Veritas™ High Availability Agent for WebSphere MQ Installation and Configuration Guide

Windows

5.0

Veritas High Availability Agent for WebSphere MQ Installation and Configuration Guide

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Contents

Introducing the Veritas High Availability Agent for WebSphere MQ

This chapter includes the following topics:

- About the High Availability agent for WebSphere MQ
- What's new in this release
- Supported software
- Agent functions

About the High Availability agent for WebSphere MQ

Veritas High Availability agents monitor specific resources within an enterprise application, determine the status of these resources, and start or stop them according to external events.

The Veritas agent for WebSphere MQ manages the WebSphere MQ Queue Managers in a clustered environment. The agent can bring a specific WebSphere MQ Queue Manager online and monitor the state of the Queue Manager. The agent can also detect failures and can shut down the Queue Manager in case of a failure.

See the following Technical Support TechNote for the latest updates or software issues for this agent:

http://seer.entsupport.symantec.com/docs/282004.htm

What's new in this release

The following change was made for this release:

■ Added support for custom WebSphereMQ authorization module.

■ Added support for VCS 5.1 on Microsoft Windows Server 2008 (x64)

Supported software

The Veritas agent for WebSphere MQ is supported in the following environments:

Veritas Cluster Server	4.3, 5.0, 5.1
Operating Systems	■ Microsoft Windows 2003 Server (32-bit) ■ Microsoft Windows Server 2003 (x64) ■ Microsoft Windows Server 2003 (IA64) ■ Microsoft Windows Server 2008 (x64)
WebSphere MQ Queue Manager	6.0, 7.0

Agent functions

Online

The online function performs the following tasks:

■ Verifies that the WebSphere MQ Queue Manager is not already online.

■ Uses an IBM provided start command to start the WebSphereMQ using the name of the Queue Manager.

■ Ensures that the WebSphere MQ Queue Manager is up and running successfully. The function uses the wait period that the OnlineTimeout attribute specifies to enable the Queue Manager to initialize fully before allowing the monitor function to probe the resource.

Offline

The offline function performs the following tasks:

■ Verifies that the WebSphereMQ Queue Manager is not already offline.

- Uses an IBM provided stop command to stop the WebSphere MQ Queue Manager using the name of the Queue Manager.

- Ensures that the WebSphereMQ Queue Manager is given enough time to go offline successfully. The function uses a wait period that the OfflineTimeout attribute specifies, to allow the WebSphereMQ Queue Manager to complete the offline sequence before allowing further probing of the resource.

Monitor

The monitor function monitors the states of the WebSphere MQ Queue Managers running on all nodes within the cluster. The monitor function can monitor the following WebSphere MQ Queue Manager components:

- Queue Manager

- Channel Initiator

- Command Server (If the CommandServer attribute is set to 1)

The monitor function performs the following tasks:

- The first level check searches for all system processes that must be running for a WebSphereMQ Queue Manager. If the first level check does not find these processes running on the node, the check exits immediately, and reports the Queue Manager as OFFLINE.

- If the SecondLevelMonitor attribute is set to greater than 0, the monitor function performs a second level check to determine the status of the WebSphereMQ Queue Manager.
  The second level check executes the runmqsc command and pings the Queue Manager to see if the manager is up and running. This check ensures that the processes are truly available for MQ Queue processing.

- Depending upon the MonitorProgram attribute, the monitor function can perform a customized check using a user-supplied monitoring utility. For details about executing a custom monitor program:
  See

Clean

In case of a failure or after an unsuccessful attempt to online or offline WebSphereMQ Queue Manager, the clean function removes any Queue Manager processes remaining in the system. The clean function performs the following tasks:

- Attempts to gracefully shut down the WebSphereMQ Queue Manager.

- If a graceful shutdown fails, the clean function looks for all the processes running for the WebSphereMQ Queue Manager, and cleans the processes.

- If the CommandServer attribute is set to 1 for WebSphere version 6.0, the clean function kills the Command Server processes associated with the WebSphere MQ Queue Manager.

Installing, upgrading, and removing the agent for WebSphere MQ

This chapter includes the following topics:

- Before you install the agent for WebSphere MQ
- Installing the VCS agent for WebSphere MQ
- Removing the VCS agent for WebSphere MQ
- Upgrading the agent for WebSphere MQ

Before you install the agent for WebSphere MQ

Ensure that you meet the following prerequisites before installing the agent for WebSphere MQ:

- Install and configure Veritas Cluster Server.
- Remove any previous version of this agent.
  See "Removing the VCS agent for WebSphere MQ" on page 14.

