configuration Commands Menu:
l ... List
s ... Select
c ... Create
d ... Change default configuration
x ... Exit Configuration Commands Menu
```

5. Enter **c** to create a new configuration.
6. Enter a new configuration identifier.
7. Enter **w** to select the Web Client.
8. If you want to use 'Local bindings' as locator policy, enter **j** to select the Java Agent.
9. Follow the instructions for UNIX platforms listed in "Entering further information" on page 77. Depending on your setup you may need to perform the following:
  - a. "Entering queue manager information" on page 83
  - b. "Entering connection information for a client (or Java agent)" on page 86
  - c. "Entering information for the Java CORBA Agent" on page 86
  - d. "Entering information for the Web Client" on page 89
10. Follow the instructions for UNIX platforms listed in "After entering the configuration information" on page 92. Depending on your setup you may need to perform steps 1, 4 and 5.
11. Enter **x** to exit the configuration utility.

If you have problems getting the Web Client working, refer to the WebSphere Application Server documentation, and “Web Client problem determination” on page 183.

---

## Changing passwords on Windows

If you change a password for a user ID that is used by MQ Workflow, you must notify MQ Workflow for each configuration that includes any of the following components: server, Runtime database utilities, and Buildtime. To change the password you must do the following:

1. Start the MQ Workflow Configuration Utility by selecting the **MQSeries Workflow Configuration Utility** icon in the **MQSeries Workflow** folder.
2. Select the configuration.
3. To change the password for the Runtime database user ID:
  - a. Select the **Runtime Database** page.
  - b. Click on **DB2 Connect parameters....**
  - c. Enter user ID and password in the dialog.
4. To change the password for the Buildtime database user ID:
  - a. Select the **Buildtime Database** page.
  - b. If you are using DB2, click on **DB2 Connect parameters....**
  - c. If you are using a Microsoft Jet Engine database, click on **ODBC Connect parameters....**
  - d. Enter the user ID and password in the dialog.

## Windows



---

## Chapter 17. Problem determination on Windows

If you are having problems running MQ Workflow servers or clients, you can try using the following sources of information to solve your problem:

- “Where to find MQ Workflow log files on Windows”
- “Running an MQ Workflow trace on Windows”
- “Java API Classes and Java CORBA Agent problem determination” on page 182
- “Web Client problem determination” on page 183
- “Appendix Q. Using the configuration checking utility `fmczchk`” on page 331
- The latest MQ Workflow support information is available at <http://www.ibm.com/software/ts/mqseries/workflow>

---

### Where to find MQ Workflow log files on Windows

You can find MQ Workflow log files in the following locations:

- General MQ Workflow log files:  
`x:\Program Files\MQSeries Workflow\log\*.log`
- For an MQ Workflow configuration `<ConfigID>`:  
`x:\Program Files\MQSeries Workflow\cfgs\<ConfigID>\log\*.log`

---

### Running an MQ Workflow trace on Windows

It may be necessary to run an MQSeries Workflow product trace in order to find the cause of a problem.

1. Start the trace by entering the command:

```
fmczchk -c trc:level,filename -y ConfigID
```

where

*level* Has the value 0 for high-level information, 1, 2, or 3 for increasing levels of detail.

*filename*

Is the path and file name of the trace file. The extension `.log` will be added to the file name you specify. This is optional.

*ConfigID*

Is the configuration identifier for the system you want to trace. If you do not specify the `-y` option, the trace will be performed on

the system identified by the *DefaultConfiguration ID* variable that is set in the general configuration profile.

2. Restart the MQ Workflow server or component that you want to trace.
3. Recreate the problem situation.
4. Stop the MQ Workflow server or component that you have been tracing.
5. Disable tracing by entering the command:  

```
fmczchk -c trc:0 -y ConfigID
```
6. Check the trace file *filename.log*
7. The latest MQ Workflow support information is available at <http://www.ibm.com/software/ts/mqseries/workflow>

---

### Java API Classes and Java CORBA Agent problem determination

If you have problems running the Java CORBA Agent or an application that uses the Java API classes, check the following:

1. Make sure you have the most recent level of the JDK.
2. Check that the Java Native Interface (JNI) works properly by issuing the command:

```
java com.ibm.workflow.catalog.Properties -yConfigurationID
```

This lists the Java system properties and Java Agent properties for the given configuration (or for the default configuration if the `-y` option is not specified). This requires that `fmcojagt.jar` is in the `CLASSPATH`. Your output may look similar to:

```
-- listing properties --
java.runtime.name=Java(TM) 2 Runtime Environment, Stand...
java.vm.version=1.3.0
java.vm.vendor=IBM Corporation
java.vendor.url=http://www.ibm.com/
path.separator=;
java.vm.name=Classic VM
```

....

```
-- listing properties --
Agent.CosNaming.Root=
Agent.Naming.Factory=
Agent.Reaper.Threshold=1000
Agent.IorPath=./
Agent.Naming.URL=
Agent.Reaper.Cycle=300000
Agent.Reaper.Ratio=90
```

3. To verify that your `CLASSPATH` is set correctly, that the Java Native Interface works properly, and that your MQSeries authorizations are set up correctly, run the `HelloApplication` by issuing the command:

```
java HelloApplication AgentName LOC ADMIN password
```

**Note:** This requires `fmcojagt.jar` in the CLASSPATH.  
Your output may look similar to:

```
Logon successful
available worklists:
    WL
    Workitems for worklist WL
available process templates:
    CreditRequest
Logoff successful
```

This is especially useful when you have a complex security setup.

---

## Web Client problem determination

If you have problems running the Web Client, check the following:

1. Verify that your basic Java CORBA Agent/Java API classes setup works correctly, as described in “Java API Classes and Java CORBA Agent problem determination” on page 182.
2. Verify that your Web Server installation is able to serve static content (HTML files). For details how to do this, see the documentation for your Web Server.
3. Verify that your Application Server (Servlet Container) installation works correctly. Consult your Application Server (Servlet Container) documentation for details. For example, for the WebSphere Application Server, try `http://localhost/servlet/snoop`.



---

## Part 5. Appendixes



---

## Appendix A. Basic DB2 and MQSeries commands

This appendix contains basic DB2 and MQSeries commands that you may need to use during the MQ Workflow setup procedure. For more information, see the online product documentation.

---

### Basic DB2 commands

The following contains information that explains how to:

1. "Starting DB2"
2. "Stopping DB2"
3. "Accessing a remote DB2 instance" on page 188
4. "Accessing a remote DB2 database" on page 189

For additional details not given here refer to the DB2 online books contained on the IBM DB2 Universal Database CD-ROM.



For **Windows**, all DB2 commands must be entered within a DB2 command window. To start a DB2 command window, enter **DB2CMD** at a command prompt.

For any of the **UNIX** based operating platforms, DB2 commands can be entered at a command prompt.

### Starting DB2

To start DB2 on your workstation, enter the following DB2 command:

```
db2start
```

When DB2 starts, the following message appears:

```
SQL1063N DB2START processing was successful.
```

If DB2 is already running, the following message appears:

```
SQL1026N The database manager is already active.
```

### Stopping DB2

To stop DB2 on your workstation, enter the following DB2 command:

```
db2stop
```

When DB2 stops, the following message appears:

## Accessing a remote DB2 instance

A remote DB2 instance can be accessed from another workstation via any of the following:

- Named pipes
- TCP/IP
- NetBIOS
- IPX/SPX
- APPC

Via any of these communications protocols, a DB2 instance on a remote workstation can be made accessible to your workstation by using the DB2 client configuration assistant, the DB2 control center, or by entering the DB2 command `db2 CATALOG`.

The following describes how to use this command to access a remote DB2 instance via TCP/IP. For other communication protocols refer to the DB2 *Installing and Configuring DB2 Clients* manual.

To access a remote DB2 instance via TCP/IP, enter the following command and options:

```
db2 CATALOG TCPIP NODE <node-name> REMOTE <computer-name>  
      SERVER <port-number> REMOTE_INSTANCE <instance-name>
```

Where:

**<node-name>** is a local alias or nickname that describes the node where the database instance resides. You can choose any name you want, however, all node name values within your local node directory must be unique.

**<computer-name>** is either the host name or IP address of the remote server workstation where the database instance resides.

**<port-number>** is either the connection service name or port number.

The connection service name is an arbitrary name used to represent the port number on the client.

The port number used by the client to catalog a TCP/IP node must be the same as the port number that the connection service name maps to in the services file on the server. The connection service name is located in the database manager configuration file on the DB2 server.



This value must not be used by any other applications.

*<instance-name>*

is the name of the DB2 instance on the remote workstation.

### Verifying the catalog entry

To verify the catalog entry, enter the following commands:

```
db2 ATTACH TO <node-name> USER <userID> USING <password>
db2 DETACH
```

### Example

To access a DB2 instance called *db2inst1*, located on a workstation named *deptsrv* using the node-name *srvinst1*, using the port number 60 000, with the user *userID* and the password *password*, enter the following commands:

```
db2 CATALOG TCP/IP NODE srvinst1 REMOTE deptsrv SERVER 60000
      REMOTE_INSTANCE db2inst1
db2 ATTACH TO srvinst1 USER userID USING password
db2 DETACH
```

## Accessing a remote DB2 database

Before you can access a DB2 database installed on a remote workstation you must access the remote DB2 instance for this database as described in “Accessing a remote DB2 instance” on page 188.

If a DB2 database is installed on a remote workstation, it can be made accessible to your workstation by using the DB2 client configuration assistant, the DB2 control center, or by entering the following DB2 command and options:

```
db2 CATALOG DATABASE <database-name> AT NODE <node-name>
```

Where:

*<database-name>*

is the name of the database on the remote workstation you want to access.

*<node-name>*

is a local alias or nickname that describes the node where the database resides. The name you specify must be the same as the name you specified for accessing the remote DB2 instance.

### Verifying the catalog entry

To verify the catalog entry, enter the following commands:

```
db2 CONNECT TO <database-name> USER <userID> USING <password>
db2 CONNECT RESET
```

### Example

To access a DB2 database called *testdb* on the node *srvinst1* with the user *userID* having the password *password*, make the remote database accessible to your workstation and verify that by entering the following commands and options:

```
db2 CATALOG DATABASE testdb AT NODE srvinst1
db2 CONNECT TO testdb USER userID USING password
db2 CONNECT RESET
```

---

## Basic MQSeries commands

Before you can start an MQ Workflow server, the following MQSeries services must be running:

1. Queue Manager
2. Listener
3. Trigger Monitor

How you start these services depends on your operating system.

On any of the UNIX based operating platforms, each service is started by invoking commands at a command prompt.

On Windows each service is started by setting the startup type for each service to be **Automatic** and then starting MQSeries as a Windows service.

The methods for starting these services on each platform are described in the following.

### Starting MQSeries on Windows 2000 and NT

To start the MQSeries queue manager, listener, and trigger monitor on Windows 2000 and NT, you must start MQSeries as a Windows service. To do this:

1. On the task bar, click on the Windows **Start** button and select **Settings**.
2. From **Settings**, select **Control Panel**.
3. On Windows 2000:
  - a. Within the **Control Panel**, select the **Administrative Tools** icon.
  - b. Select the **Services** icon. A dialog box appears.

On Windows NT:

- a. Within the **Control Panel**, select the **Services** icon. A dialog box appears.
4. Within the service window of the dialog box, locate the line that reads **IBM MQSeries**. Highlight this line.

5. Click on the **Start** button to the right of the window to start MQSeries. If set to do so, all MQSeries services should now start.

## **Making MQSeries services start automatically on Windows 2000 and NT**

To make MQSeries services start automatically, perform the following:

1. On the task bar, click on the Windows **Start** button and select **Programs**.
2. From **Programs**, select **IBM MQSeries**.
3. From **IBM MQSeries**, select **MQSeries Services**.
4. Within the **MQServices** window that appears, select **IBM MQSeries Services** from the panel located on the left-hand side of the window.
5. From the list that appears under **IBM MQSeries Services**, select the MQSeries queue manager for your MQ Workflow system. (FMCQM is the default).
6. From the list of services that appears in the panel located on the right-hand side of the window, check whether the status for the **Queue Manager, Listener, and Trigger Monitor** services is **Running**. Any service that is not running has not been set to start automatically when MQSeries starts as a Windows service.
7. Select the service.
8. Right-click the mouse button, and choose **All Tasks**, and **Start**.
9. Right-click the mouse button, choose **Properties** and **Automatic**.

Now these services will be started automatically when MQSeries is started as a Windows service.

## **Starting MQSeries on UNIX**

For any of the UNIX based operating platforms, all MQSeries services except the TCP/IP listener program must be started manually by entering MQSeries commands at a command prompt. The TCP/IP listener program is started automatically. Each command is described in the following.

### **Start the MQSeries queue manager**

To start the MQSeries queue manager, at a command prompt enter:

```
strmqm <MQQueueManager>
```

Where *<MQQueueManager>* is replaced by the queue manager name for your MQ Workflow system. The queue manager name is case sensitive. The queue manager name is specified during the configuration stage as explained in "Entering queue manager information" on page 83.

For example, to start the MQSeries queue manager called FMCQM, enter:

```
strmqm FMCQM
```

When the MQSeries queue manager starts, the following message appears:

```
MQSeries queue manager started.
```

If the queue manager is already running, the following message appears:

```
MQSeries queue manager is active.
```

### **Starting the MQSeries trigger monitor**

To start the MQSeries trigger monitor, at a command prompt enter:

```
runmqtrm -m <MQQueueManager> -q FMCTRIGGER &
```

Where <MQQueueManager> is replaced by the queue manager name for your MQ Workflow system. The queue manager name is case sensitive. The queue manager name is specified during the configuration stage as explained in “Entering queue manager information” on page 83.

For example, if the MQSeries queue manager name is FMCQM, to start the MQSeries trigger monitor enter:

```
runmqtrm -m FMCQM -q FMCTRIGGER &
```

### **Starting the MQSeries command server**

If you are creating an additional system, the MQSeries command server must be running on the machine that hosts the first queue manager in the cluster. On Windows, it is started automatically. On UNIX, you must start it manually.

To start the MQSeries command server, at a command prompt, enter:

```
strmqcsv <MQQueueManager>
```

---

## Appendix B. MQ Workflow variables

This appendix describes MQ Workflow variables set during the installation and configuration stages in the MQ Workflow setup process, where to find them and how to change their values.

---

### Locating MQ Workflow variables

During the installation and configuration stages in the MQ Workflow setup process, information you supply is used to set the value of MQ Workflow variables. A few MQ Workflow variables are stored in the system environment. The majority are stored in one of three profiles:

**“Installation profile variables” on page 198**

The installation profile contains data that is set during the MQ Workflow installation stage and is independent of the configuration stage. Data such as the MQ Workflow installation directory, language, version number, and MQ Workflow components installed are contained in the installation profile.

**“General configuration profile variables” on page 201**

The general configuration profile contains data that is common to any configuration in an MQ Workflow system group. Currently it only contains the configuration identifier for the default configuration.

**“Configuration profile variables” on page 201**

The configuration profile contains data that you specify during the configuration stage, such as the name of the MQ Workflow system, the Runtime database and queue manager. This data is used to configure database and communication resources and define settings for MQ Workflow. The configuration profile is created during the configuration stage and can be deleted.

These profiles are collectively referred to as the MQ Workflow profile. Only where necessary are the specific profile names used.

In addition to the MQ Workflow profile some environment variables also influence the behavior of MQ Workflow.

---

## Changing values of MQ Workflow variables

Values for each MQ Workflow variable set in the system environment and MQ Workflow profile should be changed if they cause conflicts with other applications on your workstation.



Changing the values of MQ Workflow variables can affect additional files that use the same variables. “Appendix D. Updated files” on page 223 describes the affected files and updates you may need to make to these files after changing values of variables in the MQ Workflow profile or system environment.

### Changing values in the system environment

On Windows you can change values in the system environment in the following ways:

- On Windows 2000, in the **Control panel**, select the **System** icon, the **Advanced** tab, the **Environment** button, and edit the values there.
- On Windows NT, in the **Control panel**, select the **System** icon, and the **Environment** tab, and edit the values there.
- On Windows 98 and Me, open and edit values in the AUTOEXEC.BAT file.

*Table 60. Location of the system environment variables*

Operating platform	System environment location
Windows 2000	Control panel / System icon / Advanced tab / Environment button
Windows NT	Control panel / System icon / Environment tab
Windows 98 / Me	Edit AUTOEXEC.BAT

**Note:** On Windows NT and Windows 2000, environment variables can be set as “System Variables” and “User Variables” for the currently logged on user. Generally, a variable that has been defined for a user will take precedence over a variable defined for the system. This means that the behavior can change if you log on with a different user ID. This is especially important for the variables NLSPATH and LOCPATH.

### Changing values in the MQ Workflow profile

The location of the MQ Workflow profiles and system environment for any of the supported operating platforms is as follows:

Table 61. Location of the MQ Workflow profiles

Operating platform	MQ Workflow profile
UNIX	<p><b>Installation profile</b>            For AIX: /usr/lpp/fmc/fmcrs            For HP-UX and Sun Solaris: /opt/fmc/fmcrs</p> <p><b>General configuration profile</b>            &lt;ConfigRootDir&gt;/fmcrs</p> <p><b>Configuration profile</b>            &lt;ConfigRootDir&gt;/cfs/&lt;ConfigID&gt;/fmcrs Where            ConfigID is the configuration ID.</p>
Windows 2000	Windows 2000 registry
Windows NT	Windows NT registry
Windows 98	Windows 98 registry
Windows Me	Windows Me registry

To change values in the MQ Workflow profile, use the MQ Workflow configuration utility as explained in:

- “Chapter 8. Configuring on UNIX” on page 65
- “Chapter 10. Changing your configuration on UNIX” on page 101
- “Chapter 14. Configuring MQ Workflow on Windows” on page 131

### Changing MQ Workflow variables using the configuration checking utility

If you cannot change an MQ Workflow profile variable using the configuration tools, you can use the configuration checking utility as described below.



If you use the configuration-checking utility to change a variable which can also be changed with the MQSeries Workflow configuration utility, your MQ Workflow system may stop running. There is no syntax checking or any other validation on the entered values when using this command.

To change the values of variables in the MQ Workflow profile using the configuration-checking utility, at a command prompt, enter the command:

