

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

AIX, HP-UX, Linux, Solaris

5.1

Veritas High Availability Agent for WebSphere MQ Installation and Configuration Guide

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Introducing the Veritas High Availability Agent for WebSphere MQ

This chapter includes the following topics:

- [About the Veritas agent for WebSphere MQ](#)
- [What's new in this agent](#)
- [Supported software](#)
- [WebSphere MQ agent functions](#)

About the Veritas agent for WebSphere MQ

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

The Veritas agent for WebSphere MQ provides high availability for all WebSphere MQ Queue Managers in a cluster. 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 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 agent

The enhancements in this release of WebSphere MQ agent are as follows:

- Added support for AIX 6.1 on pSeries.
- Added support for SUSE Linux Enterprise Server 9.

For information on the changes introduced in the previous releases,
See [“Changes introduced in previous releases”](#) on page 49.

Supported software

The Veritas agent for WebSphere MQ supports the following software versions:

Veritas Cluster Server	<ul style="list-style-type: none">■ AIX–VCS 4.0, 5.0■ HP-UX–VCS 4.1, 5.0■ Linux–VCS 4.0, 4.1, 5.0■ Solaris–VCS 4.0, 4.1, 5.0 <p>and all intermediate Maintenance Packs of these releases.</p>
Veritas Cluster Server One	VCS One 2.0 on AIX, HP-UX, Linux, and Solaris
ACC Library	<p>5.1 and later</p> <p>Review the ACC Library version for i18n support.</p> <p>See “Prerequisites for enabling i18n support” on page 14.</p>
Operating Systems	<ul style="list-style-type: none">■ AIX 5.1, 5.2, 5.3, 6.1 on pSeries■ HP-UX 11i version 2, HP-UX 11i version 3■ Red Hat Enterprise Linux 3.0, 4.0, 5.0 on Intel■ SUSE Linux Enterprise Server 9, 10■ Solaris 8, 9, 10 on SPARC and x86 <p>Note: The agent supports zones on Solaris in both VCS and VCS One environments.</p>
WebSphere MQ Queue Manager	<p>5.3, 6.0, 7.0</p> <p>and all intermediate minor versions of these releases.</p>

WebSphere MQ agent functions

The agent consists of resource type declarations and agent executables. The agent executables are organized into online, offline, monitor, and clean functions.

Online

The online function performs the following tasks:

- Verifies that the WebSphereMQ is not already online.
- Uses an IBM provided start script to start the WebSphereMQ using the name of the Queue Manager.
You can also configure the online function to source a shell script or a program that the EnvFile attribute specifies. This script or program ensures that the required shell environment variables are properly set before executing the start script.
- Ensures that the WebSphereMQ Queue Manager is up and running successfully. The operation 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 script to stop the WebSphereMQ Queue Manager using the name of the Queue Manager.
You can also configure the offline function to source a shell script or a program that the EnvFile attribute specifies. This script or program ensures that the required shell environment variables are properly set before executing the stop script.
- Ensures that the WebSphereMQ Queue Manager is given enough time to go offline successfully. The operation 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 WebSphereMQ Queue Managers running on all nodes within the cluster.

The monitor function can monitor the following WebSphereMQ Queue Manager components:

- Queue Manager
- Channel Initiator
- Command Server (If the CommandServer attribute is set to 1)

The 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 [“Executing a customized monitoring program”](#) on page 30.

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 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.
- The clean function executes the IBM supplied utility, `amqiclen` to clean the IPC resources that are associated with the WebSphereMQ Queue Manager.
- If the CommandServer attribute is set to 1 for WebSphere MQ version 6.0 or later, the clean function kills the Command Server processes associated with the WebSphereMQ Queue Manager.

Installing, upgrading, and removing the agent for WebSphere MQ

This chapter includes the following topics:

- [Before you install the Veritas agent for WebSphere MQ](#)
- [Installing the ACC library](#)
- [Installing the agent in a VCS environment](#)
- [Installing the agent in a VCS One environment](#)
- [Removing the agent in a VCS environment](#)
- [Removing the agent in a VCS One environment](#)
- [Removing the ACC library](#)
- [Upgrading the agent in a VCS environment](#)
- [Upgrading the agent in a VCS One environment](#)

Before you install the Veritas agent for WebSphere MQ

You must install the Veritas agent for WebSphere MQ on all the systems that will host a WebSphere MQ Queue Manager service group.

Ensure that you meet the following prerequisites to install the agent for WebSphere MQ.

For VCS, do the following:

- Install and configure Veritas Cluster Server.
For more information on installing and configuring Veritas Cluster Server, refer to the *Veritas Cluster Server Installation Guide*.
- Remove any previous version of this agent.
To remove the agent,
See [“Removing the agent in a VCS environment”](#) on page 20.
- Install the latest version of ACC Library.
To install or update the ACC Library package, locate the library and related documentation on the agentpack disc.
See [“Installing the ACC library”](#) on page 16.

For VCS One, do the following:

- Install and configure Veritas Cluster Server One.
For more information on installing and configuring Veritas Cluster Server One, refer to the *Veritas Cluster Server One Installation Guide*.
- Remove any previous version of this agent.
To remove the agent,
See [“Removing the agent in a VCS One environment ”](#) on page 21.

Prerequisites for enabling i18n support

Perform the following steps to enable i18n support to the agent:

- Install ACCLib version 5.1.2.0 or later.
You can find the latest version of ACCLib on the agent pack disc at the following location:

Platform	Location
AIX	cd1/platform/application/acc_library/vcs/version_library/pkgs/
HP-UX	cd1/platform/arch_dist/application/acc_library/vcs/version_library/pkgs/ where <i>arch_dist</i> takes the value 'generic'
Linux	cd1/platform/arch_dist/application/acc_library/vcs/version_library/rpms/ where <i>arch_dist</i> takes the value 'generic'

Solaris `cd1/platform/arch_dist/application/acc_library/vcs/version_library/pkgs/`
where *arch_dist* takes the following values:
'sparc' for Solaris SPARC
'sol_x64' for Solaris x64

- Copy the latest `ag_i18n_inc.pm` module from the following location on the agent pack disc.