Installing the VCS agent for WebSphere MQ

Use the Product Installer to install the agent for WebSphere MQ.

To install the VCS agent for WebSphere MQ

1   Log into any node in the cluster as a user with domain administrative privileges.

2   Go to the directory mentioned in the following list:

Windows 2003	*cd_mount*/windows/w2k3/application/ webspheremq_agent/*vcs_version*/*version*_agent/ webspheremq_agt.5.0-GA_w2k3
Windows 2003 (IA64)	*cd_mount*/windows/w2k3IA64/application/ webspheremq_agent/*vcs_version*/*version*_agent/ webspheremq_agt.*version*-GA_w2k3IA64
Windows 2003 (x64)	*cd_mount*/windows/w2k3x64/application/ webspheremq_agent/*vcs_version*/*version*_agent/ webspheremq_agt.*version*-GA_w2k3X64
Windows 2008 (x64)	*cd_mount*/windows/w2k8x64/application/ webspheremq_agent/*vcs_version*/*version*_agent/ webspheremq_agt.*version*-GA_w2k8X64

3   Double-click **vrtsvcswebspheremq.msi**.

Follow the instructions that the install program provides, to complete the installation of Veritas agent for WebSphere MQ.

Removing the VCS agent for WebSphere MQ

Perform the following procedure to uninstall the agent for WebSphere MQ from a cluster. Perform these steps while the cluster is active.

To uninstall the VCS agent for WebSphere MQ

1   Ensure that all clustered VCS resources are offline.

2   From the cluster, remove all the resources that use the agent for WebSphere MQ.

3   Perform the following steps on each node from which you want to uninstall the agent. Ensure that you have a user with administrative privileges.

   ■ Click **Start > Settings > Control Panel**. The Control Panel window opens.

   ■ Double-click **Add/Remove Programs**. The Add or Remove Programs window opens.

   ■ From the list of programs, select vrtsvcswebspheremq.msi.

4 Click **Change/Remove**.

5 Follow the instructions that the uninstall program provides, to complete the uninstallation of WebSphere MQ.

Upgrading the agent for WebSphere MQ

To upgrade the agent, first remove the older version of the agent.

See "Removing the VCS agent for WebSphere MQ" on page 14.

Then, follow the instructions to install the new agent software.

See "Installing the VCS agent for WebSphere MQ" on page 13.

Preparing to configure the agent for WebSphere MQ

This chapter includes the following topics:

- About configuring the agent for WebSphere MQ
- Agent attributes for WebSphere MQ
- Executing a custom monitor program

About configuring the agent for WebSphere MQ

After installing the agent for WebSphere MQ, you can create and configure a WebSphere MQ Queue Manager resource. Before you configure a resource, review the attributes table that describes the WebSphere MQ Queue Manager resource type and its attributes.

Agent attributes for WebSphere MQ

Table 3-1 shows the required attributes for configuring a WebSphere MQ Queue Manager.

Table 3-1   Required attributes

Required attributes	Description
Home	The absolute path to the WebSphereMQ installation directory. This attribute is used to locate programs executed by the agent, such as strmqm.exe.
	Type and dimension: string-scalar
	Default: No default value
	Example: c:\Program Files\IBM\WebSphere MQ
Domain	Specifies the Windows domain name to which the specified user belongs. If the attribute value for User does not belong to a Windows domain, use VCS localization settings to specify the local computer name for each system.
	Type and dimension: string-scalar
	Default: No default value
	Example: ISV-DOMAIN
Password	Password for the user. Use the vcsencrypt -agent command to encrypt the password. If you are using the VCS GUI, the GUI automatically encrypts the password. Refer to the VCS documentation for more information about VCSEncrypt.
	Type and dimension: string-scalar
	Default: No default value
CommandServer	Decides whether the monitor operation must monitor the command server process or not. This attribute is applicable for WebSphere version 6.0 only.
	If you set this attribute to 1, the agent for WebSphere MQ monitors the command server process, amqpcsea. If this process faults, the agent for WebSphere MQ restarts the process.
	If you set this attribute to 0, the agent for WebSphere MQ does not monitor the amqpcsea process.
	Type and dimension: string-scalar
	Default: 0
	Example: 1