```
fmczchk -c inst:[<profile>,<variable>[,<value>]
```

Where:

<profile> is the character that represents the profile you want to change:

- i** for installation profile
- g** for general configuration profile
- m** for configuration profile. This is the default value.

**<variable>** is the MQ Workflow profile variable name you want to add or update. See “MQ Workflow variables” for a list of MQ Workflow profile variable names.

**<value>** is the new value of the MQ Workflow profile variable. If you do not specify any value here, the variable is deleted from the profile.



It is not recommended to edit any MQ Workflow profile manually.

## Guidelines for changing values

When changing values of MQ Workflow variables in the MQ Workflow profile or system environment, adhere to the following guidelines:

- Use descriptive names. For example, use DB2 or MQSeries for the start of a name that describes a DB2 or MQSeries component, respectively.
- Use names that contain letters from A to Z or numbers from 0 to 9.

For details about using special characters for values that refer to DB2 and MQSeries variables see the DB2 and MQSeries documentation.

The conventions and rules to follow when choosing values for particular MQ Workflow variables in the system environment and MQ Workflow profile are shown in “MQ Workflow variables” where applicable.

---

## MQ Workflow variables

There are four different types of MQ Workflow variables:

- “System environment variables” on page 197
- “Installation profile variables” on page 198
- “General configuration profile variables” on page 201
- “Configuration profile variables” on page 201

The following tables contain several entries for each MQ Workflow variable. These are described as follows:

### MQ Workflow variable

This entry contains the name of the MQ Workflow variable as it appears in the MQ Workflow profile or system environment.



### Description

This entry contains a description for the MQ Workflow variable.

### MQ Workflow Windows configuration utility page

When applicable, this entry contains the name of the page, pop-up window, field, radio button, or check box in the MQSeries Workflow Configuration Utility that is used to set this MQ Workflow variable.

### Default value

This entry contains the default value for the MQ Workflow variable. If no default value is defined for this variable, this entry contains "No default".

### Naming conventions

This entry specifies the rules to adhere to when changing the value of an MQ Workflow variable. Where no rules apply, this entry contains "Not applicable". Options that are contained in the configuration profile are not case sensitive.

### Used by

This entry specifies the name of the MQ Workflow component that is affected when you set the value of this MQ Workflow variable.

Setting the value of some MQ Workflow variables only affects the behavior of the specified component during configuration and does not affect its behavior during run time. This is indicated by the statement (**configuration only**).

## System environment variables

All MQ Workflow system environment variables are listed in Table 62.

Table 62. System environment variables

MQ Workflow variable	Description	Default value	Used by
		Naming conventions	
FMC_DEFAULT_CONFIGURATION	The value of this variable is used as the default configuration identifier when MQ Workflow executables are called without specifying a configuration parameter (parameter -y).	On UNIX the default is FMC. On other platforms there is no default.	Server, Administration utility, Buildtime, Clients, Configuration Utility
		A maximum of 8 characters can be used. Characters from A-Z or a-z, and numbers from 0-9 are allowed.	
FMC_INSTALLATION_DIRECTORY	(Solaris only) This variable must be set if MQ Workflow was not installed in /opt.	/opt	All components
		A valid path to the MQ Workflow installation directory.	

Table 62. System environment variables (continued)

MQ Workflow variable	Description	Default value	Used by
		Naming conventions	
LOCPATH	Files for code page conversions.	On Windows: <InstallationDirectory>\BIN \LOCALE	Server, Administration utility, Clients, Buildtime
		A valid path to the locale files.	
MQSPREFIX	This value specifies the path to the qmgrs directory, below which the queue manager data is kept. It is effective only when a new queue manager is created.	There is no default value.	Server (configuration only)
		Must be an existing directory path, which contains a subdirectory qmgrs. The user ID mqm and group mqm must have full authorities to these directories. See the MQSeries documentation for more information.	
NLSPATH	Valid for UNIX, Windows NT and Windows 2000. Sets the search path for the message-catalog file.  For details regarding the system and MQ Workflow languages refer to "Appendix C. Language settings" on page 219.	<b>On UNIX:</b> There is no need to change this environment variable, it is set automatically.	Server, Administration Utility, Clients, Buildtime, Configuration Utility
		<b>On Windows NT and 2000:</b> C:\Program Files\MQSeries Workflow\BIN\%N;	
		Where %N is the MQ Workflow language. Do not replace it with an actual value.	
		Must be a valid path name.	

### Installation profile variables

All MQ Workflow installation variables are listed in Table 63.

Table 63. Installation profile variables

MQ Workflow variable	Description	Default value	Used by
		Naming conventions	
Configuration RootDirectory	Path or directory used to store MQ Workflow configurations.	<b>For UNIX:</b> /var/fmc	Server, Clients, Buildtime, Administration utility, Configuration Utility
		<b>For Windows:</b> C:\Program Files\MQSeries Workflow	
		The value contained here must be a valid path or drive name and cannot be changed.	

Table 63. Installation profile variables (continued)

MQ Workflow variable	Description	Default value	Used by
		Naming conventions	
FolderName	Name of the MQ Workflow folder used to start the MQSeries Workflow Configuration Utility.	IBM MQSeries Workflow	Installation, Configuration Utility
		Only applicable for Windows. The value contained here must be a valid folder name.	
Installation Directory	Directory where MQ Workflow is installed.	<b>For UNIX:</b> <FMC_INSTALLATION_DIRECTORY>/fmc <b>For Windows:</b> C:\Program Files\MQSeries Workflow	Server, Administration utility, Clients, Buildtime, Configuration Utility
		The value contained here must be a valid path or drive name and cannot be changed.	
Installed Components	Installed components on your workstation. The values set for this variable cannot be changed.	Default values depend on the components you installed.	Installation, Configuration Utility
		<b>A:</b> API runtime libraries <b>B:</b> Buildtime <sup>1</sup> <b>C:</b> Java CORBA Agent <sup>2</sup> <b>D:</b> Development kit <b>E:</b> Runtime database utilities for Oracle <sup>2</sup> <b>I:</b> Runtime database utilities for DB2 <b>J:</b> Java API <sup>2</sup> <b>L:</b> API for Lotus Notes <sup>1</sup> <b>M:</b> Samples <b>O:</b> Server for Oracle <sup>2,3</sup> <b>P:</b> Program execution agent <b>R:</b> Runtime client <sup>1</sup> <b>S:</b> Server for DB2 <sup>3</sup> <b>U:</b> Administration utility <b>W:</b> Web Client <sup>2</sup>  <b>Notes:</b> 1. Not available for UNIX. 2. Not available for HP-UX. 3. Not available for Windows 98/Me.	

Table 63. Installation profile variables (continued)

MQ Workflow variable	Description	Default value	Used by
Naming conventions			
Language	Sets the language version for the MQ Workflow component. <b>Note:</b> For UNIX, if you change the value of this variable, make sure you change the UNIX system language environment variable (\$LANG or \$LC_ALL) also. See “Appendix C. Language settings” on page 219 for details.	<b>For Windows:</b> Depends on the language installed  <b>For UNIX:</b> enu	Server, Administration utility, Clients, Buildtime, Configuration Utility
		Must be a valid 3-letter value representing the language version for the MQ Workflow component. A list of the possible 3-letter values is shown in “Appendix C. Language settings” on page 219.	
MQ Connection Type	(UNIX only) Connection type used by clients.	No default	Clients (configuration only)
		Only the values “MQClient” and “MQServer” are valid.	
MQWorkflow Administrator	(UNIX only) User ID, which is the owner of installation files and directories.	fmc	Server, Runtime database utilities, Clients (configuration only)
		Must be an existing user ID on your workstation. Must be a member of <i>MQWorkflowGroup</i> , as planned in Table 3 on page 24.	
MQWorkflow Group	(UNIX only) Group, which is the owning group of installation files and directories.	The primary group of <i>MQWorkflowAdministrator</i> .	Server, Runtime database utilities, Clients (configuration only)
		Must be either the primary group or one of the supplementary groups defined for <i>MQWorkflowAdministrator</i> .	
RTDatabase Type	(AIX and Sun Solaris only) Database type used by Runtime.	No default	Server, Runtime database utilities (configuration only)
		Only the values “DB2” and “ORACLE” are valid.	
ServiceLevel	Installed service level of MQ Workflow. The value set for this variable cannot be changed.	0	Installation
		Must be numeric.	

Table 63. Installation profile variables (continued)

MQ Workflow variable	Description	Default value	Used by
		Naming conventions	
VRM	Installed version of MQ Workflow. The value of this variable cannot be changed.	030300	Installation
		VVRRMM (Version Release Modification level)	

## General configuration profile variables

All MQ Workflow general configuration profile variables are listed in Table 64.

Table 64. General configuration profile variables

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
		Naming conventions	
Default Configuration ID	This is used as the default configuration identifier when MQ Workflow executables are called without specifying a configuration parameter (parameter -y) and a value for the FMC_DEFAULT_CONFIGURATION environment variable has not been set. <b>Page:</b> General <b>Group box/Field:</b> Mark as default	On UNIX the default is FMC. On other platforms there is no default.	Server, Administration utility, Buildtime, Clients
		A maximum of 8 characters can be used. Characters from A-Z or a-z, and numbers from 0-9 are allowed.	

## Configuration profile variables

All MQ Workflow configuration profile variables are listed in Table 65.

Table 65. Configuration profile variables

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
		Naming conventions	
Agent.CosNaming.Root	The root name context the agent uses to register the agent name. This variable must be specified if Agent.Locator is set to COS_LOCATOR. <b>Page:</b> Java CORBA Agent <b>Field:</b> Root name context	No default	Java CORBA Agent using COS_LOCATOR
		Maximum length of 254 characters is possible. It can be any alphanumeric string (without slashes). It is case sensitive.	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
Agent.IorPath	Directory where the agent will publish its IOR file. This variable must be set if Agent.Locator is set to IOR_LOCATOR. <b>Page:</b> Java CORBA Agent <b>Field:</b> Interoperable Object Reference Path	No default	Java CORBA Agent using IOR_LOCATOR
		Naming conventions Must be a valid directory. Only a slash character is accepted as a valid directory separator. During run time the platform-specific directory separator is used.	
Agent.JavaHome	This is the directory where the Java Development Kit and Java Runtime Environment has been installed. <b>Page:</b> Java CORBA Agent <b>Field:</b> JDK/JRE Installation Directory	No default	Java CORBA Agent (not using Local Bindings) (configuration only)
		Must be a valid existing directory path. The lib subdirectory must contain the file rt.jar and the bin subdirectory must contain the executable java.	
Agent.Locator	The locator policy (naming service) used by the Java CORBA Agent. <b>Note:</b> LOC_LOCATOR is not a valid value; if "Local bindings" is selected, Agent.Locator will contain no value. <b>Page:</b> Java CORBA Agent <b>Radio buttons:</b> <ul style="list-style-type: none"> <li>• Local bindings</li> <li>• VisiBroker Smart Agent</li> <li>• CORBA Naming Service</li> <li>• Java RMI</li> <li>• Root name context</li> </ul>	No value (causes local bindings to be used)	Java CORBA Agent
		If local bindings are used to directly access the C++ API via JNI, this variable is not set. Otherwise this variable can take any of the following values depending on the naming service set: <ul style="list-style-type: none"> <li>• COS_LOCATOR uses CORBA Object Service Naming Service.</li> <li>• JNDI_LOCATOR uses the Java Naming and Directory Interface.</li> <li>• IOR_LOCATOR uses an Interoperable Object Reference.</li> <li>• OSA_LOCATOR uses the VisiBroker Smart Agent.</li> <li>• RMI_LOCATOR uses the Java Remote Method Invocation Protocol.</li> </ul>	
Agent.Name	Name of the Java CORBA Agent. <b>Page:</b> Java CORBA Agent <b>Field:</b> Agent name	MQWFAGENT	When not using Local Bindings: Java CORBA Agent, Web Client
		The name must adhere to the naming rules of the chosen locator policy.	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
Agent.Naming.Factory	Java Naming and Directory Interface (JNDI) naming context factory. Class Name of initial context factory to use to access name-object bindings, methods for resolving named objects, binding and unbinding names to objects, and creating and destroying subcontexts.	When WebSphere Application Server is installed: com.ibm.ejs.ns.jndi.CNInitialContextFactory  Otherwise:com.sun.jndi.cosnaming.CNCtxFactory	Java CORBA Agent using JNDI locator, Web Client not using Local Bindings
		A valid Java class name (including package name) of a naming context factory.	
Agent.Naming.FactoryJAR	JAR file containing the naming factory.	When WebSphere Application Server is used: WCWASHome/lib/ujc.jar. Otherwise, no default.	Java CORBA Agent using JNDI locator
		Must be a valid, existing file name. Not required for the naming factory com.sun.jndi.cosnaming.CNCtxFactory	
Agent.Naming.URL	Java Naming and Directory Interface (JNDI) naming provider URL. Specifies a URL where configuration information for the chosen JNDI service provider can be found.	iiop://<hostname>:900	Java CORBA Agent using JNDI locator, Web Client not using Local Bindings
		iiop://<JNDINameServerHostName>:<JNDINameServerPort>	
Agent.Reaper.Cycle	The length of time between periodic garbage collection. <b>Page:</b> Java CORBA Agent <b>Field:</b> Agent cycle	300 seconds	Java CORBA Agent
		Values between 30 and 86 400 seconds can be specified.	
Agent.Reaper.Ratio	The percentage ratio between the client-side keep-alive message cycle and the agent-side liveliness check. <b>Page:</b> Java CORBA Agent <b>Field:</b> Client cycle	90	Java CORBA Agent
		Any value between 10 and 90.	
Agent.Reaper.Threshold	The maximum number of unreferenced objects tolerated by each client before non-periodic garbage collection is triggered. <b>Page:</b> Java CORBA Agent <b>Field:</b> Client Threshold	1000	Java CORBA Agent
		Any value between 0 and 500 000.	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
Agent.Version	Version, release, modification, and CSD level of the JAR file to be used for this configuration. <b>Page:</b> Java CORBA Agent <b>Field:</b> Code Version	Highest available code level (3300 for MQ Workflow Version 3 Release 3 Modification 0 Service Pack 0).	Java CORBA Agent not using Local Bindings, Web Client
		Must be an existing code level.	
Agent.VisiBroker Home	This is the directory where the Inprise VisiBroker has been installed. This is only required for a Java CORBA Agent using OSA, COS, or IOR locator.	No default	Java CORBA Agent using OSA, COS, or IOR locator policy (configuration only)
		Must be a valid existing directory path containing the Inprise VisiBroker.	
APITimeOut	The time-out value is used for all functions/methods requiring communication between the client and server.	180 000	Client
		Specified values are in milliseconds.	
BTDatabase Container Directory	Name of the directory where the Buildtime database containers are held. Only required if Buildtime uses DB2 as its database type. <b>Pop-up window:</b> New DB2 Database <b>Field:</b> Containers location	The default is constructed using three profile variables.  <b>For Windows:</b> <i>ConfigurationRootDirectory\BT_DB\BTDB2Instance\BTDatabaseName</i>	Buildtime (configuration only)
		The value contained here must be a valid path or drive name.	
BTDatabase Location	The location where the Buildtime database is created. This can be on a remote UNIX machine. Only required if Buildtime uses DB2 as its database type. <b>Pop-up window:</b> New DB2 Database <b>Field:</b> Database location	C: (the drive letter where MQ Workflow is installed)	Buildtime (configuration only)
		If the DB2 instance for the Buildtime database is on Windows, then this value must be a valid drive name. If the DB2 instance is on UNIX, the value must be an existing path.	



Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
<b>Naming conventions</b>			
BTDatabase LogLocation	Name of the directory where the Buildtime database logs are held. Only required if Buildtime uses DB2 as its database type. <b>Pop-up window:</b> New DB2 Database <b>Field:</b> Log files location	Same as <i>BTDatabaseContainerDirectory</i>	Buildtime (configuration only)
		The value contained here must be a valid path or drive name.	
BTDatabase Name	Buildtime Database name. This value must only be set if DB2 is used and must be the same as the value specified for the variable <i>BTODBCDataSourceName</i> . <b>Page:</b> Buildtime Database (IBM DB2) <b>Group box/Field:</b> 2. Select an existing database or create a new database	FMCBTDB	Buildtime (configuration only)
		<ul style="list-style-type: none"> <li>• A maximum of 8 characters can be used.</li> <li>• The name must be unique, that is, no other database can have the same name.</li> </ul>	
BTDatabase Password	Password for the user ID used for running Buildtime. Must be specified only when the Buildtime database type is DB2. <b>Pop-up window:</b> Buildtime Database ODBC Connect parameters... <b>Field:</b> Password	No default	Buildtime
		Only required if the Buildtime user ID is different to that used to create the database.	
BTDatabase Space Management	Indicates whether Buildtime database is managed by the system (S) or by the database itself (D). Only required if Buildtime uses DB2 as its database.	S	Buildtime (configuration only)
		Only the values "S" and "D" are valid.	
BTDatabase Type	Database type used by Buildtime. <b>Page:</b> Buildtime <b>Radio buttons:</b> "IBM DB2 Universal Database" or "Microsoft Jet Engine"	If DB2 is installed: DB2, else: MSACCESS	Buildtime (configuration only)
		Only the values "MSACCESS" and "DB2" are valid.	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
BTDatabase UserID	User ID used to access the Buildtime database. <b>Pop-up window:</b> Buildtime Database ODBC Connect parameters... <b>Field:</b> User ID	No default	Buildtime
		Naming conventions	
BTDB2Instance	Name of a cataloged DB2 instance to manage the Buildtime Database. Only required when <i>BTDatabaseType</i> is DB2. <b>Page:</b> Buildtime Database (IBM DB2) <b>Group box/Field:</b> 1. Select a DB2 instance already cataloged	Value of the environment variable <i>DB2Instance</i> .	Buildtime (configuration only)
		Must be a valid DB2 instance name.	
BTDB2OSType	Operating system of the DB2 Instance (BTDB2Instance) to keep the Buildtime database. The operating system is determined by attaching to the DB2 Instance, but is used to get defaults and validate entries set in <i>BTDatabaseLocation</i> , <i>BTDatabaseContainerDirectory</i> and <i>BTDatabaseLogLocation</i> .	none	Buildtime
		The following values are valid: WindowsNT (for NT or 2000), Windows95 (for 98 and Me), AIX, HPUX, or Solaris.	
BTIcon Directory	Path name where the icons for Buildtime are located. <b>Page:</b> Buildtime <b>Field:</b> Icon directory	For <b>Windows:</b> C:\Program Files\MQSeries Workflow\BIN\ICONINST	Buildtime
		Must be a valid path or directory name.	
BTODBCData SourceName	ODBC Buildtime database driver name. <b>Page:</b> Buildtime Database (Microsoft Jet Engine) <b>Field/string:</b> ODBC data source name	For <b>DB2:</b> FMCBTDB, FMCBDB1, FMCBDB2, ... FMCBDB99 For <b>MSACCESS:</b> (for Buildtime) <i>ConfigurationID</i>	Buildtime
		For <b>DB2:</b> This must be the same as the value specified for the variable <i>BTDatabaseName</i> . For <b>MSACCESS:</b> Must be less than 33 characters.	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
<b>Naming conventions</b>			
BTODBC Description	Description for the Buildtime database. <b>Page:</b> Buildtime Database (MS Access) <b>Field:</b> ODBC description	For <b>DB2:</b> 'Buildtime Database' For <b>MSACCESS:</b> 'MQSeries Workflow Buildtime Database'	Buildtime (configuration only)
		For <b>DB2:</b> Must be less than 30 characters. For <b>MSACCESS:</b> Must be less than 40 characters.	
BTODBC FileName	Fully qualified path name of the MS Access database file. Only required when the <i>BTDatabaseType</i> is MSACCESS. <b>Page:</b> Buildtime Database (MS Access) <b>Field:</b> Microsoft Jet Engine database	C:\Program Files\MQSeries Workflow\bt_db\fmcbtdb.mdb	Buildtime (configuration only)
		Must be a valid path name.	
Configuration Administrator	(UNIX only) User ID, which is the owner of configuration files and directories. If component server is configured, the administration server (fmcmain) will be started on behalf of this user.	The value of <i>MQWorkflowAdministrator</i> set in the installation profile.	Server, Runtime database utilities, Clients (configuration only)
		Must be a user ID defined on your workstation. Must be a member of <i>ConfigurationGroup</i>	
Configuration Group	(UNIX only) Group, which is the owning group of configuration files and directories.	The value of <i>MQWorkflowGroup</i> set in the installation profile.	Server, Runtime database utilities, Clients (configuration only)
		Must be an existing group.	
Configured Components	Configured components on your workstation. The values set for this variable are a subset of the <i>InstalledComponents</i> variable and cannot be changed manually. <b>Page:</b> General <b>Group box/Field:</b> Configure installed components	No default	Server, Clients, Buildtime, Administration utility (Configuration only)
		Not applicable	
Configure WebClient InWebSphere	Specifies whether the Web Client has to be configured within the IBM WebSphere Application Server.	"1"	Web Client (configuration only)
		Can be either "0" (do not configure Web Client within WebSphere) or "1" (configure Web Client within WebSphere).	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
Create Buildtime Database	Specifies whether an existing Buildtime database is to be used or a new Buildtime database has to be created.	"1"	Buildtime (configuration only)
		Can be either "0" (use an existing Buildtime database) or "1" (create a new Buildtime database)	
Create Runtime Database	Specifies whether an existing Runtime database is to be used or a new Runtime database has to be created.	"1"	Server or Runtime database utilities (configuration only)
		Can be either "0" (use an existing Runtime database) or "1" (create a new Runtime database)	
FMLClient ChannelTable	Fully qualified path name of the MQSeries Client Channel Definition Table for clients. <b>Page:</b> Client Connections <b>Group box/Field:</b> Client Channel Definition Table to be used	Default is of the form: <i>ConfigurationRootDirectory</i> \chltabs\MQWFCHL.TAB <b>For UNIX:</b> /var/fmc/chltabs/MQWFCHL.TAB <b>For Windows:</b> C:\Program Files\MQSeries Workflow\CHLTABS\MQWFCHL.TAB	Clients
		Must be an existing path name.	
FMLConnect Name	Pointer to an MQ Workflow system's queue manager. <b>Page:</b> Client Connections <b>Group box/Field:</b> Connect names	FMC.FMCGRP.FMCSYS,FMCQM	Clients
		Must take on the form: queueprefix.systemgroup.system, queuemanager	
FML Segmentation	Specifies whether MQSeries messages are split into segments. In a network containing OS/390 queue managers, messages must not be split into segments. <b>Page:</b> Client Connections <b>Group box/Field:</b> Split MQSeries messages into segments	0	Clients
		Should always be set to 0.	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
FMLSvrChannelTable	Fully qualified path name of the MQSeries Client Channel Definition Table which is updated or created by an MQ Workflow Server configuration. <b>Page:</b> Queue Manager <b>Group box/Field:</b> Client Channel Definition Table to be updated	Default is of the form: <i>ConfigurationRootDirectory</i> \chltabs\MQWFCHL.TAB <b>For UNIX:</b> /var/fmc/chltabs/MQWFCHL.TAB <b>For Windows:</b> C:\Program Files\MQSeries Workflow\CHLTABS\MQWFCHL.TAB	Server (configuration only)
		Must be a valid path name.	
LoadFDL	Specifies whether FDL containing information about the topology of the new system will be imported into an existing Runtime database.	0	Server, Runtime database utilities (configuration only)
		Can be either "0" (do not import FDL) or "1" (import FDL)	
MQBackupQueues	Specifies whether to back up MQSeries queues or not. For this to have an effect, you must set its value before the queue manager has been created. <b>Page:</b> Queue Manager <b>Radio buttons:</b> <ul style="list-style-type: none"> <li>• Circular log</li> <li>• Linear log</li> </ul>	0	Server (configuration only)
		Can be either 1 (or L) for backup, or 0 (or C) for do not backup. The default value cannot be changed after the queue manager has been created and the channel definitions have been activated.	
MQClusterCommunicationAddress	If you are configuring an additional system within an existing system group and within an existing MQSeries cluster, this is the host name or address of the workstation the primary system (keeping the MQSeries repository queue manager) is configured on. <b>Page:</b> Cluster	No default	Server (configuration only)
		This value is only required, if <i>MQClusterMode</i> is set to "A" (additional queue manager). It must be a valid address where MQ Series is running: <b>Fully qualified CP name:</b> If APPC is the communication protocol used. <b>IP address:</b> If TCP/IP is used. <b>Local NetBios name:</b> If NetBios is the communication protocol used.	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
MQClusterFirstQueueManager	If you are configuring an additional system within an existing system group and within an existing MQSeries cluster, this is the name of the queue manager, that is related to the primary system and which keeps the MQSeries repository for the cluster. <b>Page:</b> Cluster	The default is the value set for the variable MQQueueManager.	Server (configuration only)
		Naming conventions This value is only required, if <i>MQClusterMode</i> is set to "A" (additional queue manager).	
MQClusterMode	Specifies whether the queue manager is the first or an additional queue manager to be configured in an MQ Workflow system group. <b>Page:</b> Cluster	F	Server (configuration only)
		Can only take one of the following values: <b>F</b> for the first queue manager in the cluster, <b>A</b> for an additional queue manager.	
MQClusterName	Name given to the group of queue managers associated with a particular MQ Workflow system group. <b>Page:</b> Cluster	The default is the value set for the variable <i>SystemGroup</i> .	Server (configuration only)
		Not applicable	
MQClusterPort	If you are configuring an additional system within an existing system group and within an existing MQSeries cluster, this is the port number used by the MQSeries TCP/IP listener program that is running on the workstation where the primary system is configured. <b>Page:</b> Cluster	No default	Server (configuration only)
		This value is only required, if <i>MQClusterMode</i> is set to "A" (additional queue manager).	
MQClusterPrincipal	If you are configuring an additional system within an existing system group and within an existing MQSeries cluster, this is the MCAUSER (MQ channel agent user) used for communication with the repository queue manager.	On UNIX the default is fmc. On other platforms there is no default.	Server (configuration only)
		This value is only required, if <i>MQClusterMode</i> is set to "A" (additional queue manager).	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
<b>Naming conventions</b>			
MQCluster Protocol	If you are configuring an additional system within an existing system group and within an existing MQSeries cluster, this is the protocol used for communication with the repository queue manager. <b>Page:</b> Cluster	T	Server (configuration only)
		This value is only required, if <i>MQClusterMode</i> is set to "A" (additional queue manager). This can only take one of the following values: <b>T</b> for TCP/IP, <b>N</b> for NetBios, or <b>S</b> for APPC. <b>Note:</b> For UNIX, only possible value is T.	
MQ Communication Address	Name or address of your MQ Workflow workstation. <b>Page:</b> Queue Manager <b>Radio buttons:</b> <ul style="list-style-type: none"> <li>• TCP/IP port configuration</li> <li>• NetBios configuration</li> <li>• APPC configuration</li> </ul>	Host machine name or IP address.	Server (configuration only)
		Must be a valid address where MQ Workflow is running, that is: <ul style="list-style-type: none"> <li>• An IP address if TCP/IP is used.</li> <li>• A local NetBios name if NetBios is used.</li> <li>• A fully qualified CP name if APPC is used.</li> </ul>	
MQ Communication Protocol	Communication protocol used by MQ Workflow. <b>Page:</b> Queue Manager <b>Group box/Field:</b> Communication Protocol	T	Server (configuration only)
		Can only take one of the following values: <b>T</b> for TCP/IP, <b>N</b> for NetBios, or <b>S</b> for APPC. <b>Note:</b> For UNIX, only possible value is T.	
MQLog Directory	Specifies the directory to be used to hold log files for the queue manager. If not specified, the MQSeries default location is used.	None	Server (configuration only)
		Must be an existing directory path. The user ID mqm and group mqm must have full authorities to the log files. If you change the locations of these files, you must give these authorities yourself. This occurs automatically if the log files are in their default locations (see the MQSeries documentation for more information).	
MQPort	Port number. <b>Page:</b> Queue Manager <b>Field:</b> TCP/IP port configuration	5010. If 5010 is already in use, the default is 14000.	Server (configuration only)
		A valid port number not used by other applications.	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
MQPrefix	The queue prefix allows you to set a high-level qualifier for queue names in an MQ Workflow system. <b>Page:</b> Queue Manager <b>Field:</b> Queue Prefix	FMC	Server, Buildtime (configuration only)
		Naming conventions	
MQPrincipal	User ID that the Object Authority Manager (OAM) uses to grant authorization to use MQSeries resources.	On Windows NT and 2000 the default is <code>fmc</code> . On UNIX the default is the value taken from the configuration profile variable <code>ConfigurationAdministrator</code> .	Server (configuration only)
		Must be a valid user ID. For further information see the <i>MQSeries System Administration</i> manual.	
MQQueue Manager	Name of the queue manager to be used. <b>Page:</b> Queue Manager <b>Field:</b> Queue Manager name	FMCQM	Server, Buildtime (configuration only)
		<ul style="list-style-type: none"> <li>The name must be unique. No other queue manager can have the same name.</li> <li>A maximum of 8 uppercase characters can be used. However, you can use more if you define your own queues and channels. Examples are located in the subdirectory 'mq\$'.</li> </ul>	
MQTransaction Coordinator	(DB2 only) User ID, which is used by MQSeries to coordinate transactions for two-phase commit. It has to have connect authority to the Runtime database.	The value of <code>RTDatabaseUserID</code> set in the configuration profile.	Server (configuration only)
		Must be a valid DB2 user ID.	
MQTransaction Coordinator Password	(DB2 only) Password for the user ID <code>MQTransactionCoordinator</code> , which is used by MQSeries to coordinate transactions for two-phase commit. Only required, if <code>RTDatabaseUserID</code> and <code>MQTransactionCoordinator</code> are not identical.	No default	Server (configuration only)
		Not applicable	



Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
MQTransactionCoordinatorStartsQM	(DB2 only) Specifies whether the queue manager is started by the transaction coordinator or not. This parameter affects the XAOpenString stanza in qm.ini regarding the database connect parameters. For more information see the MQSeries documentation. This setting is only respected, if the Runtime database is local. If set to "1", MQTransactionCoordinator must be a member of group "mqm".	"0"	Server (configuration only)
		Can be either "0" (queue manager is NOT started by MQTransactionCoordinator) or "1" (queue manager is started by MQTransactionCoordinator)	
RTDatabase	Name of the Runtime database.  <b>Page:</b> Runtime Database  <b>Group box/Field:</b> 2. Select an existing database or create a new database	FMCDB	Server or Runtime database utilities
RTDatabaseAdminDirectory	(Oracle only) Location of the administration directory.	<b>For Oracle on UNIX:</b> <i>ConfigurationRootDirectory</i> <i>/rt_db/admin/RTDatabase</i>	
		Must be a valid path name.	
RTDatabaseAlias	Either a DB2 alias, or an Oracle alias used to connect the Runtime database. For DB2 the alias reflects a cataloged DB2 database. For Oracle the alias reflects an entry in the file tnsnames.ora located in the network/admin subdirectory of the Oracle home directory.	The default is taken from the value of <i>RTDatabase</i> .	
		A valid DB2 or Oracle alias name.	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
RTDatabase Container Directory	<p>Name of the directory or path where the Runtime database containers are created.</p> <p><b>Pop-up window: (DB2 only)</b> New DB2 Database</p> <p><b>Field:</b> Containers location</p>	<p><b>Naming conventions</b></p> <p><b>For Oracle on UNIX:</b> <i>ConfigurationRootDirectory/rt_db/oradata/RTDatabase</i></p> <p><b>For DB2 on UNIX:</b> <i>ConfigurationRootDirectory/rt_db/RTDB2Instance/RTDatabase</i></p> <p><b>For DB2 on Windows NT and 2000:</b> <i>ConfigurationRootDirectory\RT_DB\RTDB2Instance\RTDatabase</i></p>	<p>Server or Runtime database utilities (configuration only)</p>
RTDatabase InstanceIs Remote	<p>Specifies whether the instance name, specified in <i>RTDB2Instance</i>, is a local instance or a cataloged node within the instance specified in <i>RTDB2LocalInstance</i>.</p>	<p>"1"</p>	<p>Server or Runtime database utilities (configuration only)</p>
RTDatabase Location	<p>(DB2 only) Directory or path where the Runtime database is created.</p> <p><b>Pop-up window:</b> New DB2 Database</p> <p><b>Field:</b> Database location</p>	<p><b>For UNIX:</b> <i>ConfigurationRootDirectory/rt_db/RTDB2Instance/RTDatabase</i></p> <p><b>For Windows NT and 2000: c:</b></p>	<p>Server or Runtime database utilities (configuration only)</p>
RTDatabase LogLocation	<p>Name of the directory where the Runtime database logs are held.</p> <p><b>Pop-up window:</b> New DB2 Database</p> <p><b>Field:</b> Log files location</p>	<p><b>For Oracle on UNIX:</b> <i>ConfigurationRootDirectory/rt_db/oradata/RTDatabase</i></p> <p><b>For DB2 on UNIX:</b> <i>ConfigurationRootDirectory/rt_db/RTDB2Instance/RTDatabase</i></p> <p><b>For DB2 on Windows NT and 2000:</b> <i>ConfigurationRootDirectory\RT_DB\RTDB2Instance\RTDatabase</i></p>	<p>Server or Runtime database utilities (configuration only)</p>
		<p>The value contained here must be a valid path or drive name.</p>	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
RTDatabase MQWorkflow User	MQ Workflow user to import FDL that defines an additional system in an existing Runtime database.	ADMIN	Server, Runtime database utilities (configuration only)
		Naming conventions Must be an existing MQ Workflow user defined in the Runtime database with the authority to import topology data.	
RTDatabase Password	Password for the user ID used to access the Runtime database. <b>Pop-up window:</b> Connect Parameters <b>Field:</b> Password	No default	Server or Runtime database utilities
		Not applicable	
RTDatabase RawDevice	(DB2 on AIX only) Specifies whether a raw device should be used for space management of the Runtime database.	"0"	Server or Runtime database utilities (configuration only)
		Only respected, if <i>RTDatabaseSpaceManagement</i> is set to "D" (managed by database). Can be either "0" (do not use raw device) or "1" (use raw device)	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
RTDatabase Space Management	(DB2 only) Indicates whether the Runtime database is managed by the system (S) or by the database itself (D). The D option should only be chosen by an experienced DB2 administrator. If you select it, the most performance-critical table spaces are implemented as database managed. One container is pre-allocated for each table space with a maximal size. You should monitor the current size of each container using the DB2 control center and add new containers as soon as the available containers of any table space are 80% full. If the installation is for a UNIX based operating system, raw devices may be selected in conjunction with 'database' managed.	S	Server or Runtime database utilities (configuration only)
		Only the values "S" and "D" are valid. Only valid for DB2.	
RTDatabase UserID	User ID used to access the Runtime database.  <b>Pop-up window:</b> Connect Parameters  <b>Field:</b> User ID	On UNIX, the default is taken from the configuration profile variable <i>ConfigurationAdministrator</i> .	Server or Runtime database utilities
		Must be a valid DB2 or Oracle user ID.	
RTDB2Instance	Name of a cataloged DB2 Instance to manage the Runtime database.  <b>Page:</b> Runtime Database  <b>Group box/Field:</b> 1. Select a DB2 instance already cataloged	Value of the environment variable <i>DB2Instance</i> .	Server or Runtime database utilities (configuration only)
		Must be a valid DB2 instance name. For details see the DB2 manuals.	

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
<b>Naming conventions</b>			
RTDB2Local Instance	Specifies the local DB2 instance used for the Runtime database. For a local Runtime database, this is the instance, that manages the Runtime database; for a remote Runtime database, this is the instance, where the remote node is cataloged, that manages the remote Runtime database.	Value of the environment variable <i>DB2Instance</i> .  Must be an existing DB2 instance name. For details see the DB2 manuals.	Server or Runtime database utilities (configuration only)
RTError LogFile	Error Log File. For detailed information see the <i>IBM MQSeries Workflow: Administration Guide</i> .	<b>For Windows:</b> <i>ConfigurationRootDirectory</i> \cfgs\ConfigID\log\fmcerr.log  <b>For UNIX:</b> <i>ConfigurationRootDirectory</i> /cfgs/ConfigID/log/fmcerr.log  Fully qualified file name	Server
RTExecution Server Operation Mode	Operation mode of the execution server.	Standalone  Only the value "Standalone" is valid and cannot be changed.	Server
RTIcon Directory	Path name where the Runtime Client icons are located. <b>Page:</b> Client <b>Field:</b> Icon Directory	<b>For Windows:</b> C:\Program Files\MQSeries Workflow\BIN\ICONINST  Must be a valid path or directory name	Standard client
RTSystem LogFile	System log file. For detailed information see the <i>IBM MQSeries Workflow: Administration Guide</i> .	<b>For Windows:</b> <i>ConfigurationRootDirectory</i> \cfgs\ConfigID\log\fmcsys.log  <b>For UNIX:</b> <i>ConfigurationRootDirectory</i> /cfgs/ConfigID/log/fmcsys.log  Fully qualified file name	Server
System	Name of the MQ Workflow system.  <b>Page:</b> All  <b>Field:</b> System	FMCSYS  A maximum of 8 characters can be used.	Server, Administration utility, Clients, Buildtime

Table 65. Configuration profile variables (continued)

MQ Workflow variable	Description / MQ Workflow Windows configuration utility page	Default value	Used by
SystemGroup	Name of the MQ Workflow system group.  <b>Page:</b> All  <b>Field:</b> System Group	FMCGRP	Server, Administration utility, Clients, Buildtime
		Naming conventions  A maximum of 8 characters can be used.	
WCApplicationServerType	The application server type of your Web Server.	If WebSphere is installed on your workstation: 'WebSphere', otherwise 'Other'	Web Client (configuration only)
		Must be one of 'WebSphere' or 'Other'.	
WCWASAdminNode	WebSphere Administration Node, this is the machine where WebSphere's DB2 configuration database resides. <b>Note:</b> This database can be shared between several machines running WebSphere installations.	<i>localhostname</i> of machine	Web Client (configuration only)
		Must be a valid TCP/IP host name.	
WCWASHome	Location where IBM WebSphere Application Server is installed. This enables you to have multiple installations of WebSphere on the same machine.	On <b>AIX:</b> /usr/WebSphere/AppServer  On <b>Sun Solaris:</b> /opt/WebSphere/AppServer  On <b>Windows:</b> c:\WebSphere\AppServer	Web Client
		Must be a valid path name.	
WCWASXMLSkeletonFile	The name of the skeleton file that was used for installing the Web client. The file must exist in the directory <i>InstallationDirectory/skeleton/WebClient</i> .	fmcoh35.skel.	Web Client (configuration only)
		Filename only (no path).	

---

## Appendix C. Language settings

This appendix lists the various language versions for MQ Workflow.

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### Language settings for UNIX

When installing MQ Workflow on any of the UNIX based operating platforms, all language versions of MQ Workflow that are supported by the operating system are installed. This means that it is possible to change the language version of MQ Workflow after installing it.

To change the language of MQ Workflow, set the value of the **Language** variable held in the MQ Workflow profile to the 3-letter code that represents the desired language. (See “Appendix B. MQ Workflow variables” on page 193 for details about the MQ Workflow profile and how to set the value of the **Language** variable). For AIX, there are two sets of 3-letter codes. Either set of 3-letter codes can be used.



When you change the value of the **Language** variable in the MQ Workflow profile, you must also change the UNIX system language to the corresponding language. To change the UNIX system language, you must set the environment variable \$LANG or \$LC\_ALL to the appropriate value.

The following sections list the MQ Workflow 3-letter codes and the corresponding UNIX system language codes for each language.

#### MQ Workflow and system language codes for AIX

Table 66 lists the MQ Workflow 3-letter codes and the corresponding AIX system language codes for each language.

Table 66. MQ Workflow and system language codes for AIX

Language	Set one (ISO code page)		Set two (PC compatible code page for AIX only)	
	MQ Workflow 3-letter code	UNIX system language code	MQ Workflow 3-letter code	AIX system language code
Brazilian Portuguese	ptb	pt_BR	—	—
Danish	dan	da_DK	DAN	Da_DK
Dutch	nld	nl_NL	NLD	NI_NL
Finnish	fin	fi_FI	FIN	Fi_FI
French	fra	fr_FR	FRA	Fr_FR

Table 66. MQ Workflow and system language codes for AIX (continued)

Language	Set one (ISO code page)		Set two (PC compatible code page for AIX only)	
	MQ Workflow 3-letter code	UNIX system language code	MQ Workflow 3-letter code	AIX system language code
German	deu	de_DE	DEU	De_DE
Hebrew	heb	iw_IL	HEB	Iw_IL
Hungarian	hun	hu_HU	—	—
Italian	ita	it_IT	ITA	It_IT
Japanese	jpn	ja_JP	JPN	Ja_JP
Korean	kor	ko_KR	—	—
Norwegian	nor	no_NO	NOR	No_NO
Polish	plk	pl_PL	—	—
Portuguese	ptg	pt_PT	PTG	Pt_PT
Simplified Chinese	chs	zh_CN	CHS	ZH_CN
			Chs	Zh_CN
Spanish	esp	es_ES	ESP	Es_ES
Traditional Chinese	cht	zh_TW	CHT	Zh_TW
Turkish	trk	tr_TR	—	—
U.S. English	enu	en_US	enu	En_US

## MQ Workflow and system language codes for HP-UX

Table 67 lists the MQ Workflow 3-letter codes and the corresponding AIX system language codes for each language.

Table 67. MQ Workflow and system language codes for HP-UX

Language	MQ Workflow 3-letter code	HP-UX system language code
Brazilian Portuguese	ptb	pt_BR.iso88591
Danish	dan	da_DK.iso88591
Dutch	nld	nl_NL.iso88591
Finnish	fin	fi_FI.iso88591
French	fra	fr_FR.iso88591
German	deu	de_DE.iso88591
Hebrew	heb	iw_IL.iso88598
Hungarian	hun	hu_HU.iso88592
Italian	ita	it_IT.iso88591
Japanese	jpn	ja_JP.eucJP
Korean	kor	ko_KR.eucKR
Norwegian	nor	no_NO.iso88591
Polish	plk	pl_PL.iso88592
Portuguese	ptg	pt_PT.iso88591
Simplified Chinese	chs	zh_CN.hp15CN



Table 67. MQ Workflow and system language codes for HP-UX (continued)

Language	MQ Workflow 3-letter code	HP-UX system language code
Spanish	esp	es_ES.iso88591
Traditional Chinese	cht	zh_TW.eucTW
Turkish	trk	tr_TR.iso88599
U.S. English	enu	en_US.iso88591

## MQ Workflow and system language codes for Sun Solaris

Table 68 lists the MQ Workflow 3-letter codes and the corresponding Sun Solaris system language codes for each language.

Table 68. MQ Workflow and system language codes for Sun Solaris

Language	MQ Workflow 3-letter code	Sun Solaris system language code
Brazilian Portuguese	ptb	pt_BR
Danish	dan	da
Dutch	nld	nl
Finnish	fin	fi
French	fra	fr
German	deu	de
Hebrew	heb	he
Hungarian	hun	hu
Italian	ita	it
Japanese	jpn	ja
Korean	kor	ko
Norwegian	nor	no
Polish	plk	pl
Portuguese	ptg	pt
Simplified Chinese	chs	zh
Spanish	esp	es
Traditional Chinese	cht	zh_TW
Turkish	trk	tr
U.S. English	enu	en_US

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## Language settings for Windows

For Windows Me, 98, 2000, and NT, the language version of an MQ Workflow component is set at the beginning of the installation. When the language version is set, it cannot be changed.

The **Language** variable in the MQ Workflow profile holds a 3-letter code that represents the installed language version of MQ Workflow. The list of possible 3-letter codes and the language they represent for Windows NT, Windows Me,

98, 2000, and NT are:

*Table 69. MQ Workflow language codes for Windows Me, 98, 2000, and NT*

<b>Language</b>	<b>3-letter Code</b>
Chinese (Simplified)	CHS
Chinese (Traditional)	CHT
Danish	DAN
Dutch	NLD
English (U.S.)	ENU
Finnish	FIN
French	FRA
German	DEU
Hebrew	HEB
Hungarian	HUN
Italian	ITA
Japanese	JPN
Korean	KOR
Norwegian	NOR
Polish	PLK
Portuguese (Brazilian)	PTB
Portuguese (European)	PTG
Spanish	ESP
Turkish	TRK

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## Appendix D. Updated files

This appendix describes which files on your workstation are updated during the installation and configuration process. The path and updates made to each file are given.

- “Files updated on UNIX”
- “Files updated on Windows” on page 227



If you change values in the MQ Workflow profile or system environment, you may need to make changes to the files listed in this Appendix. For details about the MQ Workflow profile or system environment see “Appendix B. MQ Workflow variables” on page 193.

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### Files updated on UNIX

The following lists files that are updated during the installation and configuration stages of the MQ Workflow setup process for any of the UNIX based operating systems.

#### MQ Workflow profile

The MQ Workflow profile is the collective name for the general configuration, installation and configuration profiles that contain MQ Workflow specific data entered during the installation and configuration stages of the MQ Workflow setup process. “Appendix B. MQ Workflow variables” on page 193 contains detailed information about the MQ Workflow profile and its contents.

If the values of MQ Workflow profile variables cause conflicts with other applications, you should change them using one of the available configuration tools, or open the relevant MQ Workflow profile and change the default values directly.



Be aware that some information is kept in more than one place, and editing values directly might cause MQ Workflow to not work correctly.

#### **/etc/inetd.conf**

On **AIX**: The following line is added to this file:

```
fmcl<MQQueueManager><MQPort> stream tcp nowait mqm  
/usr/mqm/bin/amqcrsta amqcrsta -m <MQQueueManager>
```

On **Sun Solaris** and **HP-UX**: The following line is added to this file:

```
fmcl<MQQueueManager><MQPort> stream tcp nowait mqm  
/opt/mqm/bin/amqcrsta amqcrsta -m <MQQueueManager>
```

Where:

<MQQueueManager>  
is the name for the MQSeries queue manager.

<MQPort>  
is the TCP/IP port number.

If you change either the MQSeries queue manager name or TCP/IP port number within the MQ Workflow profile, you must also change them in this line as well as in `/etc/services`. Additionally, you need to change the client channel definition table. Refer to “Appendix B. MQ Workflow variables” on page 193 for details about the MQSeries queue manager name and TCP/IP port number.

If you make changes to this file, you must activate the changes made by entering one of the following commands at a command prompt:

**refresh -s inetd**  
(for AIX only)

**kill -1 <inetd-pid>**  
(for all supported UNIX platforms)

#### **/etc/services**

The following line is added to this file:

```
fmcl<MQQueueManager><MQPort> <MQPort>/tcp #MQSeries
```

Where:

<MQQueueManager>  
is the name for the MQSeries queue manager.

<MQPort>  
is the TCP/IP port number.

#### **/var/mqm/qmgrs/<MQQueueManager>/qm.ini**

This is the MQSeries queue manager configuration file where <MQQueueManager> is the name for the MQSeries queue manager.

If you are using **Oracle**, the following lines are added to this file during the MQ Workflow configuration procedure:

```
XAResourceManager:  
Name=<RTDatabaseAlias>  
SwitchFile=<InstallationDirectory>/ora8swit/oraswit  
XAOpenString=Oracle_XA+Acc=P/<MQTransactionCoordinator>/  
                  <MQTransactionCoordinatorPassword>  
+SqlNet=<RTDatabaseAlias>+SesTm=15
```

If you are using **DB2**, the following lines are added to this file during the MQ Workflow configuration procedure:

```
XAResourceManager:  
  Name=<RTDB2Instance> <RTDatabaseAlias>  
  SwitchFile=<InstallationDirectory>/db2swit/db2swit  
  XAOpenString=<RTDatabaseAlias>,<MQTransactionCoordinator>,  
    <MQTransactionCoordinatorPassword>
```

Where:

*<RTDB2Instance>*

is the name of the cataloged DB2 instance used to manage the Runtime database.

*<RTDatabaseAlias>*

is the alias name of the DB2 or Oracle Runtime database used by MQ Workflow.

*<InstallationDirectory>*

is the name of the directory where MQ Workflow is installed.

*<MQTransactionCoordinator>*

is the user ID for the transaction coordinator.

*<MQTransactionCoordinatorPassword>*

is the password for the transaction coordinator.

The values for *<InstallationDirectory>*, *<RTDatabaseAlias>*, and *<RTDB2 Instance>* are taken from the MQ Workflow profile. If you change the values for these variables in the MQ Workflow profile, you must also make the same changes in the `qm.ini` file. Refer to “Appendix B. MQ Workflow variables” on page 193 for details about these variables.

#### **\$ORACLE\_HOME/network/admin/tnsnames.ora or /var/opt/oracle/tnsnames.ora**

If you are using an Oracle Runtime database, the following will be added:

```
<RTDatabaseAlias> =  
  (DESCRIPTION =  
    (ADDRESS_LIST =  
      (ADDRESS = (PROTOCOL = TCP)(HOST = <hostname>)(PORT = <portnumber>))  
    )  
    (CONNECT_DATA =  
      (SERVICE_NAME = <RTDatabase>)  
    )  
  )
```

### **Changes made by the configuration utility `fmczutil`**

After collecting all the information required for a configuration, the configuration utility performs the following actions:

1. Creates a configuration and a log subdirectory, owned by the configuration administrator and configuration group:
 

```
<CfgRootDir>/cfgs/<ConfigID>
<CfgRootDir>/cfgs/<ConfigID>/log
```
2. A configuration profile will be created in <CfgRootDir>/cfgs/<ConfigID>, containing the values you have specified. This file can only be changed by the configuration administrator and configuration group members.
3. Based on the components you selected in your configuration, additional directories and files will be created.
4. If you selected 'Server', <CfgRootDir>/cfgs/<ConfigID>/bin will be created, and owned by the configuration administrator and configuration group. Executables to start the different types of servers are copied into this directory.
5. If you selected either 'Server' or 'Runtime Database Utilities', the directories <CfgRootDir>/cfgs/<ConfigID>/fd1 and <CfgRootDir>/cfgs/<ConfigID>/log/rtdb will be created. In the fd1 subdirectory the FDL files used to populate the Runtime database will be created based on the templates located in the installation subdirectory fd1. If you selected to create a new Runtime database, fmczref.fdl will be created; if you selected to use an existing Runtime database, fmcznews.fdl will be created.
6. If you selected to create a new DB2 Runtime database, then, if necessary, the DB2 database layout file and its directory will be created using default values.
7. If you selected to create a new DB2 Runtime database, and the DB2 instance you specified is local, the directories you specified when prompted for
  - DB2 database location
  - DB2 container location
  - DB2 log files location

will be created if you selected the default values. If you decided to specify other values, you have to create the directories before creating the Runtime database. The owner of these directories and files will be the DB2 instance user ID you specified, the owning group will be the primary group of the DB2 instance.
8. If you selected to create a new Oracle Runtime database, the directories you specified when prompted for
  - Database administration directory
  - Database container directory
  - Database log directory

- a. The directories will be created if you selected the default values. If you decided to specify other values, you have to create the directories before creating the Runtime database.
  - b. The file `tnsnames.ora` in one of the above directories will be updated to add the alias for the database.
9. If you selected 'Server' or 'Client with queue manager', the queue manager sub-directories `<CfgRootDir>/qmgrs/<queuemanager>` and `<CfgRootDir>/qmgrs/<queuemanager>/mqs` will be created. In the `mqs` subdirectory the MQSeries files used to define, alter, suspend, and delete queue manager resources such as queues, channels, and aliases will be created based on the templates located in the installation subdirectory `mqs`. Owner of these directories and files will be the user ID 'mqm', the owning group will be 'mqm'.
  10. If you selected 'Server' or 'Client with queue manager', the files `/etc/services` and `/etc/inetd.conf` will be modified to add an entry for the listener program of the new queue manager.
  11. If you selected 'Java CORBA Agent' and did not choose the locator policy 'Local bindings', a bin subdirectory `<CfgRootDir>/cfigs/<ConfigID>/bin` will be created. An executable to start the Java CORBA Agent will be created within that directory. Owner of the directory and executable will be the user ID you specified when prompted for the configuration administrator, the owning group will be the configuration group.
  12. If you selected 'Web Client', a subdirectory `<CfgRootDir>/cfigs/<ConfigID>/WebClient` will be created. This subdirectory will contain the file `webclient.properties`, and if you selected "WebSphere" as the application server type, the file `wasconfig.xml`. Also, a subdirectory `<CfgRootDir>/cfigs/<ConfigID>/WebClient/webpages` will be created that will contain a file `logon.html` and some other files and directories. The owner of the directory and files will be the user ID you specified when prompted for the configuration administrator, the owning group will be the configuration group.

**Note:** If you delete the configuration that contains the Web Client, those files and directories are also deleted; any changes that you have made to those files and directories to customize your Web Client will also be erased.

---

## Files updated on Windows

The following lists files that are updated when MQ Workflow is set up on workstations running Windows Me, 98, 2000, or NT.

### MQ Workflow profile

The MQ Workflow profile is the name given to the set of MQ

Workflow specific data contained in the Windows registry entered during the installation and configuration stages of the MQ Workflow setup process. "Appendix B. MQ Workflow variables" on page 193 contains detailed information about the MQ Workflow profile and its contents.

If the values of MQ Workflow profile variables cause conflicts with other applications, you should change them using one of the available configuration tools.

### **Environment**

This is only updated when MQ Workflow components are installed and configured on Windows NT or Windows 2000. Information you supply during the installation stage is used to set the values of variables in the Windows Environment. On Windows NT, it is found by selecting the Environment tab from the system icon in the control panel. On Windows 2000, it is found under Control panel / System icon / Advanced tab / Environment variables.

If the default values contained in the Windows Environment cause conflicts with other applications, open the Environment and change the values directly. To ensure that all programs can use the changes you made, restart your system.

### **AUTOEXEC.BAT**

This is only updated when MQ Workflow components are installed on Windows 98 and Windows Me. Information you supply during the installation stage is used to set the values of variables in the AUTOEXEC.BAT file.

If the default values contained in the AUTOEXEC.BAT file cause conflicts with other applications, open the AUTOEXEC.BAT file and change the values directly. To ensure that all programs can use the changes you made, restart your system.

### **Windows registry**

During the MQ Workflow configuration procedure, the following lines are added to the registry:

```
XAResourceManager:  
  Name=<RTDB2Instance> <RTDatabaseAlias>  
  SwitchFile=<InstallationDirectory>/DB2SWIT/DB2SWIT.DLL  
  XAOpenString=<RTDatabaseAlias>,<MQTransactionCoordinator>,  
    <MQTransactionCoordinatorPassword>  
  ThreadOfControl=PROCESS
```

Where:

<RTDB2Instance>

is the name of the cataloged DB2 instance used to manage the Runtime database.



*<RTDatabaseAlias>*

is the alias name of the DB2 database used by MQ Workflow.

*<InstallationDirectory>*

is the name of the directory where MQ Workflow is installed.

*<MQTransactionCoordinator>*

is the user ID for the transaction coordinator.

*<MQTransactionCoordinatorPassword>*

is the password for the transaction coordinator.

The values for *<InstallationDirectory>*, *<RTDatabaseAlias>*, and *<RTDB2 Instance>* are taken from the MQ Workflow profile. If you change the values for these variables in the MQ Workflow profile, you must also make the same changes in the Windows registry as well as in `\etc\services`. Additionally, you need to change the client channel definition table. Refer to "Appendix B. MQ Workflow variables" on page 193 for details about these variables.

### Services file

The Services file has the following path:

#### For Windows 2000/NT:

`Bootdrive\WINNT\SYSTEM32\DRIVERS\ETC\SERVICES`

#### For Windows 98/Me:

`Bootdrive\WINDOWS\SERVICES`

For each TCP/IP port number you specify during configuration, an entry with the following syntax is added to the services file:

```
fmcl<MQQueueManager><MQPort> <MQPort>/tcp
      #MQSeries Workflow Listener for Queue Manager
```

Where:

*<MQQueueManager>*

is the name for the MQSeries queue manager.

*<MQPort>*

is the TCP/IP port number.

Changing values in the MQ Workflow profile does not affect this file.



---

## Appendix E. Stand-alone client/server setup on Windows NT/2000

This appendix contains all you need to know in order to setup a stand-alone MQ Workflow system and its prerequisite software on a single Windows NT or 2000 workstation.

---

### Steps for a stand-alone setup

Setting up a stand-alone MQ Workflow system is often the first type of setup performed and is useful for becoming familiar with MQ Workflow functions and evaluation purposes.

The steps involved in setting up a stand-alone MQ Workflow system are described in the following sections and are summarized as follows:

#### **Verifying MQ Workflow requirements**

Prior to installing and configuring a stand-alone MQ Workflow system, your workstation must meet certain minimum requirements.

#### **Installing prerequisite software**

DB2 and MQSeries are prerequisites for MQ Workflow and must be installed prior to installing MQ Workflow.

#### **Installing MQ Workflow**

The installation simply copies the software from the MQ Workflow CD-ROM to your workstation and performs basic setup and registration functions.

#### **Configuring MQ Workflow**

Configuration must be performed directly after installation for MQ Workflow to use database and communication resources provided by the prerequisite software, DB2 and MQSeries.

#### **Checking the MQ Workflow setup**

After setting up MQ Workflow, the setup is checked using the MQ Workflow configuration checker.

#### **Verifying the MQ Workflow setup**

Simple checks are performed to verify that MQ Workflow has been setup correctly and is running.

After performing these steps, you can start MQ Workflow Server, Client, and Buildtime components as explained in:

- “Starting components in the right order” on page 165

- “Starting the standard Client” on page 169
- “Starting Buildtime” on page 170

---

## Verifying MQ Workflow requirements

To install MQ Workflow, your workstation must have access to a CD-ROM drive and meet the following minimum requirements:

	<b>Requirements</b>
Processor	Intel Pentium processor
Speed	200 MHz
Screen resolution	800x600
Real memory	256 MB
Hard-disk space	3 GB

In addition, you must have the correct version of Windows installed and perform some basic setup and configuration tasks, as follows:

1. Verify that you have **Windows 2000** or **Windows NT Workstation Version 4.0 at Service Pack 4, 5, or 6a** installed on your workstation. The version and service level installed on your system are displayed on the screen during boot time. See the Microsoft Network or the following Microsoft Web site for Windows NT service packs:  
<http://support.microsoft.com/support/ntserver/content/servicepacks/>. If you are going to use MQSeries Version 5.2 on Windows NT, Service Pack 6a is required.
2. Create a new Windows user ID with administration rights. This user ID is used later during the MQ Workflow configuration.

**Note:** This user ID must conform to the naming rules for DB2. The password must not be longer than 8 characters, and must not contain accent characters.

### To create a user ID on Windows 2000:

- a. In the **start** menu, click on **select settings -> control panel**, the Control Panel appears.
- b. Select **Users and Passwords**, the Users and Password dialog appears.
- c. Click on the **Add...** button, the Add New User Dialog appears.
- d. Enter a user name, and click on **Next**.
- e. Enter a password, confirm the password, and click on **Next**.
- f. Select the **Others** radio button, specify **Administrators** in the combo box, and click on **Finish**.

- g. Close the Users and Password dialog.
- h. Close the Control Panel.

**To create a user ID on Windows NT:**

- a. On the task bar, click on the Windows **Start** menu and select **Programs->Administrative Tools (Common)->User Manager**. The **User Manager** window appears.
  - b. Within the **User Manager** window, from the menu bar select **User->New User...** A **New User** dialog box appears.
  - c. Within the **New User** dialog box:
    - Enter a user name that is a maximum of eight characters long within the **Username** field. Make a note of your new user ID.
    - Enter a password within the **Password** field and confirm the password within the **Confirm Password** field. Make a note of the password and keep it in a safe place.
    - Deselect the **User Must Change Password at Next Logon** check box.
    - Click on the **Groups** button. A **Group Memberships** dialog box appears.
    - Within the **Group Memberships** dialog box, make your new user ID a member of the administrators group by selecting **Administrators** and clicking on **<-Add**. Select **OK**. Control passes back to the **New User** dialog box.
  - d. Select **OK** and close the **User Manager** window.
3. Log off from Windows and log on again specifying the new user ID and password.

---

## Installing prerequisite software

DB2 and MQSeries are prerequisites for MQ Workflow and must be installed before running the MQ Workflow installation on your workstation.

The following gives the minimum steps needed to install the prerequisites, DB2 and MQSeries, for an MQ Workflow stand-alone system.

### Installing DB2 on Windows

The following instructions describe how to install DB2 Universal Database Version 7.1 on Windows NT or Windows 2000 for an MQ Workflow stand-alone system.

For further information about DB2, see the *Quick Beginnings* online manual on the DB2 CD-ROM.

**Note:** If an older version of DB2 is already installed on your workstation, read 'Migrating from Previous Versions of DB2' in the *DB2 Enterprise - Extended Edition for Windows NT Quick Beginning* manual.



If DB2 is already installed on your workstation, the following steps change the existing DB2 configuration.

1. You must be logged on with a user ID that has administrative rights.
2. Insert the CD-ROM labeled **DB2 Universal Database Enterprise Edition Version 7.1 for Windows Operating Environments** into your CD-ROM drive.
3. If the installation does not start automatically, start it by clicking on the **Start** menu on the task bar, selecting **Run...** and entering `x:\Setup.exe` in the **Open** field, and click on **OK**, where *x* is the drive letter for your CD-ROM drive.
4. The **Installation** window with the welcome text appears.
5. Click on **Install** to start the installation procedure. The **Select Products** window is displayed.
6. Select **DB2 Enterprise Edition** and then click on **Next**. The **Select Installation Type** window is displayed.
7. Select **Custom** and then click on **Next**. The **Select Components** window is displayed.
8. Select the following components:
  - Application Development Interfaces
  - Documentation
  - Base DB2 UDB support
  - Administration and Configuration Tools
9. Click on **Next**.
10. If you get a message about installing Microsoft MDAC, click on **OK**. MQ Workflow will install this if it is required.
11. When you see the **Create DB2 Instance** window, click on **Next**.
12. When you see the **Configure DB2 Services** window, click on **Next**.
13. Enter the **user ID** and **password** that gives administrative rights that you created in step 2 on page 232, and click on **Next**.
14. When you see the **Start Copying Files** window, click on **Next**. The DB2 program files will now be copied to your workstation, DB2 will be configured, and the DB2 services will be started.
15. When you see the **Setup Complete** window, click on **Finish**.

## Installing MQSeries on Windows

This describes how to install MQSeries for Windows NT and Windows 2000 Version 5.2 for an MQ Workflow stand-alone system.

For further information about MQSeries, see the *MQSeries for Windows NT and Windows 2000 V5.2 Quick Beginnings* online manual, located on the *IBM MQSeries for Windows NT and Windows 2000 Version 5.2* CD-ROM.

1. Insert the CD-ROM labeled **MQSeries for Windows NT and Windows 2000, Version 5.2** into your CD-ROM drive.
2. If the installation does not start automatically, start it by clicking on the **Start** menu on the task bar, selecting **Run...** and entering *x:\Setup.exe* in the **Open** field, where *x* is the drive letter for your CD-ROM drive, and click on **OK**.
3. The **Select Setup Language** window appears.
4. Select the language **English** and click on **OK**. The **Setup** dialog appears as MQSeries prepares the install shield after which the **Welcome** window is displayed.
5. Click on **Next**. The **Read License Conditions** window is displayed.
6. Click on **Yes** to accept the terms of the License Agreement.

Certain prerequisite software must exist on your workstation for MQSeries to install correctly. If:

  - a. The prerequisite software required by MQSeries is not already installed on your workstation, the **Software Requirements** window appears displaying a list of prerequisite software items. If you need any of these items, follow the instructions given in the window to install them. After installing prerequisite software, you must reboot your system, and restart the MQSeries installation.
  - b. The prerequisite software is already installed on your workstation, after the installation program has checked the prerequisite software, the **Choose Installation Folders** window is displayed.
7. To accept the default MQSeries installation folders, click on **Next**. If you do not want to use the defaults given, change them and then click on **Next**. The **Setup Type** window is displayed.
8. Select the **Typical** radio button and then click on **Next**.
9. The **Select Program Folder** window is displayed.
10. Click on **Next**. This causes a folder called **IBM MQSeries** to be added to the Windows Start menu under Programs. The **Ready to Copy Files** window is displayed.
11. Click on **Next**. Program files are copied to the MQSeries installation directory. This may take some time after which the **Setup Complete** window is displayed.
12. MQSeries is now installed and is set to start automatically as a Windows service. If necessary, (depending on your current setup), your workstation will be rebooted.
13. The **Setup Complete** window allows you to select the following options:
  - Launch MQSeries Default Configuration Wizard.

- Launch MQSeries Information Center.
  - Launch MQSeries First Steps.
  - Launch MQSeries Explorer.
  - Launch Notepad to view the release notes.
14. Uncheck all check boxes.
  15. Click on **Finish**.

You have completed installing MQSeries. It has been set to start automatically as a Windows service.

---

## Installing MQ Workflow on Windows

Before installing the MQ Workflow stand-alone software, several services that may be running on your system must be stopped, as follows:

- If **IBM Antivirus** is installed on your workstation, make sure you stop the service **AvService**.
- If **Norton Antivirus** is installed on your workstation, make sure you stop the service **NAV Auto-protect**.
- If **Microsoft Outlook** is installed on your workstation, close the application and log off.

After stopping these services, follow the instructions given next that describe how to install a stand-alone MQ Workflow system on a single Windows NT workstation:

1. Insert the CD-ROM labeled '*IBM MQSeries Workflow Version 3.3 - Program Code for Windows platforms*' into the CD-ROM drive.
2. If the installation program does not start automatically, start it by opening a command prompt window and entering:  
`x:\WINDOWS\SETUP`  
 where *x* is the drive letter for the CD-ROM drive.
3. Select the language that you want to use. When selected, this language becomes the default for your MQ Workflow stand-alone installation.
4. The **Software License Agreement** window is displayed. Read the license agreement and select **Accept** to accept the license or **Decline** to decline the license.

**Note:** The language of the Software License Agreement dialog depends on the Regional Settings specified in the Windows Control Panel, not on the language you selected in the previous dialog.

5. Click on **Next**. The **Welcome** window is displayed.
6. Click on **Next**. The **Choose Destination Location** window is displayed with the default directory **C:\Program Files\MQSeries Workflow** set as



the installation directory for MQ Workflow. If you do not want to use this as your installation directory, enter a new location.

7. Click on **Next**. The **Setup Type** window is displayed.
8. Select **All Components** and click on **Next**.
9. The **Select Components** window is displayed. If all the components are not selected, click **Select All**.
10. Click on **Next**. The **Select Program Folder** window is displayed.
11. Click on **Next**. A folder for MQ Workflow is created and appears on the Windows **Start** menu under **Programs**. The **Start Copying Files** window is displayed.
12. Confirm your selection by clicking on **Next**. Program files are copied to the MQ Workflow installation directory.
13. When the installation phase is complete, remove the program code disk from the CD-ROM drive.
14. Click **Finish** to restart your workstation and activate the changes made by the installation program. After rebooting, the MQ Workflow configuration utility should start automatically.

---

## Configuring MQ Workflow

Configuration must be performed directly after installing MQ Workflow so that database and communication resources provided by the prerequisite software, DB2 and MQSeries, can be used. This is done using the MQ Workflow configuration utility that starts automatically after the MQ Workflow installation stage. If necessary, you can start it manually by selecting the **MQSeries Workflow Configuration Utility** icon found in the **IBM MQSeries Workflow** folder.



It is recommended to use the default values provided during the configuration stage for a test and first time MQ Workflow stand-alone installation.

The MQ Workflow Configuration Utility is made up of several pages. Within each page, set and select values that configure your MQ Workflow stand-alone system as follows:

### General

On the **General** page:

1. Click on **New** and then **OK**.
2. Within the **Configure installed components** group box, check all MQ Workflow component boxes.
3. At the bottom of the page, click on the **Next** button to move to the **Runtime Database** page.

## Runtime Database

On the **Runtime Database** page:

1. Within the **1. Select a DB2 instance already cataloged** group box, select the DB2 instance listed.
2. Within the **2. Select an existing database or create a new database** group box, click on **New...**
3. Click on **OK** to accept all default values.
4. Click on **DB2 Connect parameters...** and enter your user ID and password. Use the user ID and password that you created in step 2 on page 232.
5. At the bottom of the page, click on the **Next** button to move to the **Queue Manager** page.

## Queue Manager

On the **Queue Manager** page:

1. In the **Communication Protocol** group box, make sure that TCP/IP is selected. The IP address or host name and port number fields should contain valid values that do not need to be changed.
2. At the bottom of the page, click on the **Next** button to move to the **Cluster** page.

## Cluster

On the **Cluster** page:

At the bottom of the page, click on the **Next** button to accept all default values and move to the **Client Connections** page.

## Client Connections

On the **Client Connections** page:

At the bottom of the page, click on the **Next** button and move to the **Buildtime** page.

**Note:** If you receive a warning that a connect name must be specified, click on **OK** then click **ADD** to accept the default values.

## Buildtime

On the **Buildtime** page:

At the bottom of the page, click on the **Next** button to move to the **Buildtime Database** page.

## Buildtime Database

On the **Buildtime Database** page:

1. Within the **1. Select a DB2 instance already cataloged** group box, select the DB2 instance listed.
2. Within the **2. Select an existing database or create a new database** group box, click on **New...**

3. Click on **OK** to accept all default values.
4. At the bottom of the page, click on the **Next** button to move to the **Client** page.

## Client

On the **Client** page:

At the bottom of the page, click on the **Next** button to accept all default values and move to the **Java Corba Agent** page.

## Java Corba Agent

On the **Java Corba Agent** page:

At the bottom of the page, click on the **Done** button to accept all default values and configure MQ Workflow with the values set.

A command prompt window appears indicating that configuration is in process. This may take a considerable time, up to 45 minutes. Wait until the configuration is finished.



If errors occur during configuration, check the following log files for further help:

<b>FMCQM.LOG</b>	Queue definition log
<b>@FMCZQM.LOG</b>	Queue Manager creation log
<b>@FMCZRT.LOG</b>	Runtime database creation log
<b>@FMCZBT.LOG</b>	Buildtime database creation log

These files are located in the directory:

```
c:\Program Files\MQSeries Workflow\CFGs\FMC\LOG
```

When the configuration phase is complete, reboot your workstation. MQSeries, DB2, and MQ Workflow are automatically started and set to run as Windows NT services.

---

## Checking the MQ Workflow configuration

“Appendix Q. Using the configuration checking utility `fmczchk`” on page 331 describes how to use the MQ Workflow configuration-checking utility to check your MQ Workflow configuration. You should note that running the configuration-checking utility produces a log file. All errors found during the configuration-checking process are recorded in this log file. To check if any error or warning messages relating to your MQ Workflow configuration have been recorded in this file:

1. Start the configuration-checking utility by entering at a command prompt:  
`fmczchk`

2. Check the log file `fmczchk.log` that is created in the current directory. It contains all error or warning messages, and other important information.

---

## Verifying the MQ Workflow configuration

To verify that components are communicating correctly, you should check your MQ Workflow installation. This is done by verifying that the MQ Workflow Server on your workstation is running and that the MQ Workflow Client on your workstation can connect to it:

To verify that the MQ Workflow Server is running:

1. Select **services**:

On Windows NT:

- a. On the task bar, click on the Windows **Start** menu and select **Settings**.
- b. Select **Control Panel**.
- c. Select the **Services** icon. A dialog box appears.

On Windows 2000:

- a. On the task bar, click on the Windows **Start** menu and select **Settings**.
  - b. Select **Control Panel**.
  - c. Select **Administrative Tools**.
  - d. Select the **Services** icon. A dialog box appears.
2. Within the **Service** window of the dialog box, locate the line that reads **MQSeries Workflow Version 3.3.0 – FMC**
  3. If the status of this service is **Started**, the MQ Workflow Server is running.
  4. To verify that the client can connect to the server, perform the actions described in “Verify MQ Workflow Client” on page 243.

Your stand-alone system is now fully-functional.

---

## Appendix F. Quick client setup on Windows

Setting up a standard MQ Workflow Client on a Windows machine is a common task. This section describes how to install, configure, and verify a standard MQ Workflow Client. The necessary steps are as follows:

1. "Install MQSeries client"
2. "Install MQ Workflow Client"
3. "Configure MQ Workflow Client" on page 242
4. "Verify MQ Workflow Client" on page 243

---

### Install MQSeries client

Be sure that you have installed an MQSeries client on your machine, as described in the MQSeries documentation.

---

### Install MQ Workflow Client

To install the standard MQ Workflow Client on a machine running Windows Me, 98, 2000, or NT:

1. If you are installing on **Windows 2000 and NT**, make sure that you are logged on with a user ID that has administration rights.
2. Insert the CD-ROM labeled '*IBM MQSeries Workflow Version 3.3 - Program Code for Windows platforms*' into the CD-ROM drive. The installation program should start automatically. If it does not start automatically, you can start it by opening a command prompt window and entering:  
`x:\WINDOWS\SETUP`  
where *x* is the drive letter for the CD-ROM drive.
3. A window appears containing a list of languages. Select the language that you want to use.
4. The **Software License Agreement** window is displayed. Read the license agreement and select **Accept** to accept the license or **Decline** to decline the license.

**Note:** The language of the Software License Agreement dialog depends on the Regional Settings specified in the Windows Control Panel, not on the language you selected in the previous dialog.

5. The **Welcome** window is displayed. Click **Next**.
6. The **Choose destination location** window is displayed with the default destination location for installation: **C:\Program Files\MQSeries Workflow**. If necessary, enter a new destination location.

Select **Next**.

7. On **Windows 2000 and NT**: The **Setup-type** window is displayed. Select the category **Clients**, and click **Next**.
8. The **Select Components** window is displayed containing a list of components. Choose the MQ Workflow **Clients** component, and click **Next**.
9. The **Select Program Folder** window is displayed. Select or create a name for the Program folder you want to use for MQ Workflow. When created, this folder appears on the Windows Start menu under Programs with the name you entered. Click **Next**.
10. The **Start Copying Files** window is displayed containing the current settings. If the settings are correct, click **Next**, otherwise click **Back** to correct the settings.
11. The setup program now copies program files to the MQ Workflow installation directory, updates the registry, and creates a list of installed files. This may take several minutes to complete.
12. The **Setup Complete** window is displayed. Click **Finish** to restart your workstation to activate the changes made by the installation program.
13. After rebooting, a registration program is executed, and the installation is complete.
14. The MQ Workflow configuration utility starts automatically. See "Configure MQ Workflow Client".

---

## Configure MQ Workflow Client

After installing MQ Workflow components on a workstation for the first time, and rebooting the system, the MQSeries Workflow Configuration Utility should start automatically. If it does not, you can start it manually by selecting the **MQSeries Workflow Configuration Utility** icon found in the **IBM MQSeries Workflow** folder.

Configuring the client requires the following steps:

1. When you see the **General** page, click on **New...**
2. When you see the **MQSeries Workflow Configuration ID** dialog box, click on **OK** to accept the default configuration ID 'FMC', or enter a different configuration ID.
3. In the 'Configure Installed Components' area, select **Client**, this will cause pages to be added for 'Client connections' and 'Client'.
4. Select the **Client Connections** page:

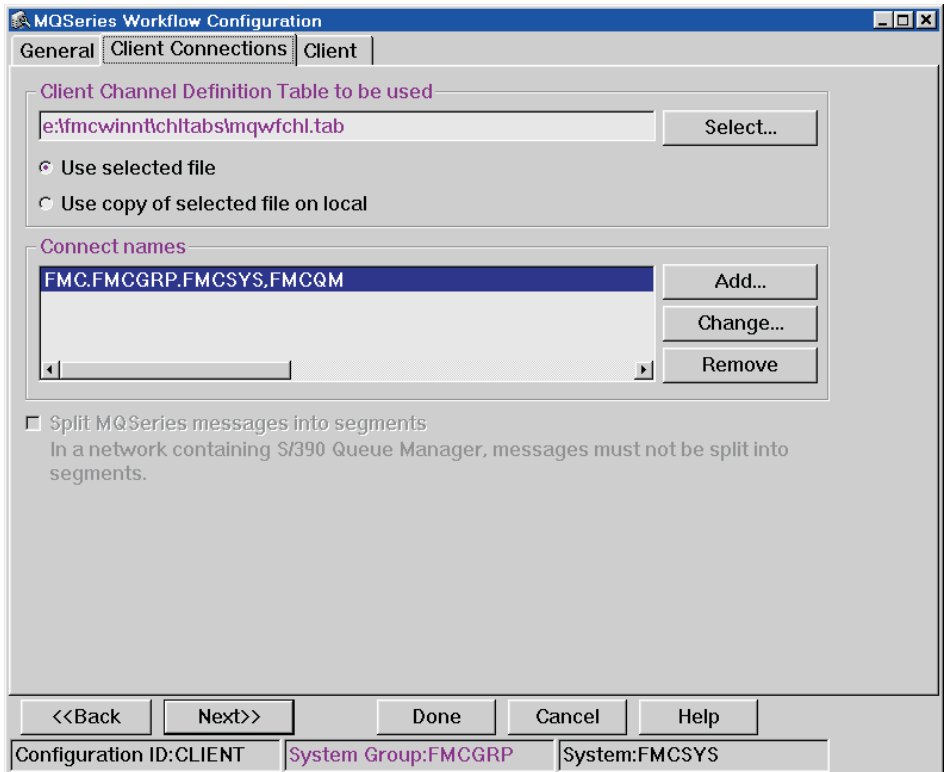


Figure 33. Configuration utility: Client Connections page

5. Enter the location of the client channel definition table that the client will use to connect to servers, or click on **Select...** to locate it.
6. Click **Add** to add a connect name.
7. In the pop-up window: Enter the names for the MQ Workflow system group, system, queue prefix, and MQSeries queue manager to specify a connection to a particular MQ Workflow system. Click **Add**.
8. Select the connect name that you want to use.
9. Click **Done** to complete the configuration process.

## Verify MQ Workflow Client

To verify that an MQ Workflow Client is installed and running and a connection can be made with the MQ Workflow Server:

1. Check that the MQ Workflow Server is started on the MQ Workflow Server machine.
2. To start the Standard Runtime Client, click on **Start** in the Windows Taskbar, select **Programs**, then **IBM MQSeries Workflow**, and click on

**MQSeries Workflow Client** - *ConfigID*. Where *ConfigID* is the configuration identifier you specified when configuring the client.

3. In the logon panel specify your **user ID** and **password**, you can leave the system and system group field blank. If you are connecting to a newly created MQ Workflow server, you can use the user ID 'ADMIN' with password 'password' to log on. If you are not sure about your MQ Workflow user ID and password, ask your MQ Workflow system administrator.
4. As soon as the **Tree View** window is populated with information, the MQ Workflow Client is running and has successfully made a connection to the MQ Workflow Server.
5. Close the MQ Workflow Client.

If the client does not establish a connection successfully, check the following:

1. Are the prerequisite products started?
2. Is the MQ Workflow server started?
3. If you are using a concentrator, is the queue manager on the concentrator started?
4. Is the correct channel table accessible to the client? The channel table must contain data that was configured on the server or concentrator that you intend to connect to.
5. Has the channel table become corrupted?
6. Have you checked the client and server configurations? For details on how to do this, see "Appendix Q. Using the configuration checking utility *fmczchk*" on page 331.
7. If you are using a client concentrator, have you checked the concentrator's configuration? When checking the client concentrator, remember that a client concentrator is simply a client with a locally installed queue manager.
8. Were any deviations from the default customization values applied consistently to both the client and the server? For example, check that the system group name, system name, queue manager name, and queue prefix entered for the client configuration match those given during the server configuration.



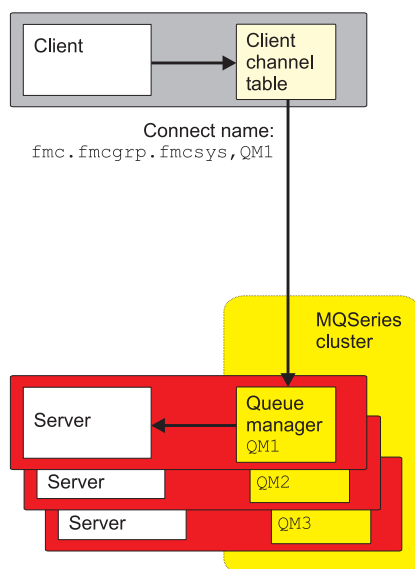
## Appendix G. Client concentrator setup

This describes how to install and configure client concentrators on Windows or on UNIX. For a high-level description of a client concentrator, its advantages, and software requirements, see “Setup scenario for a client concentrator” on page 17.

Figure 34 illustrates the differences between a normal MQ Workflow client/server setup and one which includes a client concentrator:

- The client concentrator has its own queue manager (an MQSeries Server must be installed).
- The client concentrator’s queue manager is a member of the same MQSeries cluster as the server’s queue managers.
- The client’s channel table must contain the connect name for the client concentrator’s queue manager.
- If required, a client can still connect to a particular server, providing the server’s connect name is listed in the client’s channel table.

### Normal client/server setup



### Client concentrator setup

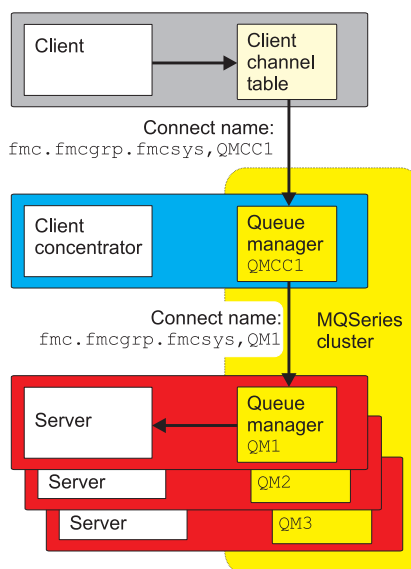


Figure 34. Client concentrator setup

---

## Configuring client concentrators

There is no 'client concentrator' component, any MQ Workflow client that is configured to use the MQSeries server APIs on a local queue manager will act as a client concentrator.

To create a client concentrator you must perform the following:

1. Make sure that you have installed and configured your MQ Workflow servers. Keep a record of the values you enter for the system group, systems, queue prefix, queue manager, cluster, the name of the cluster's primary queue manager, and the TCP/IP address and port number for the workstation that hosts the cluster's primary queue manager.
2. Make sure that the first queue manager in the cluster and the command server for that queue manager is started, as described in "Basic MQSeries commands" on page 190.
3. Copy the client channel definition table from the MQ Workflow servers to the first client concentrator machine.
4. On UNIX, assign the local copy of the client channel definition table the permissions `mqm:mqm 660`.
5. Install an MQSeries Server on your client concentrator machine.
6. Install the MQ Workflow Administration Utility component on your client concentrator machine.

**Note:** You can also use the MQ Workflow Client or API Runtime Libraries components, however, it is recommended that you use the Administration Utility component, because it is the smallest, and it can be used to verify the concentrator setup. The client concentrator machine must not host any MQ Workflow servers.

7. Configure the client concentrator **on UNIX:**
  - a. Log on as root.
  - b. Start the configuration utility by entering the command: `fmczutil`
  - c. Enter **c** to create a new configuration.
  - d. Enter a configuration identifier.
  - e. Enter the configuration administrator user ID.
  - f. Enter **c** to configure a 'client with queue manager'.
  - g. Enter **x** to exit the selection menu.
  - h. Enter the information about the queue manager, as described in "Entering queue manager information" on page 83.

**Note:** The values you enter for system group, system and queue prefix must match the values that you entered when configuring the MQ Workflow server. The name of the queue manager on the client concentrator machine must be different from the ones

used on the MQ Workflow server machines. Make sure that you specify that you are using an 'additional queue manager'.

- i. After entering the information required for the client concentrator, you will see:

```
c ... Create configuration profile for 'FMC' now
s ... Save input to file
r ... Review/change input
x ... Exit (input for configuration 'FMC' will be lost)
```

- j. Enter **c** to create the configuration profile.
  - k. Enter **y** to create the queue manager.
  - l. Enter **x** to exit the configuration utility.
  - m. You can now perform the verification described in 9.
8. Configure the client concentrator **on Windows**:
    - a. Start the configuration utility by selecting the **MQSeries Workflow Configuration Utility** icon in the **IBM MQSeries Workflow** folder.
    - b. Click on **New** to create a new configuration.
    - c. Enter a configuration identifier.
    - d. Select **client** to configure the client concentrator.
    - e. On the **Queue Manger** page, shown in Figure 16 on page 146, enter the queue manager name, queue prefix, and client channel definition table.
    - f. On the **Cluster** page, shown in Figure 17 on page 148, enter the cluster name, select **An additional queue manager in this cluster**, and enter the information about the primary queue manager.
    - g. On the **Client Connections** page, shown in Figure 18 on page 150, click on **Add** to add a new connect name, and specify the system group, system, queue prefix, and queue manager name for any configured server in the system group. Then click on **Add**.
    - h. Click **Done**.
  9. To verify that the MQ Workflow Administration Utility on your client concentrator can connect to the server, perform the following:
    - a. Ensure that at least one MQ Workflow server in the cluster is up and running. If necessary, start the administration server by issuing the following command on the server machine:

```
fmcmain -y <ConfigID> &
```
    - b. Enter the command:

```
fmcutil -y <ConfigID> -uADMIN -ppassword
```
    - c. If you see the administration utility's main menu:

```
FMC15010I Main Menu:
s ... System Commands Menu
m ... Select Server Menu
e ... Errorlog Commands Menu
l ... Systemlog Commands Menu
u ... User Commands Menu
x ... Exit Main Menu
```

the connection between the client concentrator and server has been established successfully, enter **x** to exit the administration utility.

- d. If it does not work, check the possible causes listed in “Client concentrator problem determination” on page 249.
10. If you want to create another client concentrator:
  - a. Copy the client channel definition table from the client concentrator that you just configured to the machine where you want to create the next client concentrator.
  - b. Repeat from step 5 on page 246.

---

## Configuring clients to use a client concentrator

For each client machine that is to use a client concentrator:

1. Copy the appropriate client channel definition table from the client concentrator machines to the client machine.
2. Install and configure the necessary MQ Workflow client components (including the Administration Utility will allow a simple verification), as described in “Part 4. Installing and configuring MQ Workflow on Windows” on page 125, and using the following information:

On the **Client Connections** page, specify the client channel definition table from the client concentrator that you want this client to connect to, click on **Add** to add a new connect name, and specify:

- a. System group name defined in your Runtime database.
- b. System name of any configured server in the system group.

**Note:** It does not matter which system name you specify. The client concentrators will balance the workload between all the systems in the system group.

- c. Queue prefix that was defined on the client concentrator machine.
- d. Queue manager name on the client concentrator machine.
3. If you installed the administration utility, verify that the client can connect to the server (via the client concentrator), by performing the following:
  - a. Enter the command:

```
fmcautil -y <ConfigID> -uADMIN -ppassword
```
  - b. If you see the administration utility’s main menu:

```
FMC15010I Main Menu:
s ... System Commands Menu
m ... Select Server Menu
e ... Errorlog Commands Menu
l ... Systemlog Commands Menu
u ... User Commands Menu
x ... Exit Main Menu
```

the connection between the client and server has been established via the client concentrator successfully, enter **x** to exit the administration utility.

- c. If it does not work, check the possible causes listed in “Client concentrator problem determination”.

---

## Client concentrator problem determination

If the client concentrator does not establish a connection to the server, check the following:

1. Are the prerequisite products started?
2. Is the MQ Workflow server started?
3. Is the correct channel table accessible to the client?
4. The channel table must contain data that was configured on the server that you intend to connect to.
5. Has the channel table become corrupted?
6. Have you checked both the client and server configurations? For details on how to do this, see “Appendix Q. Using the configuration checking utility `fmczchk`” on page 331.
7. Were any deviations from the default customization values applied consistently to both the client and the server? For example, check that the system group name, system name, and queue prefix entered for the client configuration match those given during the server configuration.
8. The queue manager name used on the the client concentrator machine must not be the same as the queue manager on a server machine.



---

## Appendix H. Quick server setup on AIX

This chapter describes how to set up a two-tier MQ Workflow server, suitable for testing and demonstrations. These instructions are intended to help you create default setups of the following:

- IBM DB2 Universal Database Version 7.1 (Enterprise Edition)
- IBM MQSeries Version 5.2
- All MQSeries Workflow components that run on AIX

Product CD-ROMs for MQSeries Workflow, IBM DB2 Universal Database Version 7.1, and MQSeries Version 5.2 are provided with MQ Workflow. For more information about installing these products, see:

- The *IBM DB2 Universal Database for UNIX: Quick Beginnings* manual on the DB2 installation CD-ROM.
- The *MQSeries for AIX: Quick Beginnings* manual on the MQSeries installation CD-ROM.
- “Part 3. Installing and configuring MQ Workflow on UNIX” on page 53.

---

### Verify prerequisites

For a stand-alone MQSeries Workflow server, that is only going to be used for testing or demonstration purposes, you require the following:

*Table 70. Requirements for an AIX stand-alone system*

Processor	RS/6000 uni-processor, SMP or SP2(R) machine as supported by AIX.
Operating system	AIX V4.3 or higher.
Physical memory	256 MB
Hard disk space	1 GB
Access to a CD-ROM	yes
Programming environment	If you want to develop applications using the MQ Workflow APIs, you must use one of the programming languages or development environments listed in “Clients” on page 37.

---

### Install DB2 Universal Database on AIX

This describes how to install DB2 Universal Database Version 7.1 on AIX. The installation CD-ROMs are included with MQ Workflow.

Table 71. Installing DB2 Universal Database Version 7.1 on AIX

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	Check for AIX 4.3.1	If using AIX 4.3.1 you need to check that the <code>ifor_ls.client</code> has been installed.
3	Mount the DB2 CD	<ol style="list-style-type: none"> <li>1. Insert the DB2 Installation CD-ROM in the drive.</li> <li>2. If it does not already exist, create the directory <code>/cdrom</code>, by entering the command: <code>mkdir /cdrom</code></li> <li>3. Mount the CD-ROM by entering the command: <code>mount -oro -v cdrfs /dev/cd0 /cdrom</code></li> </ol>
4	Run the DB2 setup script	<ol style="list-style-type: none"> <li>1. Change to the directory <code>/cdrom</code></li> <li>2. Run the DB2 setup script <code>./db2setup</code></li> <li>3. Select <b>DB2 UDB Enterprise Edition</b>.</li> <li>4. Select <b>OK</b>.</li> </ol>
5	Select Create a DB2 Instance	<ol style="list-style-type: none"> <li>1. Select <b>Create a DB2 Instance</b> <ol style="list-style-type: none"> <li>a. In the configuration panel that appears, note the default values.</li> <li>b. Select <b>OK</b>.</li> <li>c. Note the defaults, and select <b>OK</b>. <b>Note:</b> This creates the group <code>db2iadm1</code>, and two users, <code>db2inst1</code> and <code>db2fenc1</code>. The generated password for these users is <code>ibmdb2</code>.</li> </ol> </li> </ol>
6	Select Install the Administration Server	<ol style="list-style-type: none"> <li>1. Select <b>Install the Administration Server</b> <ol style="list-style-type: none"> <li>a. <code>DB2SYSTEM</code> will be set to your machine's host name.</li> <li>b. Keep selecting <b>Continue</b> or <b>OK</b> to complete the installation.</li> <li>c. Check the DB2 log for possible problems. The log can be found in <code>/tmp/db2setup.log</code></li> <li>d. Note the default values, and select <b>OK</b>. <b>Note:</b> The user <code>dbas</code> will be created.</li> <li>e. The message appears: "<code>DB2SYSTEM will be set to 'xxxxx'</code>", where <code>'xxxxx'</code> is the host name you are installing on.</li> </ol> </li> <li>2. Select <b>OK</b> to complete the installation.</li> </ol>
7	Check log files	If there were any error messages during the installation, see <code>/tmp/db2setup.log</code>



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## Create user IDs and groups

This describes how to create the user IDs required for installing and configuring MQSeries and MQ Workflow.

Table 72. Create user IDs and groups

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	Make the groups for MQSeries and MQ Workflow	Enter the commands: mkgroup mqm mkgroup fmcgrp
3	Create users and add them to the groups	Enter the commands: mkuser pgrp=mqm mqm mkuser pgrp=fmcgrp groups=mqm,db2iadm1 fmc
4	Set password for user fmc	Enter the command: passwd fmc <b>Note:</b> It is also recommended to set the password for user ID mqm

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## Install MQSeries on AIX

This describes how to install MQSeries Version 5.2 on AIX.

Table 73. Installing MQSeries Version 5.2 on AIX

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	Mount the MQSeries CD-ROM	1. Insert the MQSeries 5.2 Installation CD-ROM in the drive. 2. If it does not already exist, create the directory /cdrom, by entering the command: mkdir /cdrom 3. Mount the CD-ROM by entering the command: mount -oro -v cdrfs /dev/cd0 /cdrom

Table 73. Installing MQSeries Version 5.2 on AIX (continued)

Step	Description	Action
3	Install MQSeries	<ol style="list-style-type: none"> <li>1. Change to the directory <code>/cdrom</code></li> <li>2. Run either the <code>smitt</code> or <code>smitty</code> installation program.               <ol style="list-style-type: none"> <li>a. Select <b>Software Installation and Maintenance</b>.</li> <li>b. Select <b>Install and Update Software</b>.</li> <li>c. Select <b>Install and Update from the latest available Software</b>.</li> <li>d. Select at least the following MQ Workflow components:                   <ol style="list-style-type: none"> <li>1) <code>mqm.server</code></li> <li>2) <code>mqm.java</code> (optional)</li> <li>3) <code>mqm.client</code></li> <li>4) <code>mqm.base</code></li> <li>5) <code>mqm.Server.Bnd</code></li> <li>6) <code>mqm.Client.Bnd</code></li> </ol> </li> <li>e. Continue the installation.</li> </ol> </li> </ol>
4	Create a test queue manager (optional)	<p>If you want to test your installation:</p> <ol style="list-style-type: none"> <li>1. Create a test queue manager by entering the command: <code>crtmqm testqmgr</code></li> <li>2. Start the test queue manager by entering the command: <code>strmqm testqmgr</code></li> <li>3. Stop the a test queue manager by entering the command: <code>endmqm -i testqmgr</code></li> </ol>

## Install MQSeries Workflow on AIX

Table 74 describes how to install all MQ Workflow components on AIX, and configure a server using the default values. This uses the automated 'default configuration' facility that is only available for AIX.

Table 74. Install and configure MQSeries Workflow on AIX

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	Add the language and DB2 profile to the Workflow administrator's profile	<ol style="list-style-type: none"> <li>If you are <b>not</b> using csh, edit the .profile for the user <code>fmc</code>, and add the following lines:  <pre>. /home/db2inst1/sqllib/db2profile export LANG=xxxxx</pre> <p><b>Note:</b> Make sure that there is a space between the period '.' and the slash '/'. </p> </li> <li>If you are using csh, edit the .cshrc for the user <code>fmc</code>, and add the following lines:  <pre>source /home/db2inst1/sqllib/db2cshrc setenv LANG xxxxx</pre> </li> </ol> <p>Where <code>xxxxx</code> is your language code, for example, for U.S. English on AIX, use <code>en_US</code>. For a list of language codes, see "Appendix C. Language settings" on page 219.</p>
3	Start the DB2 instance	<ol style="list-style-type: none"> <li>Log on as <b>db2inst1</b> (owner of the DB2 instance). The generated password for this user is <code>ibmdb2</code>.</li> <li>Enter the command  <pre>db2start</pre> </li> <li>Log off as owner of the DB2 instance.</li> </ol>
4	Mount the MQSeries Workflow CD ROM	<ol style="list-style-type: none"> <li>Insert the CD-ROM labeled 'IBM MQSeries Workflow Version 3.3 - Program Code for UNIX platforms' into the CD-ROM drive.</li> <li>If it does not already exist, create the directory <code>/cdrom</code>, by entering the command:  <pre>mkdir /cdrom</pre> </li> <li>Mount the CD-ROM by entering the command:  <pre>mount -oro -v cdrfs /dev/cd0 /cdrom</pre> </li> </ol>

Table 74. Install and configure MQSeries Workflow on AIX (continued)

Step	Description	Action
5	Install MQ Workflow	<p>Run either the <b>smit</b> or <b>smitty</b> installation program.</p> <ol style="list-style-type: none"> <li>1. Select <b>Software Installation and Maintenance</b>.</li> <li>2. Select <b>Install and Update Software</b>.</li> <li>3. Select <b>Install and Update from the LATEST Available Software</b>.</li> <li>4. Select the component <b>fmc</b>.</li> <li>5. Select the component <b>fmcdefault</b>.</li> <li>6. Continue the installation.</li> <li>7. After installation, the configuration utility runs automatically. It creates a standard installation based on the default values, and using the user ID <b>fmc</b>.</li> </ol>
6	Load process data into the Runtime database (optional)	<p>If you already have a process model:</p> <ol style="list-style-type: none"> <li>1. Transfer your process model data <i>yourprocess.fdl</i> to your server machine.  <b>Note:</b> You can create process models using the MQSeries Workflow Buildtime component on a Windows 2000 or NT workstation. Your process model, topology, and staff definitions are exported as an FDL file.</li> <li>2. Enter the command:  <pre>fmcibie -i=yourprocess.fdl -u=ADMIN -p=password -o -t -l</pre> <p>where option <b>-o</b> overrides existing definitions in the database, <b>-t</b> translates the process so that an instance can be created, and <b>-l</b> creates a log file with the same name as the FDL file name with the extension of <i>.log</i>.</p> </li> </ol>
7	Verify the installation and configuration	<p>Perform the actions described in “Chapter 9. Verifying an MQ Workflow server on UNIX” on page 95.  <b>Note:</b> The verification checks that the administration utility (client) can connect to the local administration server. This confirms that the server is set up correctly. If you also want to connect a standard client from a remote machine, perform the actions described in “Testing a client connection to a UNIX server” on page 98.</p>

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## Appendix I. Quick server setup on Sun Solaris

This chapter describes how to set up a two-tier MQ Workflow server, suitable for testing and demonstrations. These instructions are intended to help you create default setups of the following:

- IBM DB2 Universal Database Version 7.1 (Enterprise Edition)
- IBM MQSeries Version 5.2
- All MQSeries Workflow components that run on Sun Solaris

Product CD-ROMs for MQSeries Workflow, IBM DB2 Universal Database Version 7.1, and MQSeries Version 5.2 are provided with MQ Workflow. For more information about installing these products, see:

- The *IBM DB2 Universal Database for UNIX: Quick Beginnings* manual on the DB2 installation CD-ROM.
- The *MQSeries for Sun Solaris: Quick Beginnings* manual on the MQSeries installation CD-ROM.
- “Part 3. Installing and configuring MQ Workflow on UNIX” on page 53.

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### Verify prerequisites

For a stand-alone MQSeries Workflow server, that is only going to be used for testing or demonstration purposes, you require the following:

*Table 75. Requirements for a Sun Solaris server*

Processor	SPARC processor architecture as supported by Sun Solaris
Operating system	Sun Solaris Version 7 or higher
Physical memory	256 MB
Hard disk space	1 GB
Access to a CD-ROM	yes
Programming environment	If you want to develop applications using the MQ Workflow APIs, you must use one of the programming languages or development environments listed in “Clients” on page 37.
Kernel configuration parameters	For a test system, the standard kernel configuration parameters should be sufficient. For more details, see “Kernel configuration parameters” on page 62.

## Install DB2 Universal Database on Sun Solaris

This describes how to install DB2 Universal Database Version 7.1 on Sun Solaris. The installation CDs are included in the MQ Workflow package.

Table 76. Installing DB2 Universal Database Version 7.1 on Sun Solaris

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	Check PATH	Make sure that /usr/sbin is in the PATH so that the users and groups can be created automatically.
3	Mount the DB2 CD	<ol style="list-style-type: none"><li>1. Insert the DB2 UDB Enterprise Edition Installation CD-ROM in the drive.</li><li>2. If the Volume Manager is running, the CD-ROM will be mounted as /cdrom/unnamed_cdrom, otherwise, mount it by issuing the commands: <pre>mkdir -p /cdrom/unnamed_cdrom mount -F hsfs -o ro /dev/dsk/c0t6d0s2 /cdrom/unnamed_cdrom</pre></li></ol>
4	Run the DB2 setup script	<ol style="list-style-type: none"><li>1. Change to the directory /cdrom/unnamed_cdrom</li><li>2. Run the DB2 setup script ./db2setup</li><li>3. Select <b>DB2 UDB Enterprise Edition</b> by pressing the space bar.</li><li>4. Press <b>OK</b>.</li></ol>
5	Select Create a DB2 Instance	<ol style="list-style-type: none"><li>1. Select <b>Create a DB2 Instance</b><ol style="list-style-type: none"><li>a. In the configuration panel that appears, accept the default values.</li><li>b. Press <b>OK</b>.</li><li>c. The message A system-generated password, ibmdb2, will be used  appears.</li><li>d. When the User-Defined Functions panel appears, accept the default values.</li><li>e. The message A system-generated password, ibmdb2, will be used  appears again.</li></ol></li></ol>

Table 76. Installing DB2 Universal Database Version 7.1 on Sun Solaris (continued)

Step	Description	Action
6	Select Create the Administration Server	<ol style="list-style-type: none"> <li>1. Select <b>Create the Administration Server</b> <ol style="list-style-type: none"> <li>a. In the configuration panel use the default values.</li> <li>b. Press <b>OK</b>.</li> <li>c. The password message appears.</li> <li>d. The message appears: "DB2SYSTEM will be set to '<i>hostname</i>'", where <i>hostname</i> is the host name of the machine you are installing on.</li> </ol> </li> <li>2. Press <b>OK</b>.</li> <li>3. Press <b>OK</b>.</li> </ol>
7	Confirm summary report and start installation	<p>When the summary report is displayed:</p> <ol style="list-style-type: none"> <li>1. Select <b>Continue</b>.</li> <li>2. Confirm the warning ('last chance to stop') that appears with <b>OK</b>.</li> <li>3. The installation starts; this may take some time.</li> <li>4. Press <b>OK</b> on the installation summary.</li> <li>5. Select <b>Close</b> at the top level screen.</li> <li>6. Confirm the selection with <b>OK</b>.</li> </ol>
8	Set the swap space	DB2 requires that the physical swap space for Sun Solaris be at least 2 times the size of the physical memory.
9	Create links for the DB2 libraries	<p>Enter the commands:</p> <pre>ln -s /opt/IBMdb2/V7.1/lib/libdb2.so /usr/lib ln -s /opt/IBMdb2/V7.1/lib/libdb2.so.1 /usr/lib</pre>

## Install MQSeries on Sun Solaris

This describes how to install MQSeries Version 5.2 on Sun Solaris.

Table 77. Installing MQSeries Version 5.2 on Sun Solaris

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	Make sure all prerequisites are met	<ol style="list-style-type: none"> <li>1. Create a group with the name <b>mqm</b>.</li> <li>2. Create a user ID with the name <b>mqm</b> and put it in group <b>mqm</b>.</li> <li>3. Make sure that the file systems have been created with enough space.</li> <li>4. Create a directory by entering the command::  <pre>mkdir -p -m 755 /var/mqm</pre> </li> </ol> <p><b>Note:</b> If /var/mqm is not a separate file system, the installation analysis generates a warning that can be ignored.</p>

Table 77. Installing MQSeries Version 5.2 on Sun Solaris (continued)

Step	Description	Action
3	Mount the MQSeries CD	<ol style="list-style-type: none"> <li>1. Insert the MQSeries 5.2 Installation CD-ROM in the drive.</li> <li>2. If the Volume Manager is running, the CD-ROM will be mounted as /cdrom/unnamed_cdrom, otherwise, mount it by issuing the commands:  <pre>mkdir -p /cdrom/unnamed_cdrom mount -F hsfs -o ro /dev/dsk/c0t6d0s2 /cdrom/unnamed_cdrom</pre> </li> </ol>
4	Install MQSeries	<ol style="list-style-type: none"> <li>1. Change to the directory /cdrom/mq_sol.</li> <li>2. Enter the command: pkgadd -d. (do not forget the dot after the 'd'). <ol style="list-style-type: none"> <li>a. You are asked to choose the packages you want to install. Press Enter for all.</li> <li>b. A message concerning the file system /var/mqm appears. Continue installation? [y,n,q] : <b>y</b></li> <li>c. Enter options to be installed [1-40,all,q,?] <b>all</b></li> <li>d. Install MQM DCE? [y,n,q] : <b>n</b></li> <li>e. [Press RETURN to continue]</li> <li>f. [Press RETURN to continue]</li> <li>g. Do you want to install these as setuid/setgid files [y,n,?,q] <b>y</b></li> <li>h. Do you want to continue with the installation of mqm [y,n,?] <b>y</b></li> <li>i. The product is installed. After a while you get the message: <b>Installation of mqm was successful.</b></li> <li>j. Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]: <b>q</b></li> </ol> </li> </ol>
5	Verify that MQSeries has been installed	Enter the command: <pre>pkginfo -l mqm</pre>

## Create users and groups

Create a user ID that will be used to configure MQSeries Workflow.

Table 78. Create a Workflow user and group on Sun Solaris

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	Make the group for MQ Workflow	Enter the commands: <pre>groupadd fmcgrp</pre>



Table 78. Create a Workflow user and group on Sun Solaris (continued)

Step	Description	Action
3	Create a user ID and add it to the groups	Enter the commands: <pre>useradd -g fmcgrp -G mqm,db2iadm1 -d /export/home/fmc -s /usr/bin/ksh -m fmc</pre>
4	Set password for user fmc	Enter the command: <code>passwd fmc</code>

## Install and configure MQ Workflow on Sun Solaris

Table 79 describes how to install all MQ Workflow components on Sun Solaris, configure a server using the default values and DB2 for the Runtime database.

Table 79. Installing and configuring MQ Workflow on Sun Solaris

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	Install MQ Workflow	<ol style="list-style-type: none"> <li>1. Insert the CD-ROM labeled 'IBM MQSeries Workflow Version 3.3 - Program Code for UNIX platforms' into the CD-ROM drive. The CD-ROM is mounted automatically.</li> <li>2. Enter the command:  <pre>pkgadd -d /cdrom/mqwf_progcd2/solaris/fmc-3.3.0.pkg</pre> </li> <li>3. Install component <b>fmc</b></li> </ol>
3	Verify that MQ Workflow has been installed	Enter the command: <pre>pkginfo -l fmc</pre>
4	Add the language and DB2 profile to the Workflow administrator's profile	<ol style="list-style-type: none"> <li>1. If you are using <code>csh</code> edit the <code>.cshrc</code> for the user <code>fmc</code>, and add the following commands:  <pre>source /export/home/db2inst1/sqllib/db2cshrc setenv LANG <b>xxxxx</b></pre> </li> <li>2. If you are <b>not</b> using <code>csh</code>, edit the <code>.profile</code> for the user <code>fmc</code>, and add the following commands:  <pre>./export/home/db2inst1/sqllib/db2profile export LANG=<b>xxxxx</b></pre> </li> </ol> <p><b>Note:</b> Make sure that there is a space between the period '.' and the slash '/'. Substitute your language code for <code>xxxxx</code>, for example, for U.S. English on Sun Solaris, use <code>en_US</code>. For a list of language codes, see "Appendix C. Language settings" on page 219.</p>

Table 79. Installing and configuring MQ Workflow on Sun Solaris (continued)

Step	Description	Action
5	Set the language variables	<ol style="list-style-type: none"> <li>1. If you are <b>not</b> using csh, enter the command: export LANG=xxxxx</li> <li>2. If you are using csh, enter the command: setenv LANG xxxxx</li> </ol> where xxxxx is your language code.
6	Invoke the DB2 profile	<ol style="list-style-type: none"> <li>1. If you are <b>not</b> using csh enter the command: . /export/home/db2inst1/sqllib/db2profile  <b>Note:</b> Make sure that there is a space between the period '.' and the slash '/'.  </li> <li>2. If you are using csh enter the command: source /export/home/db2inst1/sqllib/db2cshrc</li> </ol>
7	Start the DB2 instance	<ol style="list-style-type: none"> <li>1. Log on as <b>db2inst1</b> (owner of the DB2 instance). The generated password for this user is ibmdb2.</li> <li>2. Enter the command: db2start</li> <li>3. Log off as owner of the DB2 instance.</li> </ol>
8	Create the MQ Workflow installation defaults	Enter the command: fmczinsx -o env
9	Create the directory structure for MQ Workflow product files	Enter the command: fmczinsx -o inf
10	Select the database type	Enter the command: fmczinsx -o db2
11	Select the MQSeries Client API connection type	Enter the command: fmczinsx -o mqclient
12	Start the MQ Workflow configuration tool	Enter the command: fmczutil

Table 79. Installing and configuring MQ Workflow on Sun Solaris (continued)

Step	Description	Action
13	Create a new configuration profile	<p>When you see:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <pre>FMC33201I Configuration Commands Menu: l ... List c ... Create x ... Exit Configuration Commands Menu</pre> </div> <ol style="list-style-type: none"> <li>1. Enter <b>c</b> to create a new configuration profile.</li> <li>2. Press Enter to accept the default configuration identifier <b>FMC</b>.</li> <li>3. Press Enter to accept the default configuration administrator <b>fmc</b>.</li> <li>4. Enter <b>s</b> to select the server component.  <b>Note:</b> This also selects the Runtime Database Utilities and the Administration Utility part of the client.</li> <li>5. Enter <b>x</b> to exit the selection menu.</li> </ol>
14	Enter information for the database	<p>When you see:</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <pre>- Configuration of Runtime database ... u ... ( ) Use an existing Runtime database n ... (X) Create a new Runtime database</pre> </div> <ol style="list-style-type: none"> <li>1. Press Enter to accept the default 'Create a new Runtime database'.</li> <li>2. Press Enter to accept the default 'Local database'.</li> <li>3. Press Enter to accept the default DB2 instance name <b>db2inst1</b>.</li> <li>4. Press Enter to accept the default DB2 database name <b>FMCDB</b>.</li> <li>5. Press Enter to accept the default DB2 database administrator user ID <b>fmc</b>.</li> <li>6. Press Enter to accept the default DB2 database layout file.</li> <li>7. Press Enter to accept the default DB2 database location.</li> <li>8. Press Enter to accept the default DB2 container location.</li> <li>9. Press Enter to accept the default DB2 log files location.</li> <li>10. Press Enter to accept the default space management Managed by system.</li> <li>11. Press Enter to accept the default DB2 user ID to access the Runtime database <b>fmc</b>.</li> <li>12. Press Enter to accept the default system group name <b>FMCGRP</b>.</li> <li>13. Press Enter to accept the default system name <b>FMCSYS</b>.</li> <li>14. Press Enter to accept the default queue manager name <b>FMCQM</b>.</li> <li>15. Press Enter to accept the default queue manager prefix <b>FMC</b>.</li> </ol>

Table 79. Installing and configuring MQ Workflow on Sun Solaris (continued)

Step	Description	Action
15	Enter queue manager information	<p>When you see:</p> <pre>- Configuration of queue manager ... FMC33513I Select log type ...: c ... (X) Circular log l ... ( ) Linear log (prerequisite for backup)</pre> <ol style="list-style-type: none"> <li>1. Press Enter to accept the default of circular log type.</li> <li>2. Press Enter to accept the default queue manager log file location.</li> <li>3. Press Enter to accept the default channel definition table file location.</li> <li>4. Enter your TCP/IP address.</li> <li>5. Press Enter to accept the default TCP/IP port number 5010.</li> <li>6. Press Enter to accept the default principal name <code>fmc</code>.</li> <li>7. Press Enter to accept the default cluster name <code>FMCGRP</code>.</li> <li>8. Press Enter to accept the default that the queue manager is the first queue manager in the cluster.</li> <li>9. Press Enter to accept the default DB2 user ID of transaction coordinator <code>fmc</code>.</li> <li>10. Press Enter to accept the default that the queue manager will be started by a member of the group <code>mqm</code>.</li> </ol>
16	Create configuration profile	<p>When you see:</p> <pre>c ... Create configuration profile for 'FMC' now s ... Save input to file r ... Review/change input x ... Exit (input for configuration 'FMC' will be lost)</pre> <p>Enter <b>c</b> to create the profile.</p>
17	Create the Runtime database	<p>When you see:</p> <pre>- Do you want to create the Runtime database 'FMCDB' now? y ... Yes n ... No</pre> <ol style="list-style-type: none"> <li>1. Enter <code>y</code> to create the Runtime database.</li> <li>2. Enter the password for user <code>fmc</code></li> <li>3. Enter the password again</li> </ol>

Table 79. Installing and configuring MQ Workflow on Sun Solaris (continued)

Step	Description	Action
18	Create the queue manager	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <pre>- Do you want to create the queue manager 'FMCQM' now? y ... Yes n ... No</pre> </div> <p>Enter <b>y</b> to create the queue manager.</p>
19	Exit the MQ Workflow configuration tool	Enter <b>x</b> to exit the <code>fmczutil</code> utility.
20	Load process data into the Runtime database (optional)	<p>If you already have a process model:</p> <ol style="list-style-type: none"> <li>1. Transfer your process model data <code>yourprocess.fdl</code> to your machine.</li> <li>2. Log on as user <code>fmc</code>.</li> <li>3. Enter the command: <pre>fmcibie -i=yourprocess.fdl -u=ADMIN -p=password -o -t -l</pre> </li> </ol> <p>where option <b>-o</b> overrides existing definitions in the database, <b>-t</b> translates the process so that an instance can be created, and <b>-l</b> creates a log file with the same name as the FDL file name with the extension of <code>.log</code>.</p> <p><b>Note:</b> You can create process models using the MQSeries Workflow Buildtime component on a Windows 2000 or NT workstation. Your process model and staff definitions are exported as an FDL file.</p>
21	Verify the installation and configuration	<p>Perform the actions described in “Chapter 9. Verifying an MQ Workflow server on UNIX” on page 95.</p> <p><b>Note:</b> The verification checks that the administration utility (client) can connect to the local administration server. This confirms that the server is set up correctly. If you also want to connect a standard client from a remote machine, perform the actions described in “Testing a client connection to a UNIX server” on page 98.</p>



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## Appendix J. Quick server setup on HP-UX

This chapter describes how to set up a two-tier MQ Workflow server, suitable for testing and demonstrations. These instructions are intended to help you create default setups of the following:

- IBM DB2 Universal Database Version 6.1 (Enterprise Edition)
- IBM MQSeries Version 5.2
- All MQSeries Workflow components that run on HP-UX

Product CD-ROMs for MQSeries Workflow, IBM DB2 Universal Database Version 6.1, and MQSeries Version 5.2 are provided with MQ Workflow. For more information about installing these products, see:

- The *IBM DB2 Universal Database for UNIX: Quick Beginnings* manual on the DB2 installation CD-ROM.
- The *MQSeries for HP-UX: Quick Beginnings* manual on the MQSeries installation CD-ROM.
- “Part 3. Installing and configuring MQ Workflow on UNIX” on page 53.

---

### Verify prerequisites

For a stand-alone MQSeries Workflow server, that is only going to be used for testing or demonstration purposes, you require the following:

*Table 80. Requirements for an HP-UX MQ Workflow server*

Processor	HP 9000
Operating system	HP-UX Version 10.20
Physical memory	256 MB
Hard-disk space	1 GB
Access to a CD-ROM	yes
Programming environment	If you want to develop applications using the MQ Workflow APIs, you must use one of the programming languages or development environments listed in “Clients” on page 37.
Kernel configuration parameters	For a test system, the standard kernel configuration parameters should be sufficient.

## Install DB2 Universal Database on HP-UX

This describes how to install DB2 Universal Database Version 6.1 on HP-UX. The installation CDs are included in the MQ Workflow package.

Table 81. Installing DB2 Universal Database Version 6.1 on HP-UX

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	Check PATH	Make sure that /usr/sbin is in the PATH so that the users and groups can be created automatically.
3	Mount the DB2 CD	<ol style="list-style-type: none"><li>1. Insert the DB2 Installation CD-ROM in the drive.</li><li>2. Mount the CD-ROM by issuing the commands: mkdir -p /cdrom /usr/sbin/mount /dev/dsk/c0t2d0 /cdrom</li></ol>
4	Run the DB2 setup script	<ol style="list-style-type: none"><li>1. Change to the directory /cdrom</li><li>2. Run the DB2 setup script ./db2setup</li><li>3. Select <b>DB2 UDB Enterprise Edition</b> by pressing the space bar.</li><li>4. Press <b>OK</b>.</li></ol>
5	Select Create a DB2 Instance	<ol style="list-style-type: none"><li>1. Select <b>Create a DB2 Instance</b><ol style="list-style-type: none"><li>a. In the configuration panel that appears, accept the default values.</li><li>b. Press <b>OK</b>.</li><li>c. The message "A system-generated password, ibmdb2, will be used" appears.</li><li>d. When the User-Defined Functions panel appears, accept the default values.</li><li>e. The message "A system-generated password, ibmdb2, will be used" appears again.</li></ol></li></ol>
6	Select Create the Administration Server	<ol style="list-style-type: none"><li>1. Select <b>Create the Administration Server</b><ol style="list-style-type: none"><li>a. In the configuration panel use the default values.</li><li>b. Press <b>OK</b>.</li><li>c. The password message appears</li><li>d. The message appears: "DB2SYSTEM will be set to 'xxxxx'", where 'xxxxx' is the host name you are installing on.</li></ol></li><li>2. Press <b>OK</b>.</li><li>3. Press <b>OK</b>.</li></ol>



Table 81. Installing DB2 Universal Database Version 6.1 on HP-UX (continued)

Step	Description	Action
7	Confirm summary report and start installation	When the summary report is displayed: <ol style="list-style-type: none"> <li>1. Select <b>Continue</b>.</li> <li>2. Confirm the warning ('last chance to stop') that appears with <b>OK</b>.</li> <li>3. The installation starts; this may take some time.</li> <li>4. Press <b>OK</b> on the installation summary.</li> <li>5. Select <b>Close</b> at the top level screen.</li> <li>6. Confirm the selection with <b>OK</b>.</li> </ol>
8	Check the swap space	Enter the command: <code>swapinfo</code> to check the swap space. DB2 requires that the physical swap space to be at least two times the size of the physical memory.
9	Create links for the DB2 libraries	Run the script <code>/opt/IBMdb2/cfg/db21en</code>

## Install MQSeries on HP-UX

This describes how to install MQSeries Version 5.2 on HP-UX.

Table 82. Installing MQSeries Version 5.2 on HP-UX

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	Make sure all prerequisites are met	<ol style="list-style-type: none"> <li>1. Create a group with the name <b>mqm</b> by entering the command: <code>groupadd mqm</code></li> <li>2. Create a user ID with the name <b>mqm</b> and put it in group <b>mqm</b> by entering the command: <code>useradd -g mqm -d /export/home/mqm -s /usr/bin/ksh -m mqm</code></li> <li>3. Make sure that the file systems have been created with enough space.</li> <li>4. Create a directory by entering the command:: <code>mkdir -p -m 755 /var/mqm</code></li> </ol> <p><b>Note:</b> If <code>/var/mqm</code> is not a separate file system, the installation analysis generates a warning that can be ignored.</p>

Table 82. Installing MQSeries Version 5.2 on HP-UX (continued)

Step	Description	Action
3	Mount the MQSeries CD-ROM	<ol style="list-style-type: none"> <li>1. Insert the MQSeries 5.2 Installation CD-ROM in the drive.</li> <li>2. Mount the CD-ROM by issuing the commands:  <pre>mkdir -p /cdrom/unnamed_cdrom mount -F hsfs -o ro /dev/dsk/c0t6d0s2 /cdrom/unnamed_cdrom</pre> </li> </ol> <p><b>Note:</b> This may be different on your system. In case of errors, see your system documentation.</p>
4	Install MQSeries	<ol style="list-style-type: none"> <li>1. Change to the directory /cdrom/HPUX10.20</li> <li>2. Enter the command: <code>swinstall</code></li> <li>3. Select and install MQSeries.</li> </ol>

## Create user and groups

Create a user ID that will be used to install and configure MQSeries Workflow.

Table 83. Creating a Workflow user and group on HP-UX

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .
2	Make the group for MQ Workflow	Enter the commands: <code>groupadd fmcgrp</code>
3	Create user and add it to the groups	Enter the commands: <code>useradd -g mqm -G fmcgrp,db2iadm1 -d /export/home/fmc -s /usr/bin/ksh -m fmc</code>
4	Set password for user fmc	Enter the command: <code>passwd fmc</code>

## Install and configure MQ Workflow on HP-UX

Table 84 describes how to install all MQ Workflow components on HP-UX, configure a server using the default values and DB2 for the Runtime database.

Table 84. Installing and configuring MQ Workflow on HP-UX

Step	Description	Action
1	Log on as root	Log on as <b>root</b> .

Table 84. Installing and configuring MQ Workflow on HP-UX (continued)

Step	Description	Action
2	Install the package from the CD-ROM	<ol style="list-style-type: none"> <li>1. Insert the CD-ROM labeled 'IBM MQSeries Workflow Version 3.3 - Program Code for UNIX platforms' into the CD-ROM drive.</li> <li>2. Mount the CD-ROM by issuing the commands: <pre>mkdir -p /cdrom/unnamed_cdrom mount -F hsfs -o ro /dev/dsk/c0t6d0s2 /cdrom/unnamed_cdrom</pre> <p><b>Note:</b> This may be different on your system. In case of errors, see your system documentation.</p> </li> <li>3. Enter the command: <pre>swinstall</pre> </li> <li>4. Select and install the MQ Workflow component <code>fmc</code>.</li> </ol>
3	Verify that MQ Workflow has been installed	Enter the command: <pre>swlist MQSERIESWorkflow</pre>
4	Add the language and DB2 profile to the Workflow administrator's profile	<ol style="list-style-type: none"> <li>1. If you are <b>not</b> using <code>csch</code>, edit the <code>.profile</code> for the user <code>fmc</code>, and add the following commands: <pre>. /export/home/db2inst1/sqllib/db2profile export LANG =xxxxx</pre> <p><b>Note:</b> Make sure that there is a space between the period <code>'.'</code> and the slash <code>'/'</code>.</p> </li> <li>2. If you are using <code>csch</code> edit the <code>.cshrc</code> for the user <code>fmc</code>, and add the following commands: <pre>source /export/home/db2inst1/sqllib/db2cshrc setenv LANG xxxxx</pre> </li> </ol> <p>Substitute your language code for <code>xxxxx</code>, for example, for U.S. English on HP-UX use <code>en_US.iso88591</code>. For a list of language codes, see "Appendix C. Language settings" on page 219.</p>
5	Start the DB2 instance	<ol style="list-style-type: none"> <li>1. Log on as <b>db2inst1</b> (owner of the DB2 instance). The generated password for this user is <code>ibmdb2</code>.</li> <li>2. Enter the command <pre>db2start</pre> </li> <li>3. Log off as owner of the DB2 instance.</li> </ol>

Table 84. Installing and configuring MQ Workflow on HP-UX (continued)

Step	Description	Action
6	Invoke the language and invoke the DB2 profile	<ol style="list-style-type: none"> <li>1. Log on as <b>root</b>.</li> <li>2. If you are not currently using ksh, change to ksh by entering the command: <code>/usr/bin/ksh</code></li> <li>3. Enter the command: <code>. ~fmc/.profile</code></li> </ol> <p><b>Note:</b> Make sure that there is a space between the period ('.') and the '~'.</p>
7	Set up the MQ Workflow environment	Enter the command: <code>fmczinsx -o env</code>
8	Create the directory infrastructure for MQ Workflow product files	Enter the command: <code>fmczinsx -o inf -G fmcgrp</code>
9	Select the MQSeries Client API connection type	Enter the command: <code>fmczinsx -o mqclient</code>
10	Start the MQ Workflow configuration tool	Enter the command: <code>fmczutil</code>
11	Create a new configuration profile	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <pre>FMC33201I Configuration Commands Menu: l ... List c ... Create x ... Exit Configuration Commands Menu</pre> </div> <ol style="list-style-type: none"> <li>1. Enter <b>c</b> to create a new configuration profile.</li> <li>2. Press Enter to accept the default configuration identifier FMC.</li> <li>3. Press Enter to accept the default configuration administrator fmc.</li> <li>4. Enter <b>s</b> to select the server component. <b>Note:</b> This also selects the Runtime Database Utilities and the Administration Utility part of the client.</li> <li>5. Enter <b>x</b> to exit the selection menu.</li> </ol>

Table 84. Installing and configuring MQ Workflow on HP-UX (continued)

Step	Description	Action
12	Enter information for the database	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 10px; padding: 10px; margin: 10px 0;"> <pre> - Configuration of Runtime database ...   u ... ( ) Use an existing Runtime database   n ... (X) Create a new Runtime database                     </pre> </div> <ol style="list-style-type: none"> <li>1. Press Enter to accept the default 'Create a new Runtime database'.</li> <li>2. Press Enter to accept the default 'Local database'.</li> <li>3. Press Enter to accept the default DB2 instance name db2inst1.</li> <li>4. Press Enter to accept the default DB2 database name FMCDB.</li> <li>5. Press Enter to accept the default DB2 database administrator user ID fmc.</li> <li>6. Press Enter to accept the default DB2 database layout file.</li> <li>7. Press Enter to accept the default DB2 database location.</li> <li>8. Press Enter to accept the default DB2 container location.</li> <li>9. Press Enter to accept the default DB2 log files location.</li> <li>10. Press Enter to accept the default space management Managed by system.</li> <li>11. Press Enter to accept the default DB2 user ID to access the Runtime database fmc.</li> <li>12. Press Enter to accept the default system group name FMCGRP.</li> <li>13. Press Enter to accept the default system name FMCSYS.</li> <li>14. Press Enter to accept the default queue manager name FMCQM.</li> <li>15. Press Enter to accept the default queue manager prefix FMC.</li> </ol>

Table 84. Installing and configuring MQ Workflow on HP-UX (continued)

Step	Description	Action
13	Enter queue manager information	<p>When you see:</p> <pre style="border: 1px solid black; border-radius: 10px; padding: 10px;"> - Configuration of queue manager ... FMC33513I Select log type ...: c ... (X) Circular log l ... ( ) Linear log (prerequisite for backup) </pre> <ol style="list-style-type: none"> <li>1. Press Enter to accept the default of circular log type.</li> <li>2. Press Enter to accept the default queue manager log file location.</li> <li>3. Press Enter to accept the default channel definition table file location.</li> <li>4. Enter your TCP/IP address.</li> <li>5. Press Enter to accept the default TCP/IP port number 5010.</li> <li>6. Press Enter to accept the default principal name <code>fmc</code>.</li> <li>7. Press Enter to accept the default cluster name <code>FMCGRP</code>.</li> <li>8. Press Enter to accept the default that the queue manager is the first queue manager in the cluster.</li> <li>9. Press Enter to accept the default DB2 user ID of transaction coordinator <code>fmc</code>.</li> <li>10. Press Enter to accept the default that the queue manager will be started by a member of the group <code>mqm</code>.</li> </ol>
14	Create configuration profile	<p>When you see:</p> <pre style="border: 1px solid black; border-radius: 10px; padding: 10px;"> c ... Create configuration profile for 'FMC' now s ... Save input to file r ... Review/change input x ... Exit (input for configuration 'FMC' will be lost) </pre> <p>Enter <b>c</b> to create the profile.</p>
15	Create the Runtime database	<p>When you see:</p> <pre style="border: 1px solid black; border-radius: 10px; padding: 10px;"> - Do you want to create the Runtime database 'FMCDB' now? y ... Yes n ... No </pre> <ol style="list-style-type: none"> <li>1. Enter <code>y</code> to create the Runtime database.</li> <li>2. Enter the password for user <code>fmc</code>.</li> <li>3. Enter the password again.</li> </ol>

Table 84. Installing and configuring MQ Workflow on HP-UX (continued)

Step	Description	Action
16	Create the queue manager	<p>When you see:</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; margin: 10px 0;"> <pre>- Do you want to create the queue manager 'FMCQM' now? y ... Yes n ... No</pre> </div> <p>Enter <b>y</b> to create the queue manager.</p>
17	Exit the MQ Workflow configuration tool	Enter <b>x</b> to exit the <code>fmczutl</code> utility.
18	Load process data into the Runtime database (optional)	<p>If you already have a process model:</p> <ol style="list-style-type: none"> <li>1. Transfer your process model data <code>yourprocess.fdl</code> to your machine.</li> <li>2. Log on as user <code>fmc</code>.</li> <li>3. Enter the command: <pre>fmcibie -i=yourprocess.fdl -u=ADMIN -p=password -o -t -l</pre> </li> </ol> <p>where option <b>-o</b> overrides existing definitions in the database, <b>-t</b> translates the process so that an instance can be created, and <b>-l</b> creates a log file with the same name as the FDL file name with the extension of <code>.log</code>.</p> <p><b>Note:</b> You can create process models using the MQSeries Workflow Buildtime component on a Windows 2000 or NT workstation. Your process model and staff definitions are exported as an FDL file.</p>
18	Verify the installation and configuration	<p>Perform the actions described in “Chapter 9. Verifying an MQ Workflow server on UNIX” on page 95.</p> <p><b>Note:</b> The verification checks that the administration utility (client) can connect to the local administration server. This confirms that the server is set up correctly. If you also want to connect a standard client from a remote machine, perform the actions described in “Testing a client connection to a UNIX server” on page 98.</p>





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## Appendix K. Unattended installation and configuration

This chapter describes the concepts and files that are required for an unattended setup of MQ Workflow components. An automatic setup consists of the following steps:

1. Installation:
  - a. There is no unattended installation available for UNIX. This must be performed manually, as described in “Chapter 7. Installing on UNIX” on page 55.
  - b. For Windows, see “Unattended installation on Windows” on page 278.
2. Configuration is described in “Unattended configuration on UNIX and Windows” on page 285.

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### Command and response files

Two types of files are required for the unattended installation:

#### Command file

This is a batch file which is used to start the unattended installation. The command file starts the installation program and then passes parameter information to it. The parameters specify installation-specific information.

#### Response file

This file contains general or workstation-specific information that is understood by the installation program. The path to the response file is included in the command file. When the command file is started, it calls the response file. The response file then passes the information contained in it to the installation program. The installation program reads a response file instead of prompting you for installation information.

Sample command and response files are contained on the MQ Workflow installation disk. The sample files provided are meant to be used as templates. You can modify a copy of these files by adding or removing entries so that they contain only the parameters and options you want to use for your unattended installation. The valid parameters and options for these files are explained in the following sections for the appropriate operating systems.

---

## Unattended installation on Windows

Command and response files are used to run unattended installation on any of the supported Windows based operating platforms. Before you start the unattended installation you must prepare MQ Workflow command and response files to suit your needs.

The following describes the command and response files and the parameters that can be set in these files.

### Sample command files

The `WINDOWS\lng` directory on the MQ Workflow installation disk contains the sample command file `MQWFNlng.SMP`, where *lng* is replaced by one of the 3-letter language codes described in “Appendix C. Language settings” on page 219. The 3-letter code chosen depends on the language you want to use.

Use the sample command file, `MQWFNlng.SMP`, as a template and customize it to suit your needs.

For example, to install all MQ Workflow components in U.S. English, use the sample command file, `MQWFNENU.SMP`, and then customize it. You can customize this file so it typically contains the following:

```
U:\WINDOWS\ENU\SETUP.EXE -s -f1U:\WINDOWS\ENU\MQWFALL.ISS -SMS
```

The entries in this example are explained next.

### Command file parameters

`SETUP.EXE` is the main file of the installation program. The command file must start with a call to the `SETUP.EXE` file. To do this, you must enter in the command file the fully-qualified file name of the `SETUP.EXE` file that is located on the MQ Workflow installation disk, as follows:

```
x:\WINDOWS\lng\SETUP.EXE
```

where:

- x* Is the drive letter for the CD-ROM drive.
- lng* Is replaced by one of the 3-letter language codes described in “Appendix C. Language settings” on page 219. The 3-letter code chosen depends on the language you want to use.

Installation-specific information is passed to the installation program via command-line parameters. Following is a list of command line parameters that can be used with the `SETUP.EXE` file. Note that a slash (/) or a dash (-) must precede the command line parameters. The command line parameters

are not case-sensitive, that is, uppercase and lowercase letters can be used, except for the **-SMS** parameter, which must be specified in uppercase.

When using long path and file name expressions with parameters, enclose the expressions in double quotation marks. The enclosing double quotation marks indicate that spaces within the quotation marks are not to be treated as the beginning of a new command line parameter.

**Note:** Do not insert a space between command line parameters and options.

**-s** This parameter is mandatory and executes a silent, that is, unattended installation. If you do not specify the **-s** option, you are prompted for any information that is needed to complete the installation.

**-f1**<path\response\_file>

This parameter is mandatory and specifies the location and name of the response file (file extension .ISS). If you use this option when running an unattended installation, replace <path\response\_file> with the fully qualified file name of the response file.

**-r** Causes the SETUP.EXE to generate a silent, that is, unattended installation file (.ISS) automatically that can be used for other installations on other systems. The installation file is a record of the installation input and is saved to the Windows directory on your workstation.

**-SMS** Prevents a network connection and the SETUP.EXE from closing before the installation is complete.

**Note:** Specify **-SMS** in uppercase. This parameter is case-sensitive.

## Sample response file

The `WINDOWS\lng` directory on the CD-ROM labeled '*IBM MQSeries Workflow Version 3.3 - Program Code for Windows platforms*', contains several sample response files, where *lng* is replaced by one of the 3-letter language codes described in "Appendix C. Language settings" on page 219. The 3-letter code chosen depends on the language you want to use.

The sample response files are:

1. For a Windows NT and Windows 2000 unattended installation:

**MQWFALL.ISS** for installing all MQ Workflow components.

**MQWFBT.ISS** for installing MQ Workflow Buildtime and the Runtime Database Utilities.

**MQWFCLI.ISS** for installing MQ Workflow Clients (including API for Lotus Notes).

- MQWFJAVA.ISS** for installing Java CORBA Agent, Java API, and the Web Client.
- MQWFMISC.ISS** for installing the MQ Workflow Administration utility and Runtime Database Utilities.
- MQWFSP.ISS** for installing MQ Workflow service packs.
- MQWFSVR.ISS** for installing an MQ Workflow Server and the Administration utility.

2. For a Windows Me and Windows 98 unattended installation:

- MQWF9X.ISS** for installing all MQ Workflow Windows Me and Windows 98 components.
- MQWFSP.ISS** for installing MQ Workflow service packs.

The format of a response file is similar to that of an .INI file and an extension of .ISS is used. A response file is a plain text file and consists of several sections that contain:

#### Section names

These are contained in square brackets as in:

```
[InstallShield Silent]
```

#### Data entries

These follow their section names and consist of <name=value> pairs as in:

```
Dlg0=SdWelcome-0
```

Use the sample response files as templates and customize them to suit your needs for installing the MQ Workflow components on any of the supported Windows based operating platforms.

#### Format of a response file

The response files are split into sections and have a certain format. The sections in a response file must be in the following order:

##### 1. Silent Header section

All response files begin with a response file silent header. The format of the silent header is:

```
[InstallShield Silent]
Version=v5.00.000
File=Response File
```

This header cannot be changed by the installer.

## 2. Application Header section

The response file application header section allows the installer to identify response files visually. It is not used by the installation. The format of this section is:

```
[Application]
Name=MQSeries Workflow
Version=3.3
Company=IBM
```

## 3. Dialog Sequence Section

The dialog sequence section lists all dialogs you would need to use in a normal installation in the order in which they would appear. The format of this section is:

```
[DlgOrder]
Count=7
Dlg0=SdWelcome-0
Dlg1=SdAskDestPath-0
Dlg2=SdSetupTypeEx-0
Dlg3=SdAskOptionsList-0
Dlg4=SdSelectFolder-0
Dlg5=SdStartCopy-0
Dlg6=SdFinishReboot-0
```

The dialog numbering sequence begins at 0. There is no limit to the number of dialogs you can list.

Count=<number of dialogs> specifies the exact number of dialogs listed in the dialog sequence section.



The order and the number of dialogs is significant. If either the number or the order of the dialogs does not match the order or the number of the dialogs expected by the program, the silent installation fails and the log file records the failure.

## 4. Dialog Data Section

Each dialog specified in the dialog sequence section has its own dialog data section containing the values required by the dialogs. The values listed are the same values that the dialog returns in a normal, user input-driven installation. The dialog data section format is:

```
[<DialogIdentifier>]
Result=value
Keyname1=value
Keyname2=value
```

The following data sections are used by MQ Workflow during silent installation.

**SdWelcome-0**

<b>Result=1</b>	Next Button
<b>SdAskDestPath-0</b>	
<b>Result=1</b>	Next Button
<b>szDir=default</b>	Installation directory for MQSeries Workflow. You can either specify a full path, or use the default.
<b>SdSetupTypeEx-0</b>	
<b>Result=All</b>	All Components

By using **Result=All** you can choose any combination of components, since this setup type contains all available components of MQ Workflow.



The **SdSetupTypeEx-0** data section is only required by Windows NT and Windows 2000.

#### **SdAskOptionsList-0**

<b>Result=1</b>	Next Button
<b>Component-type=string</b>	Only "string" is currently allowed
<b>Component-count=8</b>	The total number of component selections
<b>Component-&lt;#&gt;=&lt;Component&gt;</b>	The components to be installed (numbering begins with 0). For a list of components see file MQWFALL.ISS.

#### **SdSelectFolder-0**

<b>Result=1</b>	Next Button
<b>szFolder=IBM MQSeries Workflow</b>	Folder Name

#### **SdStartCopy-0**

<b>Result=1</b>	Next Button
-----------------	-------------

#### **SdFinishReboot-0**

<b>Result=1</b>	Finish Button
<b>BootOption=3</b>	Possible values are:
<b>0</b>	Do not restart Windows on the workstation.
<b>3</b>	Restart the workstation.

## Starting the unattended installation

Following are procedures for starting the MQ Workflow unattended installation on workstations running any of the supported Windows based operating platforms.

**Note:** *lng* in the following instructions is replaced by one of the 3-letter language codes described in “Appendix C. Language settings” on page 219. The 3-letter code chosen depends on the language you want to use.

To start the unattended installation, use the sample command file *MQWFNlng.SMP* as follows:

1. Access the drive where the CD-ROM is accessible.
2. Select the response file that you want to use from the `WINDOWS\lng` directory contained on the CD-ROM labeled ‘*IBM MQSeries Workflow Version 3.3 - Program Code for Windows platforms*’. If you do not want to use the values set in the selected sample response file, copy it from the directory `WINDOWS\lng` to a directory on your workstation and edit it so that it contains the values and options you want. For details about the various sample response file values and options, see “Sample response file” on page 279.
3. Copy the sample command file *MQWFNlng.SMP* from the directory `WINDOWS\lng` on your MQ Workflow installation CD-ROM to a directory on your workstation, for example, `C:\TEMP`.
4. Rename the copied sample command file *MQWFNlng.SMP* to *MQWFlng.BAT*.
5. Edit the *MQWFlng.BAT* file. This file must contain the various parameters that are required for the installation. For details about the various sample command file parameters, see “Sample command files” on page 278.
6. From the directory that contains the new batch file *MQWFlng.BAT*, start the installation by executing the new batch file *MQWFlng.BAT*.

The installation runs through a sequence of events that takes some time to finish.

7. When the installation has finished, open the log file, `SETUP.LOG`, created on your workstation in the Windows system directory, `WINDOWS\SYSTEM32`. Check the end of the file for the result code that states whether the unattended installation has been successful or not. The result code should be 0. If a result code other than 0 appears, contact IBM. The following is a list of possible result codes:

Result Code	Description
0	Success
1	General error
2	Invalid mode
3	Required data not found in the SETUP.ISS file
4	Not enough memory available
5	File does not exist
6	Cannot write to the response file
7	Unable to write to the log file
8	Invalid path to the InstallShield silent response file
9	Not a valid list type (string or number)
10	Data type is invalid
11	Unknown error during setup
12	Dialogs are out of order
51	Cannot create the specified folder
52	Cannot access the specified file or folder
53	Invalid option selected



If an error occurs during installation, the unattended installation terminates. Since messages cannot be displayed, the messages are stored in the file FMCSETUP.LOG. The file is either located in the directory specified by the environment variable TEMP or in the subdirectory LOG of the MQ Workflow installation directory.

8. If specified in the response file, your workstation automatically reboots after installation has finished.



---

## Unattended configuration on UNIX and Windows

After you have installed MQ Workflow on your workstation, you must create a configuration before you can use it.

On any of the supported Windows based operating platforms, MQ Workflow can be configured using the interactive configuration utility, as explained in “Chapter 14. Configuring MQ Workflow on Windows” on page 131. On UNIX platforms, you can use the configuration utility described in “Chapter 8. Configuring on UNIX” on page 65.

After using the configuration utility to configure MQ Workflow, a configuration data file is created which can then be used to run the unattended configuration on workstations where MQ Workflow is installed.

### The configuration data file

After using the configuration utility to configure MQ Workflow, the data file `fmczkcfg.dat` is created. This file contains information about your configuration and is located on your workstation in the subdirectory:

#### On UNIX:

`<ConfigurationRootDirectory>/cfgs/<ConfigID>`

#### On Windows:

`<ConfigurationRootDirectory>\cfgs\<ConfigID>`

where:

`<ConfigurationRootDirectory>`

is the configuration root directory specified in the installation profile.

`<ConfigID>`

is the configuration identifier specified during configuration. The default is FMC.

For example, for Windows NT, the default location for this file is:

`c:\Program Files\MQSeries Workflow\cfgs\FMC`

The file is made up of a set of lines containing “key=value” pairs. For a description of the keys see “Appendix B. MQ Workflow variables” on page 193.

A sample data file for a client configuration on Windows is shown below:

```
ConfigurationId=FMC
ConfiguredComponents=AR
FMLClientChannelTable=C:\Program Files\MQSeries Workflow\chl\tabs\MQWFCHL.TAB
FMLConnectName=FMC.FMCGRP.FMCSYS,FMCQM
FMLSegmentation=0
MQPrefix=FMC
```

```
MQQueueManager=FMCCM
RTIconDirectory=C:\Program Files\MQSeries Workflow\bin\iconinst
System=FMCSYS
SystemGroup=FMCCGRP
```

This file can be used as input file to start the unattended configuration on workstations where you have installed MQ Workflow. The contents of the configuration data file are used as input for the configuration. This is especially useful to create client configurations. It can also be used to configure other components.

## The unattended configuration utility

After configuring MQ Workflow with the configuration utility, you can run an unattended configuration on additional workstations where MQ Workflow has been installed but not yet configured.

The unattended configuration utility can be used to:

1. Create a configuration based on a configuration data file.
2. Delete a configuration.
3. List the configurations defined on your workstation.
4. Generate a data file based on an existing configuration.
5. Generate a default configuration data file.

To invoke the unattended configuration, enter the command with the appropriate options:

```
fmczkcfg -o:<Action> -y:<ConfigID> -c:<Comps> -f<I/PFile> -p<user:password> -n
```

Where:

**-o:<Action>** Action to be performed by the unattended configuration utility:

**c** Create a configuration.

**Note:** The configuration must not exist on the workstation.

**d** Delete the configuration. This does not delete databases and queue managers.

**Note:** The configuration must exist on the workstation.

**l** List all configurations defined on your workstation.

**p** If you specified an existing configuration identifier, a configuration data file will be generated that reflects

the variables set for this configuration. The configuration data file specified must not exist.

If you specified '\*' as the configuration identifier, a configuration data file will be generated that reflects the default settings for a new configuration. If the configuration data file exists, it will be used to overwrite the system defined default values for the keys set in the configuration data file.

**Note:** The defaults for some variables are derived from values of other variables.

**-y:<ConfigID>** If action **l** (list) is selected, this option is ignored.

If action **c** (create) is selected, the configuration must not exist on your workstation.

If action **d** (delete) is selected, the configuration must exist on your workstation.

If action **p** (print) is selected, the configuration must exist on your workstation or (to print default values) it must have the value '\*'.

**-c:<Comps>** Component to be configured.

If action '**l**' (list) or '**d**' (delete) is selected, this option is ignored.

To configure a component, it must be installed on your workstation. The following are the supported components that can be configured using the unattended configuration utility:

- A** API Runtime Libraries
- B** Buildtime<sup>1</sup>
- C** Java CORBA Agent<sup>2</sup>
- E** Runtime Database Utilities (Oracle)<sup>2</sup>
- I** Runtime Database Utilities
- O** Server (Oracle)<sup>2,4</sup>
- Q** Client with queue manager<sup>3</sup>
- R** Runtime Client<sup>1</sup>
- S** Server<sup>4</sup>
- U** Administration Utility
- W** Web Client<sup>2</sup>

**Notes:**

1. Not available for UNIX.
2. Not available for HP-UX.
3. Only available if MQSeries Server is installed.
4. Not available for Windows 98/Me.

If this option is not specified, the value for the components to be configured will be retrieved from the key 'ConfiguredComponents' in the configuration data file.

**-f:<ConfigurationDataFile>**

If action **c** (create) is selected, the configuration data file must exist. It contains input data ('key=value' pairs) used to create the configuration.

If action **p** (print) is selected, *and an existing configuration is specified*, the configuration data file must not exist. Variables defined for the specified configuration will be written to the configuration data file.

If action **p** (print) is selected, and '\*' is specified as the configuration identifier, the configuration data file will be used as input and output file. If it already exists, input data ('key=value' pairs) will be read. The configuration data file will be created or updated and will contain all default values for the set of components specified by option **-c** or the key ConfiguredComponents in the configuration data file.

If action **l** (list) or **d** (delete) is selected, this option is ignored.

For more information about the configuration data file see "The configuration data file" on page 285.

**-p:<user:password>**

This option is only used, if action **'c'** (create) is selected, and one or more of the following components are included in the configuration:

- B** Buildtime<sup>1</sup>
- I** Runtime Database Utilities
- S** Server<sup>3</sup>

Passwords will not be written to the configuration data file using the **-p** (print) action nor will they be retrieved from the configuration data file. Therefore they have to be provided with the option **'-p'** in the form of user:password pairs.

**Note:** If you do not specify passwords, you will be prompted for them unless you specify option `'-n'`.

Keys in the configuration that require an associated password are:

- BTDatabaseUserID (default: not set)
- RTDatabaseUserID (default: fmc)
- RTDatabaseAdministratorUserID (default: fmc)
- RTDatabaseWorkflowUser (default: ADMIN)
- MQTransactionCoordinator (default: fmc)

If more than one password has to be provided, the user:password pairs can be passed by providing the option `-p` multiple times (for example, `-p:uid1:pwd1 -p:uid2:pwd2`). Alternatively the user:password pairs can be separated by a comma (',') (for example, `-p:uid1:pwd1,uid2:pwd2`).

`-n` Do not prompt for missing data.

### Unattended configuration utility examples

The following sections provide example uses of the unattended configuration utility:

**To display a list of all configurations defined on your workstation:** Enter the command:

```
fmczkcfg -o:l
```

**To print the values of an existing configuration 'FMC':** Enter the command:

```
fmczkcfg -o:p -y:FMC -f:fmc.dat
```

**To print the default values for a configuration including the runtime client component:** Enter the command:

```
fmczkcfg -o:p -y:* -f:dftcli.dat -c:AR
```

**Note:** It is recommended to provide values for system group, system, queue manager and queue prefix to ensure that they match with the values set on the server.

*Sample contents of dftcli.dat:*

```
SystemGroup=MYGRP  
System=MYSYS  
MQQueueManager=MYQM  
MQPrefix=FMC
```

Alternatively you could use the configuration data file from the server configuration to create the client configurations.

**To print the default values for a configuration including the server component:** Enter the command:

```
fmczkcfg -o:p -y:* -f:dftsrv.dat -c:S
```

**Note:** If you want to configure an additional system within an existing system group, it is recommended to provide the values for system group, system, queue manager and queue prefix to ensure their correctness; the system group must be identical to the one defined in the Runtime database; system and queue manager must not be configured on other workstations. The value for CreateRuntimeDatabase must be set to '0'.

*Sample contents of dftsrv.dat:*

```
SystemGroup=MYGRP  
System=MYSYS2  
MQQueueManager=MYQM2  
MQPrefix=FMC  
CreateRuntimeDatabase=0
```

**To run an unattended configuration on a workstation and create an MQ Workflow client configuration 'CLI':** Enter the command:

```
fmczkcfg -o:c -y:CLI -f:cli.dat -c:AR
```

**To run an unattended configuration on a workstation and create an MQ Workflow server configuration with configuration identifier 'SVR' using 'svr' with the password 'svrpwd' as the Runtime database user ID and 'xaid' with the password 'xapwd' as the transaction coordinator user ID:** Enter the command:

```
fmczkcfg -o:c -y:SRV -f:srv.dat -c:S -p:svr:svrpwd,xaid:xapwd
```

**Note:** The input file 'srv.dat' must contain at least the following lines:

```
RTDatabaseUserID=svr  
MQTransactionCoordinator=xaid
```

**To run an unattended configuration on a workstation and create an MQ Workflow client concentrator configuration 'CONC':** Enter the command:

```
fmczkcfg -o:c -y:CONC -f:conc.dat -c:QU
```

**Note:** The input file 'conc.dat' must contain at least the following lines:

```
SystemGroup=MYGRP  
System=MYSYS  
MQQueueManager=CONCQM  
MQPrefix=FMC  
MQClusterMode=a  
MQClusterName=MYGRP  
MQClusterFirstQueueManager=<NameOfFirstQMinMYGRP>  
MQClusterCommunicationAddress=<TCP/IP-Address>  
MQClusterPort=<TCP/IP-Port>
```

---

## Appendix L. Installing the API for Lotus Notes

The client is installed by selecting **API for Lotus Notes** during the installation process, see “Chapter 13. Installing MQ Workflow on Windows” on page 127.

After installation is complete, copy the following external LotusScript files

1. EXMP4API.LSS (general Lotus Notes functions)
2. EXMP4ARC.LSS (error return codes)

from the MQ Workflow directory *<InstallationDirectory>*\LNC to the Lotus Notes directory, which is usually: *x:\NOTES* where *x* is the drive letter.





---

## Appendix M. Using the Java API and Java CORBA Agent

The MQ Workflow Java API consists of a set of Java classes (that provide MQSeries Workflow API functionality to Java based applications), and an agent (that allows the Java API to be used over a network). How to use them is explained in the following:

- “Java API classes”
- “Java CORBA Agent” on page 294
- “MQ Workflow client types” on page 294
- “Java API architecture and locator policies” on page 299
- “Configuring your Java applications” on page 303

For information about how to program using the Java API, refer to the *IBM MQSeries Workflow: Programming Guide*.

**Note:** In this release, the Java API and Java CORBA Agent are not available for HP-UX, because the Java 2 runtime environment is not supported on HP-UX 10.20.

---

### Java API classes

The Java API classes provide the same functionality as the C++ API, except that no asynchronous API calls are supported. The Java API wraps the C++ API via Java Native Interface (JNI) into a form that is accessible from the Java environment. The MQ Workflow Java API supports multi-threading for action methods of the API.

The Java API is available in several different ‘flavors’. The best performance is achieved using “Local Bindings” (LOC\_LOCATOR), where the MQ Workflow C++ API is directly used via Java Native Interface.

The Java API is available also over the network, using the Java CORBA Agent described below, which allows you to write slim applications.

It is contained in two different jar files. `fmcojagt.jar` contains the whole API code and is needed for “Local Bindings” and by the Agent. `fmcojapi.jar` contains the same API methods, but requires a Java CORBA Agent, that runs somewhere in the network, to which it can connect and forward the API calls.

---

## Java CORBA Agent

In order to support "thin clients", the Java API is split up into a part which runs on the thin client, the Java API, and another part which is capable to serve multiple clients, called a Java CORBA Agent. This Java CORBA Agent then exploits the C++ API via Java Native Interface. On one side, the Java CORBA Agent wraps the native product APIs and on the other side publishes a Java form of the MQ Workflow APIs on the network.

Figure 35 shows a typical thin client configuration type with a Java CORBA Agent.

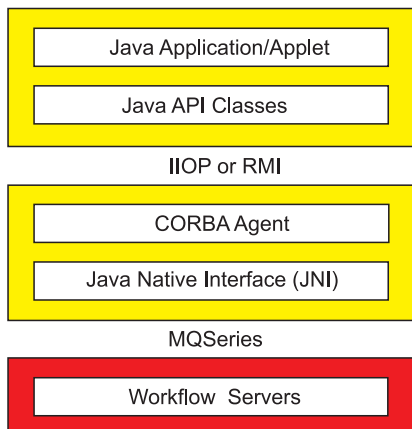


Figure 35. Java CORBA Agents supporting thin clients

When this approach is used, the clients have to locate their corresponding Java CORBA Agent. The Java CORBA Agents are named entities which register themselves with a directory service on startup. In MQ Workflow, the communication protocol and directory service to be used by the Java CORBA Agent is called the 'locator policy'. The locator policy is a configuration option for the Java CORBA Agent. When a client is started, it must use the same directory service to locate the corresponding Java CORBA Agent in order to be able to communicate with it. You can have many Java CORBA Agents in the same MQ Workflow domain, using the same or different locator policies.

**Note:** When multiple agents use the same locator policy, some locator policies require that the Java CORBA Agents have different names.

---

## MQ Workflow client types

The following describes three typical MQ Workflow clients that use the Java API:

- “Fat client”, that requires the installation of the MQ Workflow Java API, the MQ Workflow C++ API and MQSeries on the client machine.
- “Thin client” on page 296, that requires only the installation of the MQ Workflow Java API on the client machine.
- “Ultra-thin client” on page 297, that requires only the installation of a Web Browser on the client machine.

## Fat client

A client application that uses ‘Local Bindings’ (LOC\_LOCATOR) is a so-called ‘fat client’, since it must be an MQSeries client, with a correspondingly large installation and memory footprint. The MQ Workflow C++ API and MQSeries has to be available on the same physical machine.

Using the MQ Workflow Java API in this way provides the best performance. It is also the only client type, that allows the execution of activity implementations invoked by the Program Execution Agent on the client machine.

Figure 36 illustrates the structure of a Java application implemented as a fat client.

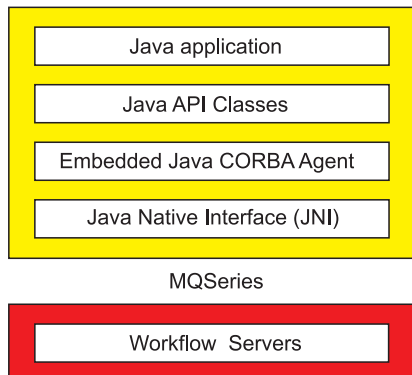


Figure 36. Fat client

This setup requires the following software on the machine running the Java application:

- MQ Workflow Java CORBA Agent (fmcojagt.jar).
- MQ Workflow API Runtime libraries.
- A Java 2 runtime environment.
- MQSeries:

1. If your application uses many threads (for example, Servlets), then an MQSeries server is required and a client concentrator setup is needed. For more details, see “Setup scenario for a client concentrator” on page 17.
2. For applications that use only a few threads, an MQSeries client is sufficient.

For further details, refer to the *IBM MQSeries Workflow: Programming Guide*.

## Thin client

The thin client requires only the MQ Workflow Java API on the client machine. This kind of client requires that a Java CORBA Agent is available, which can be located using one of the locator policies. The client does not use the C++ API directly, it forwards the calls to the Agent, which uses the C++ API and MQSeries. The Agent can run on another machine and serve multiple clients.

The execution of activity implementations invoked by the Program Execution Agent is possible only on the machine, where the Agent is running.

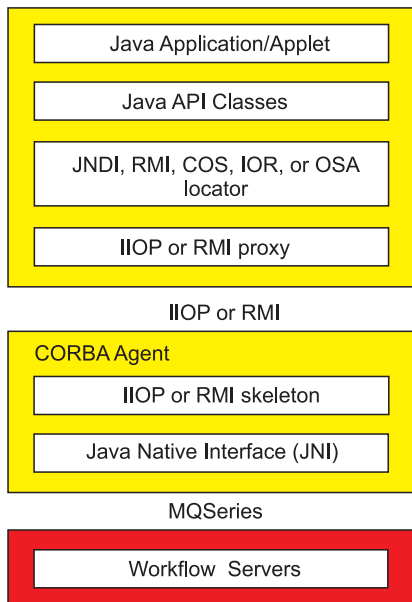


Figure 37. Thin client

For this setup, the client machine requires the following:

- A Java 2 runtime environment.
- MQ Workflow Java API (fmcojapi.jar).

- If you are using JNDI locator policy: Any JNDI compliant ORB, for example, a Java 2 runtime environment with RMI-IIOP support.
- If you are using COS, IOR, or OSA locator policy: Inprise VisiBroker V3.4.

The CORBA Agent requires the following:

- A Java 2 runtime environment.
- MQ Workflow Java CORBA Agent (fmcojagt.jar).
- MQ Workflow API Runtime libraries.
- If you are using JNDI locator policy: Any JNDI compliant ORB.
- If you are using COS, IOR, or OSA locator policy: Inprise VisiBroker V3.4.
- MQSeries server is required and a client concentrator setup is needed. For more details, see “Setup scenario for a client concentrator” on page 17.

### **Ultra-thin client**

The ultra-thin client requires only a Web Browser on the client machine. The Web pages displayed by the Browser are generated by a Web Server with Servlet and JSP support. The MQ Workflow Java API calls are invoked by the Servlet code.

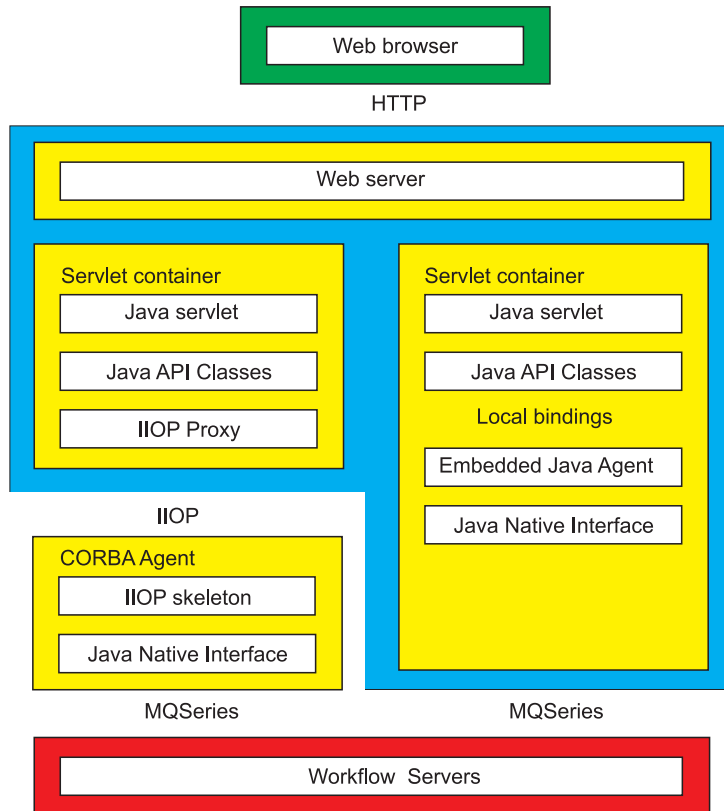


Figure 38. Ultra-thin client

Figure 38 illustrates two possible Web server configurations for ultra-thin clients.

You can configure the Web Server to use local bindings or to access the MQ Workflow Java API using the Java CORBA Agent. The local bindings (LOC\_LOCATOR) configuration is recommended for the best performance.

The execution of activity implementations invoked by the Program Execution Agent is only possible on either the machine where the Web Server is running (LOC\_LOCATOR), or on the machine where the Java CORBA Agent is running (JNDI\_LOCATOR).

- The client machines only require a Web Browser with JavaScript enabled.
- A Web Server machine that uses local bindings requires the following software:
  - A Java 2 runtime environment.
  - A servlet and JSP enabled Web server, for example the IBM WebSphere Application Server.

- An MQ Workflow Web Client or a custom servlet-based application.
- MQ Workflow Java CORBA Agent (fmcojagt.jar).
- MQ Workflow API Runtime libraries.
- MQSeries server is required and a client concentrator setup is needed. For more details, see “Setup scenario for a client concentrator” on page 17.
- A Web Server machine that uses the JNDI locator policy requires the following software:
  - A Java 2 runtime environment.
  - Any JNDI compliant ORB, for example, a Java 2 runtime environment with RMI-IIOP support.
  - A servlet and JSP enabled Web server, for example the IBM WebSphere Application Server.
  - An MQ Workflow Web Client or a custom servlet-based application.
  - MQ Workflow Java API (fmcojapi.jar).
- If you choose the JNDI locator policy, this setup requires an Agent configuration, usually on another machine. The CORBA Agent requires the following:
  - A Java 2 runtime environment.
  - MQ Workflow Java CORBA Agent (fmcojagt.jar).
  - MQ Workflow API Runtime libraries.
  - Any JNDI compliant ORB.
  - MQSeries server is required and a client concentrator setup is needed. For more details, see “Setup scenario for a client concentrator” on page 17.

---

## Java API architecture and locator policies

Figure 39 on page 300 illustrates the different communication protocols and locator policies available to an application that uses the MQ Workflow Java API.

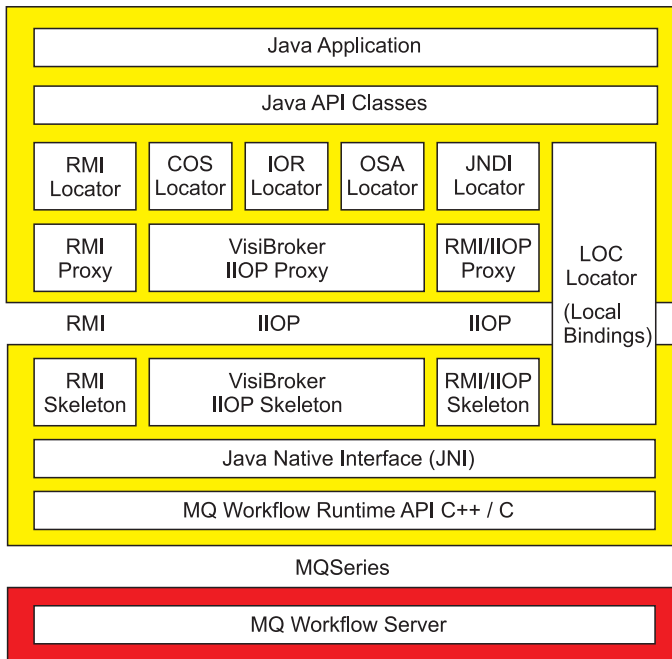


Figure 39. Java API architecture and locator policies

The MQ Workflow Java API always runs in the same process (Java Virtual Machine) as the Java application that uses it. Depending on the chosen locator policy the MQ Workflow API calls will be forwarded directly to the C++ API via JNI or will be directed over the network to the Java CORBA Agent who forwards them to the C++ API using JNI.

For the communication between client application and Java CORBA Agent you can choose between several locator policies. It is recommended to use one of the following locator policies for clients to find and access their agent:

- “Local bindings” on page 301
- “Java Naming and Directory Interface” on page 301

The following locator policies are deprecated. They are currently still implemented, however, they may be removed in future releases. It is not recommended to use these locator policies:

- “OSA naming” on page 302
- “COS naming” on page 302
- “IOR naming” on page 302
- “Remote Method Invocation” on page 302



## Local bindings

When using local bindings (LOC\_LOCATOR), the Java API directly calls the JNI layer (this is effectively an embedded Java CORBA Agent) and thus the Java application runs in the same process (Java Virtual Machine) as the C++ API and the MQSeries client.

Using Local Bindings is best suited for the following cases:

- Java-based MQ Workflow activity implementations invoked by a Program Execution Agent.
- Server-side applications, for example, servlets.
- For large Java applications that use the MQ Workflow API.
- To create a client using the MQ Workflow API on platforms where no standard client is available, for example, on UNIX.

## Java Naming and Directory Interface

The JNDI locator policy (JNDI\_LOCATOR) is recommended when using an agent. It is best suited for the following cases:

- Small Java applications (thin clients).
- Java applications that are not allowed to invoke JNI method calls, for example, EJBs.

JNDI is an API specified in Java that provides naming and directory functionality to applications written in Java. It is designed especially for Java, and uses Java's object model. Using JNDI, Java applications can store and retrieve named Java objects of any type. In addition, JNDI provides methods for performing standard directory operations, such as associating attributes with objects and searching for objects using their attributes.

The JNDI definition is independent of any specific naming or directory service implementation. It enables Java applications to access different, possibly multiple, naming and directory services using a common API. Different naming and directory service providers can be plugged in seamlessly behind this common API. This allows Java applications to take advantage of information in a variety of existing naming and directory services, such as LDAP, NDS, DNS, and NIS(YP), and allows Java applications to coexist with legacy applications and systems.

The communication protocol used for JNDI is RMI-IIOP, which combines the RMI ease-of-use for method invocation, with the IIOP's reliability of method execution.

Java JNDI is an approach that is completely Java based and is already integrated into the JDK (Sun JDK 1.3, IBM JDK 1.2.2, IBM JDK 1.3) or is available as extension (Sun JDK 1.2). Multiple Java CORBA Agents are only

supported if they have different names. With JNDI, there is support for other vendor ORBs, providing that they are compliant with the Java 2 specification.

### **OSA naming**

This is a specific naming facility (Smart Agent) of the Inprise VisiBroker Object Request Broker (ORB), that is easy to use. It only requires an OSAgent running on the subnetwork that keeps track of all the objects and their names in the network. Since Smart Agents synchronize their information, via the TCP/IP UDP protocol, the only thing that has to be known is the name of the object that the client program is looking for. If there are Java CORBA Agents with the same name, the VisiBroker Smart Agent automatically performs load balancing between them.

Currently the only supported ORB for this locator policy (OSA\_LOCATOR) is Inprise VisiBroker for Java V3.4. For more information about Inprise VisiBroker see <http://www.inprise.com>.

### **COS naming**

CORBA Naming services is the native CORBA directory service. Objects can use COS to publish their identity to the CORBA system.

Currently the only supported ORB for this locator policy (COS\_LOCATOR) is Inprise VisiBroker for Java V3.4. For more information about Inprise VisiBroker see <http://www.inprise.com>.

**Note:** COS Naming is usually vendor dependent. Multiple Java CORBA Agents are only supported if they have different names.

### **IOR naming**

Interoperable Object References (IOR) is a vendor-independent naming service for CORBA applications. The stringified identity of a specific object (its identity expressed as a string), and its IOR are published in a file. This file can be accessed by clients via a published URL for a Web server, or by other means in a local area network file sharing, for example, NFS. Multiple Java CORBA Agents are only supported if they have different names.

Currently the only supported ORB for this locator policy (IOR\_LOCATOR) is Inprise VisiBroker for Java V3.4. For more information about Inprise VisiBroker see <http://www.inprise.com>.

### **Remote Method Invocation**

The Remote Method Invocation locator policy (RMI\_LOCATOR) requires a running RMI registry. The RMI registry comes with most Java development kits. It can be run as a stand-alone program where object implementations register, or it can be embedded into the application. Embedding has the big advantage that no separate program is necessary to provide naming functions.

To locate objects via the RMI registry, the host which runs the RMI registry has to be known. Java RMI is an approach that is completely Java based and does not require additional software.

Multiple Java CORBA Agents are only supported if they have different names. Java RMI agents should only be used for prototyping. They are not suited for production purposes.

---

## Configuring your Java applications

For each Java CORBA Agent that you configure, a script (batch) file to start a specific Java CORBA Agent configuration is created in the bin subdirectory of the MQ Workflow configuration data directory. On Windows, the batch file is named `fmcagent-ConfigurationID.bat`. On UNIX, the batch file is named `fmcagent-ConfigurationID`. These script (batch) files have the CLASSPATH and bootclasspath setup to run the Java CORBA Agent.

If you are using MQSeries 5.1 on AIX from within Java 2, you need to export the following setting in the invoking shell and in the Java agent script files:

```
export LDR_CNTRL=MAXDATA=0x30000000
```

Use this setting with caution: From this shell you cannot invoke MQSeries commands like `strmqm`. For further information, see the MQSeries Java Support Pack readme at <http://www.ibm.com/software/ts/mqseries/support/summary/jvreadme.html>

Depending on the locator policy used and the Java API Classes, the Java CORBA Agent needs the following setup:

### Local Bindings (LOC\_LOCATOR):

The CLASSPATH environment variable for the client application must include `fmcojagt.jar`. For example,  
`CLASSPATH=.;d:\fmcwinnt\bin\java3300\fmcojagt.jar`

**Note:** You must set the CLASSPATH environment variable yourself. It is not set by MQ Workflow to allow maximum flexibility. MQ Workflow supports multiple versions for the Java API Classes and Java CORBA Agent and stores the appropriate files in *MQ Workflow installation directory*\bin\javaVRMS, where VRMS represents the Version, Release, Modification, and Service Pack.

### Java Naming and Directory Interface (JNDI\_LOCATOR):

IBM WebSphere Application Server or any other JNDI compliant Naming Service can be used. The JNDI Name Server must have been started.

For example, if you are using `tnameserv`, which is part of the JDK, you should issue the command: `'tnameserv -ORBInitialPort JNDINameServerPort'`. If you do not specify the `-ORBInitialPort` option, port 900 is used.

**If Java security is enabled:**

Some authorizations have to be added on the Java Agent side and on the Client side, this is described in "Security authorizations for Java CORBA Agent using JNDI" on page 137 for Windows, and in Table 30 on page 73 for UNIX.

**On the Java Agent side:**

A JNDI compliant ORB must have been installed and configured. The script (batch) file contains all necessary settings to start the agent.

**On the Client side:**

The Java API must have been installed. The CLASSPATH environment variable must include `fmcojapi.jar`. For example,  
`CLASSPATH=.;d:\fmcwinnt\bin\java3300\fmcojapi.jar`. On Windows, this update is done by the installation program when the Java API is installed on the machine.

The client application has to be started with additional parameters, which define the Naming Context Factory class, and the URL where the JNDI Naming Service is running. How to set these parameters from a program is described in the *IBM MQSeries Workflow: Programming Guide*.

For example, when using the JDK Naming Context Factory:

```
e:\jdk1.2.2\bin\java.exe -classpath
    "e:\fmcwinnt\bin\java3300\fmcojagt.jar;%CLASSPATH%"
    -Djava.naming.factory.initial
        =com.sun.jndi.cosnaming.CNCTxFactory
    -Djava.naming.provider.url=iio://JNDINameServerHostname:
        JNDINameServerPort MyApplication
```

**Note:** This sample corresponds to a COS naming JNDI implementation. Other kinds of JNDI service provider may require additional or other properties.

**RMI (RMI\_LOCATOR):**

**On the Java Agent side:**

The script (batch) file contains all necessary settings to start the agent.

**On the Client side:**

The Java API must have been installed. The CLASSPATH environment variable must include `fmcojapi.jar`. For

example,  
CLASSPATH=.;d:\fmcwinnt\bin\java3300\fmcojapi.jar. On Windows, this update is done by the installation program when the Java API is installed on the machine.

**VisiBroker Smart Agent (OSA\_LOCATOR), Interoperable Object Reference (IOR\_LOCATOR), CORBA Naming Service (COS\_LOCATOR):**

The service or agent must have been started. The script (batch) file contains all necessary settings to start the agent.

**On the Java Agent side and Client side:**

You must have installed and configured the Inprise VisiBroker for Java V3.4. The VisiBroker ORB must be used instead of the JDK's built-in ORB implementation, as described in Table 29 on page 72 for UNIX, and in "Prepare the Java CORBA Agent and Java API classes" on page 137 for Windows.

**On the Client side:**

When the client application is to be started, the appropriate VisiBroker ORB .jar files have to be used, this is done by specifying them with the -Xbootclasspath option.

**Note:** All VisiBroker specific .jar files have to be specified in the bootclasspath before any .jar files which are part of the JDK distribution (rt.jar and i18n.jar).

The Java API must have been installed. The CLASSPATH environment variable must include fmcojapi.jar. For example,

CLASSPATH=.;d:\fmcwinnt\bin\java3300\fmcojapi.jar. On Windows, this update is done by the installation program when the Java API is installed on the machine.

Starting the COS Naming Service, for example, may require the one-line command:

```
e:\jdk1.2.2\bin\java.exe -DJDKrenameBug -DORBservices=CosNaming
-DSVCnameroot=RootNameContext
-Xbootclasspath:e:\inprise\vbroker\lib\vbjapp.jar;
e:\inprise\vbroker\lib\vbjorb.jar;
e:\inprise\vbroker\lib\vbjcosnm.jar;
e:\jdk1.2.2\jre\lib\rt.jar;
e:\jdk1.2.2\jre\lib\i18n.jar
com.visigenic.vbroker.services.CosNaming.ExtFactory RootNameContext
```



## Appendix N. Migrating from a previous release

This appendix contains information and procedures for migrating from MQ Workflow Version 3.1.2 and higher to Version 3.3.0.

If you want to use your existing MQ Workflow profile, Runtime, and Buildtime data, Table 85 shows the sequence of actions that you must perform.

Table 85. Required migration actions

Step	Migration action	Your current version	
		3.2.0, 3.2.1, or 3.2.2	3.1.2
1	"Export Buildtime data" on page 308	●	●
2	"Stop the MQ Workflow system group" on page 308	●	●
3	"Back up Runtime data" on page 308	●	●
4	"Migrate from DB2 Version 5.2" on page 309	● <sup>1</sup>	● <sup>1</sup>
5	"Migrate the MQ Workflow profile from Version 3.1.2 to Version 3.3.0" on page 309	—	●
6	"Migrate the Runtime database from Version 3.1.2 or higher to Version 3.3.0" on page 310	●	●
7	"Upgrade MQSeries" on page 313	● <sup>2</sup>	●
8	"Uninstall MQ Workflow on UNIX" on page 314	●	●
9	"Install MQ Workflow" on page 314	●	●
10	"Change directory and file permissions on UNIX" on page 314	●	●
11	"Switch client connection type" on page 314	●	●
12	"Prepare Buildtime" on page 315	●	●
13	"Import data into the Buildtime database" on page 316	●	●
14	"Import Buildtime data into Runtime database" on page 316	●	●
15	"Migrate the queue manager from Version 3.1.2 or higher to Version 3.3.0" on page 317	●	●
16	"Migrate from JDK 1.1 to 1.2 or 1.3" on page 317	● <sup>3</sup>	● <sup>3</sup>
17	"Migration verification" on page 318	● <sup>4</sup>	● <sup>4</sup>

**Notes:**

1. Required if you have DB2 Version 5.2. On HP-UX you must migrate to DB2 Version 6.1. On all other platforms you should migrate to Version 7.1.
2. Required if your MQSeries installation is not at Version 5.1 with CSD level 5, or Version 5.2.
3. Required if you have been using Java API or the Java CORBA Agent with JDK 1.1.
4. Verification is optional, but it is strongly recommended.



The following locator policies are deprecated: VisiBroker Smart Agent (OSA\_LOCATOR), CORBA Naming Service (COS\_LOCATOR), Java Remote Method Invocation (RMI\_LOCATOR), and Interoperable Object Reference (IOR\_LOCATOR). Deprecated means, it is recommended to no longer use these locator policies, they are currently still implemented, they may be removed in future releases, and it is recommended to use other locator policies.

---

## Export Buildtime data

To be able to migrate your Buildtime data, you must export it from your existing Buildtime tool before you install the new version of the Buildtime tool.

1. Start the Buildtime tool.
2. Export your Buildtime data, as described in "Exporting from Buildtime" in the *IBM MQSeries Workflow: Getting Started with Buildtime* manual.
3. Note the file name for later when you will have to import the Buildtime data back into the new Buildtime database as part of "Import data into the Buildtime database" on page 316.

---

## Stop the MQ Workflow system group

Before you can migrate your existing MQ Workflow system group, you should:

1. Stop all MQ Workflow clients that use systems (servers) in the system group.
2. Stop all MQ Workflow systems in the system group.

---

## Back up Runtime data

It is strongly recommended that you back up your Runtime data. For information about backing up on DB2, see the *IBM DB2 Universal Database Administration Guide*.



---

## Migrate from DB2 Version 5.2

MQ Workflow no longer supports IBM DB2 Universal Database Version 5.2. If you have been using DB2 Version 5.2, you must migrate your database to a higher version. The MQ Workflow package includes CD-ROMs for suitable versions of DB2 (Version 6.1 for HP-UX, and Version 7.1 for all other platforms).

To migrate your DB2 version, you must follow the instructions in the section *"Migrating from Previous Versions"* in the IBM DB2 Universal Database *Quick Beginnings* online manual. You can find it in various languages on the DB2 installation CD-ROM for your platform.

---

## Migrate the MQ Workflow profile from Version 3.1.2 to Version 3.3.0

If you are currently working with MQ Workflow Version 3.1.2, you must migrate the MQ Workflow profile before you can migrate the Runtime database. The profile settings for MQ Workflow Version 3.2 and higher do not need to be migrated.

To migrate the MQ Workflow profile from Version 3.1.2 to Version 3.3.0:

1. Insert the CD-ROM labeled *'IBM MQSeries Workflow Version 3.3 - Program Code...'* for your platform into the CD-ROM drive.
2. Change to the directory on the MQ Workflow installation disk for your operating system:

**For AIX:** `cd x/mig312_320/aix`

**For Windows:** `cd x:\WINDOWS`

where *x* is the drive letter or mount point of the CD-ROM drive.

3. From the command prompt, migrate the MQ Workflow profile by entering the following command:

**For AIX:** `fmczp320.aix`

**For Windows:** `fmczp320`

The MQ Workflow profile migration starts. This may take a few minutes.

4. When control has passed back to the command prompt, the MQ Workflow profile migration is complete.

---

## Migrate the Runtime database from Version 3.1.2 or higher to Version 3.3.0

If you have already migrated the MQ Workflow profile from MQ Workflow Version 3.1.2 to Version 3.3.0, as previously explained, or you are currently running MQ Workflow Version 3.2.0 or higher, and want to use Runtime data with the new release of MQ Workflow, you must perform the steps given in this section.



**Warning:** If you migrate from Version 3.1.2, all persistent lists will be deleted. A private or public persistent list can be a process template list, a process instance list, or a worklist. If you want to recreate the lists after migration, make sure that you have the filter specification, because after migration they will be deleted in the Runtime database. You can get the filter properties using the Runtime client or API.

To migrate the Runtime database from your current MQ Workflow version to Version 3.3.0 you must perform the following:

1. Make sure that all MQ Workflow Servers are shut down.
2. Back up the existing Runtime database data. Details about how to back up a database are given in the DB2 Administration Guide.
3. Log on as the MQ Workflow configuration administrator.
4. At a command prompt, create a temporary directory named temp330 on your workstation.
5. Change to the directory temp330 you created.
6. Insert the CD-ROM labeled '*IBM MQSeries Workflow Version 3.3 - Program Code...*' for your platform into the CD-ROM drive.
7. Copy all the files for your operating system from the MQ Workflow installation disk to the directory temp330 you created on your workstation by entering:

**On AIX:** `tar -xvf x/mig_330/aix/db2/*`

**On HP-UX:** `tar -xvf x/mig_330/hpux/db2/*`

**On Sun Solaris:** `tar -xvf x/mig_330/solaris/db2/*`

**On Windows NT:** `COPY x:\MIG_330\WINDOWS\DB2\*.*`

where *x* is the drive letter for the CD-ROM drive.

8. From the temporary directory temp330, invoke the command-line migration tool by entering the following command and options:

```
fmczm330 [-h] [-d] [-i] [-r] [-c] [-b] [-n <DB_Name>]
          [-u <UserID> -p <Pword>] [-y <ConfigID>]
```

**Note:** To test the migration, you can use the `-r` option, which forces a rollback after the migration. This command and the command-line options are described in “Runtime database migration tool”.

For example, if your existing Runtime database is called `FMCDDB`, no user ID and password are required to access it, and the MQ Workflow configuration is identified by the default configuration ID, then the command to test the migration of the Runtime database from your current version to Version 3.3.0 would be:

```
fmczm330 -d -c -n FMCDDB -r
```

to actually migrate the database, use the command:

```
fmczm330 -d -c -b -n FMCDDB
```

9. When you see the following message:

Database migration completed successfully.

The migration of your Runtime data is complete, and you can delete the temporary directory `temp330`, and its contents.



If errors occur during the migration process, restore the Runtime database data you backed up and repeat the migration procedure. How to restore backed-up data is described in the DB2 Administration Guide.

If persistent errors exist, you should check the log files (\*.log) contained in the temporary directory `temp330` to find the cause.

10. You must make sure that the DB2 heap size parameter `applheapsz` is large enough. To set the heap size to the suggested value of 512 for the database `FMCDDB`:
  - a. Log on with a user ID that has DB2 administration rights, for example, `fmc` or `db2inst1`
  - b. Enter:

```
db2 get db cfg for FMCDDB
db2 update db cfg for FMCDDB using applheapsz 512
```

## Runtime database migration tool

The command-line migration tool `fmczm330` is used to migrate the Runtime database. To invoke the migration tool, the migration command is used followed by the appropriate options as follows:

```
fmczm330 [-b] [-c] [-d] [-h] [-i] [-r] [-n <DB_NAME>]
          [-u <USER ID> -p <PASSWORD>] [-y <CFG_ID>]
```

**Note:** The command-line options are entered after the migration command without the square brackets, [ ]. The order in which command-line parameters are entered depends on whether you enter them all together after the command or one at a time. If you enter them all together after the command, the order is not important. If you want to enter them one at a time, you must first perform the schema changes using option **-d**. Then perform data preparation using option **-c** or binding using option **-b** in any order.

The command-line parameters have the following functions:

- b** Causes the new packages for Version 3.3.0 to be bound to the Runtime database. New packages must be bound to the Version 3.3.0 Runtime database.
- c** Prepares existing Runtime data. The data contained in the existing Runtime database must be prepared for the next Version of MQ Workflow.
- d** Changes the schema of the Runtime database. The layout and underlying processes of the existing database must be prepared for the next Version of MQ Workflow.
- h** Invokes the online help text. This displays and describes all command-line options and the migration tool command.
- i** Reports information about the version of the Runtime database and about the current migration state.
- r** Tests the migration. After performing the migration, a rollback is performed to undo all changes.
- n <DB\_Name>**  
Specifies which database to migrate. Replace **<DB\_Name>** with the name of the database you want to perform the migration on. If this command-line parameter is not specified, the database name from the MQ Workflow profile is used instead.
- u <USER ID>**  
Specifies the database administrator user ID used to access the database. Replace **<USER ID>** with a valid user ID. If no user ID is specified, access to the database is tried without user ID and password values.
- p <PASSWORD>**  
Specifies the password for the database administrator user ID that is used to access the database. Replace **<PASSWORD>** with a valid password value. The password is only valid when a user ID has been previously specified. If no password is specified, access to the database is tried without a password value.

**-y <CFG ID>**

Specifies the configuration ID that is set during the MQ Workflow configuration stage and which is used to identify an MQ Workflow configuration. If no configuration ID is specified, the default value is used.

### **Runtime database migration tool example**

For example, to migrate the Runtime database called FMCDB to Version 3.3.0, use the migration command:

```
fmczm330 -d -c -b -n FMCDB
```

This assumes that no user ID and password are required to access it, and the MQ Workflow configuration is identified by the default configuration ID.

### **Runtime database migration tool help**

Calling **fmczm330 -h** displays the following help:

```
fmczm330 [-b] [-c] [-d] [-h] [-i] [-r] [-n <DB_NAME>]
          [-u <USER ID> -p <PASSWORD>] [-y <CFG_ID>]
```

- b Packages will be bound to the database
- c 3.3.0. data will be prepared
- d Database schema changes will be performed
- h online help information will be displayed and no task will be performed
- n <DB\_NAME> specifies the database for which the migration will be performed.
- u <USER ID> specifies the user ID, with which the connection to the database is made (in this case -p must also be specified)
- p <PASSWORD> specifies the password with which the user, given by <USER ID>, has access to the database.
- y <CFG\_ID> specifies a configuration ID where missing parameters are found.
- i Information about the state of the migration will be reported
- r test migration. Rollback will be done at the end of migration.

The sequence of the parameters is not relevant, except for:

- n which must be followed by the database name,
- u must be followed by the user name and
- p must be followed by the password.

If -n is not specified, the database name is taken from the profile.  
To carry out all the tasks, use: `fmczm330 -b -c -d`  
To carry out all the tasks, you must specify user ID and password; use:  
`fmczm330 -b -c -d -u <USER ID> -p <PASSWORD>`

---

## **Upgrade MQSeries**

If you already have MQSeries Version 5.1 installed, you must either make sure that it is with CSD level 5, or upgrade it to Version 5.2.

**Note:** The MQ Workflow package contains MQSeries Version 5.2.

To upgrade the existing queue managers from a version below Version 5.1, it is recommended to install MQSeries Version 5.2 over your existing version.

Details about how to install MQSeries are contained in the *Quick Beginnings* online manual selected from the file `start.htm` on the MQSeries CD-ROM that comes as part of the MQ Workflow package.

---

## Uninstall MQ Workflow on UNIX

Before installing MQ Workflow on UNIX, you must first uninstall your previous version as described in:

- “Uninstalling MQ Workflow on AIX” on page 320
- “Uninstalling MQ Workflow on HP-UX” on page 321
- “Uninstalling MQ Workflow on Sun Solaris” on page 321

**Note:** Do not delete your existing configurations, Runtime database, or queue manager. Uninstalling your existing installation will not delete your Runtime database or queue manager.

---

## Install MQ Workflow

Install the new version of MQ Workflow according to the instructions for your platform:

1. “Installing MQ Workflow on AIX” on page 57
2. “Installing MQ Workflow on HP-UX” on page 60
3. “Installing MQ Workflow on Sun Solaris” on page 61
4. “Chapter 13. Installing MQ Workflow on Windows” on page 127

---

## Change directory and file permissions on UNIX

Some ownerships and access rights for directories and files within the configuration root directory (usually `/var/fmc`) have been modified compared to previous versions of MQSeries Workflow. On UNIX platforms, you must migrate an existing configuration directory structure by entering the command:

```
fmczinsx -o mig
```

**Note:** If nothing needs to be done, this command will have no effect.

---

## Switch client connection type

If you have installed no MQ Workflow clients, or have only installed MQ Workflow clients that will use an MQSeries client, you do not have to switch the client connection type.

If you have an MQSeries server installed on your machine, the client connection type decides whether MQ Workflow clients will use the MQSeries server API, or the MQSeries client API.

If you have installed the Java CORBA Agent, or intend to use an MQ Workflow client with MQSeries server API on a local queue manager (for example, as a client concentrator), you must also have an MQSeries Server on your machine, and must switch the client connection type to use the MQSeries Server API:

**On UNIX:**

Enter the command:

```
fmczinsx -o mqserver
```

**Notes:**

1. This is a system-wide setting. All MQ Workflow client components configured on this machine will use the MQSeries Server API on a local queue manager for communication. Any existing clients that are configured to use the MQSeries client API may stop working.
2. you can switch back to the client API by entering the command:  

```
fmczinsx -o mqclient
```

**On Windows:**

Edit your system environment variable Path. If it contains the entry:

```
...;InstDir\bin\mqclient;...
```

you should change it to

```
...;InstDir\bin\mqserver;...
```

where *InstDir* is the MQ Workflow installation directory. If you use the default values, the correct path would include one of the following:

```
...;C:\Program Files\MQSeries Workflow\bin\mqserver;...  
...;C:\progra~1\mqseri~1\bin\mqserver;...
```

**Note:** This is a system-wide setting. All MQ Workflow client components configured on this machine will use the MQSeries Server API on a local queue manager for communication. Any existing clients that are configured to use the MQSeries client API may stop working.

---

## Prepare Buildtime

On the Windows machine on which you run the Buildtime tool:

1. If you have not already installed the Buildtime component, install it from the CD-ROM labeled 'IBM MQSeries Workflow Version 3.3 - Program Code for Windows platforms', as described in "Chapter 13. Installing MQ Workflow on Windows" on page 127.

**Note:** Do **not** configure Buildtime. The existing configuration will be used.

2. If you are using DB2 for your Buildtime database, you must drop and re-create the tables in the database by issuing the following commands:

```
fmcbdcdb -o=db -yConfigID  
fmcbdcdb -o=cb -yConfigID
```

where *ConfigID* is the name of your existing Buildtime configuration.

3. If you are using a Microsoft Jet database for the Buildtime data, replace the file *InstallationDirectory\bt\_db\fmcbtdb.mdb* (or the filename you specified in your Buildtime configuration) with the file *InstallationDirectory\bin\fmcbtdb.mdb*.

For example, if your current .mdb file is named *myJetDb.mdb*, and your installation directory is *d:\fmcwin2k*, then issue the MS-DOS command:

```
copy d:\fmcwin2k\bin\fmcbtdb.mdb d:\fmcwin2k\bt_db\myJetDb.mdb
```

4. To initialize the new tables in your Buildtime database, and reset the user/password to admin/password, enter the command:

```
fmcbcimp -yConfigID
```

---

## Import data into the Buildtime database

To be able to use the Buildtime data from a version lower than Version 3.3.0:

1. Start the Buildtime tool.
2. Import the FDL file that you produced during "Export Buildtime data" on page 308 back into the Buildtime database, as described in "Importing into Buildtime" in the *IBM MQSeries Workflow: Getting Started with Buildtime* manual.

**Note:** By importing the Buildtime data, it has been migrated to Version 3.3.0, and can now be used in the new release of MQ Workflow.

3. Export the migrated Buildtime data.

---

## Import Buildtime data into Runtime database

You must import your migrated Buildtime data into the Runtime database, as described in "Importing FDL" on page 117.



---

## Migrate the queue manager from Version 3.1.2 or higher to Version 3.3.0

Migrating the existing queue managers creates additional queue definitions required by the new release of MQ Workflow. This will be done by recreating and executing the MQSeries definitions for the queue manager based on the template files in the subdirectory `mq5`.

### Queue manager migration tool

The command-line migration tool `fmczqmig` is used to migrate queue managers defined for MQ Workflow configurations. To invoke the migration tool, the migration command is used followed by the appropriate options as follows:

```
fmczqmig [-y <CFG ID>]
```

You can perform queue manager migration for a single configuration by specifying the `'-y'` parameter and the configuration identifier. If you omit the `'-y'` parameter all queue managers used by MQSeries Workflow will be migrated.

**Note:** On UNIX the executing user of that command must have update authority to the configuration profile, and must be a member of group `mqm`.

If you are migrating from MQSeries Workflow Version 3.1.2 you will be prompted for the following data:

- Principal name.
- Cluster name.
- Repository type (first/additional).

If the queue manager is an additional one in the cluster, you will also be prompted for data concerning the primary queue manager:

- Queue manager name.
- TCP/IP address.
- TCP/IP port number.
- Principal name.

For more information see “Entering queue manager information” on page 83.

---

## Migrate from JDK 1.1 to 1.2 or 1.3

With this version of MQ Workflow, JDK 1.1 is no longer supported. You must change your environment, as described in:

- “Migrating from JDK 1.1” on page 318
- “Migrating Java CORBA Agent configurations” on page 318

## Migrating from JDK 1.1

If you have been using Java API or the Java CORBA Agent with JDK 1.1, you should migrate to JDK 1.2 or 1.3 by performing the following:

1. If it is no longer used by any other Java application, uninstall JDK 1.1.

**Note:** Multiple installations of different JDKs can coexist on one machine. For more information, see the JDK documentation.

2. Install JDK 1.2 or 1.3.
3. Update your system and user settings such as PATH, CLASSPATH, and LIBPATH (UNIX only).

**Note:** This may have already been done by the installation procedure. For more information, see the JDK documentation.

## Migrating Java CORBA Agent configurations

If you have been using a Java CORBA Agent with JDK 1.1, you should migrate it to JDK 1.2 or 1.3 by performing the following:

1. Migrate the JDK as described in “Migrating from JDK 1.1”.
2. You must change the *JDK installation directory* parameter in the configuration for the Java CORBA Agent:
  - For UNIX, see “Changing the settings for the Java CORBA Agent” on page 114.
  - For Windows, see “Changing the settings for the Java CORBA Agent on Windows” on page 173.

---

## Migration verification

After performing all necessary migration steps, it is recommended that you verify your system as described for your platform:

- “Chapter 9. Verifying an MQ Workflow server on UNIX” on page 95
- “Chapter 15. Verifying MQ Workflow on Windows” on page 165

---

## Appendix O. Uninstalling MQ Workflow

This appendix explains how to uninstall MQ Workflow installed on workstations running on UNIX or Windows.

---

### Before uninstalling MQ Workflow

Before you can uninstall MQ Workflow you must:

1. Stop any running MQ Workflow components.

**Note:** On Windows 2000 and NT, if MQ Workflow Servers are running as a Windows service, they must be stopped via the service panel as explained in “Using the service panel to stop the Administration server” on page 172.

2. If you are **not** migrating, remove all MQ Workflow configurations:
  - a. On **UNIX** workstations, use the configuration utility **fmczutil**, as described in “Chapter 11. Deleting a configuration on UNIX” on page 119.
  - b. On **Windows** workstations, use the **Remove** button after selecting a configuration in the **configuration utility**, described in “How to configure MQ Workflow on Windows” on page 139.
3. On Windows: By hand, remove the changes made to the files, environment variables, and registry entries during installation and configuration. These changes are described in “Appendix D. Updated files” on page 223.
4. If you are migrating on UNIX: If the installation profile has been modified after the initial installation. If it contains values necessary for a subsequent re-installation (for example, the Workflow administrator user ID, or location of the configuration root directory), you should save it for further reference.

On UNIX, you should reverse the actions that were performed in “After installing MQ Workflow on UNIX” on page 63. It cannot be done automatically, because the changes were made outside the installation package. This is done by executing the same commands, but adding the **-r** option to remove the changes, for example:

```
fmczinsx -o mqclient -r      or      fmczinsx -o mqserver -r
fmczinsx -o db2 -r          or      fmczinsx -o oracle -r
fmczinsx -o inf -r
fmczinsx -o env -r
```

**Note:** If you do not perform these steps, some files or symbolic links may remain in the installation directory after deinstalling the code.

After performing these steps you can delete MQ Workflow from workstations running any of the supported operating platforms as described in the following sections:

- “Uninstalling MQ Workflow on AIX”
- “Uninstalling MQ Workflow on HP-UX” on page 321
- “Uninstalling MQ Workflow on Sun Solaris” on page 321
- “Uninstalling MQ Workflow on Windows” on page 322

---

## Uninstalling MQ Workflow on AIX

Use the System Management Interface Tool (smit) to delete selected MQ Workflow components from an AIX workstation.

**Note:** If you used the automatic default configuration option, uninstalling the component `fmcdefault.config` will not remove or change the configuration `FMC`, which was created during the installation of this package. If you want to delete the configuration `FMC`, you must follow the instructions given in “Chapter 11. Deleting a configuration on UNIX” on page 119.

To delete MQ Workflow components from an AIX workstation, do the following:

1. Log on to the workstation as root and enter the root password.
2. Start the System Management Interface Tool:
  - To use AIX windows, enter **smit** on the command line.
  - To use the character-based interface, enter **smitty** on the command line. The sequence of panels that is subsequently displayed is similar to those described in this section, but are character based.

The System Management Interface Tool window is displayed.

3. In the **System Management** list, select the **Software Installation and Maintenance** option.

The Software Installation and Maintenance list is displayed.

4. Select the **Software Maintenance and Utilities** option.

The Software Maintenance and Utilities list is displayed.

5. Select the **Remove Installed Software** option.

The Remove Software Products list is displayed

6. Select the **List** option for the **SOFTWARE name** field.

The Multi-select List window is displayed.

7. Select the MQ Workflow components you want to delete from the workstation (all items starting with **fmc**).

8. Select **OK**.

The Remove Software Products window is displayed.

9. If you want to remove the product installation completely, change the **REMOVE dependent software** field to yes.  
To preview if you can remove the selected software products, select **OK**.  
To finally remove the selected software products, change the **Preview only** field to no.
10. Select **OK**.
11. When you are prompted Are you sure?, select **OK**. The deinstallation program runs and MQ Workflow is removed from your workstation.
12. When the deletion process is completed, leave smit from the **Exit** menu.

---

## Uninstalling MQ Workflow on HP-UX

Use the HP-UX software deinstallation program `swremove` to delete MQ Workflow from an HP-UX workstation.

To delete MQ Workflow components from an HP-UX workstation, perform the following:

1. Log on to the workstation as `root` and enter the root password.
2. Start the software deinstallation program by entering the command:  
`swremove &`
3. A list of all products installed on your workstation is displayed. Select **MQSERIESWorkflow**.
4. From the **Actions** menu, choose **Mark for Remove**.
5. After the next message appears, click on **OK**.
6. From the **Actions** menu, choose **Remove (analysis)**.
7. A window appears. Click on **OK** as soon as it is highlighted.
8. A **Confirmation** window appears. Click on **Yes**.
9. If an **Error** window appears informing you that your HOME environment variable is not set, click on **OK**.
10. Click on **Done** as soon as it is highlighted. The deinstallation program runs and MQ Workflow is removed from your workstation.
11. From the **File** menu, choose **Exit** to leave the deinstallation program.

---

## Uninstalling MQ Workflow on Sun Solaris

Use the software deinstallation program `pkgrm` to delete MQ Workflow from a Sun Solaris workstation.

To delete MQ Workflow components from a Sun Solaris workstation, do the following:

1. Log on to the workstation as root and enter the root password.
2. Start the software deinstallation program by entering the command:  
pkgrm fmc
3. When you see:

```
The following package is currently installed:
fmc                MQSeries Workflow
                   (sparc) 3.3.0