Note: Review the `readme.txt` for instructions to copy this module.

VCS 5.0	<code>cd1/<i>platform/arch_dist</i>/application/i18n_support/vcs/5.0</code>
VCS 4.1	<code>cd1/<i>platform/arch_dist</i>/application/i18n_support/vcs/4.1</code>
VCS 4.0	<code>cd1/<i>platform/arch_dist</i>/application/i18n_support/vcs/4.0</code>

where *arch_dist* takes the following values:
'sparc' for Solaris SPARC
'sol_x64' for Solaris x64
'generic' for HP-UX and Linux

Note: *arch_dist* is not applicable to AIX.

About ACC Library

The operations for the Veritas agent for WebSphere MQ depend on a set of Perl modules known as the ACC library. The library must be installed on each system in the cluster that will run the agent for WebSphere MQ. The ACC library contains common, reusable functions that perform tasks, such as process identification, logging, and system calls.

Note: If you are installing the agent for WebSphere MQ in a VCS 5.0 or VCS One environment, do not install the ACC library package separately. If you are installing the agent in a VCS 4.x environment, you must install the ACC library package before installing the agent.

Installing the ACC library

Install the ACC library on each system in the cluster that runs an agent that depends on the ACC library.

To install the ACC library

- 1 Log in as superuser.
- 2 Navigate to the pkgs directory (the pkgs directory on the CD).

AIX	<code>cd_mount/aix/application/acc_library/vcs/version_library/pkgs</code>
HP-UX	<code>cd_mount/hpux/generic/application/acc_library/vcs/version_library/pkgs</code>
Linux	<code>cd_mount/linux/generic/application/acc_library/vcs/version_library/rpms</code>
Solaris	<code>cd_mount/solaris/dist_arch/application/acc_library/vcs/version_library/pkgs</code> where <i>dist_arch</i> is sparc or sol_x64.

- 3 Install the package. Enter **Yes** if asked to confirm overwriting of files in the existing package.

AIX	<code># installp -ac -d VRTSacclib.rte.bff VRTSacclib.rte</code>
HP-UX	<code># swinstall -s 'pwd' VRTSacclib</code>
Linux	<code># rpm -i \</code> <code>VRTSacclib-VersionNumber-GA_GENERIC.noarch.rpm</code>
Solaris	<code># pkgadd -d . VRTSacclib</code>

- 4 For HP-UX, install the HP-UX patch PHCO_29042 if it is not already installed.

Installing the agent in a VCS environment

Install the agent for WebSphere MQ on each node in the cluster.

Note: The agent package VRTSmq6 includes the Veritas agents for WebSphere MQ and WebSphere MQ FTE. So, the following procedure to install the agent for WebSphere MQ installs the agent for WebSphere MQ FTE also.

To install the agent in a VCS environment

- 1** Log in as superuser.
- 2** Navigate to the directory containing the package for the platform running in your environment.

AIX	<code>cd_mount/aix/application/webspheremq_agent/ vcs_version/version_agent/pkg</code>
HP-UX	<code>cd_mount/hpux/generic/application/webspheremq_agent/ vcs_version/version_agent/pkg</code>
Linux	<code>cd_mount/linux/generic/ application/webspheremq_agent/vcs_version/ version_agent/rpms</code>
Solaris	<code>cd_mount/solaris/dist_arch/application/ webspheremq_agent/vcs_version/version_agent/pkg</code>

Where *dist* is the Solaris distribution and *arch* is the Solaris processor architecture.

- 3** Install the package.

AIX	<code># installp -ac -d VRTSmq6.rte.bff VRTSmq6.rte</code>
HP-UX	<code># swinstall -s `pwd` VRTSmq6</code>
Linux	<code># rpm -ihv \ VRTSmq6-AgentVersion-GA_GENERIC.noarch.rpm</code>
Solaris	<code># pkgadd -d . VRTSmq6</code>

Installing the agent in a VCS One environment

You must install the agent for WebSphere MQ on all the client systems of the server farm that will host the WebSphere MQ service group. The installagpack program enables you to install the agent for WebSphere MQ along with the other agents that the Veritas High Availability Agent Pack includes.

The installation of the agent packs typically involves the following phases:

- Installing the agent packages
See [“Installing the agent packages”](#) on page 18.
- Adding the agent resource type definitions
See [“Adding the agent resource type definitions”](#) on page 19.

Note: The `installagpack` program supports only the `-addtypes`, `-rmtypes`, `-responsefile`, and `-rsh` options. Symantec recommends that you do not use any of the other options from the `installagpack` command help output.

Installing the agent packages

Perform the following steps to add the agent packages on one or more client systems of a specific platform type.

Note: The agent package `VRTSmq6` includes the Veritas agents for WebSphere MQ and WebSphere MQ FTE. So, the following procedure to install the agent for WebSphere MQ installs the agent for WebSphere MQ FTE also.

To install the Veritas high availability agents in a VCS One environment

- 1 Mount the VCS One Agent Pack software disc on the client system where you plan to run the installation.
- 2 Depending on the platform type, navigate to the directory containing the installer for the VCS One agents:

AIX	<code># cd aix/high_availability_agents</code>
HP-UX	<code># cd hpuxos_version/high_availability_agents</code> Where <code>os_version</code> is the HP-UX version.
Linux	<code># cd linux/dist_arch/high_availability_agents</code> Where <i>dist</i> is the Linux distribution and <i>arch</i> is the architecture.
Solaris	<code># cd solaris/arch/high_availability_agents</code> where <i>arch</i> is the Solaris processor architecture.