Table 3-1   Required attributes *(continued)*

Required attributes	Description
User	Windows user name of the owner of the WebSphere MQ directories and executables. The agent operations use this name to execute all WebSphere MQ commands. This user name does not have to be unique within a cluster. Do not include the domain name when specifying this attribute; use the Domain attribute to specify domain requirements. Type and dimension: string-scalar Default: mqm Example: mqusr1
MQVer	Version of the WebSphere MQ Queue Manager. Supported version is 6.0. Type and dimension: string-scalar Default: 6.0
QueueManager	Name of the WebSphere MQ Queue Manager that the cluster server manages. You must uniquely define this attribute for each Queue Manager within the cluster. This attribute also uniquely identifies the processes running for a specific WebSphere MQ Queue Manager. Type and dimension: string-scalar Default: No default value Example: venus.queue.manager

| **Table 3-1** | Required attributes *(continued)* |

Required attributes	Description
ResLogLevel	Specifies the logging detail performed by the agent for the resource.
	Valid values are:
	■ INFO: Logs error messages. ■ TRACE: Logs error and trace messages. TRACE is very verbose and should only be used during initial configuration or for troubleshooting and diagnostic operations. To see trace messages while agent entry point is executing, add value DBG_21 to LogDbg attribute of WebSphereMQ resource type and set ResLogLevel attribute value to TRACE.
	Type and dimension: string-scalar
	Default: INFO
	Example: TRACE

Table 3-2 shows the optional attributes for configuring a WebSphere MQ Queue Manager.

Table 3-2

Optional attributes	Description
MonitorProgram	Absolute path name of an external, user-supplied monitor executable. For information about setting this attribute:
	See "Executing a custom monitor program" on page 21.
	Type and dimension: string-scalar
	Default: No default value
SecondLevelMonitor	Specifies if second-level monitor is enabled and how frequently it is performed. Second-level monitor is a deeper, more thorough state check of the configured WebSphere MQ resource, performed by executing the runmqsc.exe utility.
	Type and dimension: integer-scalar
	Default: 0
	Example: 1

Executing a custom monitor program

The monitor operation executes a custom monitor program to perform a userdefined WebSphere MQ Queue Manager state check.

The monitor operation executes the MonitorProgram if the following conditions are true:

- The specified utility is a valid executable file.

- The first level process check indicates that the WebSphere MQ Queue Manager is online.

- The SecondLevelMonitor attribute is either set to 0 or 1, and the second level check indicates that the WebSphere MQ Queue Manager is online.

- The SecondLevelMonitor attribute is set to greater than 1, but the second level check is deferred for this monitoring cycle.

The monitor operation interprets the program exit code as follows:

110 or 0	WebSphere MQ Queue Manager is ONLINE
100 or 1	WebSphere MQ Queue Manager is OFFLINE
99	WebSphere MQ Queue Manager is UNKNOWN
Any other value	WebSphere MQ Queue Manager is UNKNOWN

To ensure that the custom monitor program is always available to the agent application, Symantec recommends storing the file in a directory that is available on an online node.

Configuring the service groups for WebSphere MQ Queue Manager

This chapter includes the following topics:

- About configuring a service group for the agent for WebSphere MQ
- Configuring a WebSphere MQ resource
- Configuring a WebSphere MQ Listener

About configuring a service group for the agent for WebSphere MQ

To provide high availability for WebSphere MQ components, you must configure WebSphere MQ in a clustered environment and use the Veritas agent for WebSphere MQ to manage the Queue Manager components.

Configuring a WebSphere MQ resource

In a clustered environment, you can configure a WebSphere MQ resource using two methods:

Active-Passive configuration

The Active-Passive configuration is an easier method of configuration. This method limits the configuration to one service group running a WebSphere MQ Queue Manager on a particular node at one time.

The Active-Active configuration allows multiple service groups running WebSphere MQ Queue Managers on a particular node simultaneously. This configuration incurs additional complexity in configuration and maintenance.

Active-Passive configuration

In an active-passive configuration, all WebSphere MQ Queue Managers running on a single node are configured under a single service group. In case of a failure of any queue manager component, the whole service group fails over to the other node in a cluster.