Do you want to remove this package?
```

Enter y to remove MQ Workflow from your workstation.

---

## Uninstalling MQ Workflow on Windows

Use the Add/Remove Programs application located in the control panel to delete MQ Workflow from a Windows based workstation.

To delete MQ Workflow from a Windows Me, 98, 2000, or NT workstation, perform the following:

1. On the task bar, click on the Windows **Start** menu and select **Settings**.
2. From **Settings**, select **Control Panel**.
3. Within the **Control Panel**, select the **Add/Remove Programs** icon. A dialog box appears.
4. Select the **Install/Uninstall** tab (on Windows 2000: **Change or remove programs**).
5. Select **IBM MQSeries Workflow Version 3.3.0**.
6. Click on the **Add/Remove** button (on Windows 2000: **Change/Remove**).
7. The **Confirm File Deletion** window appears. Select the **Yes** button to delete all MQ Workflow components.
8. When the deletion is completed, select the **OK** button from the **Remove Programs From Your Computer** window.

---

## Appendix P. Installation messages

This appendix lists all information, warning, and error messages that can be displayed during the MQ Workflow installation and uninstallation procedure on Windows. For each message, its message code, text, ID, severity, explanation, and user response is given.

---

**36200**      **unInstaller setup failed to initialize.**

**Severity:** Error

**MsgID:** FMC\_ERROR\_UNINSTSETUP\_FAILED

**Explanation:** The unInstaller setup failed to initialize. The uninstallation key cannot be created or the uninstall log file Uninst.Isu cannot be initialized. The initialization may fail because the log file is corrupted by a previously unsuccessful installation of MQSeries Workflow.

**User Response:** Check that you have enough privileges to update the registry. If the log file Uninst.isu is on your system, check that it is not marked as read-only or system file. If it is from a previously unsuccessful installation, erase the log file.

---

**36202**      **MQSeries Workflow requires that the Windows NT 4.0 Service Pack %s or higher is installed.**

**Severity:** Error

**MsgID:** FMC\_ERROR\_NO\_SERVICEPACK

**User Response:** Install the required fix pack for Windows NT 4.0.

---

**36210**      **You must have Administrator rights to install IBM MQSeries Workflow on Windows NT. The installation will stop.**

**Severity:** Error

**MsgID:** FMC\_ERROR\_NO\_ADMINISTRATOR

**Explanation:** If you want to perform the

installation, you need Administrator rights on Windows NT.

**User Response:** Log on with a user ID with Administrator rights and start the installation again.

---

**36211**      **This program requires VGA or better resolution.**

**Severity:** Warning

**MsgID:** FMC\_WNG\_NO\_VGARESOLUTION

**Explanation:** Some components of MQSeries Workflow require VGA or a better resolution.

**User Response:** If you need information about how to change the resolution, contact your local system support.

---

**36212**      **The installed video adapter is %s with a resolution of %d x %d. Some components like the Buildtime need a resolution of 800 x 600 or higher.**

**Severity:** Warning

**MsgID:** FMC\_WNG\_RESOLUTION\_TOO\_LESS

**User Response:** If you need information about how to change the resolution, contact your local system support.

---

**36213**      **Installation messages are saved in file %s.**

**Severity:** Information

**MsgID:** FMC\_INFO\_INSTALLATION\_LOG\_FILE

**Explanation:** The log file includes messages to help you determine problems during installation.

**User Response:** If you have encountered problems during installation, use this log file as part of your problem description. The location of the file `fmcsetup.log` is as follows: Before the MQSeries Workflow files are moved to your system, the file is located in the directory specified by the environment variable `TEMP`. After MQSeries Workflow files have been moved, the file is located in the subdirectory 'log' of your installation directory.

---

**36214**      **This program will update your existing installation. Ensure that no MQSeries Workflow programs or services are running. There will be no backup version.**

**Severity:** Warning

**MsgID:** `FMC_WNG_ALREADY_INSTALLED`

**User Response:** Since the installation will update an existing installation, MQSeries Workflow programs and services must not be running. Stop all MQSeries Workflow programs and services.

---

**36216**      **With this installation program you can update MQSeries Workflow from version 3.1.2 to version 3.3.0. The MQSeries Workflow version installed on your workstation is at the wrong level. The installation will abort.**

**Severity:** Error

**MsgID:** `FMC_ERROR_INSTALLED_MQWF_VERSION_TOO_LESS`

**User Response:** Migrate your installation to MQSeries Workflow version 3.3.0 as described in file `README.MIG` on the MQSeries Workflow version 3.3.0 CD-ROM.

---

**36217**      **The installed MQSeries Workflow version is a later version than the MQSeries Workflow version 3.3.0 installation. The installation will abort.**

**Severity:** Error

**MsgID:** `FMC_ERROR_INSTALLED_MQWF_VERSION_HIGHER_GEN`

**User Response:** None

---

**36219**      **The existing MQSeries Workflow version 3.1.2 profile cannot be migrated.**

**Severity:** Error

**MsgID:** `FMC_ERROR_MIGRATE_PROFILE_FAILED`

**User Response:** Migrating the MQSeries Workflow profile from version 3.1.2 to version 3.3 failed. For more information, see the chapter 'Migrating data from a previous release' in the installation guide.

---

**36220**      **If you want to use Buildtime and Runtime data from your existing MQSeries Workflow installation, you must migrate the databases before continuing with this installation.**

**Severity:** Information

**MsgID:** `FMC_INFO_MIGRATE_COMPONENTS`

**User Response:** If you want to use Buildtime and Runtime data from your existing MQSeries Workflow installation with the new release of MQSeries Workflow, you need to migrate the databases before installing the new release. "Appendix N. Migrating from a previous release" on page 307 explains how to do this.



---

**36221**      **If you want to use Runtime data from your existing MQSeries Workflow installation, you must migrate the database before continuing with this installation.**

**Severity:** Information

**MsgID:** FMC\_INFO\_MIGRATE\_COMPONENTS\_OS2

**User Response:** If you want to use Runtime data from your existing MQSeries Workflow installation with the new release of MQSeries Workflow, you need to migrate the databases before installing the new release. "Appendix N. Migrating from a previous release" on page 307 explains how to do this.

---

**36222**      **There is not enough disk space available, %ld kilobytes, on the disk %s. %ld kilobytes are required. Set your environment variable TEMP to a directory with more disk space.**

**Severity:** Error

**MsgID:** FMC\_ERROR\_DISKFULL\_TEMP

**Explanation:** The installation requires more temporary disk space.

**User Response:** Set the environment variable to a directory with the required disk space and start the installation again.

---

**36223**      **There is not enough disk space available, %ld kilobytes, on the disk %s. %ld Kilo bytes are required. Make sure that more space is available.**

**Severity:** Warning

**MsgID:** FMC\_WNG\_DISKFULL

**Explanation:** The disk space available in the specified MQSeries Workflow directory is not enough.

**User Response:** Make sure that more disk space is available or choose another destination for the MQSeries Workflow directory.

---

**36226**      **You must select at least one component.**

**Severity:** Warning

**MsgID:** FMC\_WNG\_NO\_COMPONENT\_SELECTED

---

**36228**      **The following command failed: %s. Run this command again after installation.**

**Severity:** Warning

**MsgID:** FMC\_WNG\_COMMAND\_FAILED

**Explanation:** During installation some commands are processed.

**User Response:** Open a command prompt and enter the command displayed in the message.

---

**36229**      **The update of the profile failed. Run the command '%s' again.**

**Severity:** Warning

**MsgID:** FMC\_WNG\_PROFILE\_UPDATE\_FAILED

**Explanation:** During installation the MQSeries Workflow installation profile is created. It is required later by the configuration.

**User Response:** Open a command prompt and enter the command displayed in the message.

---

**36232**      **At least one MQSeries Workflow configuration is found on your system.**

**Severity:** Warning

**MsgID:** FMC\_WNG\_UNINST\_CONFIGURATION\_EXIST

**Explanation:** If you proceed with uninstalling MQSeries Workflow, the existing configuration will remain in an undefined state. MQSeries Workflow configurations can be removed by using the MQSeries Workflow Configuration Utility.

**User Response:** Start the MQSeries Workflow

Configuration Utility and remove the configurations.

---

**36250**            **An unexpected error has occurred. More information is included in file fmcsetup.log in directory %s.**

**Severity:** Severe

**MsgID:** FMC\_ERROR\_ABORT\_INSTALLATION

**Explanation:** An unexpected error has occurred. The file fmcsetup.log contains more information. The location of the file fmcsetup.log is as follows: Before the MQSeries Workflow files are moved to your system, it is located in the directory specified by the environment variable TEMP. After MQSeries Workflow files have been moved, the file is located in the subdirectory 'log' of your installation directory.

**User Response:** Contact the MQSeries Workflow Service and provide the file fmcsetup.log.

---

**36251**            **Access to the MQSeries Workflow media has been lost.**

**Severity:** Severe

**MsgID:** FMC\_ERROR\_MEDIA\_NOT\_AVAILABLE

**Explanation:** The MQSeries Workflow installation media is not available. Check that you still have access to the MQSeries installation media.

**User Response:** If you have removed the CD-ROM, insert the CD-ROM again and start the installation again. If you accessed the installation media over a network, establish the connection again.

---

**36252**            **A file cannot be copied to your system. More information is included in file fmcsetup.log in directory %s.**

**Severity:** Severe

**MsgID:** FMC\_ERROR\_INSTALLING\_FILE

**Explanation:** A file cannot be copied to your

system. The file fmcsetup.log contains more information. The location of the file fmcsetup.log can be as follows: Before the MQSeries Workflow files are moved to your system, it is located in the directory specified by the environment variable TEMP. After MQSeries Workflow files have been moved, the file is located in the subdirectory 'log' of your installation directory.

**User Response:** Check that the file is not marked as read-only or system file. If the directory is on the network, check that you have the privileges to create files. Close any running program to ensure that the file is not in use by this program. Start the installation again.

---

**36253**            **A file cannot be copied to your system because the target disk is full. More information is included in file fmcsetup.log in directory %s.**

**Severity:** Severe

**MsgID:** FMC\_ERROR\_INSTALLING\_FILE\_DISKFULL

**Explanation:** A file cannot be copied to your system because the target disk is full. The file fmcsetup.log contains more information. The location of the file fmcsetup.log can be as follows: Before the MQSeries Workflow files are moved to your system, it is located in the directory specified by the environment variable TEMP. After MQSeries Workflow files have been moved, the file is located in the subdirectory 'log' of your installation directory.

**User Response:** Provide more disk space on your disks.

---

**36254**            **Unable to allocate memory.**

**Severity:** Severe

**MsgID:** FMC\_ERROR\_MEMORY\_NOT\_ENOUGH

**Explanation:** The installation was unable to allocate memory.

**User Response:** Close some programs to free memory or provide more memory.

---

**36255            Unable to create directory %s.**

**Severity:** Severe

**MsgID:** FMC\_ERROR\_CREATE\_DIRECTORY\_FAILED

**Explanation:** The installation was unable to create the specified directory.

**User Response:** Check that the specified directory is correct. Check that the drive or any subdirectory in the specified directory is not write-protected. Check that the drive name is valid. If the drive is a network drive, check that you have the network privileges to create subdirectories.

---

**36256            Unable to delete file %s in directory %s.**

**Severity:** Severe

**MsgID:** FMC\_ERROR\_DELETE\_FILE

**Explanation:** The installation was unable to delete the specified file.

**User Response:** Check that the file is not a read-only, system, or hidden file. If the directory is on the network, check that you have the privileges to delete files.

---

**36257            Unable to update environment variable %s with value: %s.**

**Severity:** Severe

**MsgID:** FMC\_ERROR\_UPDATE\_ENVIRONMENT\_VARIABLE\_W95

**Explanation:** The installation was unable to update an environment variable within the file autoexec.bat.

**User Response:** Check that the file autoexec.bat is not a read-only, system, or hidden file.

---

**36258            Unable to add or replace a line within AUTOEXEC.BAT with value %s.**

**Severity:** Severe

**MsgID:** FMC\_ERROR\_REPLACE\_ENVIRONMENT\_VARIABLE\_W95

**Explanation:** The installation was unable to update an environment variable within the file autoexec.bat.

**User Response:** Check that the file autoexec.bat is not a read-only, system, or hidden file.

---

**36259            Unable to load %s.**

**Severity:** Error

**MsgID:** FMC\_ERROR\_UNABLE\_LOADDLL

**Explanation:** The installation was unable to load the DLL into memory.

**User Response:** Check that the specified DLL is on your system. Use a tool to find out which files are required by the DLL. Check that these files are located within the path of your system. If the checks are successful, restart Windows again.

---

**36262            Failed to get environment variable Key: %s Name: %s, Return Code: %d.**

**Severity:** Error

**MsgID:** FMC\_ERROR\_GETENVVAR\_FAILED

**Explanation:** Installation cannot retrieve the value for the specified environment variable name. The file fmcsetup.log contains more information. The location of the file fmcsetup.log can be as follows: Before the MQSeries Workflow files are moved to your system, it is located in the directory specified by the environment variable TEMP. After MQSeries Workflow files have been moved, the file is located in the subdirectory 'log' of your installation directory.

**User Response:** Contact the MQSeries Workflow Service and provide the file fmcsetup.log.

---

**36263**            **Unable to set environment variable (Key: %s, Name: %s).**

**Severity:** Error

**MsgID:** FMC\_ERROR\_SETENVVAR\_FAILED

**Explanation:** Installation cannot set the value for the specified environment variable name. The file fmcsetup.log contains more information. The location of the file fmcsetup.log depends on the following: Before the MQSeries Workflow files are moved to your system, it is located in the directory specified by the environment variable TEMP. After MQSeries Workflow files have been moved, the file is located in the subdirectory 'log' of your installation directory.

**User Response:** Check that you have enough privileges to update the environment.

---

**36311**            **MQSeries Workflow programs or services are running. This setup requires that they are stopped.**

**Severity:** Error

**MsgID:** FMC\_ERROR\_RUNNING\_MQWF

**Explanation:** MQSeries Workflow programs or services are running. This setup requires that they are stopped.

**User Response:** Stop all MQWorkflow Services.

---

**36332**            **Setup will abort due to missing prerequisite software.**

**Severity:** Error

**MsgID:** FMC\_ERROR\_MISSING\_PREREQ

**Explanation:** You have not installed all the prerequisite software. MQ Workflow cannot be installed.

**User Response:** Check the software requirements described in "Chapter 5. Hardware and software requirements" on page 37. Also refer to "Chapter 6. Installing the prerequisite software" on page 47. Install the missing software, then retry.

---

**36334**            **The Web Client component requires the Java CORBA Agent or the Java API Beans component. Please select one of these components.**

**Severity:** Warning

**MsgID:**  
FMC\_WNG\_WEBCLIENT\_INCONSISTENCY

**Explanation:** To function, the Web Client component requires either the Java CORBA Agent or the Java API Beans component.

**User Response:** Select in addition, the Java API Beans or Java CORBA Agent component.

---

**36335**            **You cannot install on a system without the correct type of operating system - you need Windows NT 4.0, Windows 2000, Windows 98 or Windows Me installed. The installation will stop.**

**Severity:** Error

**MsgID:** FMC\_ERROR\_OS\_WRONG\_V330

---

**FMC36338E**      **The installed MQ Workflow version is a newer version than the MQ Workflow version %s installation. The installation is aborted.**

**Explanation:** You cannot install an old version of MQ Workflow over a newer version.

---

**36339**            **The existing MQSeries Workflow version 3.1.2 profile has not been migrated to a profile that can be used by MQSeries Workflow version 3.3. Do you want to migrate it now?**

**Severity:** Warning

**MsgID:** FMC\_WNG\_MIGRATE\_PROFILE  
\_MISSING\_GEN

**User Response:** If you want to use the existing MQSeries Workflow version 3.1.2 profile settings,

you must migrate the profile. “Appendix N. Migrating from a previous release” on page 307 explains how to do this.

---

**FMC36340E Before proceeding with the installation make sure that you have migrated your databases. If you have not migrated the databases, your data will be lost.**

**Explanation:** Refer to “Appendix N. Migrating from a previous release” on page 307.



---

## Appendix Q. Using the configuration checking utility `fmczchk`

This chapter describes how to check your MQ Workflow configuration using the MQ Workflow configuration-checking utility `fmczchk`. With this utility you can check the configuration of all components and locate and diagnose configuration problems after installing and configuring MQ Workflow.

---

### Checking the configuration of a component

The MQ Workflow configuration-checking utility can be used to check the configuration of an MQ Workflow Server, Client, or Buildtime running on any of the supported platforms in a standard MQ Workflow Client/Server network or stand-alone system.

To help you configure MQ Workflow, the configuration-checking utility can find and correct installation errors and inconsistencies. That is, you can check if:

- Environment variables are set correctly.
- Network drivers are installed properly.
- Network configuration files have been updated.
- The MQ Workflow profile contains consistent settings.

Start the utility immediately after each change to the MQ Workflow configuration. For example, if you have changed your MQ Workflow configuration, and if MQ Workflow does not run, use the configuration-checking utility.

### Starting the configuration checking utility

The configuration-checking utility is started and used in the same way for all MQ Workflow components. It is a command-line utility in U.S. English only and is designed to be platform-independent. No additional installation or configuration steps are needed for the utility. It is a self-contained tool, which is copied to the MQ Workflow BIN directory during installation.

To start the utility, type at a command prompt:

```
fmczchk
```

Configuration checking is done in several phases. During each phase one particular MQ Workflow component is checked. Even if the checks for a

component do not complete successfully, the configuration-checking utility proceeds with the checks for all other components. Problems are displayed as soon as they are detected.

In addition, the configuration-checking utility creates a log file called `fmczchk.log` which contains all error or warning messages, and other important information.

## Using command-line options

The configuration-checking utility is a command-line utility. Although you can start the utility without any options, several command-line options are available which can be specified directly after the `fmczchk` command.



The command-line options explained here are valid for MQ Workflow Version 3.2 and later only. For command-line options for earlier versions, see the MQ Workflow installation guide for that version or refer to the online documentation.

Not all options are described here, for a full description of the `fmczchk` command, see *MQSeries Workflow Administration Guide*.

Command-line options start with a slash (/)<sup>1</sup> or minus (-), and can be followed by an argument.

Arguments to options can be separated from the option letter by an empty string ("), a blank (' '), a colon (:), or an equals sign (=). The options are not case sensitive. Use the following options:

- 330** Specifies that you want to perform checks on MQ Workflow Version 3.3.0. The default is the version with which the utility was created. The checks that are available depend on the MQ Workflow version that you specify. When you start the utility, only those checks are displayed which apply to the defined version.
- b** Selects batch mode. Messages are not written to the console.
- d** Show debug messages. Debug messages are needed by support personnel to help analyze problems. Since these messages are intended for support personnel only, they are not documented here.
- e** Show error messages only. The default is to show error and warning messages and to suppress information messages.
- i** Show all messages, that is, error, warning, and information messages.
- htm, -html** Write messages to the `fmczchk0.htm` file instead of the `fmczchk.log`

---

1. Does not apply to AIX, HP-UX, or Sun Solaris.



file. The `fmczchk0.htm` file provides links to online documentation that contains further information describing the configuration-checking utility. Error, warning, and information messages written to the `fmczchk0.htm` file are written as links. Clicking on each message takes you to an online description for that message, which gives you information regarding severity and the user action required for the message.

**Note:** The hyperlinks in the generated `fmczchk0.htm` file only work in the `InstallationDirectory/bin` directory because that is where the message explanation file (`fmczchk.htm`) is located.

**-l filename**

Name of the log file. If this file already exists, the messages will be appended to the file.

**-y configurationidentifier**

Allows you to specify a configuration ID other than the default. Specifying a different configuration ID allows you to perform checks on different systems. If this option is not used, the value of the `DefaultConfigurationID` variable set in the general configuration profile is used.

**-c command[;...]**

Performs a task specified by the command. The following are valid commands:

**sca[:filemask;...]**

Specify this command to scan all MQ Workflow executables for the version string. You can restrict the scanning by specifying your own file mask as an optional argument:

```
fmczchk -c sca:dll\fmck*.dll;bin\fmce*.exe
```

**tcp:service,port**

Adds a port to the TCP/IP services file. For example, to add port definitions for MQSeries to your services file:

```
fmczchk -c tcp:fmc\FMCQMA5010,5010
```



Port definitions are automatically added to the services file during configuration.

**trc:level[,filename][,split][,flipflop][,filesize]**

Can be used to enable and disable tracing. The trace level can range from 0, for minimum information, to 3, for maximum information. You can optionally specify the name of the trace file. For example, to enable a full trace of system `Config001`, using split tracing, and using 5000 kilobyte flip-flop tracing files, you can enter:

```
fmczchk -y Config001 -c trc:3,/tmp/traces/my_trace,1,1,5000
```

### **@cmdfile**

Alternatively, you can create a file containing several commands that you wish to run. For example, if you create a file `fmczchk.cmd` with the following lines in it:

```
-c tcp:fmc\FMCQM5010,5010  
-c sca:dll\fmck*.dll;bin\fmce*.exe
```

You can start the utility as follows:

```
fmczchk @fmczchk.cmd
```

**Note:** You must prefix commands with the `-c` option. This allows you to include other command options that previously could not be used in the response file, for example: `-y FMC1`.

## **The configuration checking log file and online documentation**

The configuration checking utility writes a log file with the name `fmczchk.log` in the current directory. This log file is intended to be used by your support personnel. The message options you specify after the `fmczchk` command determine what messages are displayed on the screen during the configuration checking routine. These options are ignored when writing to the log file, that is, all messages are recorded in the log file.

A list of all the messages that can be written in the log file is available in the file `fmczchk.htm`. By specifying the `html` option after the `fmczchk`, an HTML file is created instead of the log file. This HTML file contains links that give you access to online documentation. The online documentation gives an explanation, user response, and severity for each message. Each message is made up of a message identifier code and message text. The last character of the message identifier code denotes the message type or severity of the message.

**Note:** The hyperlinks in the generated `fmczchk0.htm` file only work in the *InstallationDirectory/bin* directory because that is where the message explanation file (`fmczchk.htm`) is located.

The following shows the format for each type of message identifier code, where *nnn* is a number used to identify each message:

**FMC34nnnI** Informational message. No action is required.

**FMC34nnnW** Warning message. An action may be required. Check the user response in the online documentation to see if any further action is required.

**FMC34mmnE** Error message. An action is required. Check the user response in the online documentation for a solution to the problem.

The log file is not created if it cannot be opened, for example, due to missing write permission in the current directory. However, the configuration utility continues to display important error and warning messages on the screen. To display all messages on the screen, use option *i* as explained on page 332.



---

## Appendix R. Tivoli inventory enablement

Large IT environments require sophisticated and automatable methods to help system administrators to distribute new software or software updates on a huge number of computers.

Every installation of MQ Workflow Version 3.3 on any machine will install additional files on these machines, containing information about the installed MQSeries Workflow component, this information can be used by system administrators using Tivoli to manage future installations of updates, or new releases.

Depending on which Workflow components are installed, different files will be installed. Table 86 shows which files are installed, and in which locations, for each operating system, and each MQ Workflow component. The drives are the same as the general installation drives.

*Table 86. Tivoli Inventory enablement file locations*

<b>Operating system</b>	<b>Component</b>	<b>Default location</b>
Windows	Buildtime	C:\Program Files\MQSeries Workflow\tivoli\mqwfbt33.sys
	Client	C:\Program Files\MQSeries Workflow\tivoli\mqwfcli33.sys
	Server	C:\Program Files\MQSeries Workflow\tivoli\mqwfsvr33.sys
AIX	Client	/usr/lpp/fmc/tivoli/mqwfcli33.sys
	Server	/usr/lpp/fmc/tivoli/mqwfsvr33.sys
Sun Solaris	Client	/opt/fmc/tivoli/mqwfcli33.sys
	Server	/opt/fmc/tivoli/mqwfsvr33.sys
HP-UX	Client	/opt/fmc/tivoli/mqwfcli33.sys
	Server	/opt/fmc/tivoli/mqwfsvr33.sys



---

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## Glossary

This glossary defines important terms and abbreviations used in this publication. If you do not find the term you are looking for, refer to the index or the *IBM Dictionary of Computing*, New York: McGraw-Hill, 1994.

### A

**administration server.** The MQSeries Workflow component that performs administration functions within an MQSeries Workflow system. Functions include starting and stopping of the MQSeries Workflow system, performing error management, and participating in administrative functions for a system group.

**API.** Application Programming Interface.

**application programming interface.** An interface provided by the MQSeries Workflow workflow manager that enables programs to request services from the MQSeries Workflow workflow manager. The services are provided synchronously.

**audit trail.** A relational table in the database that contains an entry for each major event during execution of a process instance.

**authorization.** The attributes of a user's staff definition that determine the user's level of authority in MQSeries Workflow. The system administrator is allowed to perform all functions.

### B

**Buildtime.** An MQSeries Workflow component with a graphical user interface for creating and maintaining workflow models, administering resources, and the system network definitions.

### C

**cleanup server.** The MQSeries Workflow component that physically deletes information in the MQSeries Workflow Runtime database, which had only been deleted logically.

**client concentrator.** Receives requests from clients, and distributes the workload evenly across all the servers in a system group. Any MQSeries Workflow client component can work as a client concentrator by configuring it to use the MQSeries server API on a local queue manager. For more information, see "Setup scenario for a client concentrator" on page 17.

**configuration profile.** The configuration profile contains data that you specify during the configuration stage, such as the name of the MQSeries Workflow system, the Runtime database and the queue manager. This data is used to configure database and communication resources and define settings for MQSeries Workflow. The configuration profile is created during the configuration stage and can be updated and deleted.

**container API.** An MQSeries Workflow API that allows programs executing under the control of MQSeries Workflow to obtain data from the input and output container of the activity and to store data in the output container of the activity.

### D

**domain.** A set of MQSeries Workflow system groups which have the same meta-model, share the same staff information, and topology information. Communication between the components in the domain is via message queuing.

## E

**execution server.** The MQSeries Workflow component that performs the processing of process instances at runtime.

**export.** An MQSeries Workflow utility program for retrieving information from the MQSeries Workflow database and making it available in MQSeries Workflow Definition Language (FDL) or HTML format. Contrast with *import*.

## F

### (FDL) MQSeries Workflow Definition

**Language.** The language used to exchange MQSeries Workflow information between MQSeries Workflow system groups. The language is used by the import and export function of MQSeries Workflow and contains the workflow definitions for staff, programs, data structures, and topology. This allows non-MQSeries Workflow components to interact with MQSeries Workflow. See also *export* and *import*. The name FDL comes from the predecessor product Flowmark.

**fully-qualified name.** A qualified name that is complete; that is, one that includes all names in the hierarchical sequence above the structure member to which the name refers, as well as the name of the member itself.

## G

**general configuration profile.** Contains data that is common to any configuration in an MQ Workflow system group. Currently it only contains the configuration identifier for the default configuration.

## I

**import.** An MQSeries Workflow utility program that accepts information in the MQSeries Workflow definition language (FDL) format and places it in an MQSeries Workflow database. Contrast with *export*.

**installation profile.** Contains data that is set during the MQ Workflow installation stage and is independent of the configuration stage. Data such as the MQ Workflow installation directory, language, version number, and MQ Workflow components installed are contained in the installation profile.

## J

### Java Naming and Directory Interface (JNDI).

JNDI provides naming and directory functionality to applications written in Java. These applications can use the JNDI API to access the services of a variety of naming and directory services that are plugged in transparently.

**JNDI locator.** The locator policy that uses JNDI as the naming service to register the Java CORBA Agent, and uses RMI-IIOP as the transport protocol for the API method invocations.

## M

**message queuing.** A communication technique that uses asynchronous messages for communication between software components.

### MQ Workflow configuration administrator.

The user ID that owns the directories and files relating to MQ Workflow configuration. It is the only user ID that can change the configuration profile, and is also used to start the MQ Workflow server and the Java agent.

**MQ Workflow profile.** The collective name for the *configuration profile*, *general configuration profile*, and *installation profile*.

## P

**principal.** The user ID associated with an MQSeries channel, so that any client that accesses the channel, has the authority of the principal. Such a user is known as an MCAUSER (MQ channel agent user). Without using a principal, every client user would have to be

known to the queue manager, and be authorized access to the necessary channels.

## R

. RMI-IIOP is a client/server transport protocol used in Java that combines the RMI-style ease-of-use for method invocation with the IIOP (CORBA) reliability and cross-language interoperability.

## S

**scheduling server.** The MQSeries Workflow component that schedules actions based on time events, such as resuming suspended work items, or detecting overdue processes.

**server.** The servers that make up an MQSeries Workflow system are called execution server, Administration server, Scheduling server, and Cleanup server.

**system.** The smallest MQSeries Workflow unit within an MQSeries Workflow domain. It consists of a set of the MQSeries Workflow servers.

**system group.** A set of MQSeries Workflow systems that share the same database.

**system administrator.** (1) A predefined role that conveys all authorizations and that can be assigned to exactly one person in an MQSeries Workflow system. (2) The person at a computer installation who designs, controls, and manages the use of the computer system.

## R

**transaction coordinator.** The MQSeries queue manager is used to coordinate transactions for two-phase commit. It therefore needs to be able to connect to the Runtime database.

## U

**user ID.** An alphanumeric string that uniquely identifies an MQSeries Workflow user.

## W

**workflow.** The sequence of activities performed in accordance with the business processes of an enterprise.

**Workflow Management Coalition (WfMC).** A non-profit organization of vendors and users of workflow management systems. The Coalition's mission is to promote workflow standards for workflow management systems to allow interoperability between different implementations.

## Z

**z/OS.** Since the new version of OS/390 is named z/OS, the new version of MQSeries Workflow for OS/390 is named MQSeries Workflow for z/OS.



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## Bibliography

To order any of the following publications, contact your IBM representative or IBM branch office.

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### MQSeries Workflow publications

This section lists the publications included in the MQSeries Workflow library.

- *IBM MQSeries Workflow: Concepts and Architecture*, GH12-6285, explains the basic concepts of MQSeries Workflow. It also describes the architecture of MQSeries Workflow and how the components fit together.
- *IBM MQSeries Workflow: Getting Started with Buildtime*, SH12-6286, describes how to use Buildtime of MQSeries Workflow.
- *IBM MQSeries Workflow: Getting Started with Runtime*, SH12-6287, describes how to get started with the Client.
- *IBM MQSeries Workflow: Programming Guide*, SH12-6291, explains the application programming interfaces (APIs).
- *IBM MQSeries Workflow: Installation Guide*, SH12-6288, contains information and procedures for installing and customizing MQSeries Workflow.
- *IBM MQSeries Workflow: Administration Guide*, SH12-6289, explains how to administer an MQSeries Workflow system.
- *IBM MQSeries Workflow for z/OS: Customization and Administration*, SC33-7030, explains how to customize and administer an MQSeries Workflow for z/OS system.
- *IBM MQSeries Workflow for z/OS: Programming*, SC33-7031, explains the C, C++, Java, and Cobol application programming interfaces (APIs), and the program exits.
- *IBM MQSeries Workflow for z/OS: Messages and Codes*, SC33-7032, explains the MQSeries Workflow for z/OS system messages and codes.
- *IBM MQSeries Workflow for z/OS: Program Directory*, GI10-0483, explains how to install MQSeries Workflow for z/OS.

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### Related publications

- Frank Leymann, Dieter Roller, *Production Workflow: Concepts and Techniques* (New Jersey: Prentice Hall PTR, 1999)
- Frank Leymann, Dieter Roller, "Workflow-based Applications", *IBM Systems Journal* 36, no. 1 (1997): 102–123
- *Workflow Handbook 1997*, published in association with WfMC, edited by Peter Lawrence

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### MQSeries Workflow for z/OS publications

This section lists the publications included in the MQSeries Workflow for z/OS library.





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