- 3 Enter the command to start the agent pack installation.

```
# ./installagpack [-rsh]
```

You can use the `-rsh` option if `rsh` and `rcp` are used for communication between systems instead of the default `ssh` and `scp`. This option requires that systems be preconfigured such that the `rsh` commands between systems execute without prompting for passwords or confirmations.

- 4 Enter the name of a client system or client systems where you want to install the agents.
- 5 Review the output as the installation program installs the agent packages.
You can view installation logs in the `/var/VRTS/install/logs` directory.

Adding the agent resource type definitions

You must add the agent resource type definitions to the Policy Master database configuration. You can perform this task from any client system in the server farm.

Note: You must add the agent resource type definitions only one time per platform type.

To add the VCS One agent resource types to the PM database configuration

- 1 Set up `rsh` or `SSH` communications between the client system and the PM system.

For information on configuring `SSH` for remote communication, refer to *Veritas Cluster Server One Installation Guide*.

- 2 Make sure that the PM daemon is running.

```
# haclus -display
```

The output should show `ClusterState` is `RUNNING`.

- 3 If you have just installed the agents on VCS One client systems and still have the VCS One Agent Pack software disc mounted, skip to step 6.
- 4 Mount the VCS One Agent Pack software disc.

- 5 Depending on the platform type, navigate to the directory containing the installer for the agents:

AIX	<code>cd aix/high_availability_agents</code>
HP-UX	<code>cd hpux/hpux<os_version>/high_availability_agents</code>
Linux	<code>cd linux/dist_arch/high_availability_agents</code> Where <i>dist</i> is the Linux distribution and <i>arch</i> is the architecture.
Solaris	<code>cd solaris/dist_arch/high_availability_agents</code> where <i>dist</i> is distribution and <i>arch</i> is the Solaris processor architecture.

- 6 Enter the command to start the agent pack installer for adding resource types to the Policy Master configuration database. Use the `-addtypes` option.

```
# ./installagpack -addtypes
```

- 7 When the installer prompts, enter the virtual IP address of the Policy Master.
- 8 Review the output as the installer verifies communication with the Policy Master system.
- 9 Review the output as the installer adds the agent types to the PM database configuration and copies the appropriate `types.xml` files to the PM system.
You can view installation logs in the `/var/VRTS/install/logs` directory.

Removing the agent in a VCS environment

You must uninstall the agent for WebSphere MQ from a cluster while the cluster is active.

Warning: The agent package VRTSmq6 includes the Veritas agents for WebSphere MQ and WebSphere MQ FTE. So, the following procedure to remove the agent for WebSphere MQ removes the agent for WebSphere MQ FTE also.

To uninstall the agent in a VCS environment

- 1 Log in as a superuser.
- 2 Set the cluster configuration mode to read/write by typing the following command from any node in the cluster:

```
# haconf -makerw
```

- 3 Remove all WebSphere MQ Queue Manager resources from the cluster. Use the following command to verify that all resources have been removed:

```
# hares -list Type=WebSphereMQ6
```

- 4 Remove the agent type from the cluster configuration by typing the following command from any node in the cluster:

```
# hatype -delete WebSphereMQ6
```

Removing the agent's type file from the cluster removes the include statement for the agent from the main.cf file, but the agent's type file is not removed from the cluster configuration directory. You can remove the agent's type file later from the cluster configuration directory.

- 5 Save these changes. Then set the cluster configuration mode to read-only by typing the following command from any node in the cluster:

```
# haconf -dump -makero
```

- 6 Use the platform's native software management program to remove the agent for WebSphere MQ from each node in the cluster.

Execute the following command to uninstall the agent:

AIX	# installp -u VRTSmq6.rte
HP-UX	# swremove VRTSmq6
Linux	# rpm -e VRTSmq6
Solaris	# pkgrm VRTSmq6

Removing the agent in a VCS One environment

Make sure you have disabled the agent on all client systems before you remove the service group, the resource type, or both from the VCS One configuration.

You can remove all the VCS One packages that the installagpack program installed, or remove only the VCS One agent package for WebSphere MQ. Removing the agent involves removing the agent files from each client system where you installed. Before you attempt to remove the agent, make sure the application service group is not ONLINE.

See [“Removing the VCS One agent package for WebSphere MQ”](#) on page 23.

You can remove the agent type definition from the Policy Master system after removing the agent packages.

Removing all the VCS One agent packages

You can remove all the VCS One agent packages that the installagpack program installed using the uninstallagpack program.

Note: The uninstallagpack program supports only the `-responsefile` and `-rsh` options. Symantec recommends that you do not use any of the other options from the `uninstallagpack` command help output.

To remove all the VCS One agent packages from client systems

- 1 Mount the VCS One Agent Pack software disc on the client system where you plan to run the uninstallagpack program.
- 2 Depending on the platform type, navigate to the directory containing the uninstaller for the VCS One agents:

AIX # `cd aix/high_availability_agents`

HP-UX # `cd hpuxos_version/high_availability_agents`

Where *os_version* is the HP-UX version.

Linux # `cd linux/dist_arch/high_availability_agent`

Where *dist* is the Linux distribution and *arch* is the architecture.

Solaris # `cd solaris/arch/high_availability_agents`

Where *arch* is the architecture.

- 3 Start the uninstallagpack program.

`./uninstallagpack`

- 4 Enter the name of the client systems on which you want to uninstall the agent pack. The names must be separated by spaces.
- 5 Review the output as the program verifies the agent pack that you installed and removes the agent packages.

You can view logs in the `/var/VRTS/install/logs` directory.

Removing the VCS One agent package for WebSphere MQ

You must remove the VCS One agent for WebSphere MQ from each client system in the server farm.

To remove the VCS One agent for WebSphere MQ from a client system

- ◆ Type the following command on each client system to remove the agent. Answer prompts accordingly:

AIX	<code># installp -u VRTSmq6</code>
HP-UX	<code># swremove VRTSmq6</code>
Linux	<code># rpm -e VRTSmq6</code>
Solaris	<code># pkgrm VRTSmq6</code>

Removing the agent type definition from the Policy Master system

After you remove the agent packages, you can remove the agent type definitions for all the agents for specific agents from the Policy Master system.