Perform the following steps on the node that hosts the service group:

To configure a WebSphere MQ Queue Manager using active-passive configuration

1   Ensure that a file system is located on a shared disk.

 This file system must be in the same service group in which the WebSphere MQ Queue Manager is to be created.

 Mount location should be same on all clustered nodes.

2   Use the WebSphere MQ tools to create the WebSphere MQ Queue Manager.

 Refer to the WebSphere MQ documentation for details.

3   Define this WebSphere MQ Queue Manager as a resource in the service group.

 See "Sample configuration for WebSphere MQ" on page 32.

You can now create additional Queue Managers on the same node on which the service group is currently online.

Ensure that you always define the additional Queue Manager as a cluster server resource in the same service group where other Queue Managers are defined.

Active-Active configuration

In an active-active configuration, you can configure each WebSphere MQ Queue Manager in a separate service group, and each Queue Manager can fail over independent of each other. This configuration is complex to implement and maintain. However, this configuration provides the flexibility that some applications may require. This method also supports many-to-one and many-to-many cluster configurations.

Perform the following steps on the node that hosts the service group to which the WebSphere MQ Queue Manager belongs.

To configure a WebSphere MQ Queue Manager using active-active configuration

1   Use the WebSphere MQ tools to create the WebSphere MQ Queue Managers that you require. Refer to the WebSphere MQ documentation for details.

2   Create a file system for each WebSphere MQ Queue Manager on the shared disk. Add each file system to a separate service group.

    See "Sample configuration for WebSphere MQ" on page 32.

3   Move the log directory (for example, C:\Program Files\IBM\WebSphere MQ\log*QueueManagerName*) to a directory on each file system on the shared disk. Ensure that you copy the sub-directories also.

    ■   Take a backup of the contents of the log directory for the queue manager at some other location.

    ■   Make sure that the log directory is empty.

    ■   Create mount points for shared storage.

    ■   Restore the content of the log directory from the backup location, on to a directory on shared storage.

4   Move the qmgr directory (for example, C:\Program Files\IBM\WebSphere MQ\Qmgrs*QueueManagerName*) to a directory on each file system on the shared disk. Ensure that you copy the sub-directories also.

    ■   Take a backup of the contents of the qmgr directory for the Queue Manager at some other location.

    ■   Make sure that the qmgr directory is empty.

    ■   Create mount points for shared storage.

    ■   Restore the content of the qmgr directory from the backup location, on to a directory on shared storage.

5   Define the Queue Managers as resources in separate service groups.

    See "Sample configuration for WebSphere MQ" on page 32.

Note: WebSphere MQ can run on many nodes in the cluster. These nodes are defined in the SystemList attribute. Replicate the registry information for newly created queue manager from the node in which the queue manager is created to all other clustered nodes. The replicated registry key is:
HKLM\Software\IBM\MQseries\CurrentVersion\Configuration\QueueManager*QueueManager NAME*

Configuring a WebSphere MQ Listener

A WebSphere MQ Queue Manager uses a Listener to listen for requests on a specific IP address. You must configure a Listener resource in the cluster using a bundled process agent. A example listener resource configuration is shown as follows.

You can replace these values with the virtual IP address and Queue Manager name defined within the cluster.

```
Process mq_listener (
Critical = 1
StartProgram = "\"C:\\Program Files\\IBM\\WebSphere
MQ\\bin\\runmqlsr.exe\" -r -m QM_57 -t TCP"
StopProgram = "\"C:\\Program Files\\IBM\\WebSphere
MQ\\bin\\endmqlsr.exe\" -m QM_57"
UserName = administrator
Password = FTLrITi
Domain = isv-domain
)
```

For details about the WebSphere MQ listener, refer to the IBM WebSphere MQ documentation.

Troubleshooting the agent for WebSphere MQ

This chapter includes the following topics:

- Using correct software and operating system versions
- Meeting prerequisites
- Configuring WebSphere MQ Queue Manager resources
- Starting the WebSphere MQ Queue Manager outside a cluster
- Monitoring WebSphere MQ Queue Manager processes
- Reviewing error log files

Using correct software and operating system versions

Ensure that no issues arise due to incorrect software and operating system versions. For the correct versions of operating system and software to be installed on the resource systems:

See "Supported software" on page 10.

Meeting prerequisites

Before installing the Veritas agent for WebSphere MQ, double check that you meet the prerequisite requirements. For a list of prerequisites:

See "Before you install the agent for WebSphere MQ" on page 13.