To remove the agent type definition from the Policy Master system

- 1 Navigate to the following directory on the client system.

```
# cd /opt/VRTS/install
```

- 2 Run the following command to remove the agent type definition from the Policy Master system:

```
# ./installagpack -rmtypes
```

- 3 When the installer prompts, enter the virtual IP address of the Policy Master.
- 4 Choose whether to remove the type definitions for all the agents or for specific agents. Follow the installer prompts to remove the type definitions.

You can view logs in the `/var/VRTS/install/logs` directory.

Removing the ACC library

Perform the following steps to remove the ACC library.

To remove the ACC library

- 1 Ensure that all agents that use ACC library are removed.
- 2 Run the following command to remove the ACC library package.

```
AIX                # installp -u VRTSacclib.rte
HP-UX              # swremove VRTSacclib
Linux              # rpm -e VRTSacclib
Solaris            # pkgrm VRTSacclib
```

Upgrading the agent in a VCS environment

Perform the following steps to upgrade the agent with minimal disruption, in a VCS environment.

Note: The agent package VRTSmq6 includes the Veritas agents for WebSphere MQ and WebSphere MQ FTE. Hence, both the agents will be upgraded as the result of upgrading the package. So, perform the following steps for the agent for WebSphere MQ FTE as well.

To upgrade the agent in a VCS environment

- 1 Persistently freeze the service groups that host the application.

```
# hagrps -freeze GroupName -persistent
```

- 2 Stop the cluster services forcibly.

```
# hstop -all -force
```

- 3 Ensure that the agent operations are stopped on all the nodes.

```
# ps -ef | grep WebSphereMQ6
```

- 4 Uninstall the agent package from all the nodes.

Refer to step 6 from,

[Removing the agent in a VCS environment](#)

- 5 Install the new agent on all the nodes.

See “[Installing the agent in a VCS environment](#)” on page 16.

- 6 Copy the new WebSphereMQ6Types.cf file from the agent's sample conf directory,

VCS 4.x /etc/VRTSvcS/conf/sample_WebSphereMQ6

VCS 5.0 /etc/VRTSagents/ha/conf/WebSphereMQ6

to the VCS conf directory /etc/VRTSvcS/conf/config.

Note: If you are using Solaris zones, copy the WebSphereMQ6Types_zones.cf file from the agent's sample conf directory.

- 7 Check for the changes in the resource values required, if any, due to the new agent types file.

Note: To note the list of changed attributes, compare the new type definition file with the old type definition file.

- 8 Start the cluster services.

```
# hastart
```

- 9 Start the agent on all nodes, if not started.

```
# haagent -start WebSphereMQ6 -sys SystemName
```

- 10 Unfreeze the service groups once all the resources come to an online steady state.

```
# hagrps -unfreeze GroupName -persistent
```

Upgrading the agent in a VCS One environment

Perform the following steps to upgrade the agent with minimal disruption, in a VCS One environment.

Note: The agent package VRTSmq6 includes the Veritas agents for WebSphere MQ and WebSphere MQ FTE. Hence, both the agents will be upgraded as the result of upgrading the package. So, perform the following steps for the agent for WebSphere MQ FTE as well.

To upgrade the agent with minimal disruption, in a VCS One environment

- 1** Freeze service groups that hosts the application.

```
# hagrps -freeze -propagate GroupName
```

- 2** Stop the clients forcibly. Execute the following command from the Policy Master.

```
# hstop -client -sys SystemName -force
```

- 3** Ensure that the agent operations are stopped on all the nodes.

```
# ps -ef | grep WebSphereMQ6
```

- 4** Uninstall the agent package from all the nodes.

Refer to step 6 from,

[Removing the agent in a VCS One environment](#)

- 5** Install the new agent on all the nodes in the cluster.

See “[Installing the agent in a VCS One environment](#)” on page 17.

- 6** Add the agent types, using the installagpack program.

- 7** Check for the changes in the resource values required, if any, due to the new agent types file.

- 8** Start the clients.

```
# hstart -client
```

- 9** Start the agent on all nodes, if not started.

```
# haagent -start WebSphereMQ6 -sys SystemName
```

- 10** Unfreeze the service groups.

```
# hagrps -unfreeze -propagate GroupName
```

Configuring the agent for WebSphere MQ

This chapter includes the following topics:

- [About configuring the Veritas agent for WebSphere MQ](#)
- [Importing the agent types files in a VCS environment](#)
- [WebSphere MQ agent attributes](#)
- [Executing a customized monitoring program](#)

About configuring the Veritas agent for WebSphere MQ

After installing the Veritas agent for WebSphere MQ, you must import the agent type configuration file. After importing this file, you can create and configure a WebSphere MQ Queue Manager resource. Before you configure a resource, review the attributes table that describes the resource type and its attributes.

To view the sample agent type definition and service groups configuration.

See [“About sample configurations for the agent for WebSphere MQ”](#) on page 43.

Importing the agent types files in a VCS environment

To use the agent for WebSphere MQ, you must import the agent types file into the cluster.

To import the agent types file using the Veritas Cluster Server graphical user interface

- 1
- Start the Veritas Cluster Manager and connect to the cluster on which the agent is installed.
- 2
- Click **File > Import Types**.
- 3
- In the Import Types dialog box, select the following file:

VCS 4.x

/etc/VRTSvcs/conf/sample_WebSphereMQ6/WebSphereMQ6Types.cf

VCS 5.0

/etc/VRTSagents/ha/conf/WebSphereMQ6/WebSphereMQ6Types.cf

- 4
- Click **Import**.
- 5
- Save the VCS configuration.

The WebSphere MQ Queue Manager agent type is now imported to the VCS engine.

You can now create WebSphere MQ Queue Manager resources. For additional information about using the VCS GUI, refer to the *Veritas Cluster Server User's Guide*.

WebSphere MQ agent attributes

Refer to the required and optional attributes while configuring the agent for WebSphere MQ Queue Manager.

[Table 3-1](#) shows the required attributes for configuring a WebSphere MQ Queue Manager.

Table 3-1 Required attributes

Required attributes	Description
CommandServer	<p>Decides whether the monitor function must monitor the command server process. This attribute is applicable for WebSphere version 6.0 and later.</p> <p>If this attribute is set 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.</p> <p>If you set this attribute to 0, the agent for WebSphere MQ does not monitor the amqpcsea process.</p> <p>Type and dimension: Boolean-scalar</p> <p>Default: 0</p> <p>Example: 1</p>

Table 3-1 Required attributes (*continued*)

Required attributes	Description
MQUser	<p>UNIX user name of the owner of the WebSphere MQ directories and executables. The agent functions use this name to execute all WebSphere MQ commands. This user name also owns the WebSphere MQ processes.</p> <p>This user name does not have to be unique within a cluster. The login shell for this user must be Bourne, Korn, or C-shell.</p> <p>Type and dimension: string-scalar</p> <p>Default: mqm</p> <p>Example: mqusr1</p>
MQVer	<p>Version of the WebSphere MQ Queue Manager. Valid values are 5.3, 6.0, and 7.0.</p> <p>Type and dimension: string-scalar</p> <p>Default: 6.0</p> <p>Example: 5.3</p>
QueueManager	<p>Name of the WebSphere MQ Queue Manager that the cluster server manages.</p> <p>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.</p> <p>Type and dimension: string-scalar</p> <p>Default: ""</p> <p>Example: venus.queue.manager</p>
ResLogLevel	<p>The logging detail performed by the agent for the resource. Valid values are:</p> <p>ERROR: Only logs error messages.</p> <p>WARN : Logs above plus warning messages.</p> <p>INFO: Logs above plus informational messages.</p> <p>TRACE: Logs above plus trace messages. TRACE is very verbose and should only be used during initial configuration or for troubleshooting and diagnostic functions.</p> <p>Type and dimension: string-scalar</p> <p>Default: INFO</p> <p>Example: TRACE</p>

[Table 3-2](#) shows the optional attributes for configuring a WebSphere MQ Queue Manager.

Table 3-2 Optional attributes

Optional attribute	Description
EnvFile	Full path to the file that the WebSphere MQ sources to set the environment variables. Type and dimension: string-scalar Default: "" Example: /was/MQ/setEnv.sh
MonitorProgram	Absolute path name of an external, user-supplied monitor executable. For information about setting this attribute: See “Executing a customized monitoring program” on page 30. Type and dimension: string-scalar Default: "" Example 1: /ibm/mq/myMonitor.sh Example 2: /ibm/mq/myMonitor.sh arg1 arg2
SecondLevelMonitor	Used to enable second-level monitoring. Second-level monitoring is a deeper, more thorough state check of the WebSphere MQ Queue Manager. The numeric value specifies how often the monitoring routines must run. 0 means never run the second-level monitoring routines, 1 means run routines every monitor interval, 2 means run routines every second monitor interval, and so on. Note: Exercise caution while setting SecondLevelMonitor to large numbers. For example, if the MonitorInterval is set to 60 seconds and the SecondLevelMonitor is set to 100, then the runmqsc command is executed every 100 minutes, which may not be as often as intended. For maximum flexibility, no upper limit is defined for SecondLevelMonitor. Type and dimension: integer-scalar Default: 0 Example: 1

Executing a customized monitoring program

The monitor function can execute a customized monitoring utility to perform an additional WebSphere MQ Queue Manager server state check.

The monitor function executes the utility specified in the MonitorProgram attribute if the following conditions are satisfied:

- The specified utility is a valid executable file.
- The first level process check indicates that the WebSphere MQ Queue Manager instance is online.

- The SecondLevelMonitor attribute is either set to 0 or 1, and the second level check indicates that the WebSphere MQ Queue Manager instance is online.
- The SecondLevelMonitor attribute is set to greater than 1, but the second level check is deferred for this monitoring cycle.

The monitor function interprets the utility exit code as follows:

110 or 0	WebSphere MQ Queue Manager server instance is online
100 or 1	WebSphere MQ Queue Manager server instance is offline
99	WebSphere MQ Queue Manager server instance is unknown
Any other value	WebSphere MQ Queue Manager server instance is unknown

To ensure that the customized utility is always available to the agent, Symantec recommends storing the file in a shared directory that is available on the online node.

Configuring the service groups for WebSphere MQ

This chapter includes the following topics:

- [Before configuring the service groups for WebSphere MQ](#)
- [Configuring service groups for WebSphere MQ Queue Managers](#)

Before configuring the service groups for WebSphere MQ

Before you configure the WebSphere MQ Queue Manager service group, you must:

- Verify that VCS is installed and configured on all nodes in the cluster where you will configure the service group.
Refer to the *Veritas Cluster Server Installation Guide* for more information.
- Verify that the Veritas agent for WebSphere MQ is installed on all failover nodes in the cluster.
See [“Installing the agent in a VCS environment”](#) on page 16.

Configuring service groups for WebSphere MQ Queue Managers

You can cluster WebSphere MQ Queue Managers in a clustered environment, and you can use the Veritas agent for WebSphere MQ to manage these components.

Configuring a WebSphere MQ resource

In a clustered environment, you can configure a WebSphere MQ resource using the following 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.

- **Active-active configuration**

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

Use this configuration only where you need WebSphere MQ Queue Managers in a clustered environment.

On the node that hosts the service group, perform the following steps:

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 is to be created.
- 2 If required, copy the WebSphere MQ default files from the local copy in to the /var/mqm directory. This directory is a WebSphere MQ configuration item that is not changeable.
- 3 Mount the file system at the /var/mqm directory.
- 4 Use the WebSphere MQ tools to create the WebSphere MQ Queue Manager. Refer to the WebSphere MQ documentation for details.
- 5 Define this WebSphere MQ Queue Manager as a resource in the service group.