Configuring WebSphere MQ Queue Manager resources

Before using an WebSphere MQ Queue Manager resource, ensure that you configure the agent attributes correctly. For more information,

See "Agent attributes for WebSphere MQ" on page 17.

Starting the WebSphere MQ Queue Manager outside a cluster

If you face problems while working with a resource, you must disable the resource within the cluster framework. A disabled resource is not under the control of the cluster framework, and so you can test the WebSphere MQ Queue Manager independent of the cluster framework. Refer to the cluster documentation for information about disabling a resource. You can then restart the WebSphere MQ Queue Manager outside the cluster framework.

Note: Use the same parameters that the resource attributes define within the cluster framework while restarting the resource outside the framework.

A sample procedure to start a WebSphere MQ Queue Manager outside the cluster framework, is illustrated as follows:

To restart the WebSphere MQ Queue Manager outside the framework

1   Log in as an MQUser.

2   Start the WebSphere MQ Queue Manager.

    `strmqm Queue Manager Name`

    If the WebSphere MQ Queue Manager works properly outside the cluster framework, you can then attempt to implement the Queue Manager within the cluster framework.

Monitoring WebSphere MQ Queue Manager processes

The agent for WebSphere MQ monitors the following processes:

■   amqzxma0.exe

■   amqzmuc0.exe

■   amqzmur0.exe

■   amqrrmfa.exe

- amqzdmaa.exe
- runmqchi.exe
- amqpcsea.exe

Reviewing error log files

If you face problems while using the WebSphere MQ Queue Manager or the agent for WebSphere MQ, use the error log files described in this section to investigate the problems. Contact Symantec help for more information.

Reviewing VCS log files

In case of problems while using the agent for WebSphere MQ, you can also access the VCS engine log file for more information about a particular resource.

The VCS engine log file is c:\program files\veritas\cluster server\log\engine_A.txt.

Using WebSphere MQ log files

If the WebSphere MQ Queue Manager has problems, you can access the server log files to further diagnose the problem. The WebSphere MQ Queue Manager log files are located in the Queue Manager Home\qmgrs*Queue Manager Name*\errors directory.

Using trace level logging

The ResLogLevel attribute controls the level of logging that is written in a cluster log file for each WebSphere MQ Queue Manager resource. You can set this attribute to TRACE, which enables very detailed and verbose logging. If you set ResLogLevel to TRACE, a very high volume of messages is produced. Symantec recommends that you must localize the ResLogLevel attribute for particular resource.

To localize ResLogLevel attribute for a resource

1   Identify the resource for which you want to enable detailed logging.

2   Localize the ResLogLevel attribute for the identified resource:

```
# hares -local Resource_Name ResLogLevel
```

3   Set the ResLogLevel attribute to TRACE for the identified resource:

```
# hares -modify Resource_Name ResLogLevel TRACE -sys SysA
```

4   Note the time before you begin to operate the identified resource.

5   Test the identified resource. The function reproduces the problem that you are attempting to diagnose.

6   Note the time when the problem is reproduced.

7   Set the ResLogLevel attribute back to INFO for the identified resource:

```
# hares -modify Resource_Name ResLogLevel INFO -sys SysA
```

8   Review the contents of the VCS engine output log file. Use the time noted in Step 4 and Step 6 to diagnose the problem.

Contact Symantec support for more help.

Sample Configurations

This appendix includes the following topics:

- About the sample configuration for the agent for WebSphere MQ

- Sample agent type definition

- Sample configuration for WebSphere MQ

- Sample service group configuration for WebSphere MQ

About the sample configuration for the agent for WebSphere MQ

The sample configuration depicts the resource types, resources, and resource dependencies within the Service Group. Review these dependencies carefully before configuring the agent for WebSphere MQ. For more information about these resource types, see the *Veritas Cluster Server Bundled Agents Reference Guide*.