See “[Sample service group configurations](#)” on page 47.

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.

On the node that hosts the service group to which the WebSphere MQ Queue Manager belongs, perform the following steps:

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 on the shared disk. Add each file system to a separate service group.

See [Figure A-1](#) on page 47.

- 3 Move the log directory from the `/var/mqm/log/QueueManager` directory to a directory on each file system. Ensure that you copy the sub-directories also.

If a period occurs in the name of the Queue Manager, replace the period with `!`. For example, if the queue name is `venus.veritas` and the filesystem is `/mq/venus`, execute the following commands:

```
# mkdir /mq/venus/log
# cp -rp /var/mqm/log/venus!veritas /mq/venus/log
```

- 4 Remove the QueueManager directory:

```
# rm -r /var/mqm/log/venus!veritas
```

- 5 Create a symbolical link between the `/var/mqm/log/QueueManager` directory and the directory on the file system on which you copied the data in step 3.

Ensure that the permissions for all the copied files, directories, and symbolic links are the same as the original files and are owned by `"mqm:mqm"`.

For example:

```
# ln -s /mq/venus/log /var/mqm/log/venus!veritas
# chown mqm:mqm /var/mqm/log/venus!veritas
```

- 6 Move the qmgr directory from the /var/mqm/qmgr/QueueManager directory to a directory on the shared file system that you created in step 1.

- 7 Ensure that you copy the sub-directories also.

If a period occurs in the name of the Queue Manager, replace the period with !. For example, if the queue name is venus.veritas and the filesystem is /mq/venus, execute the following commands:

```
# mkdir /mq/venus/qmgrs
# cp -rp /var/mqm/qmgrs/venus!veritas /mq/venus/qmgrs
```

- 8 Remove the QueueManager directory:

```
# rm -r /var/mqm/qmgrs/venus!veritas
```

- 9 Create a symbolical link between the /var/mqm/qmgrs/QueueManager directory and the directory on the file system on which you copied the data in step 6.

Ensure that the permissions for all the copied files, directories, and symbolic links are the same as the original files and are owned by "mqm:mqm".

For example:

```
# ln -s /mq/venus/qmgrs /var/mqm/qmgrs/venus!veritas
chown mqm:mqm /var/mqm/qmgrs/venus!veritas
```

- 10 Define the Queue Managers as resources in separate service groups.

See [Figure A-1](#) on page 47.

The WebSphere MQ can run on many nodes in the cluster. These nodes are defined in the SystemList attribute. On all such nodes, perform the following steps:

- Create a symbolical link between the /var/mqm/log/QueueManager and the directory in which the logs were copied in step 3.
- Create a symbolical link between the /var/mqm/qmgr/QueueManager and the directory in which the qmgr directory was copied in step 6.
- Add the following lines at the end of the /var/mqm/mqs.ini file using a text editor:

```
QueueManager:
    Name=QueueManager
```

```
Prefix=/var/mqm  
Directory=QueueManager
```

If all these nodes are to handle the queues, then copy the /var/mqm/mqs.ini file from the first node to all other nodes.

Follow these steps whenever you want to add new WebSphere MQ Queue Managers in the cluster.

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 application agent.

An example listener resource configuration is shown as follows. In this example, the virtual IP address is set to 1.2.3.4 and the Queue Manager name is venus.veritas.

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

```
Application was4WSMQ_listen  
(  
  User          = mqm  
  StartProgram  = "/opt/mqm/bin/runmqslr -t tcp  
                  -i 1.2.3.4 -m venus.veritas &"  
  StopProgram   = "/opt/mqm/bin/endmqslr -m venus.veritas"  
  MonitorProcesses = {" /opt/mqm/bin/runmqslr -t tcp  
                      -i 1.2.3.4 -m venus.veritas" }  
)
```

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

Troubleshooting the agent for WebSphere MQ

This chapter includes the following topics:

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

Using the 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 agent for WebSphere MQ, double check that you meet the prerequisites.

For example, you must install the ACC library on VCS before installing the agent for WebSphere MQ.

See [“Before you install the Veritas agent for WebSphere MQ”](#) on page 13.

Configuring WebSphere MQ Queue Manager resources

Before using a WebSphere MQ Queue Manager resource, ensure that you configure the resource properly. For a list of attributes used to configure all WebSphere MQ Queue Manager resources, refer to the agent attributes.

Starting the WebSphere MQ Queue Manager instance 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 instance 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 instance outside the cluster framework.

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

A sample procedure to start a WebSphere MQ instance outside the cluster framework, is illustrated as follows.

To restart the WebSphere MQ Queue Manager outside the framework

- 1 Log in to the WebSphere MQ Queue Manager as an MQUser.

```
# su - MQUser
```

- 2 Start the WebSphere MQ Queue Manager.

```
# strmqm QueueManagerName
```

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:

MQ 5.3

```
"amqhasmx X_QUEUE_MANAGER_X( |\\$) ",
"amqzllp0 .*-m *X_QUEUE_MANAGER_X( |\\$) ",
"amqzlaa0 .*-m *X_QUEUE_MANAGER_X( |\\$) ",
"amqrrmfa .*-m *X_QUEUE_MANAGER_X( |\\$) ",
"runmqchi .*-m *X_QUEUE_MANAGER_X( |\\$) ",
"amqzdmaa .*-m *X_QUEUE_MANAGER_X( |\\$) ",
"amqzfuma .*-m *X_QUEUE_MANAGER_X( |\\$) ",
"amqzxma0 .*-m *X_QUEUE_MANAGER_X( |\\$) ",
```

MQ 6.0 and later

```
"amqrrmfa .*-m *X_QUEUE_MANAGER_X( |\\$) ",
"runmqchi .*-m *X_QUEUE_MANAGER_X( |\\$) ",
"amqzdmaa .*-m *X_QUEUE_MANAGER_X( |\\$) ",
"amqzfuma .*-m *X_QUEUE_MANAGER_X( |\\$) ",
"amqzxma0 .*-m *X_QUEUE_MANAGER_X( |\\$) ",
"amqzmuc0 .*-m *X_QUEUE_MANAGER_X( |\\$) ",
"amqzmur0 .*-m *X_QUEUE_MANAGER_X( |\\$) ",
```

Reviewing error log files

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

Using WebSphere MQ log files

If a WebSphere MQ Queue Manager is facing 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.

Reviewing cluster log files

In case of problems while using the agent for WebSphere MQ, you can also access the engine log file for more information about a particular resource. The engine log files are located at the following location:

- The VCS engine log file is */var/VRTSvcs/log/engine_A.log*.
- The VCS One engine log file is */var/VRTSvcsone/log/engine_A.log*.
- The VCS One client log file is */var/VRTSvcsone/log/vcsoneclientd_A.log*.

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 are produced. Symantec recommends that you localize the `ResLogLevel` attribute for a 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 log file. Use the time noted in Step 4 and Step 6 to diagnose the problem.

You can also contact Symantec support for more help.

Sample Configurations

This appendix includes the following topics:

- [About sample configurations for the agent for WebSphere MQ](#)
- [Sample agent type definition for WebSphere MQ](#)
- [Sample configuration in a VCS environment](#)
- [Sample configuration in a VCS One environment](#)
- [Sample service group configurations](#)

About sample configurations for the agent for WebSphere MQ

The sample configuration graphically 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 for WebSphere MQ

After importing the agent types into the cluster, if you save the configuration on your system disk using the `haconf -dump` command, you can find the `WebSphereMQ6Types.cf` file in the `/etc/VRTSvcs/conf/config` cluster configuration directory.

Examples of agent type definition files for different versions of VCS are as follows:

For VCS 4.x

```
type WebSphereMQ6
(
    static str ArgList[] = { ResLogLevel, State, IState,
                           QueueManager, CommandServer, MQUser,
                           MQVer, EnvFile, SecondLevelMonitor,
                           MonitorProgram }

    str ResLogLevel = INFO
    str QueueManager
    boolean CommandServer = 1
    str MQUser = mqm
    str MQVer = "6.0"
    str EnvFile
    int SecondLevelMonitor
    str MonitorProgram
)
```

For VCS 5.x

```
type WebSphereMQ6
(
    static str AgentFile = "/opt/VRTSvcs/bin/Script50Agent"
    static str AgentDirectory =
"/opt/VRTSagents/ha/bin/WebSphereMQ6"
    static str ArgList[] = { ResLogLevel, State, IState,
                           QueueManager, CommandServer, MQUser,
                           MQVer, EnvFile, SecondLevelMonitor,
                           MonitorProgram }

    str ResLogLevel = INFO
    str QueueManager
    boolean CommandServer = 1
    str MQUser = mqm
    str MQVer = "6.0"
    str EnvFile
    int SecondLevelMonitor
    str MonitorProgram
)
```

VCS One

After installing the agent, go to the /etc/VRTSagents/ha/conf/WebSphereMQ6/ directory to view the WebSphereMQ6Types.platform.xml agent definition file.

Sample configuration in a VCS environment

An excerpt from the main.cf file that includes a WebSphere MQ resource follows.

```
group WASMQ_Sol_x64 (
    SystemList = { system_A = 0, system_B = 1 }
)
    DiskGroup DG_OPT (
        DiskGroup = WAS
    )
    DiskGroup DG_VAR (
        DiskGroup = WAS
    )

    Mount Mount_OPT (
        MountPoint = "/opt/mqm"
        BlockDevice = "/dev/vx/dsk/WAS/MQ_Opt"
        FSType = vxfs
        FsckOpt = "-y"
    )

    Mount Mount_VAR (
        MountPoint = "/var/mqm"
        BlockDevice = "/dev/vx/dsk/WAS/MQ_Vol"
        FSType = vxfs
        FsckOpt = "-y"
    )

    Volume Volum_OPT (
        Volume = MQ_Opt
        DiskGroup = WAS
    )

    Volume Volume_VAR (
        Volume = MQ_Vol
        DiskGroup = WAS
    )

    WebSphereMQ6 WASMQ (
        QueueManager = MQ1
        CommandServer = 1
        MQVer = "6.0"
```

```
        SecondLevelMonitor = 5
        MonitorProgram = "/tmp/mp"
    )

Mount_OPT requires Volum_OPT

Mount_VAR requires Volume_VAR

Volum_OPT requires DG_OPT

Volume_VAR requires DG_VAR

WASMQ requires Mount_OPT

WASMQ requires Mount_VAR


// resource dependency tree
//      group WASMQ_Sol_x64
//      {
//      WebSphereMQ6 WASMQ
//      {
//      Mount Mount_OPT
//      {
//      Volume Volum_OPT
//      {
//      DiskGroup DG_OPT
//      }
//      }
//      Mount Mount_VAR
//      {
//      Volume Volume_VAR
//      {
//      DiskGroup DG_VAR
//      }
//      }
//      }
//      }
```