Sample agent type definition

A sample agent type definition is shown as follows:

```
type WebSphereMQ (
 static str ArgList[] = { ResLogLevel, State, IState,
QueueManager, CommandServer, Domain, User, Password, MQVer, Home,
SecondLevelMonitor, MonitorProgram }
 str ResLogLevel = INFO
 str QueueManager
 boolean CommandServer = 0
 str Domain
```

```
str User
str Password
str MQVer = "6.0"
str Home
int SecondLevelMonitor
str MonitorProgram
)
```

Sample configuration for WebSphere MQ

A sample main.cf file is shown as follows:

```
include "types.cf"
include "WebSphereMQTypes.cf"
cluster SFWHA50 (
UserNames = { admin = gpqIpkPmqLqqOyqKpn, a = jQQk }
Administrators = { admin, a }
)
system systemA (
)
system systemB (
)
group mqgrp (
SystemList = { systemA = 0, systemB = 1 }
)
MountV mq_qmgr_mnt (
MountPath = "C:\\Program Files\\IBM\\WebSphere
MQ\\Qmgrs\\QM_57"
VolumeName = mq_qmgr_vol
VMDGResName = mq_qmgr_dg
ForceUnmount = ALL
)
MountV mq_log_mnt (
MountPath = "C:\\Program Files\\IBM\\WebSphere
MQ\\log\\QM_57"
VolumeName = mq_log_vol
VMDGResName = mq_log_dg
ForceUnmount = ALL
)
Process mq_listener (
StartProgram = "\"C:\\Program Files\\IBM\\WebSphere
MQ\\bin\\runmqlsr.exe\" -r -m QM_57 -t TCP"
StopProgram = "\"C:\\Program Files\\IBM\\WebSphere
```
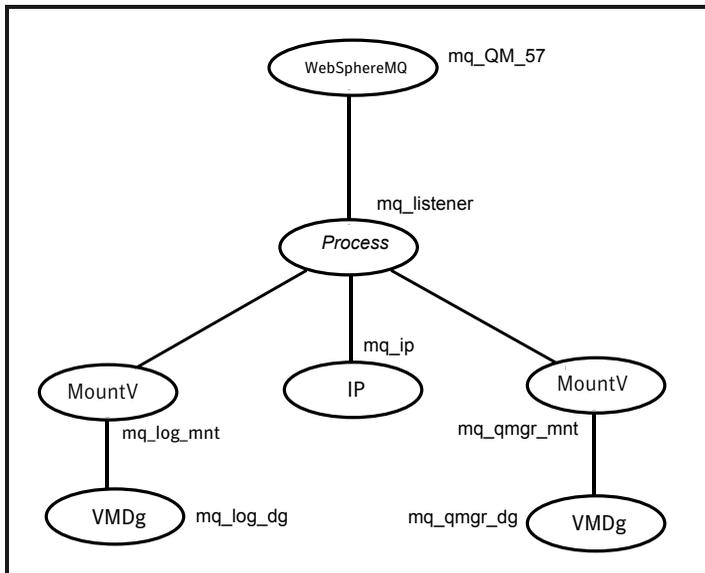
```
MQ\\bin\\endmqlsr.exe\" -m QM_57"
UserName = administrator
Password = FTLrITi
Domain = isv-domain
)
VMDg mq_qmgr_dg (
DiskGroupName = mq_qmgr_dg
DGGuid = c844de2f-efbc-431f-b6dd-9a5abc6ece55
)
VMDg mq_log_dg (
DiskGroupName = mq_log_dg
DGGuid = "0dd2cb27-b7e3-4f72-a6a5-2b0e80b90b31"
)
WebSphereMQ mq_queuemgr_QM_57 (
QueueManager = QM_57
CommandServer = 1
Domain = isv-domain
User = administrator
Password = HVNtKVk
Home = "C:\\Program Files\\IBM\\WebSphere MQ"
SecondLevelMonitor = 1
)
mq_qmgr_mnt requires mq_qmgr_dg
mq_log_mnt requires mq_log_dg
mq_queuemgr_QM_57 requires mq_listener
mq_listener requires mq_qmgr_mnt
mq_listener requires mq_log_mnt
// resource dependency tree
//
// group mqgrp
// {
//  WebSphereMQ mq_queuemgr_QM_57
//  {
//    Process mq_listener
//    {
//     MountV mq_qmgr_mnt
//     {
//      VMDg mq_qmgr_dg
//     }
//     MountV mq_log_mnt
//     {
//      VMDg mq_log_dg
//     }
```

```
//      }
//    }
//  }
```

Sample service group configuration for WebSphere MQ

Figure A-1 depicts a typical service group configuration for WebSphere MQ Queue Manager.

Figure A-1   Service group configuration

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