Sample configuration in a VCS One environment

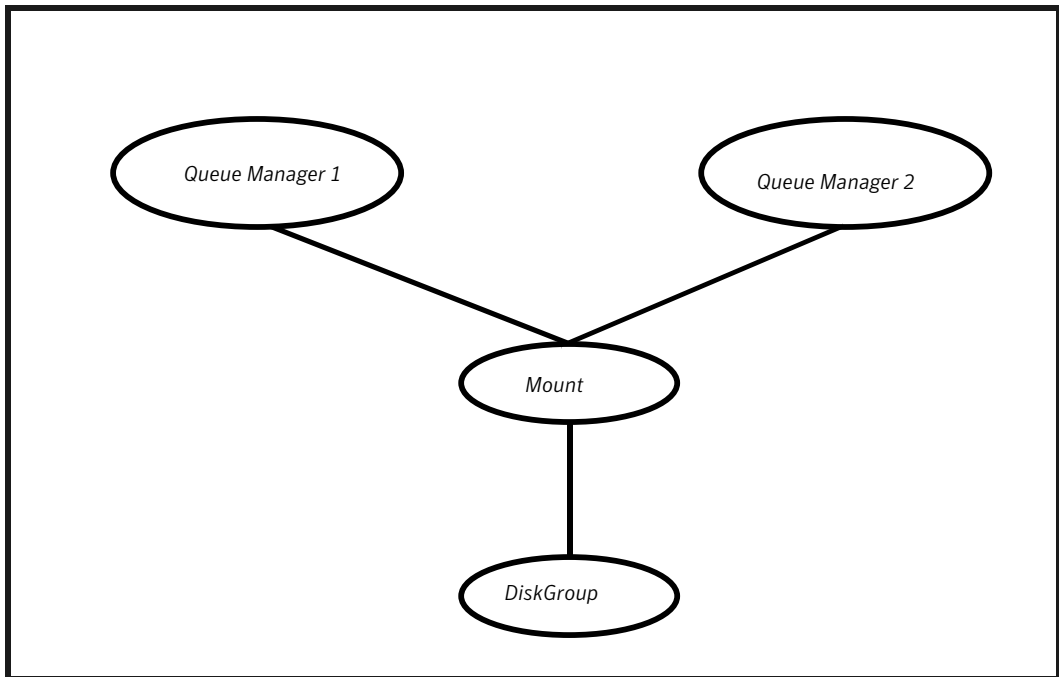
To view a sample VCS One configuration file (main.xml) with an MQ Listener and a WebSphere MQ Queue Manager, go to the `/etc/VRTSagents/ha/conf/WebSphereMQ6/` directory.

Sample service group configurations

[Figure A-1](#) shows a sample service group that shows two WebSphere MQ Queue Manager resources.

This simple configuration also requires a Mount and a Disk Group resource.

Figure A-1 Sample Service group configuration

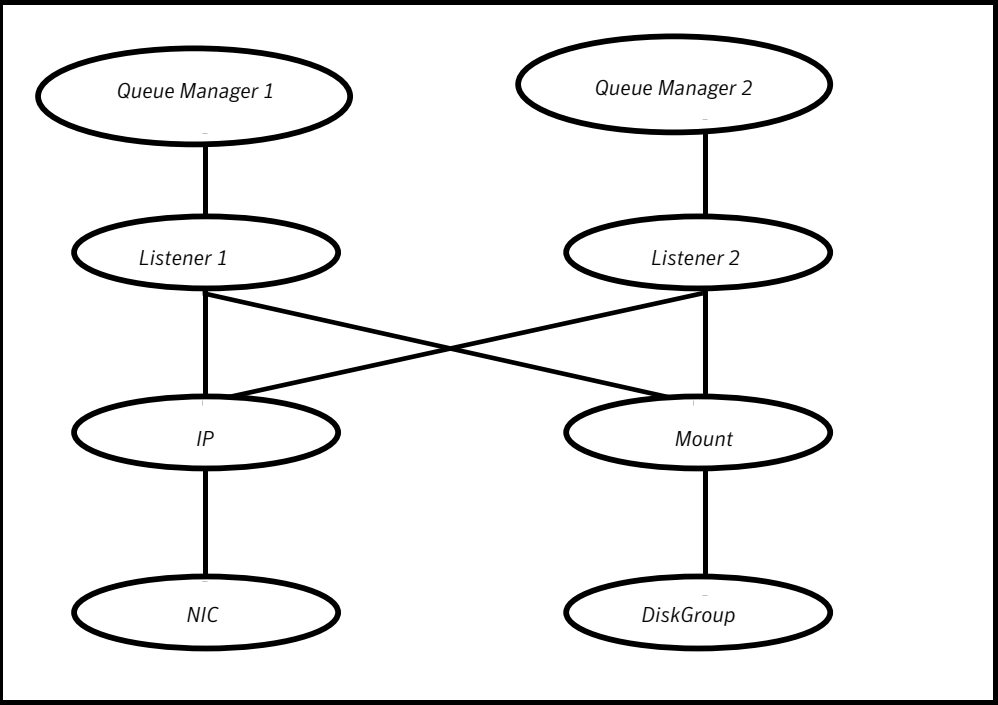


[Figure A-2](#) shows a sample service group that includes two WebSphere MQ Queue Manager resources with associated listeners.

In this example, each resource depends on a listener, which in turn depends on an IP and a Mount resource. This configuration applies to WebSphere MQ when listeners are used to provide remote services to application clients.

Figure A-2

Sample Service group configuration with listeners



Changes introduced in previous releases

This appendix includes the following topics:

- [Changes introduced in previous releases](#)

Changes introduced in previous releases

The enhancements in the previous releases of Veritas agent for WebSphere MQ agent are as follows:

- Added support for VCS One 2.0.
- Added support for WebSphere MQ version 6.0 and 7.0.
- Added support for Solaris x86 for VCS 4.1 and 5.0
- Added support for Internationalization (i18n).
- Added support for ACC library 5.0 that is compliant with VCS and VCS One.
- Added support for zones on Solaris 10 in a VCS environment.
- Added support for the First Failure Data Capture (FFDC) feature.
- Removed the following attributes:
 - MQImmediateTimeout
 - MQPreemptiveTimeout
 - FirstMonitorDelay
 - VProLogLevel
- Added the following attributes:

- MQVer
- MonitorProgram
- ResLogLevel
- CommandServer
- Added support for monitoring the Command Server for WebSphere MQ version 6.0 and later. The WebSphere MQ enables remote administration of queue managers. To facilitate this functionality, a Command Server can run within a WebSphere MQ Queue Manager. This Command Server executes commands sent to the Queue Manager.

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